Environmental Citizenship in Chilean School Textbooks
A case study on environmental citizenship education in
Chilean basic-education textbooks of 2012

by

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Abstract

The role of education in the formation of citizens, particularly from the perspective of sustainable development, has strongly influenced the Chilean environmental-education curriculum since Chile’s educational reform of the 1990s. The school textbooks provided by the Chilean Ministry of Education (MINEDUC) are an important resource for teachers and students in Chilean public and private-subsidized education. This study explores how Chilean school textbooks for basic-education (elementary years) appear to convey relationships between citizens and the environment. Apart from the Chilean context, similar studies have focused on identifying conceptions and social representations of the environment and the human-environment relationship among students, teachers, curricula, and textbooks. In this study, I specifically explore school textbooks and focus the inquiry on three aspects that appear to link environmental citizenship, sustainability, and education: awareness, values, and civic action. For the purpose of this interpretive study, I conducted a qualitative content analysis to examine the text and images in school textbooks for grades one, four, and eight for two compulsory subjects in Chile: Natural Science and History, Geography, and Social Science. These textbooks seem to represent civic-environmental relationships generally at local and national scales. The textbooks also appear to encourage environmental care mainly as an individual or personal duty and scientific attitudes, skills, and knowledge focusing mostly on material and practical aspects of the human-environmental system. The results of this study intend to advance our knowledge and understanding of how Chilean textbooks for the public and private-subsidized educational systems represent citizen-environment relationships. These representations appear to disconnect humans from dimensions that regard the environment symbolically and promote collective deliberation and participation. This study may guide interested ministries of education and publishers in the production of future school textbooks that may better foster sustainable and participative relationships between citizens and the environment.

1 In Chile, basic education refers to grades one to eight (commonly six to thirteen year old students).
Preface

This dissertation is an original and unpublished work by Victor Acuna. The textbooks analyzed in this study were provided by the Chilean Ministry of Education (MINEDUC) and all the images shown in this work have the corresponding authorization from their original publishers.
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<td>Decade of education for sustainable development</td>
</tr>
<tr>
<td>ESD</td>
<td>Education for sustainable development</td>
</tr>
<tr>
<td>MINEDUC</td>
<td>Chilean Ministry of Education</td>
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<tr>
<td>UN</td>
<td>The United Nations</td>
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<td>UNESCO</td>
<td>United Nations Educational, Scientific and Cultural Organization</td>
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Dedication

This study is in memory of Fernando Torrejon. His love and support made the project of studying abroad possible.
1. Introduction

This thesis provides a critical look at how Chilean basic education (grades 1 to 8) conveys the relationship between citizens and the environment in the school textbooks for two compulsory subjects (Natural Science and History, Geography, and Social Science), giving attention to aspects of the nature-society relation suggested by text and images. Rather than relying on specific citizenship ideologies (whether liberal, civic republican, communitarian, or cosmopolitan), this study analyzes the aforementioned textbooks focusing on the following aspects: the types of interaction appearing between citizens and the environment; citizenry participation in society toward sustainability; the norms and social structures that appear to delimit citizen participation and interaction with the environment; and the apparent promotion of awareness regarding the complexity of human-environment relations, considering their different scales and cultural determinants. To gain an appreciation of the overall curriculum for Chilean basic education in 2012, I focus on the textbooks for two mandatory subjects: Natural Science and History, Geography and Social Science for grades one (first year of basic education), four (last year of the first cycle of basic education), and grade eight (the last year of the basic education). In this chapter, I describe in broad terms the panorama of Chilean education in the context of environmental education and environmental citizenship, beginning with an explanation of the research problem and following with my own stance toward education for environmental citizenship while conducting this research.
1.1 Chilean context for environmental education and environmental citizenship

The links between environmental education and sustainable development in Chile

The international discussion on the role of education in the promotion and implementation of sustainability strongly influenced the Chilean school curriculum during the educational reform of the 1990s. This reform aimed at updating the curriculum developed during the Chilean dictatorship in the early 1980s, fostering decentralization and incorporating new pedagogic trends (Arellano 2001; Donoso 2005 for more information on the Chilean educational reform from the 1990s). The reform from the 1990s established a framework for the new curriculum that is comprised of four core objectives: “ethical training, personal growth and self-assertion, the person and her (or his) environment, and the development of the ability to think” (Arellano 2001:88). It is worth mentioning that the third objective (directly related with environmental) education specifies human-environment linkages through emphasis on an individual perspective. The implementation of a new curriculum according to the aforementioned framework also required new programs of teacher training centered, for example, on environmental education and the development of new school textbooks. This new curriculum established general objectives and cross-sectional content concerning environmental education to be implemented and taught in every subject. Based on these new objectives and content, the implementation of environmental education in the curriculum after the reform from the 1990s has been, in part, up to each school, depending on their focus and priorities.

Since the educational reform of the 1990s, the Chilean Government appeared to regard Chilean environmental education also as an important means to address the environmental objectives of the nation (UNESCO 2011:19). As a result, during the early 2000s, the Chilean Government created several initiatives aimed at integrating Education for Sustainable Development (ESD) in Chilean
school education (UNESCO 2011). These initiatives were implemented in the framework of the
*Decade of Education for Sustainable Development* (DESD) (see Arima et al. 2006; UNESCO 2005 for
more information regarding the DESD) that ran from 2005 to 2014 and was actively promoted by
UNESCO. For example, one of the Chilean initiatives created in the spirit of the DESD was the
*National Environmental School Certification System* (SNCAE). The SNCAE was aimed at fostering
awareness, values, and behavior regarding the prevention of, and solutions to, environmental
problems (Ministerio del Medio Ambiente 2014a, 2014b). The overall implementation of ESD in
Chile was later evaluated by UNESCO in 2011. This evaluation analyzed educational institutions
and recent modifications to the Chilean school curriculum, as well as other formal and informal
educational initiatives that sought to implement ESD in Chilean education. UNESCO’s analysis
examined how ESD principles were implemented in Chilean education, how the efforts to
implement ESD in Chile were coordinated, and how extensive the implementation of ESD was at
the national level at the end of the first half of the DESD. The 2011 evaluation concluded that
Chilean education had not developed effective mechanisms to assess the implementation of ESD
in *basic* and *middle* levels, and pointed out the absence of citizenship-related content in the
Chilean school curriculum (not only referring to environmental citizenship, but more broadly as
well, such as the content concerning human rights). Further, the report identified the lack of
integration of the concept of sustainable development with other content within the curriculum,
and noted the dominant presence of scientific topics in comparison to social topics in the Chilean
curriculum for basic education. The evaluation done by UNESCO in 2011 was based on an
extensive examination of Chilean institutions and curriculum for all levels (eight years of basic
education and four years of middle education), and considered several governmental initiatives in
focused on education for sustainable development. However, this evaluation does not make
specific references to the school textbooks, which are produced by private publishers based on the
curriculum elaborated by the Chilean Ministry of Education (MINEDUC). In Chilean education, there are two kinds of school textbooks: textbooks elaborated and printed by several publishers (which can be found in the market) that are used mainly by private school students, and textbooks commissioned (tender) by the MINEDUC to specific publishers each year that are used by students in the public and private-subsidize schools. This last type of textbooks is distributed by the MINEDUC every year and cannot be found in the market. The school textbooks for public and private-subsidize segments are the subject of my research.

The curricular update from 2009 that gives shape to the textbooks analyzed in this study

In this section, I explain some aspects of the curriculum in effect in 2012 to help contextualize the textbooks analyzed in this study. The curricular update from 2009 (MINEDUC 2009a) restructures guidelines established in 1996 and states the core objectives and basic mandatory content for basic education (commonly 6 to 13 year old students) and middle education (commonly 14 to 17 year old students). Particularly for basic education (the sector that concerns this study), the update from 2009 eliminates and modifies subjects that were developed since the educational reform from the 1990s. Specifically, the 2009 update eliminates the subject Comprehension of the Natural, Social, and Cultural Environment, and replaces the subjects Study and Comprehension of Nature and Study and Comprehension of Society with the traditional subjects of Natural Science (comprising physics, chemistry, and biology) and History, Geography and Social Science respectively. These two compulsory subjects are the focus of this research due to their presence across the whole curriculum for basic education and the nature of the topics they include, which comprise content concerning environmental citizenship and sustainability. The curricular guidelines made by the MINEDUC in 2009 present scarce and scattered content.
referring to sustainability, which mainly appears concentrated in the general curriculum\(^2\) for the subject *History, Geography and Social Science*. The few occasions the general curriculum for *basic education* includes sustainability appear to be associated with content and objectives on desirable attitudes and responsibility (in general terms) towards development, the impact of human activity on the environment, and the idea of citizens with critical thinking regarding the concept of national territory. The concept of environment, in turn, is mentioned in the curriculum from 2009 as a source of resources for development (mainly in the curriculum for History, Geography, and Social Sciences) and as something that has to be protected, for example in association with the idea of conservation and the notion of national patrimony (mainly in the curriculum for *Natural Sciences*). Concerning the concepts of citizen and citizenship, the Chilean curriculum for 2009 tends to associate these concepts with the idea of being a desirable and productive citizen who contributes to the development of the country, and in fewer occurrences, as citizens with rights that participate in the public aspect of society.

1.2. Research problem: the challenges for environmental-citizenship and education in the current Chilean context

In recent decades, Chile has experienced profound social changes. These changes have influenced several interconnected aspects of society, such as education, participation, inclusion, and representation. In this section, I give a brief description of how Chilean citizenship and education have been influenced by the socio-political context and the challenges this context present to environmental citizenship.

\(^2\) The General Curriculum represents the programme and objectives of a specific subject for all the grades of *basic and middle education*. 
Since the 1970s, Chile has undergone deep social and political transformations. During the dictatorship (1973-1990) and after the return of democracy, Chile (as many other countries) has undertaken neoliberalization reforms which have included decreasing State control and regulation in several fronts accompanied by increasing privatization of institutions and services (Donoso 2005; Ffrench-Davis 2003; Torres 2001; Valenzuela, Labarrera, and Rodríguez 2008). In Chile, the process of neoliberalization has influenced education through weakening public universities, opening the field for a mushrooming of new private educational institutions, and stressing the subsidiary role of the State in the case of basic education (commonly, 6 to 13 year old students) and middle education (commonly, 14 to 17 year old students) (Donoso 2005; MINEDUC 2013; Torres 2001; Valenzuela et al. 2008). Since the 1990s, the aforementioned reforms also influenced Chilean education through promoting the link between environmental education and sustainable development; consequently, shaping the curriculum and the textbooks analyzed in this study.

The Chilean socio-political context presents several challenges to environmental–citizenship education aimed at promoting sustainability. One of the challenges for education concerning environmental citizenship appears to be how the Chilean socio-political context regards education and citizenship. In a global context of conflicting views about the environment and how humans relate to it, education receives considerable attention regarding its role in fostering citizenship that can contribute to sustainability (Arima et al. 2006; UN 1992a; UNESCO 2005). However, how education accomplishes this role depends on the political context and the conceptions of education and environment that this context support. For example, if the priority of the country is boosting the economy through the exploitation of natural resources rather than focusing on technological innovation, we might argue that this context could promote a particular relation between citizens and the environment. Regarding education, conceptions such as “to govern is to educate” (famous phrase of Pedro Aguirre Cerda, Chilean President from 1938 to 1941, in his first
presidential speech on May 21st of 1939) evoke a commitment of the government to promote citizen participation in society in an era when the labour force had voice and participation through the unions. However, currently in Chile, the social transformations experienced in the last decades have shifted the conception of education, making it operate according to the rules of the market, reducing the regulation and control by the State, while opening education to free market forces (Ffrench-Davis 2003; Torres 2001). In this context, private subsidized schools have increased in number in the last decades, while public schools have decreased (Corvalán 2011; MINEDUC 2013). Currently, education appears to be conceived more as a consumer good or as a service-client relationship, situation that might be similar in other aspects of society (such as the relationship between citizens and the environment). In this context, one of the commitments to education that the government still keeps is providing free textbooks to students in the public and private-subsidized educational segments, which represent around 93 percent of the Chilean schools and students. Examining how these textbooks provided by the government convey environmental citizenship in the above described context for education is the subject of this research.

Another current challenge that Chilean education for environmental citizenship faces is the generalized apathy and distrust in the political class, which are reflected in low civic participation. This situation appears to make many people abstain from voting and look for different political formulas and representatives. The link between the lack of civic participation and the recent period of dictatorship and social clashes that Chile experienced between the 1970s and 1980s requires a deeper analysis which is beyond the scope of the present research. Issues of participation concerning the environment are also related to the policies of land-use promoted in the current Chilean socio-political context. In Chile, similar to education, priorities and decisions regarding land use are increasingly driven by the market in the last decades, a situation that has fostered extensive segregation and differences in the quality of life experience by people
These issues in the Chilean environmental-citizenship arena are tied, for example, with the struggles of Mapuche people concerning land use and citizen participation and representation on society (as also discussed further in section 2.2). For a more extensive discussion of environmental citizenship and linked key concepts, see Chapter 2.

The aforementioned Chilean socio-political context presents significant challenges to Chilean environmental-citizenship education. These challenges imply, for instance, understanding what types of citizen-environment relations the Chilean education appears to promote. Specifically regarding citizenship, the aforementioned question might inquire how Chilean education portrays the varied worldviews and relations with the environment pertaining to the diverse members of the Chilean political community. In particular, these questions aim to understand the imaginary or representations of the diverse ethnic groups living in Chile (their relations with the environment, and their participation in society) that are conveyed and reproduced in Chilean school textbooks for basic education. In view of the Chilean socio-political context, other relevant questions also arise regarding citizen participation: How is the participation of citizens (concerning the environment) portrayed by the textbooks in terms of gender, age, and ethnicity? Are the analyzed textbooks breaking the political apathy of citizens and fostering action toward sustainability? What is the normative and institutional framework that shapes citizen participation according to the content of the analyzed school textbooks? These concerns that emerge from a brief analysis of the Chilean context (described in this section) and the discussion presented in Chapter 2 may help address the main research question of this study: How are Chilean textbooks for basic education conveying the relationship between citizens and the environment?

What I expect to find through this research, considering the Chilean context described in this section (including the reforms to the curriculum in the spirit of sustainable development) and my personal experience as a student in the Chilean educational system, is that Chilean textbooks tend
to foster utilitarian relationships between citizens and the environment, and to a lesser degree, other types of relationships (such as affective and symbolic conceptions associated with indigenous beliefs). Also considering the Chilean context, I would expect that the analyzed textbooks tend to foster individual responsibilities and conceptions of the environment based on economic values and ownership, above communitarian spaces for social practices and civic participation (Harris 2011). Complementing this prediction, the findings of this study may also shed light on how issues of scale are represented in the textbooks, comprising analyses of local, national, and global dimensions of the citizen-environment relationship (see Chapter 2 for more information on scalar issues), as well as issues of representation regarding gender and ethnicity).

1.3 My stance toward education for environmental-citizenship and undertaking this research

I think it is very difficult to reconcile the present idea of development and the current rate of economic growth with the cultivation of environmental, cultural, social, and economic sustainability (further discussion on this topic in the context of environmental citizenship in Chapter 2). This task seems almost impossible in current times due to the variety of conflicting values interplaying in our society. Considering the aforementioned context, I agree with the idea that education involving values and knowledge on how nature and society interact might help to shape a more sustainable way of living. I believe that this process, however difficult, would lead us to a gradual transformation of society toward sustainability.

My stance while conducting this research coincides with some aspects of Freire’s (1976, 1986) vision of education. I think education has to foster a critical attitude in students, rather than to solely communicate facts or instill particular forms of knowledge. This critical understanding and analytical perspective should be supported by an awareness of social and environmental
circumstances based on the real-life experiences of students. Education aiming to foster a critical attitude in students should also encourage the articulation of their own opinions based on their experiences and knowledge. A critical attitude should also translate into civic action (in the context of this research, action toward sustainability) that takes into account the impact of human activity on the environment and themselves at different scales (local: school, house, and neighborhood; national and global) (see discussion on behavioral change and action in Chapter 2).

1.4 Benefits and limitations of this study

Among the eight grades of Chilean basic education, I decided to study the textbooks for the first, fourth, and eighth grades, trying to capture a broad view of how Chilean basic education appears to convey environmental citizenship through the school textbooks. I recognize that the specific curricular content of the textbooks changes for each grade, but I am confident that I am capturing a broad representation of how environmental citizenship is portrayed throughout basic-education textbooks. This is also true when we consider that the topic of environmental citizenship is not tied to any specific subject in Chilean basic and middle education.

In this study, I decided to analyze the textbooks of Natural Science and History, Geography and Social Science because these are the subjects that cluster more (and relevant) content specifically related to sustainability and citizenship according to the Chilean curriculum for 2012 (MINEDUC 2009a). In view of this, I consider that the inclusion of textbooks from other subjects (such as Maths or Language) is not relevant for the outcome of this study, despite the fact that the topics concerning environmental citizenship should be, in principle, cross-sectional to all subjects according to the curriculum for 2012.

Relevant complements to this study would be an analysis of the textbooks for all of the eight grades of basic education and a larger study that involves analyzing the Chilean textbooks since
the return of the democracy in 1990 to date—rather than capturing a single year (2012) as this study does. Another interesting complement to the current research might be a comparative study between Chilean textbooks for public and private education (see further description of the Chilean school textbooks in section 1.1). The current research may help elucidate how Chilean education appears to convey environmental citizenship at early educational stages; hence, further exploration of higher educational stages, the curriculum, and the institutional sphere (e.g. schools and Ministry of education) may help diagnose a more complete panorama of education concerning environmental citizenship in Chile.
2. Discussion Regarding Sustainability, Environmental Citizenship, and Education

This chapter explains environmental citizenship as the core theoretical perspective informing this research. Environmental citizenship discusses the current social and political contexts concerning the citizen-environment linkages at local and global scales, proposing new citizen mindsets, participation, governance, and institutions that can foster more sustainable human-environment relationships. One ideological approach of environmental citizenship centers on individuals as responsible for the cultivation of a sustainable relation with the environment. This perspective is often seen in discussions regarding the role of education in the formation of “sustainable” citizens (for more details, see the links between environmental citizenship and education explained in the next sections of this chapter). Another ideological approach in the literature appears to focus on rights, obligations, and regulations to shape the behavior of citizens. This perspective seems to rely on institutional policies, governmental regulations, and prescriptive education aimed at normative and behavioral approaches toward sustainable development. A third ideological approach regarding environmental citizenship emphasizes on the broad social changes that communities and institutions (including nation states) would have to undergo to support inclusive sustainable relations between citizens and the environment (see further discussion regarding the Latin American context for environmental citizenship in the next sections of this chapter). In this approach, the links between citizenship and education seem to focus on the promotion of values and individual and collective action that consider diverse social and cultural contexts. Later in this chapter, I will explain these different approaches to environmental citizenship and their ideological roots.
Often, education is seen as the means to foster the necessary awareness that would allow citizens to decide and act sustainably (Huckle 2008; The Earth Charter Commission 2000; UN 1992a); in other words, that acquiring a sustainable mindset is tied to a specific knowledge that can be taught. However, the complexity of sustainability seems to represent a significant challenge to environmental education. This challenge appears to include fostering awareness about the different dimensions of sustainability, the diverse cultural ways to relate to the environment, and the different scales in which sustainability impacts society. These challenges include not only forming a citizenry that can perform sustainable actions, but also a citizenry that can push to modify society toward sustainability with a sense of community (see Freire 1976, 1986 and the discussion on Freire’s pedagogy and its relation to environmental citizenship later in this chapter).

In this chapter on the environmental-citizenship theoretical framework, I first very briefly describe the concept of sustainability and the challenges that comprise its implementation. Then, I explain the potential for environmental citizenship as it relates to ongoing sustainability challenges, elaborating on several different ideological perspectives. Finally, I explore the links between education, citizenship, and sustainability from the perspective of environmental citizenship.

2.1 The concept of sustainability and key challenges with respect to citizenship and education

Sustainability is a concept with many facets and subject to varied interpretations. In this study, I understand the concept of sustainability as the perpetuation of humanity as the result of embracing a healthy life in community and a conscious relation with the environment and other species. In this sense, sustainability is an intergenerational goal that should be implemented on a global scale within a framework of equity, democracy, and awareness of the worldwide impact of
local and transnational human practices (WCED 1987). As well, sustainability goals should consider the specific cultural, political, and economic context of each place. Accordingly, sustainability is generally visualized within three interdependent and reinforcing dimensions: the environmental, social, and economic aspects or pillars (The Earth Charter Commission 2000; UN 1992a:21; 1992b; 2002a). Also, the concept of sustainability is often conceived in the context of development and economic growth, but how well these two ideas or principles coexist is a matter of intense debate.

Sustainability poses several challenges to society. The complexity of sustainability implies, for example, that we need to deal with diverse human-environment realities. In this sense, sustainability requires that society and people are aware of the scalar dimension of sustainability, the multiple aspects of sustainability (environmental, social, and economic), and the cultural subjectivities. The diverse values associated with sustainability that emerge from diverse socio-ecological relations (Hartmann 1998:340) appear to pose the challenge of defining a shared set of values to live in community and support sustainable ways of living. Also, a further obstacle to sustainability seems to be agreeing on an ethical framework for human-environment interactions at different scales (transnational, national, organizational, and individual). In this regard, Hartmann (1998) proposes to understand society and nature as interdependent aspects of a single complex system.

According to Agenda 21 (UN 1992a), to deal with the societal challenges imposed by sustainability and its implementation, societies would have to undertake some changes. Some of the envisioned changes would be, for example, dealing with modifications to wealth distribution, trading practices, production and consumption patterns, institutions, decision-making processes, and social inequities. Part of the literature that links sustainability and citizenship states that addressing the aforementioned changes would require new forms of governance and citizenship. For example, from a Green politics perspective, tackling these challenges may require governance
systems that ensure self-evaluation, deliberation, decentralization, new regulations for global interactions, and effectual citizen participation in the public sphere (Baber 2005; Huckle 2008). Alternatively, the liberal perspective believe that tackling these sustainability challenges can coexist with economic growth, but it may require new technologies and regulations to existing economic systems and current trade practices (Huckle 2008; Turner 2001). Also from a liberal perspective, the United Nations proposes to address sustainability challenges through social systems that promote equity and the conscious use of natural resources (WCED 1987). These implementations deal with sustainability challenges from a behavioral perspective instead of relying on values. Considering the aforementioned challenges, some agree on the crucial role of education in the cultivation of sustainability as an important agent for change in terms of individual behavior and values (UN 2002b). This belief inspired the creation of initiatives such as the Decade of Education for Sustainable Development (DESD) (Arima et al. 2006; UNESCO 2005)—mentioned in the previous chapter—that influenced Chilean environmental education from the perspective of sustainable development. The DESD proposes to address sustainability through the promotion of three core objectives: focusing education on sustainable development, raising public awareness (that would encourage appropriate responsibilities, commitments, and agency toward sustainability), and promoting training (that would create the appropriate skills to contribute to sustainability); however, the idea of educating to foster individual change in behavior toward sustainability is controversial, as will be discussed in the next sections of this chapter.

Among the mentioned challenges that sustainability presents, the idea of public awareness regarding the different dimensions and contexts for sustainability (comprising the multiple socio-ecological interactions at different scales and its environmental, cultural, social, and economic aspects), the wide range of values that guide life in community and sustainable relationships between humans and the environment, as well as the possibilities of citizen participation toward
sustainability are relevant areas of inquiry. Later in this chapter, I explore the proposed links between sustainability challenges, citizenship, and education as identified in the literature.

2.2 Environmental citizenship and its response to sustainability challenges

According to MacGregor et al. (2005:1), the concept of citizenship implies a relationship between individuals and institutions in a framework of rules and norms (whether in the form of responsibilities, duties, or rights) associated with being part of a political community. In the last three decades, the perspective of environmental citizenship has discussed the concept of citizenship in connection with global issues, such as civic-environmental relationships and sustainability, and also regarding issues of justice, participation, governance, gender, ethnicity, territory, and other social concerns. At a global scale, new dynamics of institutions, politics, and power have motivated the re-evaluation of appropriate models of citizenship and democracy to foster sustainability (Huckle 2008; Latta and Wittman 2012). The literature on environmental citizenship responds to these challenges in at least three ways. First, a large part of the literature centers on two political democratic traditions that propose models of environmental citizenship based on their principles and ideology. On one side is liberalism (Hayward 2002, Bell 2005, Hailwood 2005), which focuses on rights at the individual scope, and on the other is republicanism (Smith 1998, Dobson 2003) that focuses on obligations and virtues based on the idea of common good. Latta and Wittman (2012) recognize in the literature on environmental citizenship a faction that calls for the cultivation of “responsible environmental citizens” (Latta and Wittman 2012:5) based on republican ideas. Also, it is argued that there is little contribution to long term sustainability in the perspective of norms and regulations seeking behavioral change (Latta and Wittman 2012:5) often pursued through penalties, economic rewards, and personal benefits. Environmental citizenship also inquires regarding the rights and responsibilities of individuals in a
global context beyond the borders of a nation (Dobson 2003, 2006). This relates to a second focus of the literature on environmental citizenship: the focus on the confinement of political communities into national territories and the resultant issues of scale. Part of this discussion makes reference to the spatial mismatch between ecological issues and the notion of national territory (Dobson 2003, Newby 1996, Jelin 2000, Valencia Sáiz 2005, suggested by Latta & Wittman 2012). Regarding this mismatch, a key concern of environmental citizenship focuses on conceptions of citizenship that go beyond the State (administratively and territorially). A third portion of the literature on environmental citizenship is dedicated to the concept of deliberation and how it can make environmental issues visible to society and enhance citizen participation (Latta and Wittman 2012).

Environmental citizenship also considers diversity (regarding dimensions such as gender and cultural specificities) as a key aspect of the discussion around citizenship. In the literature, environmental citizenship sometimes challenges the exclusionary masculine public scope of traditional citizenship ideologies. MacGregor (2006), for example, argues that gender is a fundamental aspect of the relationship between citizens and the environment; and as such, it should be reflected in equity of responsibilities and participation in the public and private spheres of citizenship. Other expressions of social inequities arise from the different ways in which humans relate to the environment, such as cases concerning indigenous people and environmental justice (VanWynsberghe 2002). Similarly, the discussion on Environmental citizenship that centers on the European and North American contexts differs greatly from the one concerning the contexts of the global south and specifically Latin America. Some of the literature on environmental citizenship from Europe and North America seems to focus on two main traditions (liberal and civic republican) and the analyses and proposals that stem from them. In contrast, in Latin America, environmental citizenship links to issues of cultural recognition and collective participation (Latta
and Wittman 2010, 2012) that emerge in response to postcolonial dynamics and processes of modernization and globalization in the region. Historical conflicts related to the process of European colonization in Latin America appear to still influence how indigenous people are integrated in many societies of the region. In Latin America, issues of political recognition and inclusion, as well as conflicts over land and resource management are common struggles across the region, but are tackled in different ways in each country (Gudynas 2011). In the case of Chile, for example, the Mapuche people struggle on issues of governance, cultural recognition of their traditions and worldview, and participation in society. These conflicts appear to be fuelled by pro-market policies and the opinion of a large part of the population that is keen on the ideas of development and economic progress (see Chapter 1 for more information on the Chilean context).

To summarize this section, environmental citizenship appears to argue the need for new approaches to citizenship in response to new institutional, political, and power dynamics interplaying at global scale. According to the literature, these new approaches of citizenship are tackled differently from different citizenship ideologies. For example, the focus on individual responsibilities and behavior contrasts with perspectives that center on the common good. Other approaches argue the necessity to promote awareness of the diverse scales of the citizen-environment relationships and reflect on the relation between citizenship and national territory. As well, it is argued the importance of considering diversity in aspects such as gender and cultural specificities as key aspects of citizenship in relation to the environment. These new approaches to citizenship also should promote justice, deliberation, and participation at individual and community levels based on values committed to sustainability instead of encouraging only a temporary modification of behavior (see the discussion on conscious commitment versus behavior modification in section 2.3).
2.3 Education and environmental citizenship

Many authors agree that in the current global context of conflicting views about the environment, education should have a critical role of forming citizens that can foster sustainability (Carlsson and Jensen 2006; Dobson 2003, 2007; Huckle 2008), despite the pressures that, for example, economic interests may oppose. According to Dobson (2007), to accomplish this role, the curriculum for environmental education should include the topics of rights, values and norms, and content on justice, in the form of obligations, duties, and responsibilities at transnational, intergenerational, and interspecies scopes (Dobson 2007:283). The aforementioned content may further encourage a change of attitude instead of a mere change of behavior (the latter, often associated with a penalties/incentives approach), thereby generating a long term commitment of citizens to sustainability (Dobson 2007). In this sense, fostering appropriate values and awareness of rights and justice should translate into acknowledging one’s social-environmental context, and in turn, into citizen action toward sustainability in the long term. These actions would be based on a conscious commitment of citizens to sustainability, in contrast to rules and regulations aiming to change behavior. Accordingly, Dobson (2003:205) suggests fostering “action-oriented” activities and experiences in the curriculum through providing scenarios to learn civic practices. This relates to pedagogic proposals that reject teaching and learning only based on the dissemination of facts and memorization, and rather promote inquiry, action, and hands-on experiences through direct experimentation or simulations (Bybee and Van Scotter 2006; Khan 2012; Trey and Khan 2008; VanWymsberghe, Carmichael, and Khan 2007). In this regard, Carlsson and Jensen (2006) make a distinction between activities and action in the context of education for environmental citizenship. The authors consider pedagogical activities as valid ways to promote interest and further inquiry on a topic, whereas student actions go beyond, implying further involvement and participation in the solution of problems related to environmental citizenship (Carlsson and Jensen 2006).
Concerning the above discussion, Harris (2011) and Latta and Wittman (2012) detect the “prescriptive” character of the literature on environmental citizenship that discusses education. Specifically Latta and Wittman (2012) critique the conviction of educating citizens with the aim of behavioral change. The authors argue that this objective depoliticizes the discussions about environmental citizenship and focuses on the individual scope rather than the communal. In this sense, the argument from their perspective is that education should center on forming not only informed citizens, but also citizens who can participate in political debate regarding collective struggles. The previous argument is directly related to the ideas of deliberation and participation mentioned in the discussion on environmental citizenship in section 2.2.

This section addressed the relation between education and environmental citizenship, stressing the importance of focusing education on sustainable attitudes, values, and as a conscious commitment instead of on behavioral change alone. As well, this section mentioned that education concerning environmental citizenship should focus on activities that rely on action and direct experience rather than solely on prescriptive lecture-based teaching that does not contribute to promote critical thinking, debate, and active participation.

2.3.1 Curriculum and pedagogy

In Chile and many countries, environmental education is not treated as a single specific subject but as a common content across the curriculum (across the traditional subjects) (Caravita et al. 2008). In this context, environmental education often ends up being associated with the subject natural sciences, presumably due to conceptual affinity. The curriculum that gives shape to the school textbooks studied in this research configures the learning experiences in natural science through fostering scientific inquiry and methods. The concept of inquiry-based education emerged in the last century as a response to the dogmatic traditional science education (Schwab 1962).
Scientific inquiry is explained by the National Research Council from United States (2012) through eight practices:

1. Asking questions (for science) and defining problems (for engineering)
2. Developing and using models
3. Planning and carrying out investigation
4. Analyzing and interpreting data
5. Using mathematical and computational thinking
6. Constructing explanations (for science) and designing solutions (for engineering)
7. Engaging in argument from evidence
8. Obtaining, evaluating, and communicating information. (National Research Council 2012:49)

Scientific inquiry and inquiry-based education may be considered prescriptive since they include specific steps and goals to disseminate information and facts, but may also be perceived as a response against more prescriptive and traditional forms of education seeking to primarily shape behavior\(^3\), since scientific inquiry aims to foster active participation in learning science as well. According to the National Research Council (2012), “a narrow focus on content alone has the unfortunate consequence of leaving students with naive conceptions of the nature of scientific inquiry [3] and the impression that science is simply a body of isolated facts” (p. 41). The National Research Council (2012:30) also states that students should experience scientific practices firsthand to grasp a more comprehensive understanding of the scientific practices and knowledge. In other words, scientific inquiry can also be perceived by educators as a means to promote and implement action and involvement in learning.

From another perspective, Paulo Freire’s “pedagogy of the oppressed” (1986) responds to the Latin American context from the twentieth century. Freire’s perspective conceives of dominant forms of education as a means of oppression, arguing that prescriptive education aimed at behavior modeling is a sign of oppression. Behavior modeling appears to imply the notion of teaching and learning a uniform knowledge that leaves no room for critique or subjectivities. However, Freire (1986) also considers education as liberation and a route for citizen dialogue and

\[^3\text{For more information on behavior and behaviorism see Skinner 1953, 1968, 1974, 1976}\]
participation within society. In his work, Freire (1976) makes the distinction between nature and culture—identifying the latter as human transformation of the natural world—but he proposes exploring the reasons why humans transform nature to produce culture, going beyond materialist explanations, and raising the dimension of needs. These ideas better represent the ideals of sustainability, in contrast to education that tends to disconnect human from nature (and vice versa). In line with the critique from Harris (2011) and Latta and Wittman (2012) mentioned earlier, Caravita et al. (2008) state that environmental citizenship cannot be driven only through regulations, norms, and institutional structures; it “should be a cultural revolution” (Caravita et al. 2008:97) driven by education and based on appropriate values to guide the human-environment relationships.

In sum, the authors explored in this section criticize the kind of prescriptive lecture-based education that centers primarily on disseminating facts and seeks behavioral change. Since environmental education is often associated with natural science, it is necessary to connect scientific information about the environment with human dimensions, such as social and cultural needs and values to more fully understand the human-environment interactions and possibly cultivate all the dimensions of sustainability. In this regard, promoting scientific inquiry may foster students’ voices and actions toward sustainability better than prescriptive lectures, as long as it critically considers, for example, the complexity of human-environment relationships and the societal implications of inquiry. Regarding curriculum and pedagogy, one of the main arguments in connection with environmental citizenship that appeared in this section are the ideas of action and involvement in learning as powerful ways to understand reality (or realities). According to the literature, action and involvement can be achieved through scientific inquiry and direct experiences; however, scientific inquiry also may be performed in a prescriptive way, going against the aforementioned objective of promoting action and experiences.
3. Rationale for this Research

I highlight three key concepts from the previous chapter that represent in my view, convergent points in relation to sustainability, environmental citizenship, and education. The first concept that appears to link sustainability, environmental citizenship, and education is awareness. Awareness conveys the notion of being conscious of social and environmental realities (at both a personal and collective level) for carrying out a more sustainable life and participating actively in society (see section 2 above and Freire 1986 for more details from the perspective of pedagogy). Sustainability implies a complex integration of different human and ecological dimensions that interact at various scales (individual, local, national, and global) through time (also, regarding the intergenerational aspect of sustainability). Therefore, in order to deal with the complexity of sustainability, people should be aware of their personal and collective circumstances, and the multiple ways that the cultural, social, economic, and environmental aspects of sustainability interweave.

A second key concept that appears to link sustainability, environmental citizenship, and education is values. Values involve the multiple ways in which humans conceive, understand, and assess the environment and their relations with it, as well as the principles that guide human life in community (Hartmann 1998; Huckle 2008). In this sense, values can be understood as a “system of collective preferences that orient and justify the social actions of humans” (Huron 1994 in Caravita et al. 2008:102) and as shared aesthetic, moral, or cognitive standards that influence decisions and actions. In other words, values may be considered as “an element of a shared symbolic system, which serves as a criterion or standard for selection among the alternatives of orientation that are intrinsically open in a situation” (Miceli and Castelfranchi 1989 in Caravita et al. 2008:103). According to the aforementioned definitions of values, our actions are guided by these systems of preferences or criteria also in relation to sustainability. Specifically, one of the arguments in the
previous chapter is that citizens’ values committed to sustainability might lead to sustainable attitudes and, in turn, to sustainable actions and a more sustainable life in community in the long term.

*Action or Civic Action* is the third concept from the previous chapter that appears to link sustainability, environmental citizenship, and education. In the context of this study, action refers to the will and capacity to participate actively in society seeking a more sustainable future. The literature explored in section two of this document regards citizen action as first-hand experiences of learning and the expression of a long-term commitment with sustainability (see the discussion on behavior and attitudes in page 19). According to these perspectives, the concept of action implies acting sustainably or *being sustainable* based on the aforementioned awareness and values rather than merely behaving sustainably according to specific regulations. Also, action expresses the idea of participation by informed and critical citizens that are conscious of their social and political circumstances (Freire 1976, 1986) and the norms and institutions that regulate their participation in society (Dobson 2003, 2006).

Summarizing, the idea of awareness (embraced in this study) implies understanding and considering diverse factors and dimensions involved in sustainability; values are the personal and collective preferences that guide action; and action is the way to modify the personal and collective situation. The three concepts I explained represent the central areas of inquiry of this research and, as such, help to focus my analysis of the textbooks. Each of the three explained concepts may inspire further specific inquiry in the topic of education for environmental citizenship.
4. Methods

This interpretive study aims to unveil how specific Chilean school textbooks for basic education appear to convey environmental citizenship, focusing the inquiry on three interconnected concepts: awareness, values, and action (see a definition of these concepts in section 3 of this document). In particular, I aim to understand how the analyzed textbooks appear to promote environmental citizenship through exploring three sub-questions:

a) How do the analyzed textbooks appear to promote awareness of the ecological and social diversity and socio-ecological interactions?

b) What are the values associated with the environment and the human-environment relationships that the textbooks appear to promote?

c) How do the textbooks appear to convey citizen action concerning the environment and action toward sustainability (including the references to institutional and normative frameworks that might shape civic participation)?

In order to study how Chilean basic education appears to convey environmental citizenship, I analyzed the textbooks for the two most relevant mandatory subjects for the purpose of this study: Natural Science textbooks and History, Geography, and Social Science textbooks (since environmental education and the content associated with environmental citizenship are not attached to any specific subject in the Chilean curriculum). These textbooks are produced by private publishers based on the guidelines and objectives defined by the Chilean Ministry of Education (MINEDUC) in documents such as the general curricular update from 2009 (MINEDUC 2009a, 2009b) and the curriculum for basic education created in 2012 (MINEDUC 2012). Besides representing the curriculum elaborated by the MINEDUC, according to Caravita et al. (2008) and Carvalho et al. (2008), the textbooks are a guideline of contents for teachers and models of concepts and values for students. In Chile, the textbooks given by the MINEDUC are used as a
The textbooks selected for this study have changed little since the curricular update from 2009. In fact, the textbooks for 2012 analyzed in this study are the third and fourth editions or reprinting of textbooks from 2009. In this case study, I analyze textbooks for grades one, four, and eight of basic education (normally, ranging students from the age of six to thirteen) used in the public and private-subsidized sectors in 2012. With this selection of textbooks for mandatory subjects, I intend to provide a broad panorama of how Chilean basic education appears to convey environmental citizenship, considering that this topic is not attached to any specific subjects but spread across the curriculum for the eight years of basic education. The selected textbooks represent an early exposure of young students to the concepts of sustainability and environmental citizenship promoted by Chilean education and the basis for the next more specialized educational stage: the four years of middle education, commonly for students between 14 and 17 years of age.

I categorize this study methodologically as a qualitative case study. Qualitative case studies aim to produce conclusions that include “patterns or explanations” (Yin 2009 in Creswell 2013:99) that help understand the issues or problems explored and are not meant to “generate statistical data but to stimulate hypotheses and theories” (Eisenhardt 1989, Yin 1994 in McGloin 2008:45). This case study might be categorized as an instrumental case study (Stake 1995 in Creswell 2013:98) because it intends to “understand a specific issue, problem, or concern” (Creswell 2013:98) through the exploration of a particular and appropriate case. Case studies might also be considered as sources of experience and expertise if the cumulative effect of, for example, cross-case analysis (Khan and VanWynsberghe 2008) is taken into account. The specific unit of analysis in this study is the selected school textbooks for grades one, four, and eight from 2012. This case exemplifies the evolution of the Chilean curriculum for basic education that has been influenced
by the Chilean educational reform from the 1990s and the Decade of Education for Sustainable Development promoted by UNESCO (see Chapter 1 for more information on these initiatives).

Through my analysis of the selected textbooks in this case study, I intend to shed light on how Chilean basic education promotes environmental citizenship in students of the public and private-subsidized segments through the school textbooks.

4.1 Analysis

Similar studies on environmental education focus their inquiry on school textbooks, teachers, and students. In many of these studies, the objective is to analyze the idea of environment supported by teachers, students, and textbooks, whether through the approach of social representations (Amigón and Gaudiano 2009; Calixto Flores 2008; Reigota 1990) or conceptions (Caravita et al. 2008; Carvalho and Clément 2007; Clément 2006). The social representations or conceptions of the world (informed by norms, values, and beliefs) shape human attitudes and actions, in turn shaping culture (Banchs 2000; Ibáñez 2001; Jodelet 2002; Jodelet and Tapia 2000; Moscovici 1979). Therefore, depending on the focus of education, it seems plausible to promote students’ awareness and actions in a way that, consequently, influences the world and modifies their personal circumstance (Freire 1997, 2004; Moscovici 1979 in Amigón and Gaudiano 2009:13).

For example, Amigón and Gaudiano (2009) conducted interviews and classroom observations to analyze school teachers’ social representations of environmental education. In their study, the authors reflect on how the personal perspectives and opinion of teachers influence their interpretation and teaching of the environmental-education related content and its scientific and social specificities. As in the previous example, many other studies on environmental education focus their inquiry on social representations. According to Calixto Flores (2008), many of these studies are based on the categorization for social representations of the environment proposed by
Reigota (1990). These categories are: *naturalistic* (focused on physical and ecological aspects of the environment), *anthropocentric* (focused on the functional aspects of nature as resources used by humans), and *globalizing* (involving social-ecological interactions).

Regarding textbook analysis, it is worth mentioning Clark’s (2005, 2006, 2007, 2011) work on Canadian history textbooks. Particularly relevant for this study is Clark’s analysis of how different historical periods have influenced the representations of indigenous people and women in Canadian history textbooks. For example, Clark (2006, 2007) explores Canadian history textbooks used in several provinces from 1911 to date. In this study, the author uses a “descriptive annotative approach” (O’Neil 1986:25 in Clark 2007:84) that mixes her analysis of school textbooks from specific historical periods with previous studies made by other authors to explore how the textbooks portray or represent indigenous people. According to Clark (2007:84), school textbooks from recent decades rely much more on visuals than before. For this reason, the author analyzes the information conveyed in text and visual images in her study of recent textbooks. Other examples of textbook studies provide interesting methodological approaches. For instance, Yasin et al.’s (2012) analysis of gender representation in school textbooks relies on *ideational meta-function* (Halliday 1994; Kress and Leeuwen 2006 in Yasin et al. 2012:155). This approach “focuses on represented patterns of real world experience in the images” (Yasin et al. 2012:155) and involves examining who appears, what actions are carried out, and what is the setting or circumstance of the actions that take place in the images.

The BIOHEAD-Citizen Project (Caravita et al. 2008; Carvalho et al. 2008) is a key referent for this study. This project involves a study of textbooks and teaches regarding topics, such as citizenship and human-environmental relationships in nineteen countries. Specifically, the BIOHEAD Project represents a methodological reference in terms of areas of inquiry and provides a useful set of
values to evaluate the content of the textbooks (see the description of the area of inquiry values in section 4.1.2).

**Description of the method used in this study**

The aforementioned studies provided a foundation for my analysis of the selected Chilean textbooks. For the purpose of this study, I conducted a *qualitative* thematic analysis of the content of six textbooks used in Chilean Basic education in 2012. The content analysis I carried out is similar to the *ethnographic content analysis* described by Altheide (2008) and Grbich (2013:195), which shares some aspects with Strauss’ version of the *grounded theory* method of analysis (Grbich 2013:79–87), but without the excessive fragmentation of the data (characteristic of *quantitative* versions of content analysis). In fact, ethnographic content analysis (which is different from ethnographic methods to gather data when studying communities) is focused on analyzing meaning in context; therefore, it differs from *quantitative* approaches of content analysis that focus on the fragmentation of content and the measurement of frequency of concepts. The quantitative approach to content analysis is often used in studies involving large sets of data, such as magazine collections and large sets of school textbooks that may comprise publications from several years (Bell 2001:10–34). In contrast, ethnographic content analysis and its type of approach to the interpretation of *qualitative* data can be described as follows

Ethnographic content analysis (ECA) refers to an integrated method, procedure, and technique for locating, identifying, retrieving, and analyzing documents for their relevance, significance, and meaning. The emphasis is on discovery and description of contexts, underlying meanings, patterns, and processes rather than on mere quantity or numerical relationships between two or more variables. (Altheide 2008)

In addition to the characteristics described above, the type of qualitative content analysis chosen is a suitable method for this research considering the nature of the information studied: textbook content (in text and images) regarding the environment, citizenship, and sustainability. In
particular, the concepts of citizenship, environment, and sustainability are scattered in the content of the analyzed textbooks and in many occasions are not mentioned explicitly or directly defined. For these reasons, I examined these concepts in relation to the broader contexts within the textbooks. In this way, I was able to identify patterns and interpret relevant meaning for the purpose of this study. Further description of the interpretive process and analysis in sections 4.1.1 to 4.1.6 and the validation of the analytical decisions and process explained in section 4.2.

According to the selected method, I analyzed paragraphs and images in their relation with the context of each topic and the unity of meaning within the textbooks. Overall, qualitative content analysis (and in specific, thematic analysis using codes and categories) is an iterative process that permits successive revisions in each step. In the first step of the analysis, I performed an initial coding of the content of the selected six textbooks using a specific set of codes for each one of the three areas of inquiry extracted from the theoretical framework (see section 3). In the next sections, I explain my approach to analyze the images and describe of each of the three areas of inquiry of this study. I also explain what I aim to observe and how I interpret the content of the textbooks according to each area of inquiry. Then, I explain the set of codes I constructed based on the three areas of inquiry of this study. The codes I created are intended to reveal key concepts and patterns that represent interwoven aspects of environmental citizenship.

I used different colors for each set of codes belonging to an area of inquiry to mimic or resemble the mixture of colors that happens when printing a book or textbook. When printing, three or four colors are mixed to create all the colors of an image or text. In the same way, in this study, the codes of the three areas of inquiry are combined to provide a colorful picture of how the analyzed textbooks portray environmental citizenship. In this sense, my interpretation of how the analyzed textbooks convey the ideas related to environmental citizenship emerges from the integrated analysis of the three areas of inquiry (Figure 1).
Based on this analogy, I analyzed the textbooks according to each area of inquiry using three sets of codes (one per each area of inquiry). The areas of inquiry and their associated codes are explained in sections 4.1.2, 4.1.3, and 4.1.4 of this document.

4.1.1 The analysis of images

The written text and visual images in the textbooks are inspired by ideologies, have embedded values, and can encourage specific attitudes and behavior (Caravita et al. 2008; Sturken and Cartwright 2001). Considering these characteristics, I explored methods commonly used in visual research similar to this study. Rose (2007:13–31) mentions that the most commonly used method for this kind of study is content analysis focused on interpreting the meaning from the *site of the image* in a *compositional modality*. According to Rose (2007), content analysis focused on the *site of the image* means that the analysis centers on the image itself instead of on aspects of its...
creation (site of production) or the audience that see the images (site of the audience) (Rose 2007). Content analysis focused on a compositional modality considers the meaning of the images embedded in its compositional information (such as color or absence of color, proportions, size and scale, characters and their age, actions, setting, what appears to be emphasized, suggested, or absent, and the overall meaning, among others) (Rose 2007). In this study, I analyze the images of the selected textbooks focusing on the site of the image; in other words, I analyze the meaning conveyed by the images in the context of the textbooks. In contrast, I do not analyze directly the institutions, technologies, and processes involved in the creation of the images, nor the audiences that consume them; however, I might address these aspects from the perspective of the textbooks and the images themselves at their social modality and (to a lesser degree) technological modality (see Figure 2).

![Diagram of Site and Modality of the Visual Analysis](image)

**Figure 2**: Site and modality of the visual analysis according to Rose (2007)
Specifically, the focus in this study involves analyzing the compositional aspects of the images (explained above in this section), including aspects described by Yasin et al. (2012) that inquire who appears, what happens, and what is the setting in the images. Additionally, this study focuses the analysis of the images on the social implications associated with the meaning conveyed by the images or social modality (Rose 2007) and, to a lesser degree, on the type of images and the technical aspects of their creation and printing (technological modality) (Ross 2007).

4.1.2 Areas of inquiry

A) Awareness

This area of inquiry aims to examine the complexity of the socio-ecological relations represented in the content of the textbooks, considering ecological and cultural diversity, the social and ecological interactions at different scales and settings, and the effects (past, current, and over time) of these interactions on humans and nature. I established a set of codes based on the notions conveyed by this area of inquiry to examine the content of the textbooks. Further in this Chapter, section 4.1.3 shows the sets of codes I established for each of the three areas of inquiry and section 4.1.4 explains each code and what they aim to observe.

B) Values

This area of inquiry focus on the diverse dimensions of value associated with the environment. In other words, this area examines the different ways in which humans understand nature and interact with it. As shared earlier in section 3, I understand values as a “system of collective preferences that orient and justify the social actions of humans” (Huron 1994 in Caravita et al. 2008:102) and as shared aesthetic, moral, or cognitive standards that influence decision and action. In this sense, “values may be called an element of a shared symbolic system, which serves
as a criterion or standard for selection among the alternatives of orientation that are intrinsically open in a situation” (Miceli & Castelfranchi 1989 in Caravita et al. 2008:103). Besides the ethical dichotomy between environmental and economic stances, I identify other ways in which humans understand and value nature and the environment, such as political, aesthetic, social, cultural, and scientific dimensions. These notions of value associated with nature and the environment are a synthesis based on three sets of values presented by Caravita et al. (2008:105–107) as part of the analytical process proposed for the BIOHEAD-Citizen Project (Carvalho et al. 2008), a previous study on environmental education and citizenship in school textbooks from nineteen countries. The scientific understanding of nature and the environment might be considered neutral or objective in terms of value, but I take the scientific denomination as a category in which the environment represents a source of experiences and information for the generation of scientific knowledge (see the codes created for the area of inquiry values in section 4.2.4).

C) Civic action

In this research, this area of inquiry examines the human-environment interactions in terms of civic action toward sustainability. Civic action is analyzed in terms of practices, such as: recycling, reutilization, conscious consumption, voting, and building consensus, as well as regarding the norms and social structures that shape human-environment interactions. Another aspect I aim to examine in this area of inquiry is the interaction with the environment as activities beyond the classroom. The codes that I used to characterize the content of the textbooks associated with the area of inquiry action are explained in section 4.2.4 of this document.

4.1.3 Codes for each area of inquiry

For the initial coding process, I assigned a color to each of the three groups of codes according to the analogy with printing explained in section 4.1. The use of colors also made it easier to
identify and retrieve the codes and excerpts from the textbooks later. In addition to the three colors corresponding to each of the three areas of inquiry, I also established a fourth color to introduce notes and comments regarding the relations I identified among codes and between the codes and the context. The use of different colors for each group of codes helped me to identify relations among the three areas of inquiry I explored in the textbooks. Table 1 shows the sets of codes for each if the three areas of inquiry. I explain each code in the following section of this document (4.2.4).

<table>
<thead>
<tr>
<th>1. Codes for area of inquiry Awareness</th>
<th>2. Codes for area of inquiry Values</th>
<th>3. Codes for area of inquiry Civic Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1. Protection</td>
<td>2.1. Political</td>
<td>3.1. Human-Environment Interaction</td>
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<td>2.2. Aesthetic</td>
<td>3.2. Civic Participation</td>
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<td>2.3. Social</td>
<td>3.3. Norms and Structure</td>
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<td>1.7. Development</td>
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Table 1: Sets of codes for the three areas of inquiry
4.1.4 Explanation of each code and what it aims to observe

**A) Codes for the area of inquiry awareness**

A.1. *Protection*: this code identifies content regarding protection of the environment, natural resources, and different species. The code *protection* also identifies the idea of conservation of species and the environment. I created this code because it represents a notion that often appears in the content of the analyzed textbooks. For example, this code identifies content such as:

> One morning, Camila and her brother Felipe went out to explore the garden of their home. First, they only saw plants, stones, the soil, and drops of water. But when they crouched, surprise! They found a real universe of beings... After this wonderful finding, they promised to protect their garden and the beings that lived there. (Brahim, Espinoza, Irrazábal, Navarro, San Pedro, et al. 2009:12)

A.2. *Complexity*: complexity, in the context of socio-ecological systems, implies intricate “adaptive systems with issues of scale, uncertainty, non-linear behavior, self-organization and multiple stability domains” (Berkes 2003; Harris 2007; in Berkes 2010:490). The concept of complexity (in the context of this study) is captured in the dimension of Awareness through several codes, such as: *Ecological Diversity, Ecological Interaction, Cause-Effect, Cultural Diversity, Environmental Setting*, and *Scale*. However, for the purpose of the analysis, the code *Complexity* focuses on ecological complexity and comprises *Ecological Diversity and Ecological Interactions* as sub-codes.

A.2.1. *Ecological diversity*: this code identifies content mentioning different species or showing different species together.

A.2.2. *Ecological interaction*: This code recognizes content conveying interaction between different environmental elements or different species (at least two) of animals, plants, and invertebrate beings. The following image showing different animals interacting might be an example of content associated with the codes *diversity* and *interaction*:
A.3. **Cause and effect**: this code identifies content conveying the idea of change and mutual influence in the human-environment interactions mentioned or shown in the textbooks; hence, it identifies the changes in the human-environment system originated by the environment and those produced by human activity, considering past and future contexts. This code should include, for example, the impact that a large volcanic eruption has on the future availability of resources, or the extinction of a species of fish due to excessive fishing.

A.4. **Cultural diversity**: this code relates to different cultural elements or diversity of people in the content of the textbooks. For example, this code should consider content showing or mentioning different ethnic groups (in other words, not only mentioning or showing Caucasian people) whether from one country or several, and different livelihoods, traditions, and lifestyles (different to those found in urban environments). An example of content identified with the code *cultural diversity* might be the page showing a boy from Ghana and a girl from France describing the places where they live, including typical animals and the weather (Cid et al. 2009:100).

A.5. **Environmental setting**: this code identifies the content that shows different environmental setting that might or might not include humans.
A.5.1. *Urban*: this code recognizes content mentioning or showing densely populated areas, such as cities and towns. The following image illustrates the code urban:

![Image 2: Example of the code Urban (Cid et al. 2009:97)](image)

A.5.2. *Indigenous*: this code identifies content mentioning or showing explicitly indigenous buildings and indigenous ways of living.

A.5.3. *Rural*: Identifies the content mentioning or showing less densely populated areas, such as villages or isolated houses (depending on the case). The following image might be an example of content associated to the code *rural*:

![Image 3: Example of the code Rural (Cid et al. 2009:97)](image)

A.5.4. *Outdoors*: this code identifies content conveying setting with minimal or no human-made objects to provide a category that can contrast with other codes that characterize rural, indigenous, and urban settings.

A.6. *Scale*: this code recognizes the content that shows different scales of socio-ecological interaction.
A.6.1. *Local*: this code identifies content mentioning or showing human-environment interaction at a local scale (whether associates with an individual, a group of people, a house, a village, a town, or a city) or simply implying an interaction at a scale smaller than global and national.

A.6.2. *National*: this code classifies content mentioning or showing human-environment interaction at a national scale (whether associates with Chile, its territory, or other countries shown on drawing, maps, or mentioned in the text) or simply implying an interaction at a scale smaller than global.

A.6.3. *Global*: this code identifies content mentioning or showing human-environment interaction at a global scale (whether showing or mentioning the entire world, continents, or geographical regions larger than a country) or simply implying an interaction at a scale broader than national.

A.7. *Development*: this code identifies the content of the textbooks that shows or mentions the idea of social and economic development, progress, and economic growth.

**B) Codes for the area of inquiry Values**

B.1. *Political*: this code identifies content showing or mentioning nature and the environment as rights, duties, responsibilities, entitlements, national property and territory, and space for citizen participation. The following excerpts are examples of the content associated with this code:

“Nationality signals the country you belong. If you were born in Chile, you have Chilean nationality” (Cid et al. 2009:19); “The native plants from Chile always have occupied this territory to live, they reproduce freely and to protect them is our duty” (Brahim, Espinoza, Irrazábal, Navarro, San Pedro, et al. 2009:35).
B.2. Aesthetic: this code recognizes content showing or mentioning nature and the environment in terms of its beauty, its capacity to inspire awe, or as an ornament or decoration. An example of content associated with this code might be the fragments of the Chilean national anthem that express the beauty of the Chilean flower fields and the purity of the Chilean blue sky and breeze in Cid et al. (2009:25).

B.3. Social: this code identifies content showing or mentioning nature and the environment as traditional ways of living, health, prestige, enjoyment, and common space for social practices. It also indicates direct human interaction with the environment at a small scale, such as a farmer working the land or children playing in a park. An example of associated content is: “Public spaces are open for every person and exist to be enjoyed by the whole community” (Cid et al. 2009:36).

B.4. Economic: this code identifies content portraying or mentioning nature and the environment as a good, property, resources for production, and sources of profit. It identifies the use of the environment in economic activities. This code refers to a larger scale of socio-ecological interaction in comparison to the code social, such as a large plot of land used for agriculture or a mine in a context of industrial production and as a business.

B.5. Ecological: this code identifies content showing or mentioning nature and the environment as a habitat for living beings and support for ecosystems. An example of content associated with the code Ecological might be: “The plants and the animals are living being: they grow, move, and feed. In your surroundings, there are plants, animals and other living beings” (Brahim, Espinoza, Irrazábal, Navarro, San Pedro, et al. 2009:17).
B.6. *Cultural*: this code identifies content showing or mentioning nature and the environment in the sense of belonging, identity, and local knowledge, and as historical, spiritual, religious, symbolic and traditional elements.

B.7. *Scientific*: this code identifies content showing or mentioning nature and the environment as a source of experiences, information, and data for the production of knowledge. The following image illustrates content associated with the code *scientific*:

![Image 4: Example of the code Scientific (Brahim, Espinoza et al. 2009:24)](image)

C) Codes for the area of inquiry *Civic Action*

C.1. *Human-environment interaction*: this code identifies content showing or mentioning humans directly interacting with the environment and other species of animals, plants, and invertebrates.

C.2. *Participation*: this code identifies content showing or mentioning instances of environmental citizen participation, such as

- Recycling
- Reutilization
- Conscious consumption
- Voting and building consensus, for example, to elect public representatives
C.3. Norms and structure: this code recognizes the content showing or mentioning institutions, norms, and rules for civic participation, such as the “Decalogue of the environmentally conscious citizen” (Amengual, Cisternas, and González 2009:115) that appears in the History, Geography, and Social Science textbook for grade four and states the following rules:

1. Try to save as much energy as you can (electric, gas, oil, etcetera)
2. Avoid polluting
3. Use recyclable or recycled products
4. Consume as little as possible: only what is necessary
5. Prefer natural products, not too elaborate
6. Inform yourself about the effects produced by your consumption
7. Protect the natural and artificial surroundings
8. Opt for permanent things, not those of short duration or disposable
9. Protect the flora and fauna
10. Think on the future generations (Amengual et al. 2009:114)

C.4. Activities + experience: this code identifies the content showing or mentioning educational activities proposed in the textbooks that transcend the classroom and imply relevant involvement of students in experiences related to sustainability and citizenship. For example, one of the activities that appear in the analyzed textbooks involves creating a recipe book based on geographic location and input from the community. The instructions for this activity mention the following:

1. Form groups and choose a typical dish or food from your zone.
2. Investigate and ask people from your community about the recipe of this dish...
3. Gather all the recipes and make a recipe book that includes the typical food from your zone...
4. [...] write a letter to a school from another zone of the country telling them about your recipe book and how important it is for you that they can share this information.
5. Invite them to participate in the project and encourage them to make their own recipe book... (Amengual et al. 2009:100)

Multiple codes and code overlapping

The three sets of codes defined for this study represent three different dimensions of the content of the analyzed textbooks. Therefore, each piece of content selected for the analysis
(according to the criteria explained in section 4.1.5) may be characterized with codes belonging to one or more areas of inquiry. For instance, a segment of content might be labeled with one code concerning awareness, another code that conveys its dimension of values, and another that communicates an aspect pertaining to civic action. Additionally, the selected segments of content may also be labeled with various codes from the same area of inquiry. The codes of each area of inquiry represent specific sub-dimensions that allow further characterization of the content of the analyzed textbooks. In other words, the codes and sub-codes defined for this study are not meant to overlap but complement each other as illustrated in the example of section 4.1.6. The codes and sub-codes defined for this study are not necessarily mutually exclusive, but some of them characterize contrasting content and ideas. An example of this might be the codes Ecological and Economic that characterize aspects of values. While the code Ecological represents content that regards the environment as the habitat of living beings, the code Economic conceives of the environment as property and something profitable. Despite the fact that these two notions are strictly not contradictory, they rarely appear together in the content of the analyzed textbooks.

4.1.5 Criteria for the inclusion and exclusion of content from the textbooks

I analyzed the written content in the Natural Sciences and History, Geography, and Social Science textbooks for grades one, four, and eight of Chilean public basic-education that mention or imply the following concepts:

-Environment, habitat, and surroundings
-landscape (landscape is often considered as environment in the content of the analyzed textbooks)
-Nature
-Ecosystems
The analyzed textbooks propose activities and instances to experience the content learned in each chapter. For example, some of these activities involve exploring the school backyard, others involve interviewing members of the community, and some of them involve conducting scientific experiments. I analyzed the activities that involve a direct interaction with the environment and the community, especially if they develop beyond the classroom.

Regarding visual images, I analyzed different types of images: drawings, paintings, photographs, 3D illustrations, and maps (I consider maps as a way of representing the environment at large scales) showing or implying the idea of environment as surroundings where living beings live and develop (based on a common definition of the word environment found in the ‘Oxford Dictionary’ and the ‘Diccionario de la Real Academia de la Lengua Española’), and concepts, such as

-Environment

-Nature

-Sustainability

-Sustainable development

-Natural resources

-Citizen

-Citizenship
On the other hand, I propose to exclude images showing building interiors, unless the surroundings of these buildings are shown through windows or doors. I excluded images showing indoor environments because they are difficult to classify and they tend to give limited information regarding symbolic and material aspects of the setting portrayed in the images. For example, in many of the images from the analyzed textbooks showing indoor settings, it is difficult to distinguish rural and urban settings, the materials of the buildings, and in some cases, even the ethnicity of the characters in the represented settings.

4.1.6 Examples of coding

In this example, I describe a portion of the content of one of the analyzed textbooks and the codes I used to label them.

“…The geographical landscape... is defined by the quantity of constituent elements. For example, there are geographical landscapes in which natural elements, such as relief, flora, fauna, weather, and minerals predominate. These elements form the **natural landscape**, and others that show a marked human influence, such as constructions, roads, crops, form the **cultural landscape**.” (Amengual, Cisternas, and González 2009:93)

I labeled this passage as **Social** because it implies a practical relation between humans and the environment, and as **Ecological** because the passage implies that the landscapes may support living beings (such as flora and fauna). The codes **Scientific** and **Political**, for example, do not seem appropriate for this content.

I characterized this image showing a man on a horse crossing a bridge in the countryside as **Rural** because it shows a moderate human material intervention on the landscape (for instance, an unpaved road). I also labeled this image with the code **Human-Environment relationship** because it shows direct interaction of a person with the environment.

I characterized this image showing a city using the code **Urban**.

Image 5: Example of codes and description of their associated content
Another example of the use of the codes in this study

In another example that illustrates my use of the codes in this study, I applied the code *Cause-Effect* to characterize the content of the analyzed textbooks expressing (showing in images or mentioning in the text) effects, consequences, or impacts of the interaction between humans and the environment through time. These changes on the environment and society originated by the human-environment interaction were observed in connection with value categorizations, such as, *environmental* and *cultural*. This example of code relations lets me identify, for instance, how the textbooks tend to portray human relation to the land mainly as functional and human interventions on the land mainly as material culture. These ideas appear to be represented through the distinction between *cultural landscape (and cultural elements)* and *natural landscape (and natural elements)*. These observations are complemented by other codes, such as *environmental setting* (urban, indigenous, rural, and outdoors) to help characterize how the analyzed textbooks appear to convey the relations between citizens and the environment.

4.2 Bias and trustworthiness

This section explains my biases as a researcher conducting this study and the analytical process I implemented to ensure trustworthiness. As a researcher conducting this interpretive study, most of the biases I recognize relate to my geographic origin, academic background, and the socio-political circumstances that influenced my education. Given that I come from a country in South America that came out of a long dictatorship in recent decades, I recognize that the focus of my analysis of the Chilean school textbooks and my interpretation of the content of these textbooks are influenced by distinct cultural and socio-political determinants. In other words, a reader from a different geographical location and socio-political circumstance, or a researcher studying a
different socio-ecological context than Chile or Latin America might have a different interpretation of the same textbooks studied in this research and a different approach to analyzing them.

The environmental, social, and cultural contexts also influenced my experience as school student. I was a basic education student during the Chilean dictatorship in the 1980s; therefore, I used school textbooks that were based on the curriculum from that period. For better or worse, this situation may have shaped my analysis of the current textbooks, hiding some aspects and revealing others. For instance, considering that this is not a comparative study, I think I may have an advantage over other researchers that studied in the basic-education stage after the educational reform from the 1990s, since I might better perceive the differences in Chilean education between pre and post educational reform. However, on the other hand, I might be missing some relevant insights due to the indoctrination that may have occurred through education and media control during the last years of the Chilean dictatorship. With these influences, I was raised in a social and political context that did not promote the analysis of the personal and collective circumstances and the articulation of personal opinion. Despite this reflection, I believe that my personal history may represent a relevant perspective from which to observe the current Chilean basic education in the context of environmental citizenship (see a description of my stance toward education for environmental-citizenship in section 1.3).

Another aspect that also influences my analysis and interpretation of the data in this study is my academic background. As an industrial designer, I am aware of the symbolic and functional dimensions of the relations between people and material culture. This skill set has helped me interpret and understand the diverse expressions of human-environment relationships portrayed in the analyzed textbooks. My training as a designer was especially helpful for analyzing the content of the school textbooks expressed in images.
Validation of the analytical decisions and processes in this study

Based on the idea of audit trail explained by Lincoln and Guba (1985) and the principles of dependability, transferability, and credibility (Lincoln and Guba 2007:18–19), this section explains and justifies the analytical decisions and procedures I conducted in this study. These analytical decisions and procedures were devised to ensure an appropriate approach to understand how the analyzed school textbooks appear to convey the relationships between citizens and the environment. According to Lincoln and Guba’s (2007) description of dependability, this study addresses dependability through the supervision of two professors from the University of British Columbia: one from environmental studies and one from educational studies. Their supervision contributes to ensure dependability through “the carrying out of an audit by a competent external, disinterested auditor... That part of the audit that examines the process results in a dependability judgment” (Lincoln and Guba 2007:19). Regarding transferability and credibility, this study gives a thorough description of the analytical process in the following paragraphs of this section that is complemented by the descriptions given in previous sections of chapter four (pages 32 to 57). This thorough description might be useful to other researchers who want to apply the analytical model and findings of this study in their own research. Similar to transferability, applicability (Lincoln 1985; McGloin 2008) involve the potential extrapolation of the results of this study to other cases. Due to the nature of this research, the usefulness of the finding of this case study is context specific; however, generalizations and broader hypotheses can be elaborated using cross-case analysis (Khan and VanWynsberghe 2008).

The first step toward the analysis of the textbooks was the creation of specific areas of inquiry. The three areas of inquiry of this study (that I defined based on the discussion presented in the theoretical framework in chapter two of this document) aim to compartmentalize three key concepts and dimensions that appear to link education, citizenship, and sustainability. These three
concepts or dimensions are awareness, values, and civic action. These three areas of inquiry are similar to the theoretical basis defined for the Biohead-Citizen Project (Carvalho et al. 2008) that, among other objectives, aimed at interpreting the conceptions (Caravita et al. 2008; Carvalho et al. 2008; Carvalho and Clément 2007) (concept comparable to social representations) concerning ecology and environmental education represented in school textbooks from nineteen countries.

To interpret the conceptions represented in the textbooks, the researchers of the Biohead-Citizen Project relied on the KVP Model of didactic transposition (Caravita et al. 2008; Carvalho et al. 2008; Carvalho and Clément 2007), which defines conceptions as the product of the interaction between knowledge (according to the authors, scientific knowledge), values, and social practices. This theory guided the analysis of the school textbooks in specific topics selected due to their relevance as examples of “interactions between Science and Society, and challenges in Citizenship” (Carvalho et al. 2008:4). Considering the similar objectives and the different theoretical approaches of the research conducted in the Biohead-Citizen Project and this study, their areas of inquiry are very similar. One emanates from a pedagogical theory, in the case of the KVP Model described by Carvalho and Clément (2007) and Clément (2006) used in the Biohead-Citizen Project, and the other is extracted from insights on sustainability, citizenship, and education under the general framework of environmental citizenship (in the case of this study). In addition to the aforementioned similarities, the categories I used to characterize the diverse dimensions of values in this study are based on the three sets of values presented by Caravita et al. (2008:105–107) as part of the development of the analytical process for the Biohead-Citizen Project.

Secondly, the three aforementioned areas of inquiry led to the creation of three appropriate sets of codes that aim to operationalize the content of the analyzed textbooks. Considering the interpretive and iterative nature of the methodology applied in this study, the coding of the content of the analyzed textbooks was carried out in three phases. In the first phase, I read the
textbooks completely, identifying content suitable for the analysis according to the protocol of
inclusion and exclusion described in section 4.1.5 of this document. The content selected was
marked with specific colors that indicated its belonging to one or more areas of inquiry
(awareness: yellow; values: magenta; civic action: cyan). During this step, I attached notes with my
first reactions to the content and observation that I used in the following phases of coding. In the
next phase, I further characterized the selected content of the textbooks with specific codes from
each area of inquiry. In this stage, I used the observations previously attached to the content in
the previous phase. In the final phase of the coding process, I revisited the codes previously
applied to the content and modified them, if necessary, to avoid overlapping and to improve the
accuracy of the characterization of the content done through the coding process. The described
process ensured a more precise characterization of the content of the analyzed textbooks, which
allowed a better interpretation of the content in the next stage of the analysis.
5. Findings

This chapter presents the concepts and patterns I found through the interpretive analysis of the textbooks. This analysis allowed me to identify how the textbooks seem to convey the relationship between humans and the environment, the main ways in which the textbooks seem to value the environment, and how the textbooks appear to express citizen actions and participation in relation to the environment. To examine how these three aspects were present in the analyzed textbooks, I applied the codes from sections 4.1.2 and 4.1.3 to characterize paragraphs and images from the analyzed textbooks that fulfilled the criteria explained in section 4.1.4 (p. 33). In general, I organized the findings in two umbrella categories: humans and the environment as a complex system and citizen participation concerning the environment. Before explaining these two categories, I present an overview of the analyzed textbooks and its graphics and examples of some of the first concepts that emerged from the process of analysis.

5.1 Description of the content of the analyzed textbooks

Before explaining my findings, I will describe the topics included in the content of the analyzed school textbooks. In general, the content of the analyzed textbooks is organized in units or chapters, specific topics within each chapter, application sections, summary sections for each chapter, and evaluation (and self-evaluation) sections. All the analyzed textbooks for grades one and four examined in this study were developed by the same publisher, whereas the Natural Science and History, Geography, and Social Science textbooks for grade eight were developed by different publishers. Therefore, the textbooks for grade eight have a different edition and way to organize and represent the content in comparison to the textbooks for lower grades examined in this study (in terms of layout of the information, the type of information included, and the amount of information).
Description of the content of the natural science textbook for grade one

First, the Natural Science textbook for grade one organizes the content into two broad topics: living surroundings and physical surroundings. This textbook includes the following topics:

a) “Living surroundings” (Brahim, Espinoza, Irrazábal, Navarro, San Pedro, et al. 2009): this first chapter comprises content on living beings and its characteristics, including the description of parts and its function (e.g. movement and feeding), and Chilean endemic species of plants and animals.

b) “Human body and health” (Brahim, Espinoza, Irrazábal, Navarro, San Pedro, et al. 2009): this chapter talks about the senses (and how to protect them) and healthy habits, comprising personal hygiene, home and school cleanliness, and physical activity.


d) “The Earth” (Brahim, Espinoza, Irrazábal, Navarro, San Pedro, et al. 2009): this chapter includes content on the Earth, the moon, and other planets, phenomena such as day and night, and the seasons and how they influence plants and animals.

Each chapter of the Natural Science textbook for grade one is supplemented by the sections “Lab”, that proposes activities and instances of application of some of the content in each chapter; “How am I doing?”, “Chapter evaluation”, and “Self-evaluation”, that focus on the self assessment of the students’ learning process; and “Summary of the chapter”, that summarizes the content of each chapter. Another supplementary section is “Professionals of science”, in which three scientists explain their work.
**Description of the content of the natural science textbook for grade four**

The Natural Science textbook for grade four has a similar structure to the textbooks on the same subject for grade one. This textbook also organizes the content into the two umbrella topics *living surroundings* and *physical surroundings*; however, the content in this textbook is more specific. The topics included in the Natural Science textbook for grade four are the following:

a) “The living beings” (Brahim, Espinoza, Irrazábal, Navarro, and San Pedro 2009): this first chapter includes content on animals’ external structures and its functions, and animals’ vital activities. Also, in this chapter we can find content on self-healthcare regarding the senses and sensorial organs, cooking and eating, and first aid.

b) “Living beings and the environment” (Brahim, Espinoza, Irrazábal, Navarro, and San Pedro 2009): this chapter deals with the life cycle of animals and plants.

c) “The matter and its transformations” (Brahim, Espinoza, Irrazábal, Navarro, and San Pedro 2009): this chapter comprises content on the properties of matter and changes of state, changes of state in nature, and practical applications of the changes of state of the matter.

d) “Force and movement” (Brahim, Espinoza, Irrazábal, Navarro, and San Pedro 2009): this chapter includes content such as weight and magnetism.


As in the Natural Science textbook for grade one, each chapter of the Natural Science textbook for grade four is supplemented by the sections “Lab”, that proposes instances of application of some of the content of each chapter; “How am I doing?”, “Chapter evaluation”, and “Self-evaluation”, that focus on assessing students’ learning process; and “Summary of the chapter”, that
summarizes the content of each chapter. Another supplementary section is “Professionals of science”, in which three scientists explain their work.

**Description of the content of the natural science textbook for grade eight**

In comparison with the Natural Science textbooks for lower grades examined in this study, the Natural Science textbook for grade eight has a similar structure, but a different overall style. The content of the Natural Science textbook for grade eight is organized in the following chapters:

a) “The cell and human nutrition” (Calderón et al. 2009): this chapter comprises content on the structure, function, and vital processes of cells and the human body.


d) “Structure and properties of matter” (Calderón et al. 2009): this chapter comprises topics such as the states and properties of matter, and the changes of state of matter.

e) “Natural phenomena on the Earth” (Calderón et al. 2009): this chapter includes content on plaque tectonics, the changes on the Earth’s crust, atmospheric phenomena, and impacts of natural phenomena on nature and humans.

After each chapter, the Natural Science textbook for grade eight has seven sections. The first section is “Scientific workshop”, which presents cases for student application of some of the content explained throughout the previous chapter. Next, the section “Scientific news” presents real news concerning some of the content seen in the previous chapter. The following sections are “Summarizing”, “Log book”, and “Conceptual map”. These sections summarize the previous
chapter’s content. The last supplementary sections are “What do you do?” and “What did you learn?”, which are focused on assessing what students have learned throughout that chapter.

Description of the content of the history, geography, and social science textbook for grade one

The content of the History, Geography, and Social Science textbook for grade one is organized in the following five chapters:

a) “Who am I and what is my country?” (Cid et al. 2009): this chapter comprises topics such as people’s cultural differences and individuality, self-awareness, awareness of one’s surroundings (classroom, school, and neighborhood), and the importance of the family. Also, this chapter includes content on national traditions (emblems, dances, and celebrations).

b) “How is it to live in community?” (Cid et al. 2009): this chapter covers content regarding institutions and the people that work in them, shared spaces and how take care of them, respect for others, norms to live in community, and conversation as the way to set the differences aside.

c) “The time in our lives” (Cid et al. 2009): this chapter includes content such as how people and things change through time, and how to organize the time (the daily routine, days of the week, months, and years).

d) “The places we inhabit” (Cid et al. 2009): this chapter covers content on space awareness and placement in space, the language of blueprints and maps, the location of Chile in the world map, landscapes of Chile and the world, and diversity of people associated with different landscapes.
e) “The products and the works (Cid et al. 2009): this chapter comprises content on how some products are made, the products and works from the community, the importance of work, and different types of work.

After each of the chapters, the History, Geography, and Social Science textbook for grade one has five sections that aim to supplement the content of the chapters and assess the students’ learning process. First, the section “Workshop” and “Discover and learn” are instances to apply the content of the chapter in practical situations. Next, the section “How did I learn?” aims to summarize the content of the previous chapter. Finally, the sections “What did I learn?” and “Self-evaluation” present instances to evaluate what the students have learned throughout the chapter.

**Description of the content of the history, geography, and social science textbook for grade four**

The History, Geography, and Social Science textbook for grade four has a similar structure to the textbook for grade one on the same subject. The chapters on the textbook for grade four are the following:

a) “Diverse cultures” (Amengual et al. 2009): this chapter covers topics such as cultural diversity (different ways of living and different foods and eating costumes around the world), diversity of families, miscegenation and cultural origins, and discrimination.

b) “We live in community” (Amengual et al. 2009): this chapter focuses on rights and duties, institutions and rights, people and community, and participation in the community.

c) “Chile has a living past” (Amengual et al. 2009): this chapter comprises content on migration, ancestral ways of living, and indigenous territory in the past.

d) “Chile and its natural zones” (Amengual et al. 2009): this chapter includes topics such as the diverse Chilean landscapes, classification of the Chilean natural zones, the types of Chilean
relief, types of human settlements in Chile and the associated landscapes, and rural and urban spaces.

e) “Activities and natural resources” (Amengual et al. 2009): this chapter includes content on environmental care, production activities and industries, the impact of human activity on the environment, and geographic spaces.

After each of the chapters, the History, Geography, and Social Science textbook for grade four has six sections that aim to complement and assess the students’ learning process. The first of these sections is “Values for my life”, which relates the content of each chapter to moral norms. The next section, “Project”, presents activities to apply the content of the chapter to practical situations. With the same purpose, the section “Workshop” also assesses the learning process after each topic. After the section “Project”, the sections “Synthesis” and “How did I learn?” summarize the content of the previous chapter. Finally, the sections “What did I learn?”, “Self-evaluation”, and “How am I doing?” close each chapter by assessing what the students have learned.

**Description of the content of the history, geography, and social science textbook for grade eight**

In comparison with the textbooks for lower grades examined in this study, the History, Geography, and Social Science textbook for grade eight has a different style and focuses mainly on European history, although most of the topics treated may serve for social science discussions and some for geography discussion.

a) “The Medieval roots of the Modern world” (Silva and Ramírez 2009): this chapter includes content on the cultural changes in Europe at the end of the Medieval times. Some of the
topics center on economic development, development of technologies and agriculture, urban life, arts, and the Catholic Church.

b) “The cultural bases of the Modern world” (Silva and Ramírez 2009): this chapter focuses on the Renaissance and the cultural changes associated with new human ideals, religious reforms, and commerce.

c) “The modern state and its expansion” (Silva and Ramírez 2009): this chapter covers topics such as the European monarchies, the origins of the capitalism, the maritime exploration, and the European annexation of territories.

d) “The consolidation of the Modern world” (Silva and Ramírez 2009): this chapter comprises content regarding absolute monarchy, the Baroque, and the modern science.

e) “The French Revolution and people’s rights” (Silva and Ramírez 2009): this chapter includes content on the French Revolution and its influence on Chile and other countries.

f) “The Industrial Revolution” (Silva and Ramírez 2009): this chapter focuses on the social, political, technological, and economic changes associated with the Industrial Revolution.

g) “The Modern legacy and its projection on the XIX Century” (Silva and Ramírez 2009): this chapter explains the different ideologies that influenced societies since the XIX Century, and the capitalism and new markets associated with the European trade and colonization.

After each of these chapters, the History, Geography, and Social Science textbooks for grade eight has a synthesis section that summarizes the content of the chapter, a sources section that illustrates some of the content using articles or passages written in specific periods of history (mostly from Europe), and a self-evaluation section to assess the learning process.
5.2. Comments on the graphics of the analyzed textbooks

In this section, I present general observations regarding the graphics of the analyzed textbooks. These observations focus on aspects such as the purpose of the graphics and the differences of graphic style used for each grade. A deeper analysis of the content conveyed in the images and text of the analyzed textbooks can be found in section 5.4 of this document.

The graphics in the analyzed textbooks differ according to the grade and the subject, but in general, their purpose appears to be mainly illustrative. This means that the images from the textbooks are intended mainly as examples or graphic support for the ideas expressed in the written portion of the textbooks. Regarding the graphic style, the graphics in the textbooks for grade one analyzed in this study are mainly photographs and colorful drawings. In the case of the photographs, the human characters portrayed in the scenes tend to be represented through colorful drawings mixed with photos of the settings. This technique appears to bear the notion that Chileans, especially young individuals, can interact with nature and have access to Chilean nature. In fact, most of the images showing nature include humans, photographed or drawn, and the few images showing “pristine” nature appear to show the beauty of the country and icons of national patrimony. However, the level of interaction that the mixture of photographed settings and drawn characters can portray seems to be limited because, in general, the characters drawn in photographs seem to be only present in the scenes as observers of their surroundings. This issue does not seem to be related to confidentiality because photographs of people are often used in the textbooks, in particular in the illustrations that describe activities. The photographs that already include human characters (often used as illustrative support for activities) seem to provide a more “precise” description of procedures, such as the example below (Image 6).
In comparison with the textbooks for lower grades, the textbooks for grade eight include more photography, 3D renderings, and images of paintings, which in the case of scientific content, appear to stress the specificity and precision of the topics explained in the textbooks. Specifically, paintings are used mainly in the History, Geography, and Social Science textbook for grade eight to illustrate historical periods and moments in history. In addition to paintings, the History, Geography, and Social Science textbook portrays particular moments in history using specific artists and artistic styles, political comics, schemes, and maps, such as old navigation charts. The difference in style and graphic language between lower and higher grades could be deemed reasonable considering the age gap between grades one (usually six year old students) and eight (usually thirteen year old students), but it also seems to convey more abstract and symbolic content in the textbooks for grade one, and more concrete and “exact” content in the textbook for grade eight. This difference in the way to present the content of the textbooks for lower and higher grades may lead to further research on curriculum and textbook development, as well as illustration for school textbooks.
5.3. Description of the first stages of the analysis and the concepts that emerge from the relations among codes

In this section, I present examples of some of the broad concepts that arise from the first stages of my analysis of the textbooks. These concepts emerge from the relations I found in the content that I previously characterized using the diverse codes explained in sections 4.2.3 and 4.2.4 of this document. The figures in this section highlight the most common codes I applied to the content of each analyzed textbooks and the most relevant concepts that emerged from the relations among the coded content (see Figures 3, 4, 5, 6, 7, and 8 later in this section). The concepts mentioned in the figures represent the interwoven nature of the three areas of inquiry I established for this study (awareness, values, and civic action) and, consequently, how the textbooks appear to convey environmental citizenship. Figures 3, 4, 5, 6, 7, and 8 also show the codes that appear less or do not appear at all in the content of the analyzed textbooks. In these figures, the less frequent codes are represented in gray.

Figure 3: Examples of codes and concepts in the Natural Science textbook for grade one
Figure 4: Examples of codes and concepts in the History, Geography, and Social Science textbook for grade one

Figure 5: Examples of codes and concepts in the Natural Science textbook for grade four
Figure 6: Examples of codes and concepts in the History, Geography, and Social Science textbook for grade four.

Figure 7: Examples of codes and concepts in the Natural Science textbook for grade eight.
The above figures show the most and least applied codes and the most relevant concepts that emerged from the relations among these codes. For example, Figure 3 shows the main codes I applied and the broader concepts I identified in the content of the Natural Science textbook for grade one indicated in green. In this example, the codes Human-Environment Relationship, Social, Local, and Outdoors appear to be associated with the concepts function (or functional), physical activity, enjoyment, touristic, and health. These broad concepts suggest, for instance, that the textbook portrays the relationship of humans and the environment mainly as practical or functional interactions. To be more specific, we may interpret that the concepts from Figure 3 convey that humans seek contact with nature to obtain benefits, such as health and enjoyment (see more examples of code relations and the associated concepts circled and indicated in red in Figures 4, 5, 6, 7, and 8). Further analysis and more specific reflections regarding the concepts mentioned in the following examples can be found in section 5.4 of this document.
5.4 Findings regarding humans and the environment as a complex system

5.4.1 Natural/cultural distinction: according to the textbooks, culture resides in human material intervention on the environment

One of the main concepts that emerge from my analysis of the textbooks is what I call the natural/cultural distinction. The content of the analyzed textbooks appear to make a distinction between what is cultural and what is natural from a physical and material perspective. This observation is illustrated in Figures 5 and 6 from the previous section (5.3), showing the codes (used to characterize the content of the analyzed textbooks) and concepts (identified in the coded content) associated with the natural/cultural distinction. This distinction is literally expressed in at least two chapters, but it is also implied in general across the six textbooks. According to the analyzed textbooks, cultural elements are human-made objects that form what the textbooks call cultural landscapes (Brahim, Espinoza, Irrazábal, Navarro, and San Pedro 2009:93; Brahim, Espinoza, Irrazábal, Navarro, San Pedro, et al. 2009:104). In other words, these cultural landscapes are presented as human-made transformations of what is considered natural. On the other hand, according to the analyzed textbooks, natural landscapes are described as those with minor human intervention. These natural landscapes tend to be portrayed by the analyzed textbooks as static and constant (unless they experienced interventions by humans), but also as remote and isolated locations, usually represented using rural settings and modest houses (see an example in Image 6).

Image 7: Natural landscape on the left and cultural landscape on the right (Brahim, Espinoza, Irrazábal, Navarro, San Pedro, et al. 2009:104)
Another example of the aforementioned natural/cultural distinction appears conveyed in the following excerpt in bold:

The geographical landscape... is defined by the quantity of its constituent elements. For example, there are geographical landscapes in which natural elements, such as relief, flora, fauna, weather, and minerals predominate. These elements form the natural landscape, and others that show a marked human influence, such as constructions, roads, crops, form the cultural landscape. (Brahim, Espinoza, Irrazábal, Navarro, and San Pedro 2009:93)

As illustrated in the previous example, the natural/cultural distinction and the associated natural and cultural landscapes mark an apparent division based on material and functional aspects that appears to disregard the symbolic dimensions of culture and human-environment relationships. According to this distinction, culture (in relation to nature) seems to reside in material expressions and functional relations between humans and the environment throughout the six textbooks. In addition, the textbooks appear to reinforce the material and functional focus of the natural/cultural distinction through stating that the elements composing the cultural and natural landscapes can be quantified (see the above excerpt). For example, in the History, Geography, and Social Science textbook for grade four, this quantification fosters the classification of landscapes according to the amount of cultural elements (human-made objects or human interventions on the environment) that they have. Based on the resulting classification and quantification, some may conclude, for instance, that urban settings (with large amount of human intervention on the environment) have more culture than rural settings (that has less human physical intervention on the environment in comparison with urban settings).

In addition to the natural/cultural distinction, the distinction between natural objects, living beings, and human-intervened objects seems to contribute to the detachment of humans and nature at symbolic level. According to the natural sciences textbook for grade one, “Natural objects are those that have been formed in nature without intervention of the human beings. Some of the objects that surround you are natural objects” (Brahim, Espinoza, Irrazábal, Navarro,
According to this conception, the textbooks state forced boundaries between pristinely natural objects and natural objects in relation to humans. This distinction, however, arguably creates confusion regarding elements such as stones and rocks that may be considered as natural objects but are used by humans, for example, as construction material and for artistic expressions.

To summarize this section, the analyzed textbooks tend to convey an idea of culture associated mainly with a material dimension expression and human physical interventions on nature. On the other hand, the textbooks seem to convey a conception of nature that appears to have no symbolic relations with humans. The distinction between what is natural and what is cultural can be determined visually, suggesting that the landscape can be categorized according to the quantity of its natural or cultural elements. This judgement may affect how students consider the different realities of the country and seems to give too much weight to an idea of culture defined mainly by the visible elements of material culture. Connecting with the above arguments, I explain how the textbooks seem to convey an idea of environment focused on material and functional aspects in the next section of this document (5.4.2).

5.4.2 The conceptions and value of the environment conveyed by the analyzed textbooks appear to be mainly material and utilitarian

Related to the previous point, I found that the analyzed textbooks, in general, conceive of the environment mainly in material and utilitarian terms; in other words, focusing the human-environment interaction on the use we (humans) make of the environment (whether as natural resources or places) and the benefits we obtain from it. In fact, I categorized the most common way in which the environment is regarded in the analyzed textbooks for grades one and four using the code Social. My use of the code Social means that the main contexts for the human-
The different types of settlement reflect the close relation between society and its environment. Each community adapts its way of life to the environment they inhabit, which gives them the resources for living. This is why the changes on the landscape depend on the productive activities of the population. (Amengual et al. 2009:95)
The above example illustrates some human settlements associated with different kinds of human-environment relationships in Chile; however, in reality, not only intensive industrial activities and production determines the human habitats and how humans relate to the environment. The above representation of Chilean settlements excludes, for example, indigenous communities and populations that have other types of relationship with the land rather than an intensive industrial exploitation. The above examples illustrate human interactions with the environment that can be labeled with the code *Economic*, which characterizes nature and the environment as goods, property, resources for production, and sources of profit. The code *Economic* identifies the use of the environment in large scale economic activities such as agriculture or mining in a context of industrial production or business. However, the interactions between humans and the environment represented in the analyzed textbooks appear to be focused in general at the local and individual scopes, conveying the importance of the environment and natural resources as sources of livelihood and stressing the importance of people’s work for the functioning of society.

In the case of the textbooks for grade eight, I most often categorized the human-environment relationships using the codes *Scientific*, *Political*, and *Economic*, that characterize the environment as a source of experiences, knowledge, territory, national patrimony, profit, and property. Specifically, the Natural Science textbook for grade eight appears to regard the environment mainly from a scientific perspective, conceiving it as scientific data, physical phenomena, and chemical components. The aforementioned conception focuses on physical aspects of the environment through topics such as cells, atoms, electricity, properties and structure of the matter, evolution, atmosphere, and plaque tectonics. The Natural Science textbook for grade eight expresses the aforementioned topics through concepts such as change, origins, competence, variables, system, nutrition, and function. On the other hand, in the History, Geography, and Social Science textbook for grade eight, the main conceptions of the environment appear to be focused
mainly on political and economic aspects. These conceptions are expressed through concepts such as imperialism, expansion, exploration, economic and technological development, capitalism, individual, and urban life. These concepts are presented by the textbook as desirable human achievements and are described in political and economic terms from the European perspective, excluding the most negative aspects of human and environmental conflicts (for example, in the references to war and slavery). The same textbook appears to associate the idea of progress with urban life and economic development, and portray war and slavery as means to obtain profit and power without moral critique or reflection (see the codes and concepts highlighted in section 5.3, Figure 9). In addition, in the History, Geography, and Social Science textbook for grade eight, technological innovations and the optimization of agriculture are presented as drivers of the development of medieval society and posterior cultural changes. These situations seem to conceive the environment as a territory to be conquered and owned (as well as humans) and natural resources as the fuel for commerce and exploration. The History, Geography, and Social Science textbook for grade eight also mentions how society begins valuing individuals and individual experiences as the means to attain knowledge about the world.

In contrast with the findings described above, symbolic conceptions of the environment and nature (associated with the code *cultural*) are relatively scarce in the content of the six textbooks. This situation is directly related to the natural/cultural distinction mentioned in section 5.4.1. According to the textbooks, only material expressions of culture appear to be considered cultural elements or components of a *cultural landscape*. Therefore, symbolic aspects of culture, such as spiritual and religious conceptions of nature appear to be excluded from the notion of culture described in the textbooks. The symbolic dimensions of culture seem to be excluded even when the analyzed textbooks explain the different ethnic groups living in Chile; hence, the endemic indigenous ways to understand nature, including all their spiritual and symbolic dimensions of
culture associated with the environment are underrepresented in the analyzed textbooks. The main symbolic conception that the analyzed textbooks attribute to the environment is its value as a national patrimony, which, according to my set of codes for this study, falls into the *Political* category (see section 4.2.4 of this document). Categorized under the code *Political*, national patrimony in this case means that the importance of the environment lies on its belonging to a nation and its territory (therefore, virtually to the citizens too). Valuing the environment as national patrimony is stated literally in one or two occasions throughout the analyzed textbooks for grades one and four, and more frequently in the History, Geography, and Social Science textbook for grade eight, but it also seems to be implied in several images used to illustrate places and landscapes from Chile. These occurrences involving national patrimony mentioned in the text make reference to some geographic features and specific places from Chile, focusing on their historical and traditional importance, and their visual aesthetic aspect. In the case of the images representing nature as national patrimony, the textbooks show mainly outdoor settings without humans. An interesting example of how the textbooks appear to represent the environment as national patrimony is found in the Natural Science textbook for grade one. This textbook appears to regard the Chilean flora and fauna as national patrimony, arguing that they are endemic to the Chilean territory and it is our duty to protect them (whether as students or Chileans). This representation of the environment (and the animals and plants that live in it) as national patrimony is one of the few symbolic conceptions of nature expressed or implied by the analyzed textbook. Also in the realm of symbolic conceptions of the environment, one of the few examples of human relation with the environment that I labelled as cultural (therefore, involving symbolic dimensions) comes from the textbook on History, Geography, and Social Science for grade four. The content of this textbook mentions food as the connection between cultural traditions and the environment (Amengual et al. 2009:100). This content is presented as an activity, in which the
students have to gather information interviewing people from their community to make a recipe book. This activity, besides connecting students with their community, contrasts with other content, such as the content on the senses that mainly focus on the physiology of the sensorial organs and how to protect them (see section 5.5.1) instead of on how they connect us with the environment.

In summary, the analyzed textbooks tend to portray the environment in terms of its usefulness to humans. In this sense, the value of the environment resides in the fact that it provides health, enjoyment, and livelihood, in addition to status, wealth, and knowledge. These representations focus mainly on average middle class dynamics and intensive industrial activities. Regarding symbolic dimensions, the environment appears to be represented mainly as national patrimony, stressing the idea of belonging (to Chile and Chileans) and its aesthetic aspects. Indigenous beliefs and spiritual and religious dimensions of the human-environment relationships seem to be excluded from the symbolic aspects of the environment that appear to be represented in the analyzed textbooks. The representations of the environment explained above seem to show only in part the actual human-environment relationships that occur in Chile and globally, excluding important cultural dimensions associated with traditions and symbolic aspects of human life.

5.4.3 Representations of the complexity of nature and the ecological relations

5.4.3.1 Interaction of the ecological and cultural diversity according to the analyzed textbooks

In general, the content of the analyzed textbooks seems to express the complexity of ecological relations in terms of ecological diversity and, to a lesser degree, as ecological interactions. The ecological diversity and interactions appear to be represented mainly at a local scale and, in the case of human interactions with the environment, mainly from personal and local perspectives.
Ecological and cultural diversity seems to be represented by the analyzed textbooks with a focus on functional and material dimensions. As well, cultural diversity and interactions are represented, in general, as deprived of current and past conflicts, with the exception of the European history represented in the History, Geography, and Social Science textbook for grade eight. I will explain these and other observations further in the next paragraphs.

The Natural Science textbooks analyzed in this study often represent diversity in association with activities of classification and differentiation by function (often regarding living beings and parts of living beings). For example, the Natural Science textbook for grade one represents living beings usually as isolated individuals and only in a few occasions this textbook portrays living beings integrated into an environment. Regarding humans as part of the ecological diversity and interaction, the content of textbooks for grades one and four seem to generally represent human characters in activities of enjoyment, doing physical activity (such as walking or riding a bicycle) or just observing nature (see point 5.5.1. for further analysis regarding human interaction with the environment). One of the few instances of ecological interaction involving humans, animals, plants, and the environment that explicitly appears in the text of the Natural Science textbook for grade one is an activity of building a small garden. In this activity, students can cultivate vegetables or flowers, take care of them during the process, and record the changes they observe. The textbook introduces this activity as follows:

Plants are very important living beings in nature. They are a source of food for herbivores and humans. Also, they provide us oxygen to breathe... In this project, you will have the opportunity to seed, take care, and see plants grow... (Brahim, Espinoza, Irrazábal, Navarro, San Pedro, et al. 2009:62)

This activity represents one of the few examples of interactions associated with experiences in the analyzed textbooks where students can learn hands-on about the relationships between humans and other living beings (in this case, plants). However, it would have been interesting to connect
the ideas conveyed by the activity explained above with, for example, the relationship between humans and plants in the context of food production.

The topic of the origins of life on Earth and the evolution of species addressed by the Natural Science textbook for grade eight is an example of how this textbook expresses the ideas of change and interaction in nature. This content on the origins of life and the evolution of species separates species and habitats, in a way that appears to under-represent ecological diversity and interactions. In the aforementioned textbook, the content implies the idea of interaction mainly through relations of competence within the same species, based on Darwin’s Natural Selection theory. Regarding Darwin’s theory, the textbook mentions (to a lesser degree) the interaction of animals with the environment as a catalyst of the differentiation of species through time. In this regard, evolutionary changes and adaptation to the environment appear to be explained from the perspective of species and not as a response to changing environmental contexts and ecological relations. In other words, according to the textbook, the species seem to differentiate due to intrinsic features and circumstances of separation or isolation, and different topographic and geographic conditions, rather than to adaptation to changing environmental contexts.

In another example of how the analyzed textbooks convey ecological complexity through diversity and interaction, the Natural Science textbook for grade eight describes the geological eras focused on the diversity of species that lived in each period. The aforementioned textbook excludes ecological relations between the species that characterize each geological period and their environmental contexts, with few exceptions, such as mass extinction events (see an example of the description of the geological periods given by the Natural Science textbook for grade eight in the following excerpt).

Cenozoic Era

...At the beginning of this era, many groups of mammals, birds, insects, and plants with flowers appeared. About two hundred thousand years ago, the human species originated,
obviously the fact that is most interesting to us since we belong to this species. (Calderón et al. 2009:70)

According to this example, besides focusing more on ecological and environmental diversity over ecological interactions, the chapter on geological eras also reads as anthropocentric. Among the 4.500 million years of Earth’s history, the Natural Science textbook for grade eight stresses the relevance of the period occupied by humans, over the vast chain of events that shaped the human species and the environment where we live now.

Also in the Natural Sciences textbook for grade eight, the idea of complexity regarding the human body shows scarce connections with the environment or other living beings, despite explaining the human body at different scales (cells, tissues, organs, systems, and organism). For example, the content on the human body is explained in functional terms and the only connection with the environment mentioned is through feeding, which according to the textbook, is the way the human body incorporates nutrients and elements from the environment (Calderón et al. 2009). In this sense, other systems (respiratory, circulatory, digestive, and excretory) are explained internally, without mentioning their connection with the environment. For example, the respiratory system is explained at the chemical level inside the human body, but the textbooks do not explain a scale further than the human organism. Instead, considering the organism (or the human body) in an environmental context may allow, for instance, connecting with topics such as air pollution and health. The same focus is used for the content on the human organs and cells.

Concerning cultural diversity and interactions, the analyzed textbooks have marked differences among them. The textbooks for lower grades (mainly the textbooks on History, Geography, and Social Science) mention the diverse ethnic cultures living in Chile and a few examples of children from different parts of the world describing the cities or countries where they live and some of their customs. In general, the textbooks for lower grades appear to represent cultural diversity as something valuable, even as a “treasure” (Amengual et al. 2009:8), and associate it with the
concept of tolerance. On the other hand, the textbook on History, Geography, and Social Science for grade eight presents a much more complex treatment of cultural interactions. This textbook focuses on European history from the middle ages to the industrial revolution, represented through concepts such as expansion, conquest, monarchy, territory, sovereignty, commercial trade, economic development, capitalism, urban life, exploration, discovering, entrepreneurship, and the individual. Under the umbrella of these concepts (that in general are presented as desirable human features) the History, Geography, and Social Science textbook for grade eight mentions many instances of intercultural relations, such as slavery, war, and commercial trade, mainly from an economic perspective. The cultural interactions explained in this textbook center on the individual, and the political and economic values as the drivers of society, development and progress, avoiding the conflicts and consequences that the colonial dynamics caused on, for example, the Global South.

In sum, the complexity of the ecological relations is described by the analyzed textbooks more in terms of the ecological diversity rather than on the ecological interactions. This disproportion is apparent in content such as the evolution of species and the geological eras. In turn, cultural diversity seems represented in the textbooks for lower grades as something valuable. However, in the History, Geography, and Social Science textbook for grade eight cultural diversity and interactions appears represented with a focus on the economic perspective and, in general, lacking a deep treatment of the social conflicts generated by the intercultural dynamics through human history (specifically, from middle ages to the industrial revolution). Also, the human being as an organism appears to be explained as a closed system that lacks connection with its environment.
5.4.3.2 Static versus dynamic portrayals of nature

The portrayals of nature I found in the content of the analyzed textbooks seem to differ for each grade. In general, the content of the textbooks for the grade one tends to portray nature as static and unchanging. This textbook represents nature and living beings visually as static and unchanging, for example, often portraying isolated living beings removed from an environment and not performing any action. Particularly in text, the Natural Science textbook for grade one explains lifeless natural objects as static and unchanging as illustrated in the excerpt below:

Living beings can grow. Lifeless natural objects, such as stones and earth, do not grow...
Living beings can move. Lifeless natural objects, such as stones and earth, do not move by themselves. (Brahim, Espinoza, Irrazábal, Navarro, San Pedro, et al. 2009:18–19)

Considering that this example is from a textbook for grade one, it is a reasonable explanation to say that a stone cannot move by itself if it is compared to a frog or another animal, but this distinction misses the opportunity to explain ecological and geological interactions that happen in a longer time span and the impact they have on humans. For instance, the conception of a lifeless and static earth portrayed by the textbooks for grade one represents an interesting paradox considering that Chile is a highly seismic country.

Another example from the Natural Science textbooks for grade one explains endemic species of plants and animals as fixed features of the national territory in the two following excerpts: “The native plants from Chile always have occupied this territory to live, they reproduce freely and to protect them is our duty” (Brahim, Espinoza, Irrazábal, Navarro, San Pedro, et al. 2009:35); “The wild animals from Chile always have occupied this territory to live. They live freely and to protect them is our duty” (Brahim, Espinoza, Irrazábal, Navarro, San Pedro, et al. 2009:36). In these examples, endemic species are enclosed in the national territory, suggesting that political borders apply to nature. In reality, despite the big natural frontiers that surround the Chilean territory (such as the Pacific Ocean and the Andes mountain range), the environment occupied for endemic
species of plants and animals extends beyond the borders of the nation (see also section 5.5.3. for more details on this topic). This enclosure seems to be applied also to the indigenous cultures that have inhabited the Chilean territory. The last examples (excerpts) seem to support a portrayal of nature and living beings that may be read as static and unchanging while appear to disregard ecological dynamics such as migration and evolution. The conception that nature is static and immutable relates to the natural/cultural distinction mentioned in section 5.4.1 of this document, in the sense that humans appear to be the agents that introduce change and movement in nature.

The chapter on the Earth in the Natural Science textbook for grade one is one of the exceptions that appears to portray a dynamic nature through concepts such as Earth rotation and revolution, and the consequent variations that these movements provoke: day and night, and the seasons. The chapter on the Earth also mentions several ecological relations between the behavior of different living beings (including humans) and the earth movements (Brahim, Espinoza, Irrazábal, Navarro, San Pedro, et al. 2009:106–109), content that appears to promote awareness regarding ecological relations between living being and their environments, but in a context of habits and cyclical changes. Apparently, irregular changes or events and the uncertain consequences of the relations between humans and nature are not present at this level.

Two additional examples of content that appears to regard nature as dynamic are included in the last chapter of the History, Geography, and Social Science textbook for grade four explaining (human) activities and natural resources, and the last chapter of the natural science textbook for grade eight that explains atmospheric and geological dynamics on Earth and the resulting changes on the landscape. The Natural Science textbook for grade eight also mentions and shows what appears to be a more dynamic nature in some portions of the content. For example, this textbook includes content on evolution of species, atmospheric and geologic changes and processes, and explains natural phenomena such as storms and earthquakes (see the last chapter in Calderón et
al. 2009). However, in the content of the analyzed textbooks there is a contradiction between criticizing the indiscriminate use of natural resources and the pollution caused by human activity versus the idea that society works in a certain (and, apparently, constant) way that requires the accustomed interactions between humans and nature (no matter the cost for sustainability).

In summary, the textbooks seem to convey particular elements of the environment, such as stones, and living beings as static and unchanging, except for content such as the evolution of species. Especially relevant is the apparent confinement of ethnic groups and endemic species of plants and animals into the borders of the national territory but not further. At a larger scale (tectonic, atmospheric, and planetary), the textbooks appear to convey a much more dynamic nature, but at local and national scale, they seem to portray humans as the agents that introduce change in the environment. However, the references to the negative impact of human activity on sustainability in the textbooks contradict the apparent conformism toward the perpetuation of the status-quo regarding socio-ecological interactions that seems implicit in the same textbooks.

5.5 Findings regarding civic participation concerning the environment

5.5.1 Humans as spectators of the environment and detached scientific observers

The representations of the environment and the human-environment interactions portrayed in the content of the six analyzed textbooks differ for each grade, showing the biggest difference in the content for grade eight. In general, the textbook content seems to portray notions of the environment and the human-environment interactions that focus on the physical and visual dimensions. Specifically, the content seems to cluster the notions of the environment and the human-environment interactions into dimensions, such as: practical day-to-day applications and activities, historical events and discoveries, and elements separate from the symbolic aspects of human culture that can be understood through scientific means. In particular, the textbooks for
grades one and four generally portray the human-environment interactions as pleasant experiences in which humans perform activities that strengthen health and provide enjoyment and knowledge about the world. In the content of images, the pleasant aspect of human interactions with the environment seems to be expressed through smiling characters that appear to be enjoying outdoor activities. I characterized many occasions of pleasant human-environment interaction in the content of the textbooks as touristic experiences. These touristic experiences represent, for example, the content of the grade one textbooks portraying human characters in different environments, generally enjoying themselves through physical activity, playing, observing the landscape, or without performing a specific action. The History, Geography, and Social Science textbook for grade four presents indigenous cultures as a positive model of interactions with the environment in terms of sustainability, but at the same time, labels indigenous people from Chile and their culture as a “living past” (Amengual et al. 2009:76) that can be visited as if being a living museum showing past ways of life. Examples of the idea of living past can be found in the content associated with the first objective of the chapter “Chile has a living past” (Amengual et al. 2009:54): “To identify the indigenous people (or cultures) that inhabited the current national territory before the arrival of the Spanish” (Amengual et al. 2009:54) and in the following excerpts:

[Activity called] A model about the initial people [or original people, used as indigenous people]... Now that you know more about the (Chilean) initial people, we invite you to create a model in which you can place and recreate their way of life... Copy the zone inhabited by one of the studied initial people (or cultures) from a Chilean atlas... When you have the physical shape of this Chilean zone ready, put... the name of the initial people. Do the same to indicate the current cities of the zone and the rivers... (Amengual et al. 2009:73)

[Activity] Cultural tourism in my region...
1. (...) make a list of places from your region that have cultural remains or current manifestations of initial people [or original people, meaning indigenous cultures]. 2. Investigate about the way of life that these initial people had or have; for example, their gastronomy, costumes, craftwork, rituals and legends... 4. Make advertisement flyers indicating the touristic schedule to visit these cultures. These [flyers] have to include: a) A map that indicates the places that will be visited b) An itinerary: cities and villages that will
be visited, their landscapes, the activities, etcetera c) Representative photographs of the sites that will be visited. (Amengual et al. 2009:76)

The notion of living past seems to portray Chilean indigenous cultures as something pertaining to the past that appears to be excluded or outdated in the current society (see section 5.5.5. for further analysis of this idea). Furthermore, this notion appears to give relevance mostly to the material heritage of the Chilean indigenous cultures and seems to avoid talking about non-material aspects, such as traditions and worldviews, and symbolic dimensions in general. Also excluded in the content of the inspected textbooks are the reasons why many ethnic groups from Chile do not exist anymore. This excluded content might allow relevant discussions regarding the long lasting political conflicts that might be rooted in conflicting worldviews among the Chilean indigenous cultures, the political class, the economic spheres, and the old and modern colonists.

In a similar way to the concepts of living past, the History, Geography, and Social Science textbook for grade four appears to regard national parks as the places where people can visit nature and see preserved natural resources (Amengual et al. 2009:116). This notion of nature and the Chilean environment seems to focus only on material and functional aspects of the relationships that Chileans may have with the environment and also seems to regard nature as something alien to humans and society that provides material resources for human activities. Regarding the human-environment relationships, the analyzed textbooks for grade one and four also appears to express the detachment of humans and the environment through the use of the concept landscape instead of environment. The word landscape is often used instead of environment, focusing on visual features over other aspects of the surroundings that might be interacting with humans. Another example shows a progressive detachment in the interaction between humans and the environment in the content that describes the senses, which I consider the means that humans and other living beings have to be physically and chemically in contact with the environment. In the Natural Science textbook for grade one, the content describes the
senses from a functional perspective, describing how humans can perceive sensorial stimuli using the sensorial organs and how to protect them (Brahim, Espinoza, Irrazábal, Navarro, San Pedro, et al. 2009:43–48). For example, the Natural Science textbook for grade one describes the sense of taste as follows: “The sense of taste is located in the tongue. Through the taste, you can feel the flavor of the food you consume” (Brahim, Espinoza, Irrazábal, Navarro, San Pedro, et al. 2009:46).

The topic of the senses appears again in the Natural Science textbook for grade four, but this time focusing mainly on how to protect the senses through rules of hygiene and moderate exposure to sensorial stimuli (Brahim, Espinoza, Irrazábal, Navarro, and San Pedro 2009:22–23). The following excerpt illustrates how the Natural Science textbook for grade four treat the content on the senses:

Take care of your eyes
-When you feel that a strange element got into your eye, do not rub yourself; this might produce an injury.
-Do not put dirty hands on your eyes, because (the eyes) might get an infection.
-Do not watch television at less than three meters distance.
-Prefer (using) natural light to make your homework or reading.
-Install a filter on the monitor of your computer to avoid exposing your eyes to the brightness of the screen.
-Do not use the eye-drops that other person is using (...).
-Go to the doctor when you feel that you are not seeing well. Do not worry if you have to use glasses; what matters is that your vision do not deteriorate. (Brahim, Espinoza, Irrazábal, Navarro, and San Pedro 2009:22)

As the above examples illustrate, the content on the human senses conveyed by the analyzed textbooks appears to shift from describing the humans sensorial connection with the surroundings (in the textbook for grade one) to focusing on the human physiology and the individual as an isolated organism (in the textbook for grade four). However, the overall content on the senses seem to include little reflection regarding the diverse ways in which humans and other living beings interact with the environment through sensorial stimuli. According to the History, Geography, and Social Science textbook for grade four, the only sense that is directly associated
with connecting humans with the environment is touch—a direct physical stimulus. However, other chapters seem to imply that vision (specifically, observation) may help us to acquire a scientific understanding of the world. Overall, the way the analyzed textbooks appear to convey the content on the senses seems to reinforce a notion of humans as individuals that have only a material and functional link with the environment.

The content of the Natural Science textbooks also appears to regard the environment as a source of information and as something that can be understood through scientific methods. Particularly the textbooks for first and fourth grades propose various outside-the-classroom activities for students, involving experiences that promote the observation and description of natural elements and living beings from a neutral stance. In this fashion, the textbooks generally foster the observation of objects and living beings by its parts and removed from their usual contexts or surroundings. For example, classifying the parts of a leaf seems more relevant for the textbooks than analyzing and understanding the leaf in the context of the tree and its surroundings. The example below illustrates an activity from the Natural Science textbook for grade one—not to mention that after this activity, the garden or park might lose many plants.

![Activity of observation and classification](image9.png)


In this sense, the textbooks for grade one generally ask students to describe what they observe in single objects and living beings, focusing inquiry on functional aspects and relations (see previous
example). Accordingly, the textbooks generally do not foster much reflection about the broader contexts and interactions that the observed objects may have with humans, other living beings, and the environment. For example, it seems that the textbooks assume that stones belong to the natural world, whether they are part of an architectural project or a mountain. This example (and many others) conceives the environment as a source of information about the world, but does not necessarily promote a critical analysis or reflections about the relation that humans may have with the environment. However, one of the few activities that consider broader relations between living beings and the environment is proposed in the Natural Science textbook for grade four. In this activity, students observe animals or insects in the environment and register their observations as explained in the following excerpt:

1. Form a work group of four boys or girls. 
2. Choose two living beings from your surroundings to do this activity. It is always better to observe the living beings in their natural environment; hence, do not capture them. If it is a bird, you have to be patient and follow it cautiously. If they are small living beings, use a magnifying glass to see them. 
3. Register the information in charts... (Brahim, Espinoza, Irrazábal, Navarro, and San Pedro 2009:14)

This activity aims to teach scientific methods and skills, as well as to promote scientific inquiry in young students through field observation. While the Natural Science textbooks for grades one and four aim to promote the skills of observation and description, the Natural Science textbooks for 8th grade aim to further encourage and teach scientific methods and inquiry as an analytical process.

For example, the textbook for grade eight has two thematic sections that directly promote scientific know-how in students through experimental activities: Haciendo ciencia (making science) and Taller científico (scientific workshop) (Calderón et al. 2009). The sections Haciendo ciencia and Taller científico foster scientific inquiry through the teaching and practice of the following scientific skills: conduct observation, identify scientific problems, formulate hypotheses, design research, collect data, analyze results, and produce conclusions (Calderón et al. 2009:5). The main idea or
value of nature and the environment that appears to be expressed in the Natural Science textbook for grade eight corresponds to the Scientific category (see section 4.2.4 of this document). This Scientific notion regards nature and the environment as sources of information and experiences for the production of knowledge, but at the same time, disregards their symbolic dimensions. However, at the end of most topics discussed in the Natural Science textbook for grade eight, students are asked to state their opinion regarding the studied content in the What do you think? section. An interesting example of the What do you think? section is a discussion regarding the purpose and role of science. The example below is an excerpt of the What do you think? section:

Comment with your classmates
- Do you believe it is important that scientists dedicate to investigate aspects such as the origin and evolution of living beings on the Earth?
- Should scientific work always be related to practical applications or should it be a free work that has the single aim of understanding the world that surrounds us?
- Would the knowledge on the evolution of organisms eventually have an impact on the production of food and health?
- Do you think that knowing about our origin and evolution can positively change our way of thinking and interpret the world? (Calderón et al. 2009:48)

In this example, the textbook proposes reflection on two values or stances (see section 3 of this document for a definition of values used in this study) regarding science and the scientific undertakings: a practical science in the service of material production and practical objectives, and a more theoretical science in the service of the production of knowledge. But interestingly, it seems that the topics and discussions in the content of the analyzed textbooks never center on student opinion; and when it is asked, it does not transcend into activities or actions. In this case, it seems that the time dedicated to discuss and work in class based on student opinion may depend more on the will, knowledge, and priorities of the teacher, and less on the content proposed by the textbooks.

In sum, the analyzed textbooks appear to represent human interactions with the environment focusing on visual, material, and practical aspects that seem to be characterized as pleasant
experiences of enjoyment, resources that provide material wealth, and scientific experiences and information about the world. In particular, the notion that nature and the human-environment relationships represent sources of experiences and scientific knowledge about the world seems treated in an atomistic way, avoiding broader contexts and relations. In addition, the analyzed textbooks for grades one and four appear to represent Chilean indigenous cultures and national parks focusing on the material aspects of culture and nature, suggesting they are preserved cultural elements and resources. Also, the instances of reflection and critique I found in the analyzed textbooks are generally placed at the end of the topics, do not appear to have a central role, and do not seem to extend into activities or action. The focus of the analyzed textbooks seems to disregard other types of involvement and interaction among people and between people and the environment that might lead to political discussion and action regarding, for example, conflicting worldviews among the Chilean central government, regional and local institutions, and stakeholders including indigenous groups, as well as historic struggles concerning rights, territory, and land management in Chile.

5.5.2 According to the analyzed textbooks, protecting the environment does not always mean protecting humans

The argument of this section is directed to the consistency of the content in the analyzed textbooks concerning the impact of environmental care on humans. Part of the content of the analyzed textbooks concerning environmental care does not seem to express clearly (or does not express at all in some cases) how environmental problems affect humans and, therefore, why addressing environmental problems is important to humans. The following excerpt found in the History, Geography, and Social Science textbook for grade four illustrates how the analyzed content seems to represent environmental care and its impact on humans:
We already know that people carry out productive activities using the natural resources. For this (purpose), they intervene the natural landscape and transform it into the cultural landscape. Many times, this transformation cause harmful effects on the environment. For this reason, measures for its recovery have to be taken, in other words, (make it) be healthy again. (Amengual et al. 2009:83)

This example illustrates the focus of the textbooks on functional and material aspects of the relationship between humans and the environment. Also, it is interesting to notice the passive voice when the excerpt makes reference to environmental care. This makes me wonder: then, who is in charge of this task? These observations illustrated in the above excerpt are related to the nature/culture distinction mentioned in 5.3.1 and appears to convey that nature is something static that we must intervene in order to protect it (often from the consequences of human actions) or modify it according to human needs. These needs seem associated to material and practical goals or benefits, and might be deemed pertaining to the scope of economic sustainability.

Another dimension of the analyzed content associated with environmental protection focuses on moral duties. For instance, the textbooks often mention caring for animals and plants in a paternalistic way as a moral duty, but they seem to overlook explaining its ecological importance and its impact on sustainability. Also, statements such as the Decalogue (rules) of the environmentally conscious citizen (Amengual et al. 2009:115) presented in the History, Geography and Social Science textbook for grade four are also an example of prescriptive norms of conduct and attitudes that are not explained in depth (for more information on the Decalogue, please go to section 5.5.4 of this document), missing the opportunity to explore the linkages between environmental problems and human action. The aforementioned Decalogue also focuses the responsibility for environmental care on individual students, avoiding discussions regarding whether the prescribed norms represent only desirable moral attitudes or if complying with them
would mean a significant effect on sustainability (or even on the own students’ health) versus collective action or a change of values.

As explained previously in this section, some of the content I found in the analyzed textbooks does not connect the idea of environmental care with the possible effects that it may have on humans (for example on human health, and availability of water and food); however, the analyzed textbooks do state this connection notably in regards to the future availability of resources for production processes, providing services, and the whole functioning of society.

The observations explained in this section can be summarized in three stances: the content of the analyzed textbooks appears to disassociate environmental problems and the impacts that these problems may cause on humans (for example, concerning health); the content of the textbooks seems to associate environmental care with the future availability of resources for economic activities and the whole functioning of society; and also, the textbooks seem to regard environmental care as a moral duty that each of us (or each student) has to accomplish individually.

**5.5.3 Local citizens: the representations of the interactions between people and the environment seem to be mainly enclosed within the boundaries of the nation**

In general, the content of the textbooks I analyzed tends to mention or portray relationships between citizens and the environment at local and national scales, with the exception of the History, Geography and Social Science textbook for grade eight that explains transnational interactions among people and with the environment. As an example of the analyzed textbooks for early grades, the History, Geography, and Social Science textbook for grade one represents the human-environment interactions mainly at a community level in association with the concepts such as livelihood, products, services, institutions, and norms. The aforementioned textbook also
expresses the importance of respect (for other humans) and cleanliness (of common spaces) as necessary aspects for life in community, and the importance of work for the production of goods and the whole functioning of society. The same textbook also mentions relationships between humans and the environment at a national level, in association with traditions (in the form of dances and festivities) and national patrimony (in the form of national emblems and typical elements, such as endemic animals, flowers, and food or recipes).

The content of the analyzed textbooks for grades one and four also seems to disregard commonalities between Chile and other countries of the region. These textbooks apparently rely mainly on Chilean local social and ecological dynamics and settings when representing the relationship between people and the environment. In other words, the aforementioned textbooks seem to overlook the similarities in terms of history, physical environments, flora and fauna, and language between Chile and its neighboring countries. Recognizing these commonalities might help foster a notion of community at a regional level and potentially trigger discussion on historic and current issues that affect the region socially and ecologically. Furthermore, international and global interactions seem to be underrepresented in the content of the first and fourth grade textbooks, giving the appearance that the national frontiers are the limits for the endemic species, people, and environment. Issues such as migration, exploitation of resources, and pollution are not mentioned, in general, as examples of transnational interaction with the environment (or as causes of environmental degradation at a global scale), but they are mentioned at a national level in association with the ideas of environmental protection, citizen participation, and individual responsibility. As well, the textbooks for grades one and four appear to represent the human-environment interactions concerning the production and consumption of goods and services mainly at a local and national scale; however, as an exception, the Natural Science textbook for grade four includes the global impact of human activities in the chapter ‘The Earth and the
In this chapter, the topic of conditions for life on the Earth mentions how human activity impacts the ozone layer, affecting life at global scale (Brahim, Espinoza, Irrazábal, Navarro, and San Pedro 2009:109). The dimensions of the relationship between people and the environment that appear to be represented in general in the analyzed textbooks might foster a degree of awareness that only concerns local and national issues. This notion seems to disregard the impact that human activity might have beyond the border of the nation and centers the attention on norms and values that appear to guide civic actions of individuals regarding the environment only in local and national contexts.

In contrast to the analyzed textbooks for grades one and four, the History, Geography, and Social Science textbook for grade eight shows several examples of transnational and intercultural interaction in its content covering the political dynamics of the medieval period until the industrial revolution. These transnational interactions with the environment appear to be related to the ideas of sovereignty, war, expansion, economic development, profit, and science (mainly from a European perspective), framing the relationship between humans and the environment into political, economic, and scientific dimensions. The aforementioned content transmits the idea that land, resources, and people can be owned and considered as private property; however, we must consider that the content of the History, Geography, and Social Science textbook for grade eight presents historical interpretations as facts and appears to foster inquiry and critique only in the chapter on the industrial revolution.

Overall, from my perspective, the analyzed textbooks seem to represent interactions mainly between people and the environment at a local and national scale, conveying the sense that civic participation and human impact on the environment is a local and individual phenomenon. Furthermore, the analyzed textbooks appear to represent the national borders as the boundary for endemic species of flora and fauna, ethnic groups, and the Chilean physical environment in
general. Accordingly, the textbooks appear to overlook the similarities and the notion of community between Chile and the countries of the region. In sum, the scope at which the analyzed textbooks represent the relationship of citizens and the environment does seem to foster little reflection regarding socio-ecological conflicts at a transnational scale. This may affect the students' level of awareness regarding historic and current issues at a regional and global scale and contribute to configure a citizenry who act mainly individually and only concerned with national and local matters that regard the environment.

5.5.4 The norms and rules stated in the analyzed textbooks seem to foster attitudes, but not necessarily committed actions based on values

The six textbooks I analyzed appear to foster interactions between students and the environment through activities for enjoyment and scientific exploration. Regarding norms and rules, the analyzed textbooks appear to articulate civic participation concerning the environment in a prescriptive manner, focusing mainly on individual responsibilities or moral duties. In general, these norms and rules appear to center on fostering desirable student attitudes and behavior (such as respect and cleanliness) for life in community, but not necessarily values that transcend into action nor collective civic participation toward sustainability. As mentioned in a previous section of this chapter, most of the activities involving experiences of interaction with the environment mentioned in the Natural Science textbooks focus on scientific exploration. These activities mostly encourage the scientific skills of observation and description, but the textbooks also give some space for reflection and critique. Some of the instances of critique and reflection in the analyzed textbooks focus on individual responsibilities concerning environmental care and the rational use of natural resources. Most of these instances of reflection and critique are concentrated in the Natural Science textbook for grade eight in sections such as ¿Qué haces tú?
(What do you do?) and ¿Qué piensas tú? (What do you think?) (Calderón et al. 2009). However, despite giving a space for reflection, these two sections do not seem to transcend into action and appear to keep a prescriptive tone in the case of making recommendations or stating the “right” environmental behavior.

Another example of rules and structure for civic participation regarding the environment is the Decalogue of the environmentally conscious citizen (Amengual et al. 2009:115) that appears in the History, Geography, and Social Science textbook for grade four. This Decalogue states the following ten rules:

1. Try to save as much energy as you can (electric, gas, oil, etcetera)
2. Avoid polluting
3. Use recyclable or recycled products
4. Consume as little as possible: only what is necessary
5. Prefer natural products, not too elaborate
6. Inform yourself about the effects produced by your consumption
7. Protect the natural and artificial surroundings
8. Opt for permanent things, not those of short duration or disposable
9. Protect the flora and fauna
10. Think on the future generations (Amengual et al. 2009:114)

These ten rules, besides having a prescriptive tone, ask for the individual commitment of students to acquire or perform a specific desirable behavior. According to the analyzed textbook, this desirable behavior would characterize an environmentally conscious citizen. The behavior encouraged by the Decalogue appears to center on consumer conduct (students as consumers of energy and goods) and paternalistic and moral attitudes toward environmental protection. The downside of focusing only on encouraging a specific behavior regarding the environment (as explained in section 2.3 of this document) is that students may not be moved by values or beliefs that may translate into a long term change of actions. In addition, the rules stated in the aforementioned Decalogue may be influenced or modified by competing messages (such as in advertisement) that have much larger exposure throughout the students’ life.
Direct actions toward sustainability that might have a much broader impact at a community level than the behavior encouraged through the aforementioned Decalogue seem weakly encouraged throughout the six analyzed textbooks; however, one of the exceptions is an activity to create a campaign for environmental care in the History, Geography, and Social Science for grade four (Amengual et al. 2009:110). The following excerpt shows the instruction for this campaign:

Campaign for environmental care
1. Choose an environmental problem from those seen (in this chapter) or other interesting to you
2. Investigate the causes that produce it (the environmental problem) and look for photos or create your own drawings
3. Propose alternatives for the solutions of the (environmental) problem
4. With the information you gathered, create an advertisement campaign to foster compromise to the solution of the environmental problem and environmental care in the community (Amengual et al. 2009:110)

The example above illustrates an activity that might be based on the students’ beliefs and values, transcend into action at community level, and connect students with real socio-ecological problems and its possible solutions. Activities of this type are important not only to develop awareness of socio-ecological dynamics but also to experience civic participation concerning the environment, beyond the perspective of an individual consumer.

In general, the norms and structures for civic participation concerning the environment encouraged by the textbooks appear to focus more on particular attitudes and behavior modeling instead of values or beliefs that may translate into a long term change of actions and commitment to sustainability. Specifically, the textbooks appear to encourage civic participation concerning the environment from an individual scope of responsibilities, focusing on students’ behavior as consumers (of energy and goods) and paternalistic attitudes toward environmental protection. Also at an individual scope, the textbooks noticeably encourage norms and attitudes for life in community, such as respect and cleanliness. On the other hand, the textbooks present only a few
instances to promote students’ involvement in critique and civic participation that might raise awareness regarding socio-ecological dynamics and impact sustainability at a community level.

5.5.5 The representations of interaction between citizens and the environment center on individual realities, express gender stereotyping, and portray older people as dependent and lacking involvement in society

In general, the characters that appear either in photographs or drawings in the analyzed textbooks are children (with the exception of the History, Geography and Social Science textbook for grade eight) and the inclusion of adults tends to be representing parents and teachers. See the below examples from textbooks for grade one and four showing children through two different graphic styles:

![Image 10: Children in the garden (Brahim, Espinoza et al. 2009:40-41)](image10)

![Image 11: Chilean children (Amengual, Cisternas, and González 2009:55)](image11)

As illustrated in the above example, particularly the textbooks for grades one and four generally represent the characters in drawings as Caucasian. In fact, in some chapters, it is hard to find characters with dark hair. For pictorial reasons, it might be considered more “catchy” to put more color in the illustrations, but this might imply idealization of certain features (such as hair and skin color) that do not represent the majority of Chilean citizens. On the other hand, illustrations portraying realities, such as hunter-gatherer societies and settings are portrayed using dull colors in tones of brown, giving a sense of something aged, precarious, and dirty. These representations contrast the colorful representations of urban settings found in the textbooks for grades one and
four. Also, as mentioned previously in this chapter (see section 5.5.1), indigenous cultures from Chile are presented as a “living past” giving a sense of something outdated in current times. This notion affects how indigenous values and ways to relate to the environment are represented in the analyzed textbooks; therefore, the notion of living past virtually undermines how civic participation of indigenous people in current Chilean society is represented. The natural-cultural distinction explained in section 5.4.1 also impacts how indigenous cultures and rural societies are represented in the studied textbooks. According to the natural-cultural distinction expressed in the textbooks for grade one and four, the cultural landscape is made by the human material intervention and transformation of the natural landscape. Therefore, according to the analyzed textbooks, indigenous and rural societies would have less cultural elements (material culture) than modern urban environments. These implied stances on the human relationships with the environment focus on a material and functional perspective, and overlook symbolic dimensions of the socio-ecological dynamics and cultural diversity.

In the textbooks for grades one and four, human characters are generally represented in leisure activities, doing physical activity (such as walking or riding a bicycle) or observing nature. However, another dimension of human interaction with the environment that appears to be portrayed particularly in the aforementioned textbooks represents livelihood and daily life at a local scale. In most of these occasions, the textbooks explain in text and show in images daily routines in settings such as homes, schools, stores, and other urban services. One dimension that is particularly relevant in the aforementioned types of human-environment interaction is work and livelihood. In general, these dimensions of human-environment interactions appear to exclude large extractive industries and other economic activities that imply larger interventions on the environment. However, when these industries are mentioned or shown, the textbooks represent them from a
local and individual perspective, stressing the importance of people’s work for society; in other words, the importance of the production of goods and services for the functioning of society.

On the other hand, the textbooks for grade eight represent the human-environment interactions through scientific experimentation and marine exploration driven by political and economic purposes. This textbook shows human-environment interactions from the past that focus mainly on European history from the medieval times to the industrial revolution, and presents the Chilean society as heir of Western or European culture.

Regarding gender representation and stereotyping, in general, the textbooks for grades one and four tend to portray boys and girls in equal actions and attitudes throughout the text and illustrations. In the case of sports, which are a type of interaction with the environment described by the textbooks as a way to achieve health, the textbooks do not present gender differences and stereotyping. This situation is different in the case of the content of the Natural Science textbook for grade four showing risky actions. This textbook excludes girls in the images of human-environment interaction involving risk, such as, people riding a bicycle or walking on a narrow beam (see the below examples).

Image 12: Boy taking risks (Brahim, Espinoza, Irrazábal, Navarro, and San Pedro 2009:54)  
Regarding gender stereotyping specifically in adults, the analyzed textbooks tend to portray women as teachers and mothers, and men as fathers, workers, rulers, conquerors, entrepreneurs, explorers, and scientists. An interesting example of gender stereotyping appears in the content of the History, Geography, and Social Science textbook for grade four explaining the topics of human rights, specifically, when describing the changes in women’s rights. The following example shows how the History, Geography, and Social Science textbook for grade four represents the evolution of women’s rights and participation in society through time:

In the above example, the textbook represents women from two different times illustrating how women’s rights and participation in society have changed over time. However, both images make it seem that, despite the time gap, women are still in the same physical position (seated) and the prospects of job and position for current women are not promising. The previous example seems to express the idea that women are part of the labor force in current times; however, the example also denotes the current gender inequities concerning power and participation in society.

Another interesting example of gender stereotyping appears in the vignettes that accompany most of the topics in the History, Geography, and Social Sciences textbook for grade four. The characters portrayed in the vignettes show boys interacting with different things (for example, a boy riding a scooter, or boys holding a plant, magnets, and the world), whereas girls are portrayed
reading, writing, and holding papers. The following images are examples of vignettes from the Natural Science textbook for grade four:

Image 16: Vignettes (Brahim, Espinoza, Irrazábal, Navarro, and San Pedro 2009: several pages)

The distinction illustrated in the above example seems to strengthen the stereotypes that identify men with hard sciences and experimentation, and women with the fields of humanities and arts. The differences on gender representation exhibited by the analyzed textbooks in aspects of risk taking, power, participation in society, and stereotypes of interests and skills appear to convey the notion that men tend to be in direct interaction with the environment, and women tend to be indoors. These representations seem to reinforce the idea that women participate only in the private dimension of citizenship, and men, in the public. The exception comes from the content of the History, Geography, and Social Science textbook for grade eight explaining the struggles of women to achieve equal rights for participation in society (specifically, voting).

The participation of older people in society and their interaction with the environment seems to be represented throughout the six analyzed textbooks as inactive and with mobility problems. In general, the analyzed textbooks appear to represent older people as passive characters marginalized from the action and often as physically impair. For example, the textbooks often portray the stereotypical older man with a cane and an older woman seated and knitting (see the below examples).
These representations of older people’s interactions with the environment and participation in society appear to be confined to family contexts and excluded from physical activity. In other words, the representations of older people seem to convey the idea that they are not independent and would require the support (or presence) of other family members. As well, the representations of older people appear to exclude them from collective activities and civic participation in areas such as enjoyment, work, and productive activities.

In summary, the analyzed textbooks appear to represent civic participation concerning the environment in stereotypical ways. Most of the characters represented throughout the analyzed textbooks are children. Adults seem to be represented as parents, teachers, and workers. The importance of work and livelihood seem to be the focus of the textbooks when representing the human use of natural resources. Rural and indigenous ways of living are represented with a focus on material culture and indigenous ethnic groups from Chile portrayed as outdated in current times. The representations of gender also seem to be stereotypical. The evolution of women’s rights and participation in society seem to reproduce the current inequalities that still exist regarding women’s participation in society. Regarding, career choices, interests, and skills, the analyzed textbooks also seem to represent gender stereotypically, giving the sense that women participate more indoors and in the private scope of citizenship, and men outdoors and in the
public sphere of citizenship. The analyzed textbooks also seem to represent older people stereotypically. Older people appear represented as lonely or in the company of younger family members; in other words, not independent and excluded from collective participation and aspects of life such as enjoyment and work. All these representations appear to specify people’s roles in society according to gender and age and, therefore, reproduce a type of civic participation concerning the environment that is characterized by playing and studying in childhood, productive activities and family life in adulthood, and inactivity in older life.

5.6 Summary of findings

The table in this section (Figure 10) summarizes the observations presented in the findings section of this study. The objective of this summary is to guide the readers through the topics covered in the findings section of this document and identify the main ideas that arose from the analysis of the textbooks.

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<th>Findings regarding humans and the environment as a complex system</th>
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<td>5.4.1</td>
<td>Natural/cultural distinction: culture resides in human material intervention on the environment</td>
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<td>- The Natural/cultural distinction and the notions of natural landscape and cultural landscape appear to promote a division based on the predominance or scarcity of human made objects and human transformations of the environment</td>
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<td>- The above distinctions appear to regard the notion of culture mainly as material culture and material interventions to the land</td>
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<td>- In association to the above distinctions, the textbooks also suggest that material culture, understood as material culture and material interventions to the land, is quantifiable. According to this quantification, we could argue that more interventions to the land would suggest more culture</td>
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<td>- The aforementioned distinctions and notion of culture seem to disregard symbolic understandings of the environment</td>
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<td>5.4.2</td>
<td>The conceptions of the environment conveyed by the analyzed textbooks appear to be mainly material and utilitarian</td>
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<td>- In the textbooks, human interactions with the environment are generally represented as a pleasant experience and as sources of livelihood</td>
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<td>- The textbooks also represent functional relation with the environment that understand the environment as a source of benefits in aspects such as health, enjoyment, and livelihood</td>
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<td>- Particularly the textbook of History, Geography, and Social Science represents political and economic understandings of the environment through interactions such as conquered territories, exploration, trade, and economic development</td>
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<td>- According to the textbooks, the environment is conceived as a source of scientific knowledge about the world</td>
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<td>- Symbolic dimension represented in the textbooks appear associated with the idea of national patrimony and aesthetic value. Also, food is associated with traditions and a connection between people and the environment. It is presented as an activity that connects students with their community</td>
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| 5.4.3 | Representations of the complexity of nature and the ecological relations |

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<th>Interaction of the ecological and cultural diversity</th>
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<td></td>
<td>- The content of the textbooks tends to be focused on ecological diversity and to underrepresent ecological interactions</td>
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<td>- In the textbooks, ecological diversity and interactions are represented mainly at local scale and characterized as local and national realities and issues</td>
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<td>- Ecological diversity often appears to be represented in terms of functionality and in association with activities of classification or taxonomy (particularly in the textbooks for lower grades)</td>
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<td>- Ecological diversity often appears to be represented through isolated living beings (and parts of living beings) removed from their environment (particularly in the textbooks for lower grades)</td>
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<td></td>
<td>- Humans as part of the ecological diversity and in interaction with the environment are often represented in activities of enjoyment, such as playing, doing sports, and contemplating the landscape</td>
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Evolutionary changes are described with a focus on intrinsic features of the species rather than on ecological relationships with the environment. As well, the description of the geological eras focus on the type of species that lived in each period rather than on ecological interactions among species and with the environment.

Cultural diversity and interactions seem represented in textbooks for lower grades mainly at a local scale; as *our treasure*; in association with the idea of *tolerance*; and with absence of social and cultural conflicts.

The representations of cultural diversity and interactions in the textbooks for grade eight focus on European history from the Middle Ages to the industrial revolution through concepts such as expansion, monarchy, territory, sovereignty, commercial trade, economic development, capitalism, urban life, exploration, discovering, entrepreneurship, and the individual.

The human being as an organism appears to be explained as a closed system that lacks connection with its environment. Only feeding, explained as the way in which the body get nutrients, mentions a direct connection between the human body and the environment.

### 5.4.3.2 Static versus dynamic portrayals of nature

- In general, the textbooks for grade one represent living beings as static and unchanging.
- The textbooks represent ethnic groups and endemic species of plants and animals as confined into the borders of the national territory (and not further).
- At larger scales (tectonic, atmospheric, and planetary) the analyzed textbooks appear to convey a much more dynamic nature.
- At a local and national scales, the analyzed textbooks seem to portray humans as the agents that introduce change in the environment.
- In the textbooks, changes in nature and the environment are represented as natural cycles, such as day and night, and years and seasons, but also as natural disasters.
- The analysis of the textbooks detects a contradiction between the promoted awareness of the negative impact that the human activities have on sustainability and the conformism toward the perpetuation of the status quo regarding the socio-ecological interactions and the overall functioning of society.
## 5.5 Findings regarding civic participation concerning the environment

### 5.5.1 Humans as spectators of the environment and as detached scientific observers

- The textbooks seem to represent the human-environment interactions focusing on material and practical aspects. These interactions appear to provide health, enjoyment, and knowledge about the world.

- Human interactions with the environment appear to be represented in general as pleasant and as experiences that give humans knowledge about the world and material wealth.

- In the textbooks, the representations of indigenous cultures and national parks focus on the material dimension of culture and nature.

- The concept of living past represent indigenous cultures as a sort of living museum and as outdated in current times, and national parks as reserves of natural resources.

- The textbooks exhibit a lack of insights that might lead to political discussion and action regarding, for example, conflicting worldviews among different Chilean stakeholders and historic struggles concerning rights, territory, and land management.

- The content on the senses seems to reinforce a notion of humans as individuals that have only a material and functional link with the environment.

- Nature and the human-environmental relationships often appear represented as sources of experiences and scientific knowledge about the world. This knowledge is often conceived in an atomistic way, avoiding broader contexts and relations.

- In general, reflection and discussion does not extend into activities nor action.

### 5.5.2 According to the analyzed textbooks, protecting the environment does not always mean protecting humans

- The content of the analyzed textbooks appear to disassociate environmental problems and the impacts that these problems may cause on humans and society.

- The content of the analyzed textbooks seem to associate environmental care with the future availability of resources for economic activities and the whole functioning of society.

- The content of the analyzed textbooks seem to regard environmental care as a duty.
that each of us (or each student) has to accomplish individually

<table>
<thead>
<tr>
<th>5.5.3</th>
<th>Local citizens: the representations of the interactions between the citizenry and the environment seem to be mainly enclosed within the boundaries of the nation</th>
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<tr>
<td></td>
<td>In general, the textbooks for grades one and four represent interactions between people and the environment mainly at local and national scales, and in association to concepts such as: livelihood, work, products, services, institutions, norms, respect, cleanliness, traditions, and national patrimony</td>
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<td></td>
<td>The analyzed textbooks for grades one and four appear to disregard commonalities with other countries of the region.</td>
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<td></td>
<td>The History, Geography, and Social Science textbook for grade eight shows transnational interactions among people and between people and the environment (mainly from a European perspective) in three dimensions: political, economic, and scientific; and in association with concepts such as: sovereignty, war, expansion, economic development, profit, and science or scientific knowledge</td>
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<td></td>
<td>In general, the scope at which the analyzed textbooks represent the relationships of citizens and the environment does seem to foster little reflection regarding socio-ecological conflicts at transnational scale</td>
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<td>The analyzed textbooks seem to convey the sense that civic participation and human impact on the environment are local and individual phenomena</td>
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<th>5.5.4</th>
<th>The norms and rules stated in the analyzed textbooks seem to foster attitudes, but not necessarily committed actions based on values</th>
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<td></td>
<td>In general, the content of the textbooks appear to convey the rules and structures for citizen participation in a prescriptive way and centered on individual responsibilities</td>
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<td>Civic participation toward sustainability seems encouraged from a perspective of individual consumer and paternalistic attitudes toward environmental protection</td>
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<td></td>
<td>The most relevant spaces for reflection are present in the Natural Science textbook for grade eight</td>
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<td>The textbooks present just a few instances to promote students’ involvement in critique and civic participation that might raise awareness regarding socio-ecological dynamics and impact sustainability at community level</td>
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<tr>
<th>5.5.5</th>
<th>The representations of interaction between citizens and the environment center on individual realities, express gender stereotyping, and portray older people as</th>
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</table>
|       | In each of us (or each student) has to accomplish individually...
- In general, the characters that appear either in photographs or drawings in the analyzed textbooks are children (with the exception of the History, Geography, and Social science textbooks for grade eight)

- Adults seem to be represented as parents and teachers (with the exception of the History, Geography, and Social science textbook for grade eight)

- The use of color in the illustrations does not seem to reflect the main ethnic components of the country and tend to portray hunter-gatherer ways of living as old and precarious

- In the textbooks, the interactions between humans and the environment are conceived from a material and functional perspective

- Large scale instances of human interactions with the environment (such as mining) are represented from a local perspective and in association with concepts such as work and livelihood

- The History, Geography, and Social Science for grade eight seems to represent human interactions with the environment centered on European history and in association with scientific exploration, and economic and political objectives

- In the textbooks, the representations of sports (and people doing sports) are balanced in terms of gender; however, the representations of risky physical activity exclude women

- The representations of gender in the textbooks appear to be imbalanced in terms of power and participation in society; particularly, regarding the representations of work

- The representations of gender appear to stereotype interests, skills, and roles in the family and society

- In general, representations of gender in the analyzed textbooks appear to encourage participation of women in the private scope of citizenship and men in the public

- The interactions of older people with the environment are represented conveying dependence on other family members, mobility difficulties, and weak participation in society

<table>
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<th>Table 2: Summary of findings</th>
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<td>dependant and lacking involvement in society</td>
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The above table summarizes the results of my analysis of the school textbooks. This summary identifies the main observations in each of the two categories (*humans and the environment as a complex system* and *citizen participation concerning the environment*) that cluster the findings of this study. These findings help to build a description of how the analyzed textbooks appear to convey the relationship between citizens and the environment based on my interpretation of the content of the analyzed textbooks. I will discuss these findings according to the three areas of inquiry of this study (awareness, values, and civic action) in the next section.
6. Discussion: How the Analyzed Textbooks Appear to Convey Awareness, Values, and Civic Action in the Context of Environmental Citizenship

I organized the previous chapter (section 5) around two major themes associated with two of the three areas of inquiry of this study: awareness and civic action. The third area of inquiry of this study (values) was included in the findings as a cross-sectional dimension of the relationship between citizens and the environment in connection with the other two areas of inquiry in every aspect. In other words, the findings associated with values help characterize how the analyzed textbooks appear to represent the dimensions of awareness and civic participation. In this chapter, I focus the analysis specifically on how the textbooks appear to convey the three areas of inquiry of this study (awareness, values, and civic action) and explore how the findings of my analysis may connect with the literature on environmental citizenship and education consulted for this study.

6.1 Awareness of the complex interwoven relations between humans and the environment according to the analyzed textbooks

The analyzed textbooks appear to foster awareness regarding the interrelated nature of social, cultural, and ecological complexity mainly from material and functional dimensions, from local and national perspectives, and focus on describing ecological and cultural diversity over ecological and cultural interactions. In general (but particularly the textbooks for grades one and four), the textbooks appear to represent ecological diversity focusing on functional aspects and in association with activities of taxonomy. The representations of ecological complexity in the analyzed textbooks appear to convey the notion of a diverse world, but often also the idea of a static and unchanging world in which species (and in occasions also people) are often not represented in their environmental context. Regarding the diverse relationships between humans
and the environment, some of the content in the textbooks seems to suggest the notion that humans impact the environment but not the opposite. Under this conception, humans and society appear to be the cause of the depletion of nature and, at the same time, responsible for the restoration of nature and the maintenance of supplies for society. According to the analyzed textbooks, and particularly to content such as the Decalogue of the environmentally conscious citizen, this responsibility appear to rests mostly with individual citizens and the actions they might perform as consumers and electors from their predominantly urban contexts. However, these notions conveyed by the analyzed textbooks do not seem to consider humans as part of nature or the environment as a counterpart that has its own processes and dynamics that also influence humans. An exception to this argument is the content that shows natural disasters as examples of change in the natural world (although in this case, not associated with climate change). As well, the relationships between humans and the environment seem to be represented in functional terms in content such as the placement of human settlements (in Chile). This content seems to focus only on large extractive industries and disregards other forms of interaction with the environment that might be associated with smaller-scale instances of livelihood and relations with the natural resources in Chile. Therefore, the content concerning livelihood under-represent some of the Chilean socio-ecological relations that determine not only the placement of settlements but also some of the components of Chilean society and culture. Another example of how the textbooks appear to convey the ecological interactions involving humans are the representations of the human being as an organism. Similar to the treatment of the content on the senses, the representations of the human organism in the textbooks convey the idea of humans as closed systems which lack connection with their environment. This notion of human organism serves as a metaphor of how the analyzed textbooks appear to represent citizens in relation with the environment in most of the content: as individuals that participate in society and contribute to
sustainability according to the scope defined by neoliberal principles, but not involved at
community level or beyond the role of consumer.

Additionally, the distinction between what would be considered natural and what would be
considered cultural marks how the analyzed textbooks appear to represent the complexity of the
human-environment relationships. Instead of representing the human-environment relationships
as a mixture of material and symbolic dimensions, the textbooks appear to represent the
interactions between humans and the environment from a functional perspective, focusing mainly
on the material aspect of culture. The material aspects of culture seem to be represented in
association with concepts such as work and livelihood, use of natural resources, production of
goods and services, urban life, and development. The representations of life in community also
seem to focus on the aforementioned aspects and in association with notions of cleanliness and
respect for others and the public and private property. The focus of the textbooks on the material
aspects of culture and the quantification of cultural elements may encourage the notion that
places with more human intervention (such as urban settings) have more culture than, for
example, rural contexts. On the other hand, the symbolic dimensions of culture appear to be
excluded in most of the content of the analyzed textbooks. The only symbolic dimension that
seems to be represented in the textbooks is the notion of national patrimony that, besides
inspiring pride and belonging, also might be considered as a sort of collective property or
ownership. Furthermore, the natural/cultural distinction fosters the idea that human impact on
the environment is visible if human material interventions are evident. According to this notion,
the analyzed textbooks seem to promote awareness of the impact of the human activity on the
environment mainly in contexts where material evidence of human activity is observable (with the
exception of one reference to climate change).
All of these conceptions contradict the idea that humans and the environment are part of a complex system of interwoven relations (Hartmann 1998; Huckle 2008). This complex human-environment system is understood in diverse ways, not only in different parts of the world but also among the people from the same country. However, spiritual, religious, and traditional understandings of the world seem to be underrepresented in the content of the analyzed textbooks. Regarding the idea that sustainability would require being aware of diverse understandings and ways to relate with the environment, the textbooks appear to promote little reflection and discussion on environmental and social conflicts (such as regarding the uneven use and of natural resources and unfair consequences of environmental degradation), as well as other instances to politicize the content concerning the interactions between humans and the environment. In fact, most of these interactions seem to be portrayed within economic and scientific dimensions; for example, conveying nature as natural resources or commodities required for the functioning of society and livelihood of citizens, and as sources of experiences and information for the production of knowledge. Environmental problems and sustainability also appear to be described from the aforementioned dimensions, especially from the scope of future availability of resources required for the functioning of society. Tackling environmental problems seems to be fostered mostly at an individual range of action. Accordingly, collective action is rarely encouraged throughout the analyzed textbooks and mainly appears to be included in association with traditions and family life, but not associated with politicized discussion.

The scope of interaction between humans and the environment that is generally represented in the analyzed textbooks appears to be mainly at local and national scales. However, the History, Geography, and Social Science textbook for grade eight includes interactions among humans and between humans and the environment at a global scale, but mainly from a European perspective and three specific dimensions: political, economic, and scientific. Again, the analyzed textbooks
seem to represent these interactions, in general, overlooking past and current social and
environmental conflicts. As well, these representations appear to disregard commonalities with
other countries of the region regarding history, politics, ethnicity, and environments. This scope
encourages a sense of nationality supported in ideas, such as national patrimony (national
landscapes, emblems, traditions, and endemic species of flora and fauna) and a notion of
community that centers on production and consumption of goods and services mainly at a local
scale.

The aforementioned representations of community and human-environment interactions
appear to exclude global notions of influence and interaction with the environment and other
people. Notions such as the post-cosmopolitan citizenship proposed by Dobson (2003) that regard
the impact and responsibilities of people transnationally seem to differ from the local and national
scope represented in the textbooks. In conclusion, the perspectives and level of awareness
regarding socio-ecological complexity represented in the textbooks may contribute to shape a
citizenry who act mainly individually and who are concerned only with national and local matters
that regard the environment. Also, the sense of community and awareness of the global
dimension of the environmental issues promoted in the analyzed textbooks may not make visible
the transcendence of collective action toward sustainability and its synergic impact worldwide.

6.2 Values: the values regarding the relationships between humans and the
environment conveyed by the textbooks

Values are ways to understand the world and they determine human preferences and actions
(see Chapters 3 and 4 for more information on values). In general, the analyzed textbooks appear
to represent the relationships between humans and the environment focusing on material,
functional, economic, and scientific values (according to the categories used to analyze the
textbook in this study). The material and functional dimensions seem to represent the environment as a setting for human activities and as resources to sustain human purposes (such as livelihood, enjoyment, and health) and the functioning of society. In contrast, Indigenous beliefs and indigenous conceptions of the environment appear to be disregarded in the content of the textbooks. This situation excluded symbolic aspects (such as spiritual and religious dimensions) that represent part of the socio-ecological realities from Chile. Also, the textbooks appear to convey the notion that nature is a source of profitable resources which can be owned and traded. Other values that seem to be expressed in the analyzed textbooks make reference to romanticized aspects of nature, associated with its aesthetical beauty and its significance as national patrimony. These last notions provide some contrast with the scientific conceptions that understand nature as a source of experiences and information for the production of knowledge.

The values encouraged in the textbooks often appear to focus on an individual scope of interaction with nature, particularly regarding interactions that involve work, experiences of learning (and in some cases, activities of observation or contemplation), and environmental care. Concerning work, for example, extractive industries are represented at a local and individual scale. This situation centers the attention on the importance of the environment for the livelihood of the people rather than reflecting on the large scale use of natural resources and the associated issues of uneven use of resources and land, wealth distribution, environmental degradation, and pollution. Specifically regarding environmental care, the textbooks appear to promote values associated with paternalistic attitudes toward the environment and other living beings. Another dimension of values that appears widely represented in the textbooks is associated with functional relations between humans and nature. Specifically, humans in functional relations with nature appear to be represented in interactions as producers or consumer of goods and services, and as students or researchers that observe, analyze, classify, and describe the natural world to
understand it (mostly, by its parts rather than in context). In connection with the aforementioned dimensions of value, the textbooks seem to encourage attitudes and behavior, but not necessarily committed actions or active civic participation regarding environmental issues and sustainability.

According to Freire (1986), the focus on behavior modeling alone may be considered as a sign of oppression, which might encourage specific practices not oriented to transcend into a deep and long lasting compromise with sustainability (Latta and Wittman 2012). Specifically, the textbooks encourage attitudes and behavior concerning, for example, environmental care in a prescriptive tone that remind the concept of “banking education” (Freire 1986). According to this concept, the teachers (in this case, the textbooks) are the bearers of truth and they predominantly teach facts that might not necessarily be received by students with critical spirits and their own opinions.

Accurately, the analyzed textbooks have instances of reflection and critique, but in general, they are not central part of the topics and do not seem to extend into significant actions and experiences of interaction with the environment.

In conclusion, the textbooks appear to promote mainly a functional relationship with the environment that expresses in understanding nature as a source of enjoyment, health, knowledge and wealth (material wealth appears much more than symbolic wealth). In contrast, symbolic dimensions or understandings of the environment, associated for example with indigenous beliefs, are disregarded in the textbooks. The values encouraged in the textbooks also associate with individual scales of interaction with the environment, mainly in aspects such as work, learning, and environmental care. The values promoted by the textbooks also appear to foster attitudes and behavioral change rather than promoting more committed actions and participation concerning environmental and collective issues. In sum, the values discussed above, in general, seem to do little to change the current unsustainable trend of relations between humans and the environment.
6.3 Civic action: how the textbooks appear to convey civic actions concerning the environment and sustainability

As aforementioned in this chapter, the analyzed textbooks seem to represent the interactions between humans and the environment mainly from a local and national perspective, and tend to focus civic action concerning the environment on an individual scope of participation and responsibilities. This situation may convey the notion that civic participation and the human impact on the environment is a local and individual phenomenon. In other words, the textbooks appear to convey that individual citizens bear the responsibility for adopting sustainable practices and caring for the environment. In fact, this might be true, but the range of influence on environmental issues that individuals might achieve as a community or at a synergic scale appear to be overlooked in the content of the textbooks (similar to the impact on the environment produced by corporate decisions and production processes). Particularly in the textbooks for grades one and four, the analyzed content appears to convey the individual and local focus of the civic participation as socio-ecological interactions confined to contexts such as the home, the school, and to a lesser degree, the neighborhood. The representations of socio-ecological interactions (specifically in the History, Geography, and Social Science textbook for grade eight) also appear to convey transnational dynamics associated with political, economic, and scientific objectives. In this case, the analyzed textbooks seem to disregard the negative impacts of human action upon other humans and the environment, and present economic development, entrepreneurship, technological efficiency, and scientific exploration as desirable achievements in human history. The local and individual focus of civic participation conveyed in the textbooks also appears to be represented in the way the scientific skills and attitudes are encouraged. The textbooks seem to foster scientific attitudes and actions, highlighting the skills of observation and classification. Description and analysis seem to be associated with functional aspects of the
studied subjects, and critical thinking appears to be fostered predominantly in contexts no larger than the nation. The national borders are portrayed as the containers of endemic species of plants and animals, ethnic groups, and citizens. Beyond these political (but also physical) boundaries, the textbooks scarcely stimulate citizen participation or individual involvement in broader scale issues and seem to make the impression of an independent and stable Chilean socio-ecological context (see Delaney & Leitner 1997, Kaiser & Nikiforova 2008, McCarthy 2005 for more information on scalar issues).

Regarding the local focus of civic participation, there are interesting results in studies on comparable social contexts. According to Harris’ (2011) analysis of Turkish environmental citizenship narratives in a context of neoliberalization and Europeanization, people’s narratives concerning environmental problems regard civic participation in a similar way, but in connection to the concept of cleanliness as an individual virtue and as expression of caring for the environment. In this context, cleanliness is expressed in features such as urban, organized, clean, and green as characteristics of a desirable environment. Similarly, the analyzed Chilean school textbooks also express the concept of cleanliness, but as a norm and desirable behavior for life in community (represented mainly in urban contexts). In the case of the analyzed textbooks, the focus on individual responsibilities at local scales of participation seems to suggest a short scope of citizen participation in environmental issues that centers on day-to-day realities. Taken together with the lack of encouragement for collective action and communitarian notions of citizen-environment relations, the textbooks appear to reinforce a scenario that focuses citizen participation and responsibilities mainly on the individual level. In this scenario, the political apathy of Chilean citizenry seems to plays an important role. Whether as cause or effect, the political apathy and the overall Chilean context for environmental citizenship seem to be influenced by the process of neoliberalization. In this context, the responsibility for environmental
care lies on individuals while the responsibility of state institutions in this matter decreases (Harris 2011:849; Maniates 2001), situations that appear implied in the content of the analyzed textbooks.

The textbooks appear to represent the access and use of the environment, in general, as equitable in terms of gender. However, the representations of gender associated with participation in society and in both public and private spheres of citizenship appear stereotypical. In these representations, women seem to be characterized primarily in roles such as mothers and teachers, and participating mostly in indoor activities. On the other hand, men are represented mainly as fathers, workers, curious, taking risks, and in interaction with nature outdoors. Also, in terms of jobs, men seem to be represented working outdoors while women seem to be represented indoors. These representations may encourage different roles and participation in society according to gender, and bias in terms of interest and job prospects. The civic participation of older people also appears to be represented in a stereotypical way. Older people appear represented as grandparents, not independent, not active, and with mobility problems. In general, the representation of older people indicates little participation in society in contexts such as the family and the environment, and no societal influence in dimensions such as politics and work. In a similar way as described by Clark (2006:47) in her study on indigenous representations in Canadian history textbooks, indigenous ethnic groups from Chile appear to be represented, in general, as examples of traditional and old ways of living (literally, as past). In the analyzed textbooks, the representations of indigenous cultures also focus on the material aspects of culture and disregard symbolic dimension of the human-environment relationships. The exclusion of symbolic aspects of indigenous cultures and especially their portrayal as outdated or part of the past, in some way, marginalize indigenous cultures from the current Chilean society.
Civic actions toward sustainability are much more than individual civic practices. Recycling, reutilization, conscious consumption, electing political representatives and protecting plants and animals are not the only expressions of civic action toward sustainability. The relationship of interdependence and mutual influence between the environment and society calls for a deeper and more meaningful transformation. Not only education and educational institutions have to bear an important role in this transformation. Society as a whole (more than individual citizens, as a community) has to embrace values that consider the complexity of our bond with the environment and permit the development and implementation of sustainable social practices in a framework of respect for the place and other life forms (including other humans, regardless of their culture, social condition and location). Recognizing that all humans and nature are part of a unified complex system might be the first step toward sustainability; certainly education and school textbooks have a key role in accomplishing this task.

In sum, the representations of civic participation in terms of gender, age, and ethnicity appear to portray active population in activities such as learning or playing (in the case of children), and workers and families at productive age (in the case of adults). Particularly the young adult segment of society seems to be represented as the group that moves society and who makes it function through their work (whether in extractive industries or producing goods and services). In terms of gender, the textbooks seem to promote very stereotypical and traditional social organization and participation in society that might influence job prospects and career choices. Together with the focus on individual responsibilities for environmental care, the analyzed textbooks seem to convey a notion of citizenry that participates (concerning the environment) mainly as a consumer, whether recycling, consuming less (energy and goods), or opting for greener products. As well, the individual scope of participation conveyed by the textbooks seems supported by moral norms that appear to encourage protective and paternalistic attitudes toward other living beings and the
environment. On the other hand, collective action and a sense of community that transcend the scope of the family and the frontiers of the country do not seem to be conveyed by the analyzed textbooks. The way these textbooks convey civic participation may affect students' awareness and their prospects of civic participation regarding environmental issues at different scales; and also, how students might understand and conceive their civic participation and the reach of their actions, whether as individuals or as part of a community.
7. Conclusion

The objective of this research is to shed light on how specific Chilean textbooks for basic-education convey the relationship between citizens and the environment in a context of relatively recent socio-political transformation that positioned (among other aspects) sustainable development in connection with environmental education. According to the procedures devised for this study, the way the analyzed textbooks represent the relationship between citizens and the environment is determined by the intersection of three dimensions: how the textbooks foster student awareness regarding the complexity of the human-environmental system; the values that guide the relationships between humans and environment according to the textbooks; and finally, how civic actions concerning the environment and sustainability are represented in the analyzed textbooks. These three dimensions configure how this study interprets the representations of the citizen-environment relationships in the analyzed textbooks.

The interpretation of the textbooks established that they, in general, tend to encourage students to acquire a scientific attitude (characterized mainly by observation and description of natural elements and phenomena rather than a critical spirit) and a sort of detachment from the environment as an inquirer or researcher. This detachment is also characterized by focusing the representations of culture and the relationship between society and the environment mainly on its material and functional aspects. In this focus, some segments of society seem to be underrepresented or stereotyped in the content concerning the interaction between people and the environment, and the participation of citizens in society.

Interacting with the environment is not just a visual experience that allows us to appreciate the beauty of Chilean landscapes. This might be the case for some people from urban contexts, but this is not the only reality of the country. Chilean landscapes can be understood in diverse ways according to the values and the socio-ecological relations that may be at play. For example, the
same romanticized beauty of the mountain as national patrimony might also be understood as commodities, natural resources, property, territories rightfully owned, spirits, or as places that inspire different ethnic groups to feel a sense of belonging. In contrast, the analyzed textbooks tend to focus again on more material and practical understandings of nature, and particularly disregard symbolic understandings of nature. This means that the cultural aspects associated with these symbolic dimensions are also underrepresented.

In general, the analyzed textbooks appear to convey the notion that environmental problems exclusively represent problems of future supply of natural resources for the functioning of society. Also, tackling environmental problems seems encouraged mainly as an individual responsibility and consumer decisions. However, environmental care and participation toward sustainability are much more than adopting specific consumer behavior, decisions, and products. In addition, environmental issues are not just a local and individual phenomenon. Complex socio-ecological dynamics interact at different political and geographical scales. The analyzed textbooks, in contrast, tend to promote awareness, mainly from a local perspective, regarding historic and current issues overlooking social conflicts. This focus may contribute to shape a citizenry who act mainly individually and who are solely concerned with national and local matters that regard the environment.

The analyzed textbooks dedicate large portions of the content to encourage and teach scientific attitudes and skills, but there are abstract and experiential dimensions that seem to escape from the focus of this training. The focus on physical and measurable dimensions appears to be predominant in the textbooks; however, in my opinion, it is also necessary that the textbooks connect students with socio-environmental issues and realities at national and global levels, and above all, encourage their critical thinking. Precisely, the relationships between citizens and the environment is a topic that involves different opportunities for civic participation and
discussion, ideally, including all segments of society. In my opinion, the textbooks should further encourage a sense of community and awareness of the global dimension of environmental issues. Individual participation would be much more effective and rewarding if a synergic spirit as a community (of a country or the world) and sustainable values are encouraged. This might reflect in a long term commitment with sustainability and sustainable actions.

The selection of school textbooks for this study might miss parts of the puzzle in the content of the textbooks for other grades, but I am confident that this study captures the big picture of the relationships between citizens and the environment conveyed in the basic-education textbooks and raises relevant concerns and arguments on this topic. In particular, I believe that the selection of textbooks analyzed in this study is appropriate considering the fact that environmental education and environmental citizenship are not specific subjects but topics associated with cross-sectional objectives in the Chilean curriculum. I hope this study raises awareness about the socio-ecological complexity of sustainability and all its dimensions. In this sense, this research could assist the Ministry of Education, textbook developers, and teachers in the development of curricula, school textbooks, and other educational materials that intend to convey the complexity of sustainability and citizen-environment relationships. Specifically, I hope this study may help to develop school textbooks that consider aspects such as issues of scale, representation, social justice, inclusion, and civic participation in society. Finally, I hope this study might contribute to the work of researchers from other disciplines, who may be passionate about or interested in the relationships between citizens and the environment, and environmental education in general.
References


References from the United Nations and UNESCO Consulted in This Study


Appendix 1: An Inquiry Map of This Study

**Research Question:**
How do Chilean school textbooks for basic education convey the relationship between citizens and the environment?

**Method**
- Interpretive study
- Qualitative method
- Content analysis not based on quantification (similar to ethnographic content analysis)
- Codes
- Find core themes and patterns in context

**Findings Regarding Humans and the Environment as a Complex System**
- Natural/cultural distinction: according to the textbooks, culture resides in human material intervention on the environment
- The conceptions and value of the environment conveyed by the analyzed textbooks appear to be mainly material and utilitarian
- Representations of the complexity of nature and ecological relations

**Findings Regarding Civic Participation Concerning the Environment**
- Humans as spectators of the environment and detached scientific observers
- According to the analyzed textbooks, protecting the environment does not always mean protecting humans
- Local citizens: the representations of the interactions between people and the environment seem to be mainly enclosed within the boundaries of the nation
- The norms and rules stated in the analyzed textbooks seem to foster attitudes, but not necessarily committed actions based on values
- The representations of citizen-environment interactions center on individual realities, express gender stereotyping, and portray older people as dependant and lacking involvement in society

**Result:** How the analyzed textbooks appear to convey environmental citizenship through looking at:
a) How the textbooks appear to promote awareness  
b) The values that appear to be conveyed in the textbooks  
c) How the textbooks appear to represent civic action concerning the environment

**Theory**

**Environmental Citizenship**
- Appropriate norms and structures that regulate sustainable citizen-environment relationships
- Awareness of the ecological complexity
- Awareness of the diverse scales of human-environment interaction
- Knowledge of different cultures and ways to relate with the environment
- Justice and equity in citizen-environment relationships
- Effectual citizen participation in the different spheres of citizenship
- Life in community and deliberation

**Sustainability**
- Dimensions of sustainability: environmental, social, economic
- Diverse scales of human-environment interaction
- Ethical framework for the human-environment relationships
- Integrated and interdependent complex human-environment system

**Curriculum & Pedagogy**
- Scientific inquiry
- Attitudes, behaviour, and action
- Freire’s perspective on pedagogy

**Awareness**
- Acknowledging the complexity of the human-environmental systems, its scales, and cultural determinants

**Values**
- The different conceptions of the environment and the human-environment relationship

**Civic Action**
- Critical students and active citizens in a context of norms and structures that allow social participation towards sustainability

The three concepts that converge represent the main areas of inquiry of this research.

Environmental citizenship pursues a sustainable citizen-environment relationship

Education for environmental citizens who can cultivate sustainability

**Method**

**Theory**

**Sustainability**

**Curriculum & Pedagogy**

**Awareness**

**Values**

**Civic Action**

**Result:** How the analyzed textbooks appear to convey environmental citizenship through looking at:
a) How the textbooks appear to promote awareness  
b) The values that appear to be conveyed in the textbooks  
c) How the textbooks appear to represent civic action concerning the environment

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Appendix 2: Textbooks Analyzed in This Study


Ciencias Naturales, 4to año básico (Brahim, Espinoza, Irrazábal, Navarro, and San Pedro 2009)

Ciencias Naturales, 8vo año básico (Calderón et al. 2009)

Historia, Geografía y Ciencias Sociales, 1er año básico (Cid et al. 2009)

Historia, Geografía y Ciencias Sociales, 4to año básico (Amengual et al. 2009)

Historia, Geografía y Ciencias Sociales, 8vo año básico (Silva and Ramírez 2009)
Appendix 3: Chilean Educational Context in Numbers

Number of students per educational systems from 2006 to 2013

![Bar graph showing number of students per educational systems from 2006 to 2013.](image)

(according to Data MINEDUC 2013 at www.datamineduc.cl)

Number of schools per educational systems from 2006 to 2013

![Bar graph showing number of schools per educational systems from 2006 to 2013.](image)

(according to Data MINEDUC 2013 at www.datamineduc.cl)