

Environmental Education, Values and Attitudes of Youth in Lebanese Secondary Schools: A Comparative Analysis

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The master's thesis is carried out as a part of the education at the University of Agder and is therefore approved as a part of this education. However, this does not imply that the University answers for the methods that are used or the conclusions that are drawn.

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Dedication

*I dedicate this thesis to Mrs. Myrna Semaan Haber,
who guided my research focus.*

Abstract

Economic development has been a cause of environmental degradation for several decades. Legal measures have been taken in many countries to curb the environmental impact, but awareness, particularly among the youth, is vital in safeguarding future generations. Environmental education (EE) has been developed in response to this need and implemented in many parts of the world. In the last few decades this idea has been expanded to include related issues, such as social justice, and is now more widely known as Education for Sustainable Development (ESD). Lebanon started incorporating EE into their state school curriculum in the late 1990s, and in 2012 launched the National Environmental Education Policy which set in motion a strategy to incorporate ESD in the curriculum more comprehensively. Lebanon's environment suffers from multiple stresses and there are political and socio-economic faces that making fostering an environmentally friendly culture challenging. This research looked at what the current level of EE has accomplished in the way of educating Lebanese youth on environmental issues, as the current format of EE does not make focusing on environmental issues easy for teachers. This affects youth as the research found their knowledge of environmental issues lacking, and additionally, opportunities for pro-environmental action are few. A Norwegian sample group provided comparison, and interestingly, Lebanese student's NEP scores do not lag far behind. Thus, while Lebanon has a ways to go to improve EE, create an environmentally friendly culture and stem environmental degradation, the comparison shows that local problems keep the interest in improving the environment high.

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I would like to say that I have the highest respect for ESD educators, who face the challenges of bettering the future through educating our children.

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Abbreviations and Acronyms

AFDC	Association for Forests, Development & Conservation
AFED	Al-Bia Wal-Tanmia Magazine
CERD	Center for Educational Research and Development
CSO	Civil Society Organisation
CSOs	Civil Society Organisations
DSP	Dominant Social Paradigm
EE	Environmental Education
ESD	Education for Sustainable Development
DESD	Decade of Education for Sustainable Development
GDP	Gross Domestic Product
GNI	Gross National Income
HDI	Human Development Index
IALEI	International Alliance of Leading Education Institutes
MENA	Middle East and North Africa
MoEn	Ministry of Environment
MoEd	Ministry of Education
MUN	Model United Nations
NAAEE	North American Association for Environmental Education
NEP	New Ecological Paradigm
NGO	Non-Government Organisation
SOER	State and Trends of the Environment Report
UN	United Nations
UNEP	United Nations Environmental Program
UNESCO	United Nations Educational, Scientific and Cultural Organisation
UNHCR	United Nation High Commission for Refugees

1 Introduction

Over the last few decades, development has been a source of environmental degradation (Adams 2009, p.17). As society's awareness of environmental problems has increased over the last couple decades, a variety of efforts have been made to mitigate the consequences. In many Western countries efforts have been made to educate citizens and legislation has been put in place to promote environmentally friendly industry. Due to the improvements in some Western countries, the idea of the environmental Kuznets curve developed: the idea that environmental care and conservation increases once a certain level of economic development has been reached. Stern shows that this theory is not statistically robust (Stern 2003, p.19), however the conceptual idea remains due to empirical evidence. Thus, a country with a rising Human Development Index (HDI) is a good place to examine the level of environmental conscientiousness. Economic growth clearly boost the GDP of a country, however, whether and how quickly such economic development translates into pro-environmentally attitudes and actions is debatable. In order to improve environmental awareness, many countries are implementing environmental education (EE) and now Education for Sustainable Development (ESD). EE aims to give recipients knowledge, skills and motivation to be aware of the environmental repercussions of their actions as well as make a positive difference for the long term benefit of the planet. By implementing EE in schools, it is hoped that the next generation will be more environmentally responsible than the last.

The country focus for this thesis is Lebanon, which has a high rating on the HDI, an average gross national income (GNI) per capita of over US\$12,000, and a high literacy rate (HDR 2013). Lebanon is very green compared to many other Arab nations, but faces ongoing environmentally challenges (SOER 2011). Additionally, Lebanon's political and socio-economic situation has been further destabilised by regional factors, most notably the ongoing Syrian crisis. In the face of such challenges, it is important to understand where the youth stand in their views on the environment and the importance of its care.

I. Objective

The objective of this thesis is to examine the environmental views and attitudes of Lebanese youth, against the backdrop of the environmental education (EE) which they receive in school, as well as their socio-economic setting. Challenges to implementation of EE on the side of schools has been researched qualitatively and surveys have offered insight into students views. Given the

limited resources of this research project, this is not an exhaustive EE evaluation. However, the launch of the Lebanese National Environment Education Policy in late 2012 marks an opportunity to take stock of the progress of EE in Lebanese schools (HSS 2012; Daily Star 2012).

The research is restricted to schools in districts Beirut, Baabda and Aley (see figure C). The schools have also been chosen as representative of social status diversity. Both public and private schools are included in the research for comparison. Secondary school students were the focus of this research, by which is meant 10th-12th graders.

The hypothesis is that more EE in schools results in increased awareness, knowledge, skills and motivated to improve the environment. A sampling from Norway has been surveyed to act as a control group.

II. Research question(s)

* What has been achieved in Lebanon in regards to environmental education in secondary schools?

How is EE incorporated into the Lebanese state curriculum (state schools)?

How is EE incorporated into other school curricula (private schools)?

What kind of teaching challenges are there in regards to using EE material?

What kind of impact do teachers/principals feel they have in teaching EE?

What challenges are there for educators in creating an environmentally friendly culture?

* What are the values and attitudes of Lebanese youth on environmental issues?

Note: See closed survey in appendix I for questions asked. Questions include the 15 statements of the New Ecological Paradigm (NEP) which is described in detail in chapter three (Anderson 2012, p.261).

III. Brief Methodology

Qualitative and quantitative methods were used for this research. A closed survey was completed by over 300 students in five schools, including one in Norway for comparison. Interviews were held with student groups, teachers, principals and relevant government personnel. Participant observation (Bryman 2004, p.292; Wellington & Szczerbinski 2007, p.80) was also employed. The main bulk of research was conducted during a year spent in Lebanon, allowing observation of people's day to day conduct in various areas of greater Beirut and south Lebanon. Casual conversations and responses to people's general enquiries as to the researcher's presence in Lebanon also highlighted people's interest or lack thereof on environmental themes.

IV. Thesis Outline

This thesis begins with background on Lebanon as a country as well as the educational sector, touching briefly on environmental issues. The next chapter covers the theoretical background and framework, including understanding of sustainable development and the connection with environmental education. The fourth chapter on methodology includes underlying assumptions, research process, ethical considerations as well as a section on the limitations of this research. The research findings from the surveys and interviews are covered in chapter five, with descriptive statistics charts to help illustrate the results and aid comparison between schools. Analysis and recommendations in chapter six shows how the findings shed light on the research questions, and highlights some important challenges to pro-environmental action in Lebanon and other findings. This is followed by the conclusion, references and appendices.

2 Research Area

I. Background on Lebanon



Figure 1: Map of Lebanon with capital city, Beirut, highlighted. (Owl & Mouse 2007)

Lebanon is a coastal country in the Middle East with a high literacy rate, categorised as “Middle Income Country” on the HDI (HDR 2013, p.2), with a high Gross National Income (HDR 2013). It has a population of about 5.8 million with multiple religious persuasions. Muslims sects comprise 54% of the population, Christian sects comprise 40% and other 6% (ICNL 2015). Their society is 'sectarian', which means Lebanese are legally, and often socially, identified by the 18

officially recognised sects (Accord 2012, p.99). The main languages spoken are Arabic, French and English, with a 4% ethnic minority whose mother tongue is Armenian (ICNL 2015). Besides the Palestinian refugees who have resided in Lebanon for over 50 years, over one million Syrian refugees have flooded into Lebanon during the last few years and are now scattered throughout the country (UNHCR 2015). The UNHCR further reported that by the end of 2014, almost 700,000 Syrian refugee children would need schooling in Lebanon (UNHCR 2014, p.34).

Lebanon ranked 5th place globally on the Global Competitive Index in mathematics and science in secondary and tertiary education and has a primary school enrolment rate of 93.2% (WEF 2013). Overall, education is very important to them, private education is very popular and they have a high literacy rate (HDR 2013, p.2). Lebanon has a large diaspora, with many Lebanese having relatives in one of the following countries: Canada, France, the U.S., Australia, Germany, Britain (Tabar 2009, p.18). Many Lebanese are well-travelled and visit relatives abroad regularly; many also obtain higher education in Western countries (Tabar 2009, p.8). Lebanon has also maintained close relations with France in particular, over the last few centuries. Thus it is fair to say that they are notably Westernised, for an Arab country.

The Lebanese have adopted many aspects of Western culture, and are a mercantile people (Salibi 1988, p.178), having developed the banking and commercial sectors to the detriment of other sectors, such as the agrarian (Tabar 2009, p.6). Lebanon is known for its vibrant economy and resilient international banking sector, which functioned throughout the war (Harik 1994, p.51). The civil war lasted 15 years, and due to Lebanon's strategic regional position and unique sectarian make-up continues to be vulnerable to multiple internal and external players meddling in its affairs (Hirst 2010, p.2,3). Newspaper articles detail its multiple government shut downs and ongoing political turmoil (El-Basha & Khraiche 2014).

Lebanon's political instability shows no sign of letting up with the increasing pressure of the continuing Syrian conflict (ILPI 2013, p.15). The many years of civil war and ongoing political instability have also resulted in minimalism of state provision of basic needs (Cammett & Issar 2010, p.390).

II. Education and the Environment in Lebanon

Since the Ottoman empire, a culture of sectarian and private education was developed, with public school being socially considered only for the poor (Zakharia 2011, p.20). Private schools, which continue to flourish in Lebanon, come in all sorts: English language Protestant varieties that cater to upper class and nouveau rich of all confessions, French language Catholic, Maronite,

Orthodox and other schools, private Sunni and Shi'a schools as well as for other religious confession, and secular private schools (Ayyash-Abdo et al. 2010, p.13). The Lebanese preference for private schools is not necessarily due to poor quality in public education, but rather due to lack of resources, as well as, of course, social class preferences.

Public education is mainly in Arabic, but at secondary levels, French and English curricula are also available. The Lebanese Ministry of Education has a research institute responsible for the public school curriculum called Center for Educational Research and Development or CERD (CERD 2014). Private schools offer a variety of alternate international curricula, however Lebanese students in all schools are required to sit for the government school exams, and therefore private schools must ensure they cover the requisite subjects (Ayyash-Abdo et al. 2010, p.13).

Education for Sustainable Development (ESD) in Lebanon is a relatively new phenomenon. In 1998, the Ministry of Education (MoEd) signed a Memorandum of Understanding with the Ministry of Environment (MoEn) regarding incorporating EE into the Lebanese school curriculum (MoEn interview, 2014). However, it was not until 2012 that the government launched its National Environment Education Policy (HSS 2012; Daily Star 2012; CERD 2012). From interviews at both the MoEn and MoEd it was clear that it is the CERD who are directly responsible for integrating EE, and more recently ESD, into the curriculum, and not the MoEn.

Lebanese civil society (CSOs) has been a driving force in EE over the last few decades. Lebanon boasts a healthy, if fragmented, environmental movement, with over 200 environmental NGOs listed in the MoEn's website (MoEn 2012) – some of which offer EE in various forms (LCG, n.d.). One of the organisations which is heavily involved in the drive for EE in schools is the Pan-Arab Environmental Magazine, Al-Bia Wal-Tanmia or AFED, which was started in 1996 and by the late 1990s had 300 environmental clubs in schools. In 2007, the magazine organized the Youth Environmental Parliament (YEP) with 50 student representatives, which conducted environmental activities and met with members of the Lebanese parliament (Haddad 2007).

Lebanese CSOs lobbied the government and were instrumental in the government institution of EE in the schools and incorporating it into the curriculum. The Association for Forests, Development & Conservation (AFDC), along with Al-Bia Wal-Tanmia, were part of the initiative for the creation of an EE handbook as well as the 2012 launch of the Lebanese National Environment Education Policy (AFDC 2012; AFED 2015). In addition to the launch of the policy, workshops were held and attended by representatives from 1000 schools in Lebanon, with each participant teacher receiving a copy of the EE handbook. AFED also has a current Facebook page for school EE clubs from both public and private schools and helps to facilitate regular EE related competitions.

A representative of CERD who is responsible for the incorporation of EE/ESD into the school curriculum was interviewed. She stated that although private schools are invited to participate in state EE/ESD trainings, they are not required to follow the state curriculum. Private school teachers are also not required to attend the ongoing trainings for teachers provided by CERD, although they are welcome to attend. Training, updated curricula and educational objectives are provided for public schools, however implementation is subject to school resources and initiative. This was reiterated by a retired public school teacher who was responsible for EE in a public primary school – that the implementation of government directives, for example, in regards to having someone responsible for EE at schools, was dependent on the availability, resources and enthusiasm of school principal and staff.

The CERD ESD coordinator described the 2013 curricula, which is in the process of being reworked using a new pedagogical approach with ESD being integrated into all the subjects. She said that the first cycle (grades 1-3) is already complete and that the aim is to incorporate ESD in such a way that no extra time will be needed for teaching environmental themes. In the current curriculum, EE is usually added as a unit at the end of sections in various subjects such as science and social studies as well as used as a topic, for example, for essay assignments. However, interviewed teachers from two different schools said that often the units are skipped as there is time pressure and not too much emphasis is given to EE/ESD in state exams. At the school in Aley district (Private 2), the interviewed teacher, who was environmental club supervisor, was also the science coordinator and chemistry teacher. Thus, environmental activities, including environmental clean-up initiatives, were done on a volunteer basis, in addition to her full-time teaching responsibilities.

Environmental conservation in Lebanon leaves something to be desired. It is a country comparatively blessed with much water and greenery in a region of the world characterised by extensive desert, however its bio-capacity is only 17% of its ecological footprint (GFN 2011, p.32,33). One of the impetus for the formation of some Lebanese environmental NGOs were the forest fires that have ravage Lebanon's forests periodically (AFDC 2012). Historically, Mount Lebanon was famous for its cedar trees, which



Figure 2: Flag of Lebanon, featuring the Cedar of Lebanon. (Go, See, Write 2015)

remains the symbol of Lebanon (figure 2), but over the centuries cedars have been reduced to 2% of their former coverage (Masri 1995). Lebanon's 2011 State and Trends of the Environment Report (SOER) shows that biodiversity and tree coverage is in decline, and Lebanon faces ongoing challenges with air and water pollution, as well as solid waste management (p. 53, 101, 151, 269). A recent World Bank report also highlighted the increasing water scarcity suffered by the whole MENA region (World Bank 2014).

Prior studies have been conducted in Lebanon on issues related to environmental views. Vlaardingerbroek and Taylor's (2007) paper "*The Environmental Knowledge and Attitudes of Prospective Teachers in Lebanon: A Comparative Study*" provides insight into new Lebanese teachers' perspectives on environmental issues, showing that while knowledgeable, EE places as lower priority and their views are more localised. Naoufal studied a Lebanese peace and climate change NGO, describing their challenges, and Professor Masri highlighted difficulties with encouraging students to take environmental issues more seriously (Naoufal 2014, Masri 2007). The following serves as a good summary of recurring themes in previous research and helps to paint the backdrop for the social climate in Lebanon. Naoufal begins with a quote from one of the NGO personnel:

"Soumar Dakdouk put it, *people will laugh at us if we tell them about climate change after the explosion of a bomb. They tell us that they have more urgent matters and may die now; they say they cannot worry about dying in 50 years.*

"Indeed, people exposed to war tend to develop a persistent short-term mode of reasoning exclusively focused on survival needs; they find it difficult to be more concerned about the environment, especially as armed conflict is often followed by a period of high political, social, and economic instability and a lack of safety (Naoufal 2012)." (Naoufal 2014, p.287)

Makki, Abd-El-Khalick and BouJaoude published an article in 2003 with quantitative results from a survey of Lebanese secondary students on environmental knowledge and attitudes. They focus on the "relationship between participants' knowledge and attitudes and (a) biographical and academic variables, and (b) commitment to environmental friendly behavior" (Makki et al. 2003, p.22). Oweini and Hourri's study on Lebanese college students highlighted other factors that can affect environmental attitudes and practice. They looked specifically at "gender, age, previous experience with hiking, and living abroad in countries where there are environmental laws and practices" (Oweini & Hourri 2006, p.97). These prior studies will be reflected on in the analysis.

This research seeks to build on the existing body of knowledge through an understanding of the social context and analysis of Lebanese youth's environmental attitudes in a sampling of schools through a mix of qualitative and quantitative methods (Byron et al. 2014, p.14).

3 Literature Review and Theoretical Framework

“The changes in human attitudes that we call for depend on a vast campaign of education, debate, and public participation. (WCED reprint 2009, p.23)”

I. What is the difference between Development and Sustainable Development?

'Development', in the English language, is a versatile word and can describe any type of change or growth. Within the social sciences, the term development can also be understood in this way when used with other terms, for example, economic or agricultural development. As a concept, however, its meaning is much contested. The Brundtland report states that, *“The satisfaction of human needs and aspirations is the major objective of development. (WCED reprint 2009, p.43)”* The satisfying of those needs and aspirations is an ongoing challenge – one that some parts of the world seems to have excelled at and others still face major challenges in.

These challenges cannot be readily simplified. Our dependence as humans on our natural world and the interconnectedness of processes, natural and human, mean that cause and effect are no longer localised. *“The failures that we need to correct arise both from poverty and from the short-sighted way in which we have often pursued prosperity. (WCED reprint 2009, p.27)”* The Brundtland report thus was one of the first to call for 'sustainable development'. The online Oxford Dictionaries provides an interesting basic definition:

“Economic development that is conducted without depletion of natural resources” (Oxford Dictionaries 2014).

This definition is helpful for two reasons. One reason is that it indicates the layman's understanding of the concept. A second reason is that it highlights two foundational challenges to sustainable development: the need to increase economic well-being and living standards globally, whilst preserving or maintaining the stock of natural resources upon which prosperity is built. The well-known Brundtland definition is complex in its implications and has sparked extensive debate over the past three decades:

“Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs. (WCED reprint 2009, p.43)”

The fulfilment of human needs is a vast subject, which can cover everything from basic sustenance to emotional well-being and fulfilment (Maslow 1943). Social justice, although outside this thesis' scope, is also an integral aspect of sustainable development. Gro H. Brundtland points out

that it is not enough to respect the environment if we wish to have a better future, but that poverty must be dealt with as well (Brundtland 1991, p.5). Both social justice and human reliance on our natural world highlight the need for change in society. Climate change is just one example of negative processes that have been set in motion by development. However, the realisation of sustainable development is politically exacting, necessitates public support and requires massive attitude changes (WCED reprint 2009, p.23,327,335).

II. Sustainable Development and Environmental Education

The link between sustainable development and environmental education is very much tied to the phrase “Our Common Future”, born out of the Brundtland report. The phrase itself is not defined as it is intuitive, but is much used in connection with green thinking. Thomas Berry, in discussing the earth's future prospects, talks about the need for “a sustainable human culture” (Berry 1990, p.207). Robert Allen pointed out the late 1970s *World Conservation Strategy* that humans are “progressively reducing the planet's life-supporting capacity” (Allaby 1989, p.231). Clearly the idea that we all live on this earth and must therefore all be responsible for its care is central to both sustainable development and environmental education.

Maclean says, in his foreword to *Environment, Education and Society in the Asia-Pacific*, that the important question to ask in regards to development is “how to get from where we are to where we want to be” (Yencken et al. 2000, p.xiv). This clearly cannot be accomplished without involvement of the next generation – children and youth. Hence part of the solution is to give the next generation the tools to deal with the challenges of living, “not only in harmony with each other but with the biosphere of which we are part” (Yencken et al. 2000, p.xiv).

Gro Harlem Brundtland, in her foreword to *Environmental Education for Our Common Future*, discusses the idea of knowledge and its transmission to the next generation, of which teachers are a vital part (Brundtland 1991, p.4,5). The Brundtland report further stipulates that educating the next generation for responsible environmental care should be multidisciplinary:

“*Environmental education should be included in and should run throughout the other disciplines of the formal education curriculum at all levels – to foster a sense of responsibility for the state of the environment and to teach students how to monitor, protect, and improve it.* (WCED reprint 2009, p.113)”

III. EE background

The Brundtland report outlined some key aspects of environmental education, and helped to

consolidate EE as part of the U.N.'s strategy for addressing global generational environmental concerns. However, the conceptual background for the green movement go further back. Goethe viewed nature and natural phenomena in a holistic manner as opposed to reductionist, encouraging understanding of the interdependencies of nature (Seamon & Zajonc 1998, p.215,217). Rousseau challenged early Enlightenment notions of industrialisation as being progress, viewing a closeness to nature as more healthy, as well as proposing that children be encouraged to explore nature (Barry 2007; Riley 2001, p.255). Along with Goethe and Rousseau, Montessori further encouraged the idea of guided exploration as an educational model. Geddes ideas on education of the whole person and bringing learners into connection with the natural environment helped to combine the fields of education and environmental studies, and his founding of the Outlook Tower in Edinburgh in 1892 helped to consolidate his methods by providing an environmental learning centre for educators (Palmer 1998, p.4).

EE was preceded by a global growing concern for environmental issues, with groups such as conservationists promoting conservation education along with their legislative lobbying (Disinger 1983, p.18,19). Palmer maps various precursors and parallel complementary fields, such as nature studies, rural studies, environmental studies, urban studies, urban ecology and conservation education (Disinger 1983, p.19; Palmer 1998, p.27). While some of these fields branch out of environmental studies, others arose simply out of the conviction that the natural resources on which humans depend were being devastated and without increasing awareness and education, the next generation would do little better than the current (Disinger 1983, p.19).

In the early and mid 1970s, environmental programs were started in countries as diverse as the U.S., U.S.S.R. and Sweden (Gough 2006, p.72). The first global “*Framework for Environmental Education*” comes from the U.N. Belgrade Charter of 1975. Clearly, the awareness that environmental concerns were posing a global threat to prosperity, as well to future generations, was prompting a response – action.

IV. EE definitional and other challenges

The inherent importance of earth's natural environment to positive future development for the human race is logical enough, however turning it into practice is still difficult. The International Alliance of Leading Education Institutes (IALEI) make a case in point with their description of the challenges of educating regarding climate change:

“From a pedagogical viewpoint, climate change is uniquely challenging. The starting point is a set of near-future scenarios that are all threatening and problem-filled. Climate change also requires

risk assessment on the basis of uncertain knowledge and the acknowledgment that solutions will require political and ethical choices as well as technical innovations. In these realms, there is far less agreement than there is regarding the fact that there are problems which need solving. ... this complex and depressing picture can provoke two troubling responses: a passive and paralyzing fatalism or an oversimplification of the many important factors involved". (IALEI 2009, p.14)

As a starting point, one early definition of EE, which has been much used, comes from the first *Journal of Environmental Education* in William Stapp's article on "The Concept of Environmental Education":

"Environmental education is aimed at producing a citizenry that is knowledgeable concerning the bio-physical environment and its associated problems, aware of how to help solve these problems, and motivated to work toward their solutions. (Stapp 1970, p.15)"

These themes are oft repeated in EE, if worded differently in various definitions. The North American Association for Environmental Education (NAAEE) booklet on *Measuring Environmental Education Outcomes* lists the following as some desired outcomes of EE: knowledge about environmental issues, awareness and sensitivity, pro-environmental attitudes, skills such as critical thinking, pro-environmental behaviour, pro-environmental community behaviour, and ultimately improved ecosystem and ecosystem services (Byron et al. 2014, p.7,8).

One of the ongoing challenges EE faces is its interdisciplinary nature. This results at times in diversity of meaning, and often vagueness, by those using the label of EE for their various environment related activities (Disinger 1997, p.30; Gough 2006, p.72). Another challenge is its connection with the long-term dissatisfaction with old school segmented learning models (Gough 2006, p.75; Stern et al. 2013, p.2), as EE is holistic in nature (UNESCO Beirut 2008, p.7). There is also disagreement regarding its applicatory focus: Is the goal to provide the tools to be critical thinkers and decide personally, or to modify behaviour and instil the basis for pro-environment action (Disinger 1997, p.31; Hungerford et al. 2000, p.3)? Is behaviour modification possible and how do you measure it?

Another challenge is the tailoring of EE to cultural context. The Belgrade Charter stipulations that one of the preliminary objectives is:

'For each nation, according to its culture, to clarify for itself the meaning of such basic concepts as "quality of life" and "human happiness" in the context of the total environment, with an extension of the clarification and appreciation to other cultures, beyond one's own national boundaries' (UN 1975, p.3).

This of course precludes standardisation in EE, as each country must create and implement EE as suits their individual culture. EE is broad in scope and the Lebanese State and Trends of the

Environment Report demonstrates the breadth of ‘environment’ alone, covering the topics water resources, air quality, biodiversity and forests, land resources, urbanisation, solid waste and energy (SOER 2011).

Recognising the immense difficulty associated with the measurement of behaviour modification, and in order to somewhat narrow the scope of this dissertation, the chosen working definition is based on Hoffman and Thomson’s encapsulation of EE's purpose.

“Create knowledge and understanding about ecological, social, economic, and political concepts, and demonstrate the interdependence between a healthy environment, human well-being, and a sound economy. (Hoffman & Thomson 2003, p.10)”

In other words, this dissertation seeks to measure the extent that knowledge and understanding has been created in the youth of Lebanon on environmental concerns, not changes in their behaviour. This is only one of ten points that Hoffman and Thomson provide as a sample list of elements that are present in a good EE program (Hoffman & Thomson 2003, p.10,11). However, for the purpose of this thesis, this definition is important in clarifying the research focus, and acts as the ontological assumption (Bryman 2004, p.19).

V. EE, the U.N. and other Agencies

The first U.N. workshop on Environmental Education (EE) was held in Belgrade in 1975 (UN 1975). Two years later, the first U.N. conference on EE was held in Tbilisi, Georgia, where the Tbilisi Declaration was drafted (UN 1977). With the declaration, the objectives of EE were defined as: Awareness, Knowledge, Attitude, Skills, and Participation (UN 1977).

Since the late 1970s, much work has gone into operationalising the objectives, with UNEP-UNESCO providing support to governments in incorporating EE into their policies and educational systems, at all levels (UNEP I, n.d.).

EE has been adopted by a wide variety of agencies, networks and educational institutes. Some of these are national and others network across borders and continents. Some prominent ones are the National Association for Environmental Education in the U.K. (Palmer 1998, p.4), North American Association for Environmental Education (NAAEE), the Environmental Literacy Council (Sierra Club, 2008) and the Green Schools Alliance (GSA 2013).

In recent decades, the concept of Education for Sustainable Development (ESD) has emerged, having gained international recognition via the 1992 Rio Earth and the 2002 World Summit on Sustainable Development. The later summit witnessed the launch of the UN Decade of Education for Sustainable Development (ARIES 2004). At this point, EE was in a sense subsumed

under ESD with its broader concepts of inequality and social justice (Gough 2006, p.74; UNESCO 2004, p.7). The Decade of Education for Sustainable Development (DESD) has also only recently come to a close (UNESCO 2005, p.4). In September, 2012, Tbilisi +35 was held to commemorate the initial efforts and ongoing progress made, as well as to reaffirm commitment to EE (UNEP 2012).

VI. Evaluating EE and the New Environmental Paradigm

Much work and research has also gone into evaluating the effectiveness of EE (ARIES 2014; Byron et al. 2014). Evaluating EE can be challenging, due to its holistic and interdisciplinary nature. For simplicity, NAAEE's Measuring Environmental Education Outcomes (2012) broad definition will be used as a starting point:

“We define environmental education outcomes as any desired changes that result from environmental education programs and are intended to improve aspects of social-ecological systems, including human well-being. (Byron et al. 2014, p.3)”

One EE evaluation booklet lays out the procedure quite simply: *“An educational program evaluation would usually look at both the activities of the program (how it's delivered, by whom, etc.) and its outcomes for participants (skills, knowledge, attitudes, values change, etc.). (Hoffman & Thomson 2003, p.10)”* This describes the basic plan for this research, focused on schools, with a greater emphasis on the outcomes.

A frequently used tool for evaluating environmental values and attitudes is the New Environmental Paradigm (NEP). The NEP was developed by Dunlap and Van Liere in the late 1970s in response to the detailing of the anti-environmental “dominant social paradigm” (DSP) by Pirages and Ehrlich in 1974 (Dunlap et al. 2000, p.426). Dunlap and Van Liere tested out earlier models of the NEP by surveying known environmentalists and comparing with a sampling of the general public (Dunlap et al. 2000, p.427). Statements were presented with a Likert scale, with level of agreement or disagreement signifying the extent to which the respondent adhered to the DSP or the new environmental paradigm (Anderson 2012, p.260). The results from their early study proved noteworthy and encouraged the further development of the NEP – the currently more popular version sometimes called the revised NEP (New Ecological Paradigm) – with a total of 15 statements (Anderson 2012, p.261). The NEP has thus been included in this study's survey.

V. EE Framework

Both EE and ESD have been discussed in this chapter. However, EE will be the main

framework for this research. One reason is that Lebanon's Center for Educational Research and Development (CERD) is still in the process of updating the Lebanese curriculum to reflect the 2012 National Environment Education Policy, with an ESD methodology. Another reason is that this research focuses on pro-environmental attitudes in youth, while social justice and other additional aspects of ESD are outside the scope of this thesis. Nevertheless, ESD and EE will at times be referring to together when discussing what EE has been present in school curricula, as EE is an important part of ESD.

4 Methodology

“An educational program evaluation would usually look at both the activities of the program (how it's delivered, by whom, etc.) and its outcomes for participants (skills, knowledge, attitudes, values change, etc.). (Hoffman & Thomson 2003, p.10)”

I. Underlying Assumptions

It is important to recognise that Education for Sustainable Development (ESD), as outlined by UNESCO, is not confined to environmental information incorporated into school curricula (UNESCO 2014). Research has shown that early US linear models that sought to connect environmental learning directly with pro-environmental behaviour were flawed (Kollmuss & Agyeman 2002, p.241). However, the same research recognises that knowledge is an essential first step towards such behaviour (Kollmuss & Agyeman 2002, p.243; UNESCO 2014). As such, the focus of this research is on the relationship between EE in Lebanon and the levels of environmental knowledge of Lebanese youth, taking note of the educational inputs and of the social environment.

The underlying assumptions of this research are predominantly interpretative but contain ideas that could be construed as positivist (Wight 2007, p.23,24). The research is interpretative in the understanding that people cannot be viewed objectively in the same way natural or technical research observes phenomena. People have feelings and opinions, and react through the lens of their own socially constructed view of the world. However, somewhat akin to positivism, this research also assumes that by gathering a quantitative sample of students from diverse schools, an understanding of the local social construct can be gained. The quantitative angle is taken in the hopes of achieving a measure of generalisability (Bryman 2004, p.29,76). It is not expected that exactly the same results would be generated if the study were replicated, however it is believed that the research method is reliable enough that similar general trends would emerge from a repeat of the research (Bryman 2004, p.74).

The methodology is mixed, combining quantitative and qualitative methods. Bryman points out that the two are less distinct and incompatible than is often assumed, and using them together allows for comparison of results and triangulation (Bryman 2004, p.275,446; Byron et al. 2014, p.15). Thematic analysis contains an element of quantification, as often researchers highlight and focus on recurring themes (Bryman 2004, p.448) – which is done in this research. Qualitative research can also facilitate quantitative research and vice versa (Bryman 2004, p.457), thus another

benefit to combining methods. The quantitative survey dimension adds external validity (Bryman 2004, p.29), which is desirable, as the aim is for this research to be useful to ESD practitioners in Lebanon (Byron et al. 2014, p.15).

The survey itself was based on an environmental study done in Japan (Barrett, Kuroda & Miyamoto 2002), which was reworked and adapted for Lebanon. Included are the statements from the NEP (see chapter on Theoretical framework). The NEP questions in particular were included in the closed survey to ensure comparability with other studies of environmental values and attitudes.

Epistemologically, it is difficult to know for certain whether the views of Lebanese youth that the survey and group interviews capture are in fact due to EE in school, or due to other socio-cultural or individual factors (Bryman 2004, p.14,15). However, by comparing results from both qualitative and quantitative methods, the study aims to gain understanding on how a sampling of Lebanese students in various school see environmental issues, and general deductions on source can be made. From there, Lebanese ESD educators can draw further conclusions about how to improve implementation of ESD and motivate students to become more pro-environmental in their actions as well as their attitudes.

II. Culture and Sampling

Lebanon's unique cultural, sectarian and political make up have influenced the sampling method for this paper. The research was restricted to schools in three districts: Beirut, Baabda and Aley (figure C). This is because these sample groups provided the heterogeneity that should yield a relatively representative sampling of Lebanese youngsters. Four schools in Lebanon were sampled: two private, two public.

The first private school, in Baabda district, is a Christian school catering to upper class Lebanese and expatriate children of all religious, sectarian and political persuasions. The student



Figure 3: Districts of Lebanon.
(Partners for Democratic Change 2014)

population includes expatriates and diplomat foreigners, Lebanese with second nationalities, mixed children, repatriating Lebanese, as well as Syrians. The second private school catered to only one community. This school, in the Aley district, is of interest because some of their community leaders are particularly known for their pro-environment activism. The schools have also been chosen as representative of social status diversity. The public schools are located in the Beirut district and included a number of Syrian students, as government schools have received an influx due to the Syrian refugee crisis.

III. Data Collection

Mostly qualitative methods were applied for sampling. A form of snowball sampling (Bryman 2004, p.100,102) was used, as referrals were gained from a known Lebanese environmentalist. However, it was also very much purposive sampling (Bryman 2004, p.333,334) as leads most pertinent to gaining the information needed were followed – to round out the sampling in a way that best gave a representative sample of Lebanese society.

Qualitative semi-structured interviews (Bryman 2004, p.320) were conducted with teachers, a headmistress, and people from government ministries. Semi-structured interviews were chosen to gain, not only information on EE practices, but also insight into their personal perceptions on the issues and challenges related to EE in Lebanon. A second interview was conducted with two separate interviewees who were key informants (Wellington & Szczerbinski 2007, p.83): a retired teacher, who had been the environmental instructor at a public primary school, and the EE/ESD coordinator at CERD.

Quantitative closed surveys (Bryman 2004, p.137) were conducted in five schools: two public schools, and two private schools, as well as one secondary school in Norway – a total of over 300 surveys. The Norwegian school was surveyed to aid in comparing and contrasting. One reason for choosing closed surveys was a practical one: Access to views of a larger amount of Arabic speaking secondary students could be gained without extensive translation work required. Another reason was the heterogeneous nature of Lebanese society, which necessitated a larger and more well-rounded, or representative, sample size (Healey 2009, p.25,144) than would have been possible to gather with only qualitative methods. Two focus group interviews (Bryman 2004, p.349; Wellington & Szczerbinski 2007, p.88) with secondary school students were conducted to gain further nuance on their environmental perceptions.

IV. Analysis

Analysis was conducted along both quantitative and qualitative lines. The closed surveys were analysed with quantitative software: R Commander and PSPP – which is the Linux version of SPSS (Bryman 2004, p.244; Healey 2009). The interviews were analysed for recurring themes (Bryman 2004, p.449) to gain a better understanding of the current challenges in regards to EE in Lebanon. Qualitative data helped to illuminate the contextual socio-cultural setting and general values and attitudes on environmental themes, while quantitative data analysis and descriptive statistics helped to shed light on differences in values and attitudes between social status and/or public and private schools (Healey 2009, p.87). The variety in sampling of students and schools as well as the combination of quantitative and qualitative methods made for interesting and somewhat challenging analysis.

V. Operational plan and project organisation

Once a research topic and focus has been chosen and narrowed, and pertinent literature found on the topic, gaining access to people and organisations is one of the biggest challenges in research (Bryman 2004, p.296). In Lebanon, it is most acceptable culturally to gain access through referrals. Thus suggestions on who to contact came from a noted Lebanese environmentalist, who had been interviewed for prior research.

The environmentalist provided reference to the editor of a Lebanese environmental magazine which had facilitated environmental clubs and information sharing for schools. The editor provided reference to some schools who had participated and had environmental clubs. Referrals were also gained for people to interview in the Ministry of Environment (MoEn) and Ministry of Education (MoEd).

Semi-structured interviews were conducted with the head of the Awareness department at the MoEn, the editor of the environmental magazine, and the ESD coordinator at CERD. A follow up interview was conducted with this last lady.

Several schools were contacted to request their participation, some from the referral list. The first contact was made with a school in the Aley district that has an environmental club. This private school caters to one relatively homogeneous community, therefore it was necessary to expand the sampling base. Access was gained to another school in Baabda district, which at the time did not have an environmental club, although the head of the junior department had recently started a “green” campaign. – A recycling company has supplied them with a large number of boxes to facilitate sorting paper and plastic garbage in both the primary and secondary departments of the

school. This is a private Christian school, which has a very mixed clientèle of students from multiple religions as well as a large percentage of foreign students. Through referrals, connection was made with the retired environmental and health instructor of a large public school in Beirut. Through this contact, access was gained to a primary public school, as well as the neighbouring secondary public school.

Once the cooperation of the schools was secured, the closed survey was finalised along with the Arabic translation. In the primary public school, the researcher joined a teacher in an 8th grade class where the survey was administered to 21 students. The researcher's presence added an element of excitement to the whole affair, and although the educators at this school were very helpful, their offer to continue on to other 8th grade classes to administer the survey to more students was declined. There were two reasons for this: one was that the target group was actually 10-12th graders; secondly, the researcher's presence in the classrooms was a distraction and made the process very time consuming for the teacher as well. This data is included in the empirical findings, however, treated with care, and since grades 10-12 are the main focus of this research, this is reflected in the analysis of the survey results.

In the other schools, the surveys were administered to the students by the teachers and surveys collected afterwards. In those schools deemed necessary, the teachers were provided copies of the survey in both Arabic and English, to ensure comprehension. An emphasis was made to teachers of the importance of students not viewing the surveys in terms of a test, and that there were no 'right' or 'wrong' answers.

The next step for the surveys was to input the data into computer files, e.g. Excel, and then to analyse the data with software to produce descriptive statistics. Two focus group interviews with Lebanese secondary students were conducted in order to gain nuance on their views regarding local environmental and societal matters. The focus group interviews were challenging to obtain, and those conducted were informal.

Further review was done of literature related to EE and Lebanon. This allowed for synthesising literature, Lebanese government legislation and ground reality, as well as other studies and research findings.

VI. Ethical evaluation/consideration

The subject matter of this thesis made following ethical principles relatively easy, namely: no “harm to participants”, “informed consent”, no untoward “invasion of privacy”, and no deception (Bryman 2004, p.509). The subject matter of this thesis was not one that would cause

undue emotional stress for most people, nor were their views on the matter likely to be so private that requesting their thoughts would be viewed as prying. Inform was provided to all those interviewed regarding the nature of the research and status of the researcher. This was also clearly stated on the surveys.

One point that may be on the ethical grey scale, but is still acceptable according to Bulmer in the universalists' ethical stance, is "retrospective covert observation" (Bryman 2004, p.508). Having lived in Lebanon for a period of five years prior to beginning this masters, as well as this research project, prior observations and conversations with Lebanese regarding environmental issues played a definite role in shaping the researcher's understanding of the Lebanese context.

Anonymity is another issue that is relatively easy to ensure, especially for closed survey respondents (Bryman 2004, p.510). Care was taken in the writing of the thesis to present events in an unbiased manner, as observed or as respondents stated them.

VII. Potential Limitations of the Research

The research was dependent on cooperation from schools in very different socio-economic situations, and while in some respects the data is comparable, in other respects it is not. Sample sizes were not equal from the various schools, as is shown in the demographics chart (Figure 1). The 7th and 8th graders are a noticeably small percentage and while they were included in most of the charts showing comparison with the Norwegian group, they are not discussed extensively. Conclusions about Lebanese youth at the younger grades are treated with special care.

Missing data is an issue, especially for the 7th graders from Private 2, where a larger percentage did not fully complete the surveys. Also some students of all grades clearly did not read question instructions carefully, and some applied instructions from previous questions. This is one of the drawbacks of quantitative self-completing surveys: While larger quantities of data can be gathered, the researcher is not able to perform quality control on the completion of surveys (Bryman 2004, p.135).

The sample groups are relatively small, thus while some deductions have been made, diversity is similarly noted. The thesis refers to sample groups from Lebanon as Lebanese and the sample group from Norway as Norwegians, however this does not imply that the research asserts that these findings can be unilaterally inferred to the general populace of Lebanese or Norwegian youth. As has been noted earlier, one of the private schools and the public school in Lebanon included large numbers of non-Lebanese, for example, expatriates and/or Syrians. Whether the findings from Lebanon can be further inferred to other Arab countries is even more questionable.

The understanding of this research is that “ceteris paribus” does not hold true in the real world, however, the overall quantity of survey participants means that some qualified deductions can be drawn from the resultant data.

5 Empirical Findings

I. Survey and Demographics

The survey had a total of 28 questions, with the last question being the fifteen NEP statements. The first few questions provided the demographics of the surveyed population, as shown in the chart below (Figure 4).

	School					
	Private 1	Private 2	Public 1 (Offentlig)	Public 2 (Offentlig)	Norwegian	<i>Total</i>
Female	46	21	33	14	36	150
Male	50	56	43	7	31	187
<i>Grade 7</i>		16				16
<i>Grade 8</i>		1		21		22
<i>Grade 10</i>		23			67	90
<i>Grade 11</i>	75	35	50			160
<i>Grade 12</i>	22	2	26			50
Total	97	77	76	21	67	338

Figure 4: Demographics

Students are categorised as per their school. Private 1, in Baabda district, was a mixed upper-middle class school offering curricula which would enable students to pass the Lebanese Baccalaureate, as well as alternate curricula for non-Lebanese which would provide them the opportunity to sit for the SAT exams. Thus while EE was not explicitly a part of the curricula, it is expected that enough EE was included to cover whatever would be expected in the aforementioned tests.

Private 2, in Aley district, was a homogeneous community school which used the Lebanese state curriculum for primary and secondary, with EE included as per the earlier agreement between the MoEn and MoEd. This school also had a dedicated science teacher who volunteered as environmental facilitator for their active environmental club open to students from all grades.

Public 1, in Beirut, was a government secondary school which used the state curriculum and did not have any environmental club or environmental officer.

Public 2, also in Beirut, was a government primary school which used the state curriculum, but had an environmental and health officer for many years and had taken part in various environmental activities.

The following sections will provide the results which are divided according to question type. The results have been analysed primarily according to classification or school, but gender analysis has also revealed some interesting differences and these are noted as well. The surveys were closed, with a few questions having an 'other' option, which some students took advantage of. Some students also made comments in the margins, which added insight. These comments, along with comments from the focus group interviews will be added as pertains the questions.

Please note that in many of the charts, percentages do not add up to 100% as there is missing data, with some students having skipped over certain questions. Also due to lack of space, bar charts in the first three questions have been added only for 'most important issue', and not second and third.

II. Issues of Importance and Social Commentary

The first survey question was regarding general issues, asking students to rank the top three local issues. Issues of concern were scattered along the scale by Lebanese students as they had twelve options to choose from. Here, comparing the

Norwegians with the Lebanese proved interesting as terrorism garnered the largest percentage (19.2%) of Lebanese attention, but none of the Norwegians saw terrorism as the most imminent threat. As seen in figure 5, the level of importance of terrorism also varied considerably with the Lebanese school's geographical location. The surveyed Public school is located in an area of Beirut that has been

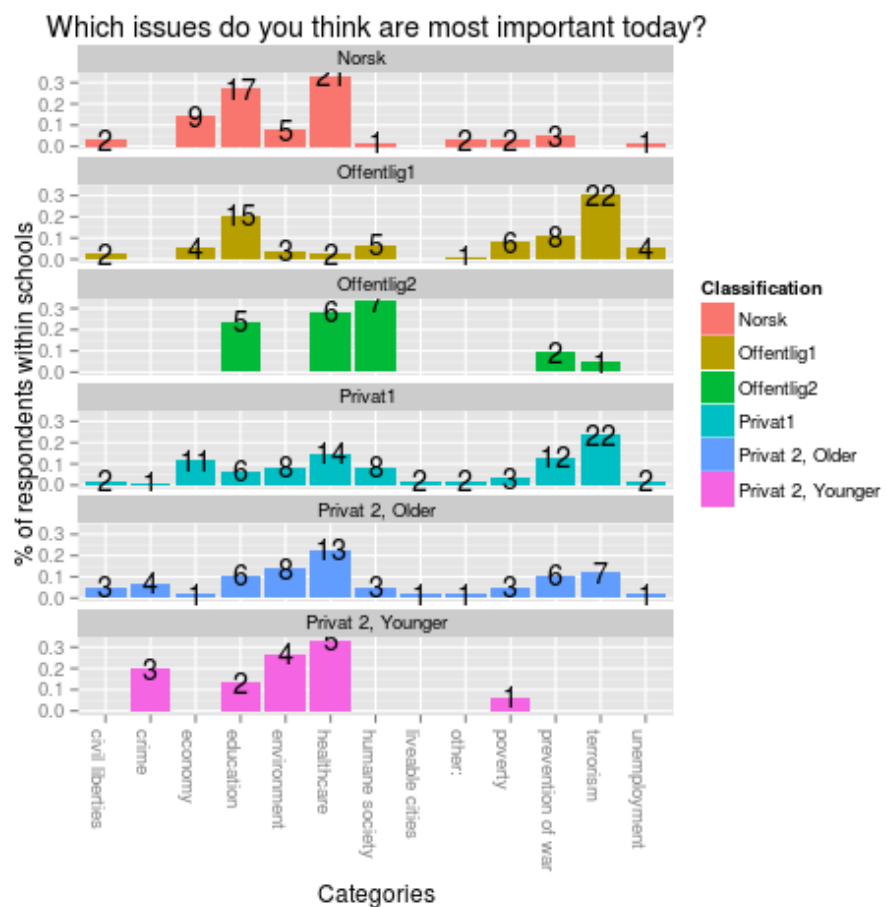


Figure 5: What issues do you think are most important for Lebanon (Norway) today?

subject to frequent threats and bombings, and 30% considered it the most pressing issue. Private 1 in Baabda district, where almost 23% felt terrorism is most important, is located on the outskirts of Beirut, but some students commute daily from more threatened areas. Private 2, in Aley district, is comparatively isolated and part of a more closed community and hence approximately 12% thought it was most important.

Healthcare (14.8%) and education (12.5%) were also high on the list, with healthcare more important for private school students and education more important for public school students. Prevention of war (10.2%) again highlights Lebanese students concerns on security issues, and environment and the creation of a fairer and more humane society each gained 8.5%. In comparison, Norwegians top three issues were healthcare, education and economy.

Differences across Lebanese schools can be noted in all categories, but one of interest is that the school with the highest percentage ranking environment 1st as most important was Private 2 school which, as mentioned, has EE included in the curriculum and an active environmental club.

Ranking 2nd place of most important issues was education at 21%, with second and third place going to prevention of war (10.3%) and healthcare (10%). Poverty gained fourth place (9.2%) with environment (8.9%) and economy (8.5%) following. Terrorism was at 7.4%.

For 3rd most important, environment (15.1%), healthcare (11.8%) and education (11.1%) were the top three, with creation of a fairer and more humane society (9.2%) taking fourth and economy (8.5%), poverty (8.5%) and prevention of war (8.1%) again on the medium scale.

As mentioned, gendered analysis was done for the Lebanese students. In the first ranking, some issues were fairly similar, such as terrorism which 19.3% of girls and 18.6% of boys thought were most important. Education (F: 12.3% and M: 12.8%), healthcare (F: 14% and M: 15.4%) and prevention of war (F: 11.4% and M: 9.6%) were also relatively similar. However, environment (F: 11.4% and M: 6.4%) showed a larger disparity and only boys voted for civil liberties (4.5%) and only girls voted for unemployment (6.1%) as the most important issue.

Figure 6 shows the averaged percentages for the top three issues for Lebanese and Norwegian students. As can be seen, the overall three most important issues for Lebanese were education, healthcare and terrorism, with environment coming a close fourth and prevention of war overtaking other issues. The creation of a fairer and more humane society tied with economy, with poverty close behind. As will be noted when comparing with the Norwegian students, the Lebanese concerns are more spread along the options, whereas over 40% of Norwegians were most concerned with education and healthcare. It will also be noted that terrorism and prevention of war are inverse on the Norwegian and Lebanese averaged figures. Also clearly noticeable is that for the Norwegians, concern for economy supersedes the creation of a fairer and more humane society,

presumable because Norway's social welfare system is strong. The similarity of education and healthcare being the top two for both Norwegians and Lebanese in such vastly different societies is also noteworthy.

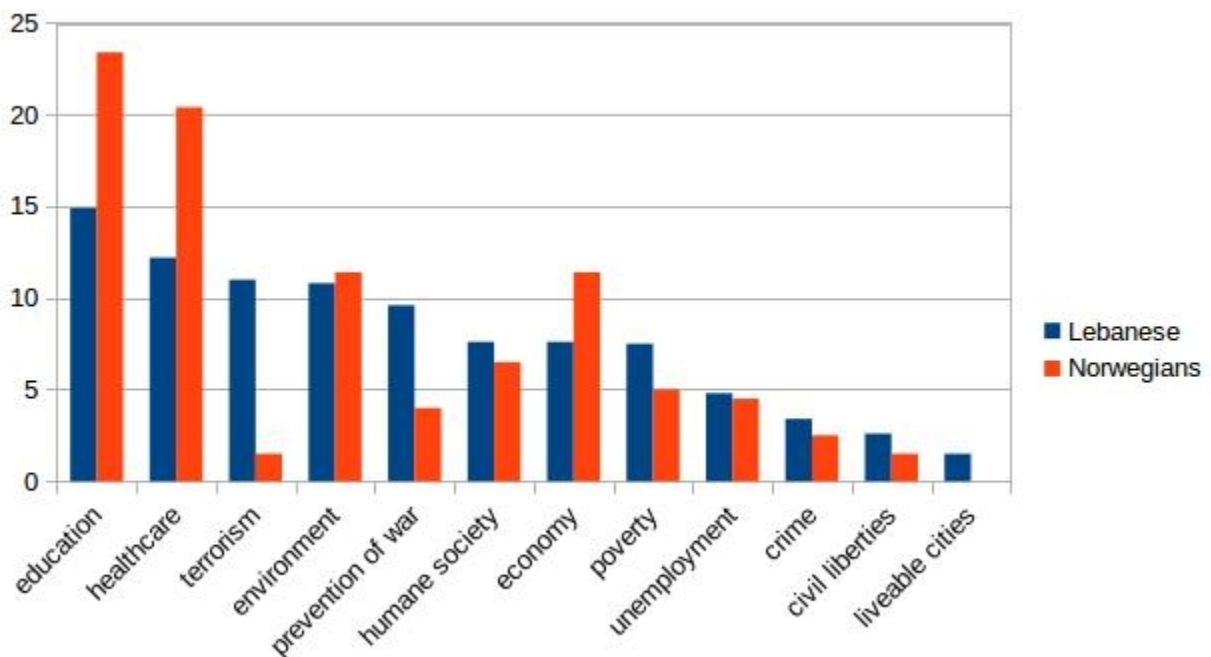


Figure 6: Averaged percentages for top three issues in Lebanon compared to Norway

Some comments regarding issue of greatest important – which Public 1 students had a number of thoughts on. A recurring theme was Lebanon's religious divisions. One student ranked sectarianism 1st place, with another echoing this sentiment, saying co-existence (in multi-sectarian communities) should be ranked 3rd most important issue in Lebanon. A third student added a 4th place as annihilation of sectarian mentality, and a fifth student ranked cancelling religious identification 2nd place. Students from Private 1, which is rich in diversity, did not comment on this in their surveys, however in the group interview there was much discussion of the political problems Lebanon faces. There was also some discussion about conflict regarding religious/political affiliation in the school. One student in particular felt there was politicking and conflict amongst students and teachers based on political leanings, while another student did not agree and a third said he hadn't noticed. This same strength of opinion versus caution on the issue was noted in the Public 1 group interview when one student said that racism is a problem and is everywhere, while another countered that it was not everywhere. This first opinionated student later said that one good thing about Lebanon was that 80% of people don't care what religion you are.

Another Public 1 student ranking 3rd place the importance of addressing corruption and eradicating nepotism. Students in both group interviews mentioned this issue in regards to Lebanese politicians, with Public one students stating there is corruption in the government and they only

want the people's money. One further explained that politicians are more interested in their salaries than finding a workable plan for extracting the oil that was discovered off Lebanon's coast some years back. Private 1 students felt that the inability of the new parliament to reach a decision on a president was a clear example of the failures of the politicians, as was the unsustainable handling of Lebanon's large debt.

Other issues of importance highlighted by survey comments were providing water and energy to all areas, ranked 3rd place by a Public 1 student, with a second ranking electricity 3rd place. In group discussion, Private 1 students also spoke of the lack of water access in certain areas of Beirut, and mentioned the electricity situation. (Note: Many areas of Beirut, as well as other parts of the country, rely on generators for electricity as even in the areas where there is electricity for more hours of a day, there are still frequent cuts.)

Another surveyed student from Public 1 felt recreational activities (e.g. football) worth noting and ranked it 3rd place. In the group interviews, socialising was also mentioned. Public 1 students mentioned the need for more green areas and playgrounds as well as safe areas to go out. They also mentioned that there are fewer and fewer beaches available to the poor, as they are either commercialised or polluted. A Private 1 student said that without the ability to socialise, they won't be able to bear the challenges of living in Lebanon.

In Private 2, one student wrote on the survey that defence from Israeli assault on Lebanon should be ranked 1st place.

The survey results do not show economy or unemployment as being high on Lebanese students list of concerns, however in the group interviews, job opportunities were important to Public 1 students and both groups talked about how the influx of Syrian refugees has impacted the economy, housing and the job market, particularly salaries. Private 1 students stated that life is difficult in Lebanon because of the need for four jobs in order to have the money needed to live.

III. Environmental Issues

The next two questions were regarding environmental issues, with the first set asking students to rank the three most important local issues and the next question considering global issues. As seen in figure 7, the most important local issue for Lebanese students was air pollution at 22%. Norwegian students also considered air pollution most important locally (42%). Water issues were the next most important in Lebanon with water shortage at 17.7% and water pollution at 16.2%. In contrast, no Norwegians considered water shortage an issue and very few ranked water pollution first. The next most important issue for Lebanese was cutting down of the forests at 11%.

What is interesting is that this issue was most important for students at Private 2, where 20% of older students and 12% of younger students considered this issue most important. Private 2 is located in Mount Lebanon region, which historically had dense tree coverage, including large amounts of cedar trees. The next most important was natural resources at 8.5%, but was most important for students at Public 1 (15.8%). Climate change only garnered 5.5% amongst Lebanese students, while more Norwegians considered it important locally (13.4%).

Ranking second place for most important Lebanese environmental issue again water pollution (18.5%) and air pollution (17%) come out on top. Cutting down of the forests (12.5%) and water shortage (11%) were also high again. Tying for fifth place with 6.6% each were climate change, natural resources and household rubbish and garbage. Household rubbish and garbage was a particular concern of Private 1 students (11.3%). Again Norwegian respondents were more concerned about climate change (24%) and not very concerned about water shortage (3%).

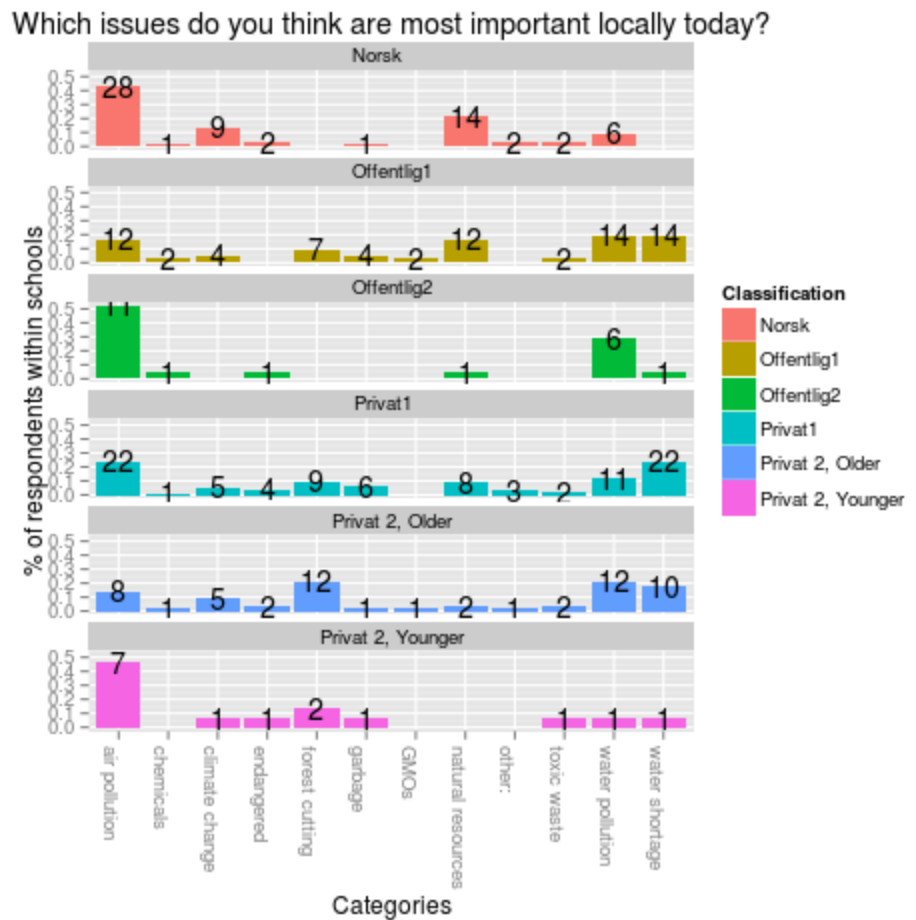


Figure 7: Which environmental problem is most important for Lebanon (Norway)?

Ranked for third place, cutting down of the forest comes out on top at 16.2% with water pollution (15.1%) and air pollution (12.2%) following. Other notable issues are household rubbish and garbage (9.6%), which again is primarily a concern for students at Private 1, and natural resources and water shortage at 7.4% each. Norwegians, in contrast, were more concerned about natural resources (19.4%), climate change (17.9%) and air pollution (14.9%), and moderately concerned about cutting down of the forests (9%) and household rubbish and garbage (9%).

From a gendered perspective among the Lebanese students, some diversity is noticeable. Ranked 1st place, air pollution is relatively uniform with 21.1% girls identifying it most important

and 22.4% of boys. Water pollution (F: 14.9% and M: 17.3%) shows some diversity and greater variance is observed in water shortage which was more important for girls (F: 23.7% and M: 13.5%) and cutting down of forests which was more important for boys (F: 7% and M: 14.1%).

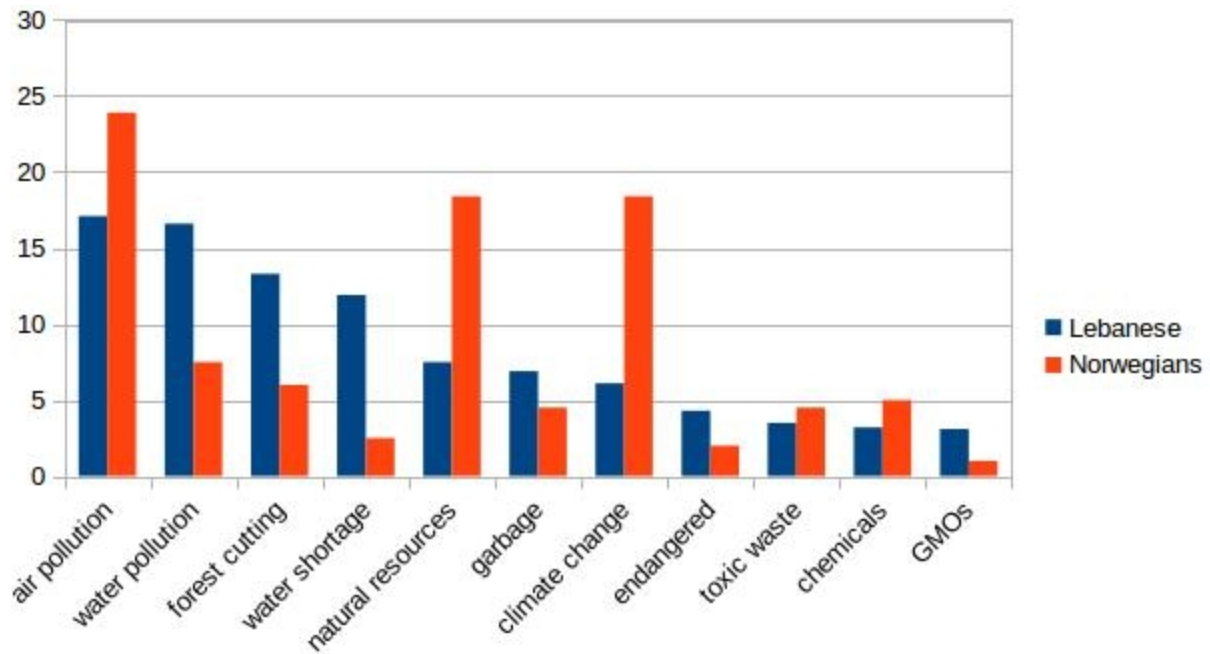


Figure 8: Averaged top three local environmental issues for Lebanon compared to Norway

Figure 8 averages out the top three most important local environmental issues for Lebanese and Norwegian students. Overall Lebanese students ranked air pollution, water pollution, cutting down of forests and water shortage as most important, with natural resources, household rubbish and garbage and climate change following. In contrast, Norwegians place climate change and natural resources at 2 and 3, with water shortage much further down the list. Norwegians and Lebanese agree on air pollution as being the most important local environmental issue, again interesting with their widely different societies. Lebanese responses were again more spread across the spectrum and Norwegians more homogeneous.

Written comments on the surveys highlighted deforestation due to irresponsible actions (Private 2), and two students from Public 1 noted electricity cuts as an environmental problem. A further student noted “foreign colonisation” as a problem under this heading as well.

Students were also asked to rank the three most important global environmental issue (figure 9). Most Lebanese students again ranked air pollution first at 24.4%. Climate change (18.8%) and natural resources (13.7%) were next, showing that while Lebanese students may not consider it very important locally, it is important globally. Interestingly, climate change and natural resources were

only voted first place by students grades 10-12, but none of the 7th and 8th graders. Other concerns were water shortage (8.9%), cutting down of forests (7.4%) and water pollution (6.3%), with water shortage gaining more attention from students at the public schools, both older (14.5%) and younger (19%). Norwegian students also felt air pollution (37.3%), climate change (22.4%) and natural resources (11.9%) were most important globally.

Ranked second place by Lebanese, water pollution was at 16.2%, with climate change and cutting down of forests both at 12.5%. Next were endangered plants and animals (11.8%) and air pollution (10%). Other issues of interest were natural resources (8.1%) and water shortage (7.4%). In comparison, Norwegians were concerned about air pollution (16.4%), water shortage (14.9%) and climate change (14.9%), and less concerned with cutting down of forests (7.5%) and endangered plants and animals (6%) than the Lebanese.

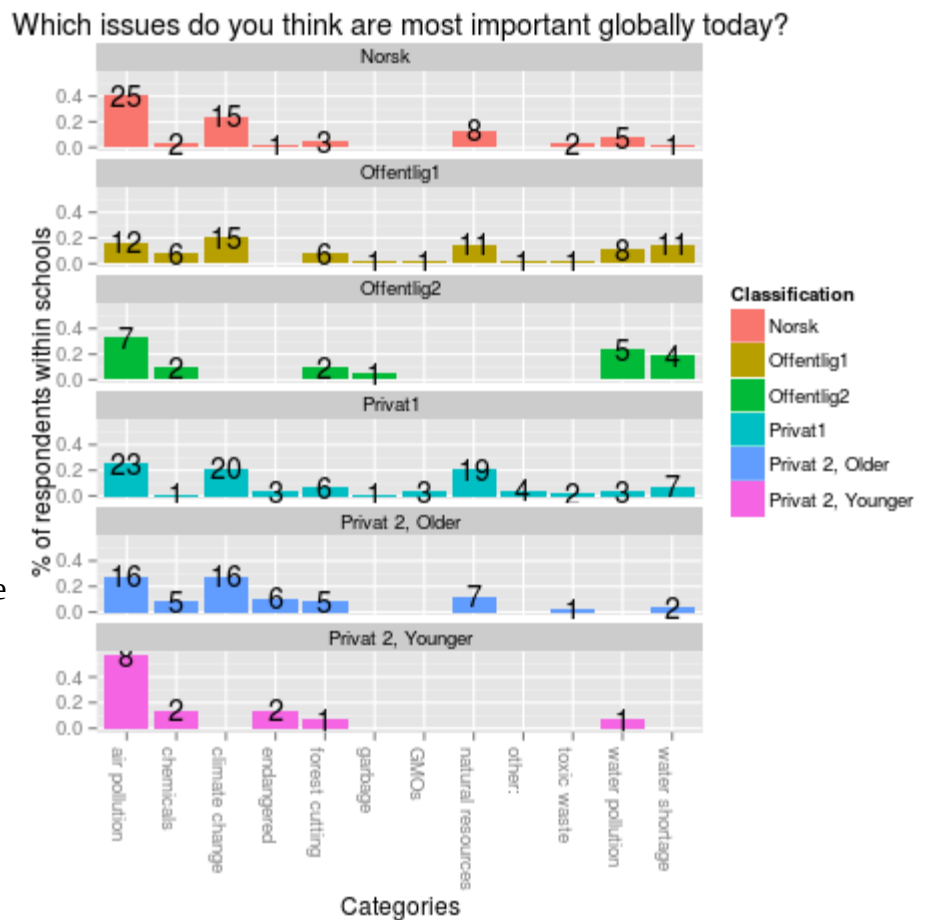


Figure 9: Which environmental problem is most important globally?

For third place ranking, natural resources was most important for Lebanese at 14.4%, with air pollution at 13.3%. Other important issues were cutting down of forests (11.1%), climate change (9.6%), and generation of toxic wastes (8.9%). Endangered plants and animals, water pollution and chemicals and pesticides all gained 7.7%, and water shortage 7%. In comparison, 16.4% of Norwegians ranked air pollution third, with 13.4% going to both water shortage and natural resources. Some concern by Norwegians went to cutting down of forests (11.9%) and climate change (10.4%).

Some variance is seen in gendered analysis of the Lebanese students 1st place ranking. Air pollution gained the attention of 21.9% of girls and 25.6% of boys. Climate change was more

important for girls at 22.8%, and 16% for boys, and natural resources was more similar (F: 13.2% and M: 14.1%).

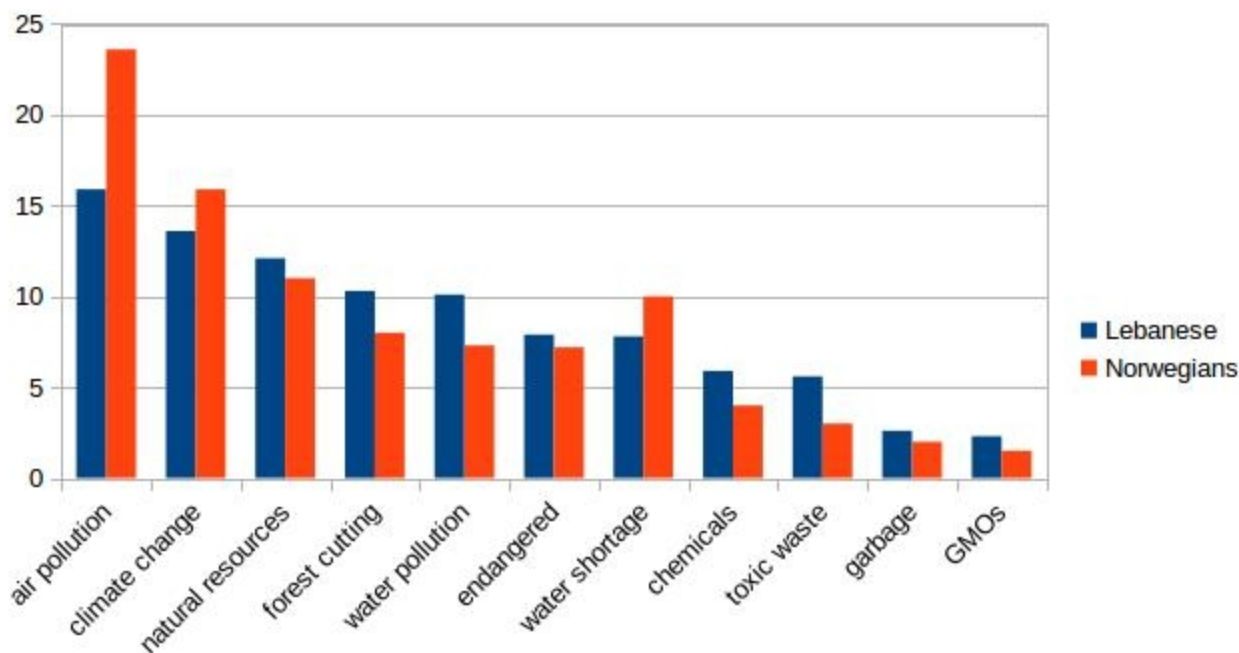


Figure 10: Averaged top three most important global environmental issues for Lebanese compared to Norwegians

Condensing the top three global environmental problems, figure 10 shows that overall, Lebanese students consider air pollution, climate change and natural resources most important. Comparing the concerns of Norwegians and Lebanese, we see many similarities, with the Lebanese concerns again less homogeneous than the Norwegians.

Other comments that students made on their surveys include a Private 2 student who ranked 3rd place ozone depletion. A student from Public 1 ranked 2nd place “the use of atomic bombs and chemical weapons”.

IV. Knowledge

The next set of survey questions related to student knowledge regarding environmental issues, as well as knowledge sources. In the first question, students were asked how much they think they know about certain issues and asked to indicate their level on a continuum from “a great deal” to “nothing”.

As figure 11 shows, for water shortage and climate change, around 50% of students felt they knew “something/quite a bit”. For water pollution and deforestation, a higher percentage of students knew “quite a bit/a great deal”. However, for generation of wastes and genetically modified foods, students are clustered around the “not very much” end of the spectrum. Endangered plants and animals is relatively spread out, with a higher percentage around “quite a bit”.

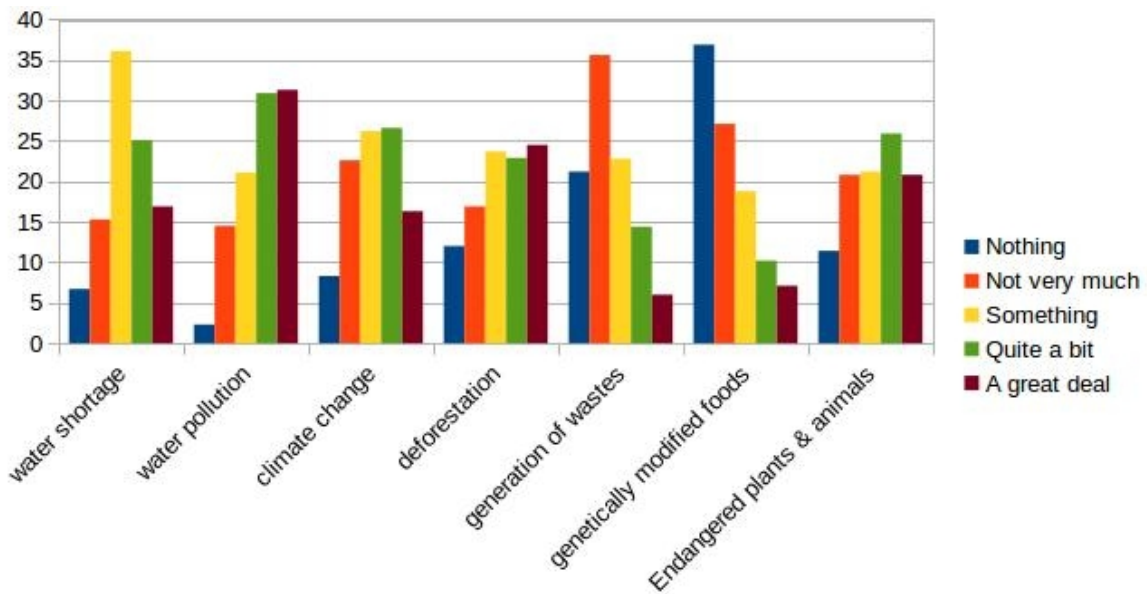


Figure 11: How much do you think you know about the causes of these environmental problems?

School diversity was noticed some in that the Lebanese Public 1 responses for water shortage were clustered around “quite a bit” while the Private 1 and 2 were clustered around “something”. For water pollution, “quite a bit” to “a great deal” was the response of 76% of Public 1 students and 71.7% of Private 2 students, while at Private 1, 78.5% of student responses were scattered along “something” to “a great deal”. Similar differences were noticed in many categories, however for genetically modified foods, 55.3% of Public 1 students wrote they knew “nothing” with 21% knowing “not very much”. Private 1 and 2 student responses were more scattered along the “nothing” to “something” end of the scale.

Some gender diversity was also noticed, for example, for deforestation, girls' responses were scattered along the whole scale, whereas boys' responses were clustered towards the “something” to “a great deal” end of the scale.

The next question, in figure 12, was regarding which of the concepts students could define. Lebanese students were most confident in defining climate change and renewable resources. Carrying capacity, biodiversity, and carbon cycle lean particularly towards limited knowledge of the concept, with intergenerational equity also considered difficult, but a higher percentage still able to define it.

In the individual Lebanese schools, some difference is noted. For example, 43% of Public 1 students could define ecology, compared to about 15% of Private school students. For sustainable development, 54% of Public 1 students could definition the concept, whereas about 17% of Private

1 and 2 students were able. Again Public 1 students were more likely to be able to define intergenerational equity at 47%, but only 12% of Private 1 and 3.3% of Private 2 could.

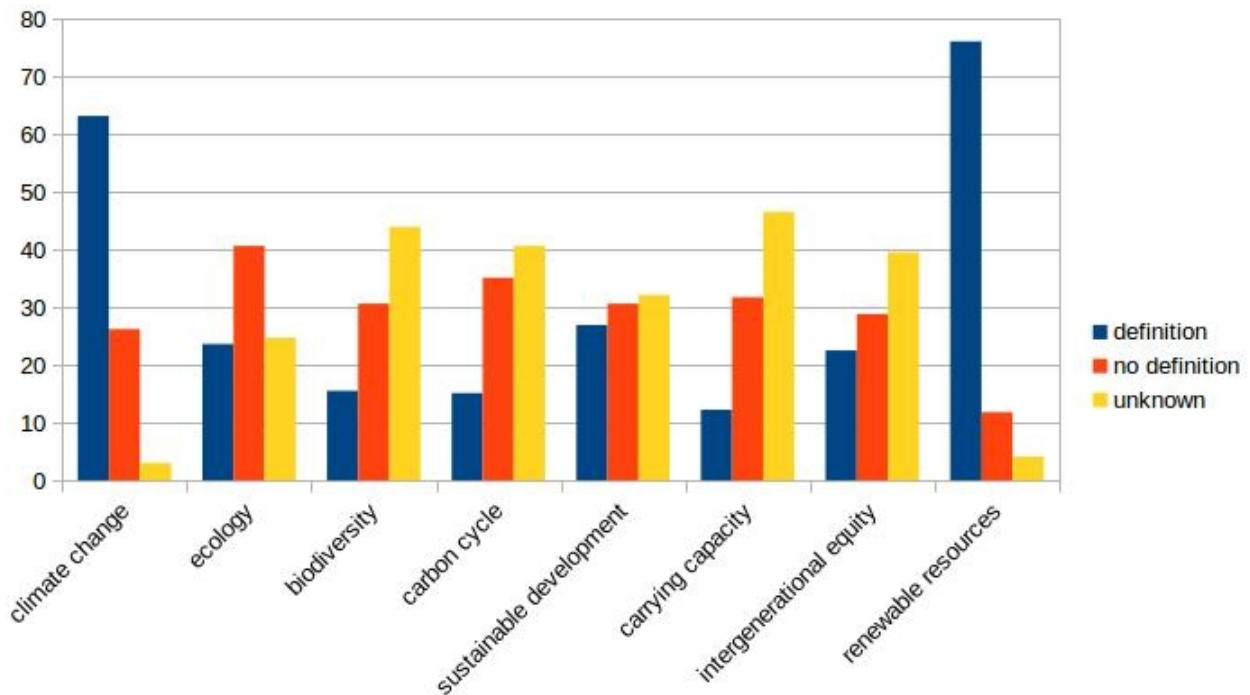


Figure 12: Which of the following environmental concepts do you think you could give a definition for?

Norwegian students were quite confident of certain definitions, such as sustainable development (85%), intergenerational equity (66%) and, of course, climate change (85%) and renewable resources (91%). On other concepts, responses were spread out – similar to the Lebanese.

EE is one explanation for more knowledge of or better ability to define environmental concepts, but another potential influence is language. Students at the Lebanese public school received the survey in Arabic, whereas the students in Private 1 and 2 took the survey in English. Norwegian students took the survey in Norwegian.

V. Information Sources

The next set of questions asked students to rank information sources according to what had been their main source. The ranking was from 1 to 6, with 1 being their main source and 6 being their least important source of information on environmental issues. One will notice in the following chart that there is more missing data for numbers 4-6. This is because many students only ranked their top three sources of information – with almost 40% skipping the last three.

Television and school were very important sources of information, coming out on top in both the 1st and 2nd ranking (figure 13). Some diversity was noted in source of information between

schools, which was of interest considering the difference in knowledge level, as well as EE differences in schools (see Analysis for more on this topic). Family and environmental groups received more votes from Lebanese girls than boys in the 1st ranking, with more boys ranking it second place. The government ranked last, with it being noted that with non-responsive students subtracted, 50% of students ranked government as least important source of information. – With the same result for Norwegian students. In regards to newspapers, Norwegian students mainly ranked them between 2 and 3, whereas Lebanese were more likely to rank lower.

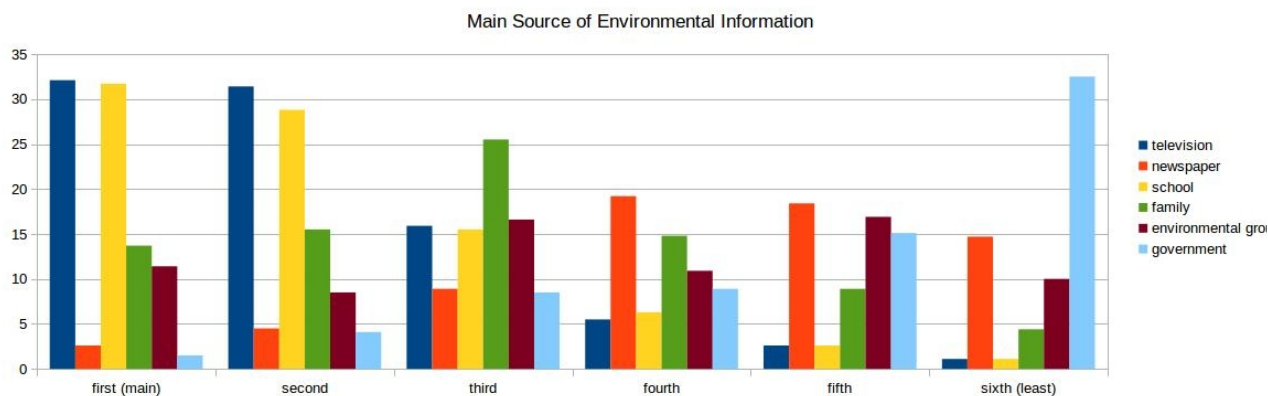


Figure 13: What has been your main source of environmental information?

A Private 1 student commented in this section that his 1st source of information on environmental issues was the internet (online videos and articles). Another student commented that participation in Model U.N. (MUN), which is facilitated by Private 1, was among the top three sources of environmental information for her. – While another commented “...and others not on the list”.

Due to the high percentage who skipped the last three sources of information, interesting diversity in missing information is highlighted. A greater percentage of Norwegians (53.7%) skipped the last three as compared to only 33% of Lebanese 10th-12th graders who skipped. Amongst the Lebanese students, diversity is also noted between the genders, with 27.5% of girls skipping the last three and 41% of boys skipping. Even among the first three sources of information, boys (11.8%) were more likely to skip than girls (2.4%).

The next question, shown in figure 14, asked students to rank information sources as to which were most reliable and accurate. Environmental groups ranked 1st place as most reliable and accurate, but some diversity was noted in that a smaller percentage (28%) of Private 2 students ranked it 1st, compared to Public 1 (47%) and Private 1 (52%). Unlike the other schools, 20% of Private 2 students ranked government as best source of information, and school was also ranked 1st by more students at Private 2 (22%) and Public 1 (17%) than at Private 1 (11%).

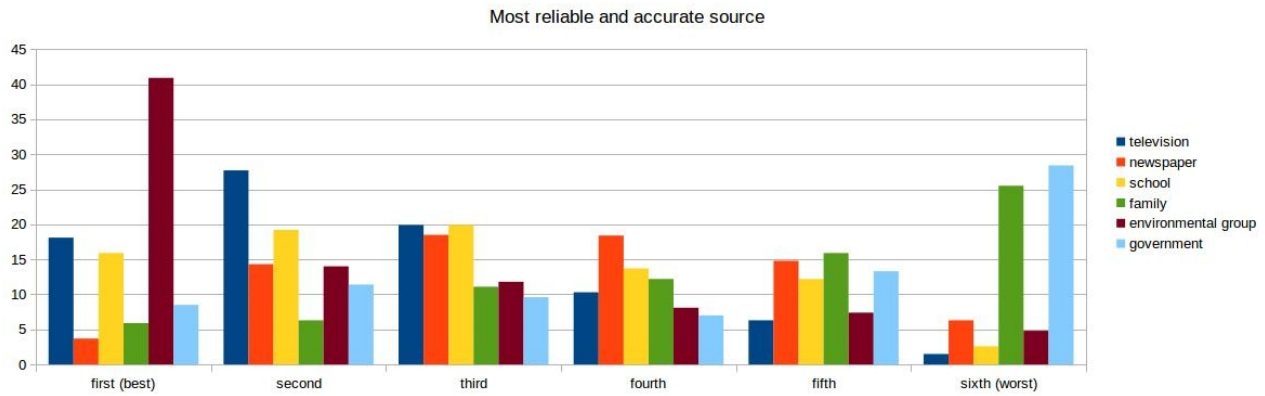


Figure 14: Which do you think is most reliable and accurate as a source of information on environmental issues?

For this second question on information source, more students completed 1-6, but with the non-responders removed, still 40% of Lebanese students agreed that government was the least accurate and reliable source of information. – In contrast, only 25% of Norwegian students (with non-responses removed). Lebanese were also slightly less confident of the quality of television and school information than Norwegians.

In gender diversity, Lebanese girls were more likely to rank environmental groups 1st as the most accurate and reliable source of information at 51%, compared with 33% of boys. More boys felt that television was the most accurate and reliable source of information at 22%, compared with girls at 13%.

VI. Opinion

The next part of the survey presented students with statements to choose from. The first set asked about priorities:

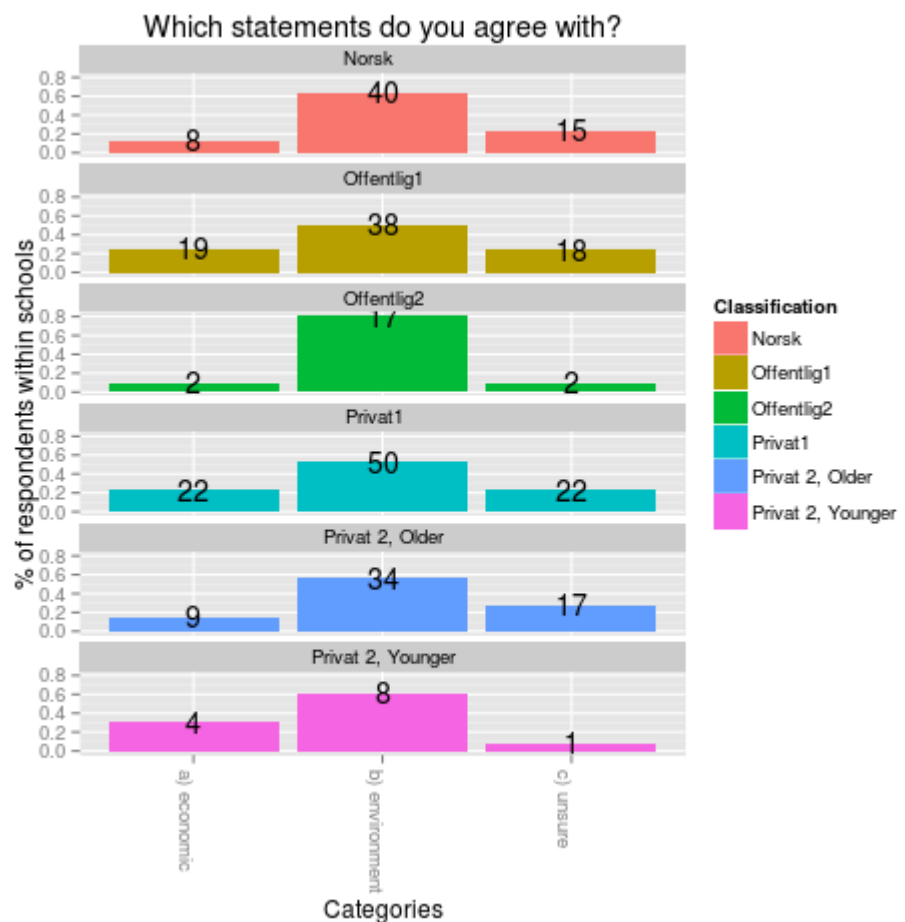


Figure 15: What statement do you agree with?

- (a) Lebanon should concentrate on economic growth even if it means some damage to the environment.
- (b) Lebanon should concentrate on protecting the environment even if it means some reduction in economic growth.
- (c) Not sure.

As figure 15 shows, environment was most important in all schools, with 54% percent choosing the environment to be protected, 22% were unsure and 21% felt that the economy was more important. The school with the least choosing economic growth was Private 2 at 15%. Norwegians were even more sure the environment was most important at 60%.

A Private 1 student commented on the survey, “I’m not sure because these are not really related, many countries have economic growth and protect the environment, this is what should be done.”

Lebanese boys and girls also differed in that more girls felt the environment was more important at 63%, with boys at 48%. Girls were also less likely to consider the economy more important at 13%, compared to the boys 26%.

The next question asked students to choose one of the following statements:

- (a) Economic growth is bound to be at the expense of the environment.
- (b) It is quite possible to have both a prosperous economy and a healthy environment.
- (c) Not sure.

As figure 16 shows, most students were optimistic that both economy and environment could be balanced – at 77%. Students at Public 1 were most confident at 88%, with Private 1 (76.3%) and Private 2

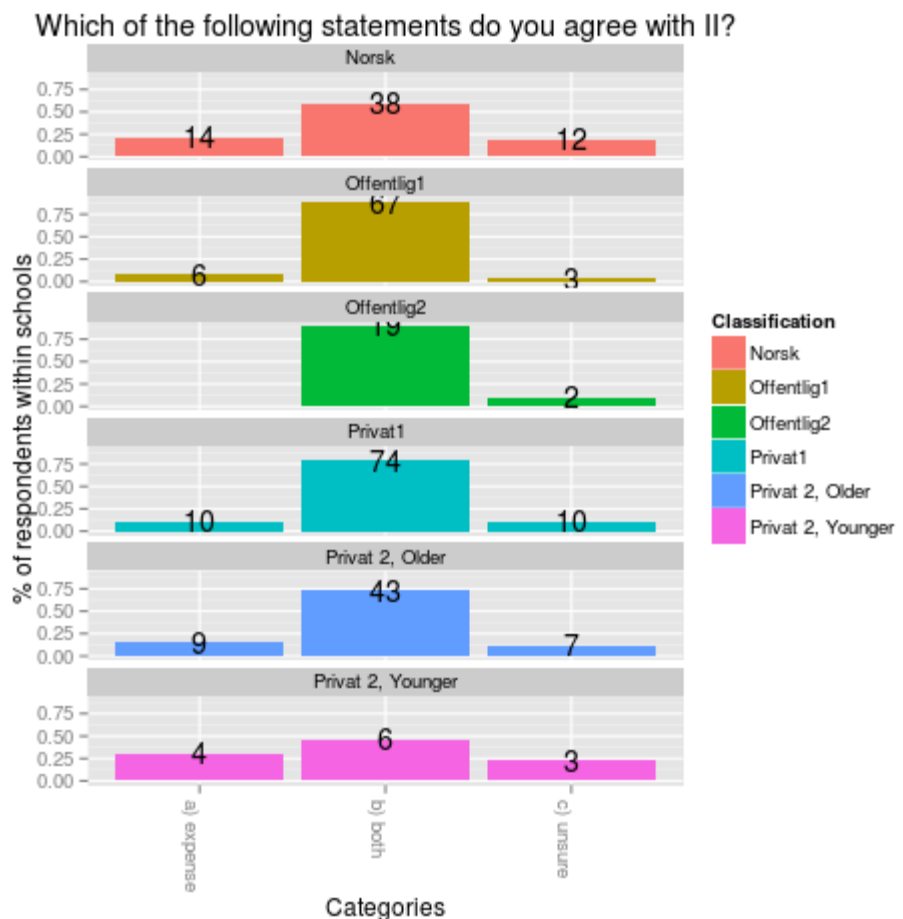


Figure 16: What statement do you agree with?

(71.7%) slightly less. The school with more students feeling that economic growth would be at the expense of the environment was Private 2 with 15% of the older and 23.5% of the younger.

Norwegians also had a high percentage (56.7%) feeling balancing economy and environment was possible, but also had a higher percent feeling economic growth would be at the expense of the environment at 20.9%.

The Lebanese students also showed some difference in gendered opinions. More girls were confident of balancing environment and economy at 86%, with 70.5% of boys. More boys felt economic growth would come at the expense of the environment at 13.5% compared to girls 7%.

VII. Action and Possibility

The next questions asked students about what type of actions were needed to solve environmental problems as well as about their own and acquaintances involvement.

Students were asked to rate their level of agreement with the following statements:

- (a) Personal lifestyle changes are required.
- (b) Communities need to work together.
- (c) More government legislation is needed.
- (d) A radical restructuring of society would be required.

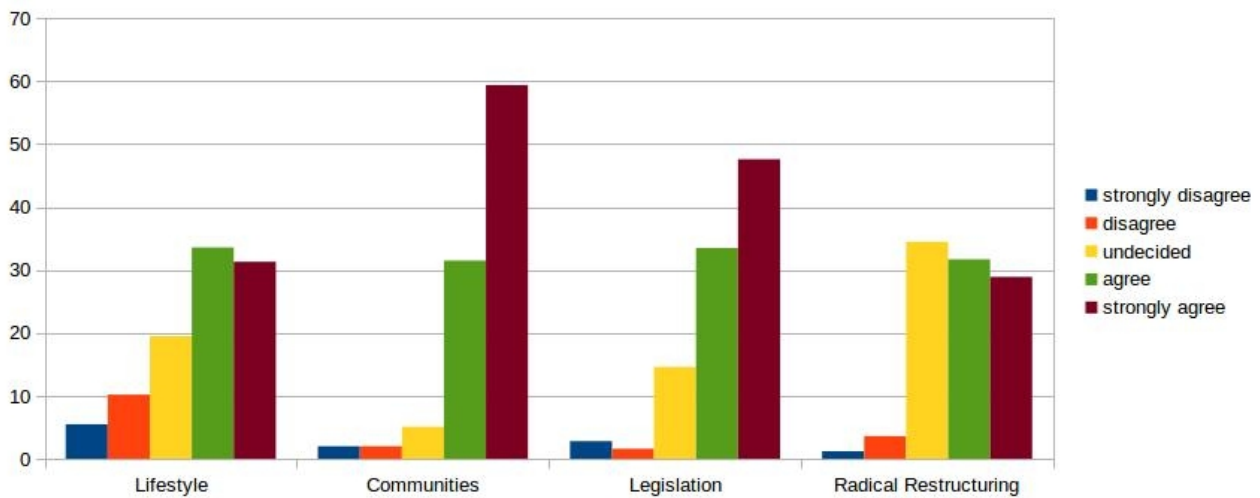


Figure 17: How important are these actions to solving environmental problems?

As can be seen in figure 17, most lean towards agree/strongly agree with the radical restructuring having a higher percentage in undecided. Students at Public 1 were mostly likely to disagree about personal lifestyle changes required at 18.4% with 23.7% undecided. Students at Private 1 were most enthusiastic about lifestyle changes with 81% in the categories agree/strongly agree. In regards to communities working together, Private 1 had a stronger leaning to strongly agree than Public 1 and Private 2. In regards to legislation, students at Private 2 leaned more towards agreed/undecided than Public 1 and Private 1. For a radical restructuring, while Private 1 and 2 clustered around undecided/agree, Public had the highest percentage in strongly agree

(41.3%) and undecided (30.7%).

Regarding radical restructuring, a student at Public 1 commented on the survey that she was undecided, as it was hard to implement.

In comparison, Norwegian students had higher percentages in agree for the first two questions and undecided for the second two.

Lebanese gender analysis shows that girls had the highest percentage in strongly agreed in the first three questions (F: 37.2%, 62.3%, 50%, compared to M: 26.8%, 57.6%, 46%), whereas for the last question on radical restructuring, the highest percentage of girls chose agree (38.7%). – Whereas the boys were strongest in undecided (38%). The boys also had higher percentages in disagree/strongly disagree for the first question on lifestyle changes (M: 13.4% and 7.7%; compared to F: 5.3% and 2.7%).

The next question asked students to rate their desire to improve the environment. As can be seen from figure 18, in all schools, the highest number of respondents was in strong desire (average 72.3%). Among the Lebanese older grades, the school with the highest percentage with a strong desire was Public 1 at 85.5%. All except for one of the younger students at Public 2 had a strong desire but it must be remembered that both the researcher and retired environmental

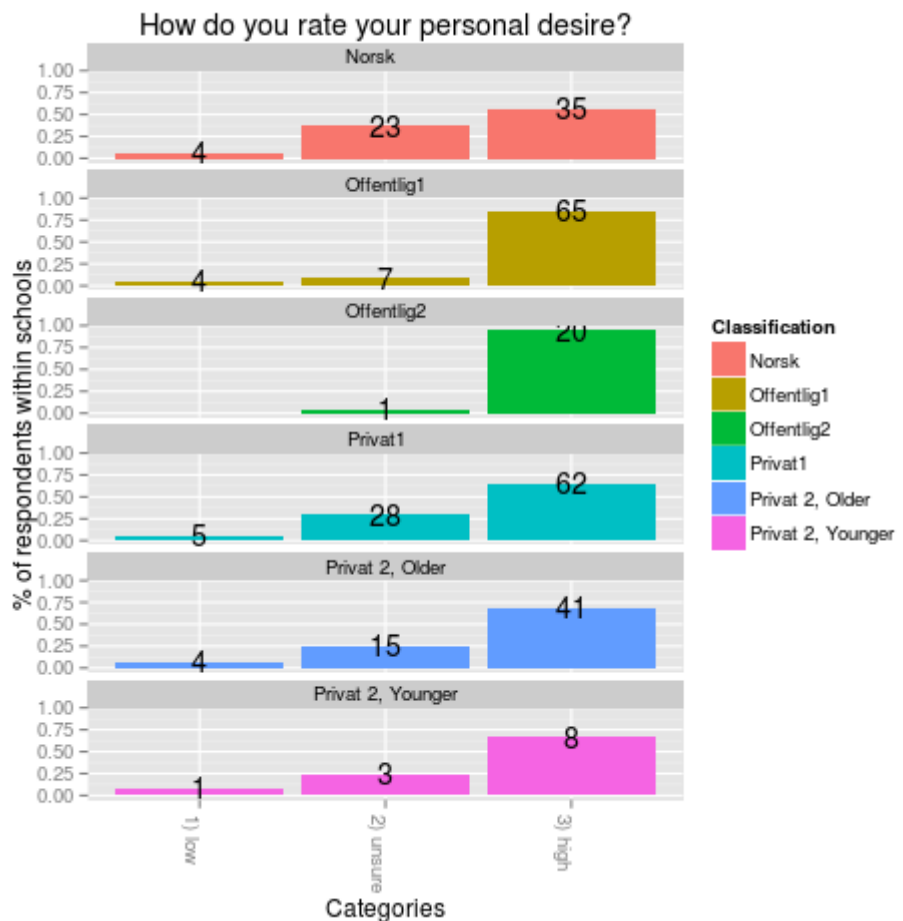


Figure 18: How would you rate your personal desire to improve the environment?

teacher were present for the students filling out the survey, so the result is treated carefully. In the category unsure, higher percentages came from Private 1 (28.9%) and Private 2 (25%).

In comparison, many Norwegian students had a strong desire (52.2%), but also a higher percentage unsure at 34.3% than any of the Lebanese schools.

Gendered difference can also be noted in that a higher percentage of Lebanese girls (81.6%) had a strong desire to improve the environment, compared to the boys at 66%.

One student at Private 1 felt the categories provided were not accurate enough and wrote “unsure, somewhere in between”. Another student at Public 1 wrote, “there is nothing I can do about it”.

The next question showed that Lebanese students were more uncertain of their skills than their desire to improve the environment (see figure 19). While 39.5% affirmed they did have the knowledge and skills, 45.4% were unsure. The school with the highest percentage who felt they did not have the knowledge and skills was Public 1 at 22.4%.

Norwegian students were also unsure of their skills at 46.3%, with 31.3% who responded yes. A look

at gender difference shows us that a while most Lebanese girls said they were unsure of their skills, more girls than boys were confident of their skills at 43%, with boys at 37.2%. – And a slightly higher percentage of the unsure were boys (M: 46.2%; F: 44.7%).

One Private 1 students responded that while she did have the skills, she need to know more.

The next set of questions asks students about their personal participation in various environment related activities. The questions pertain to figure 20.

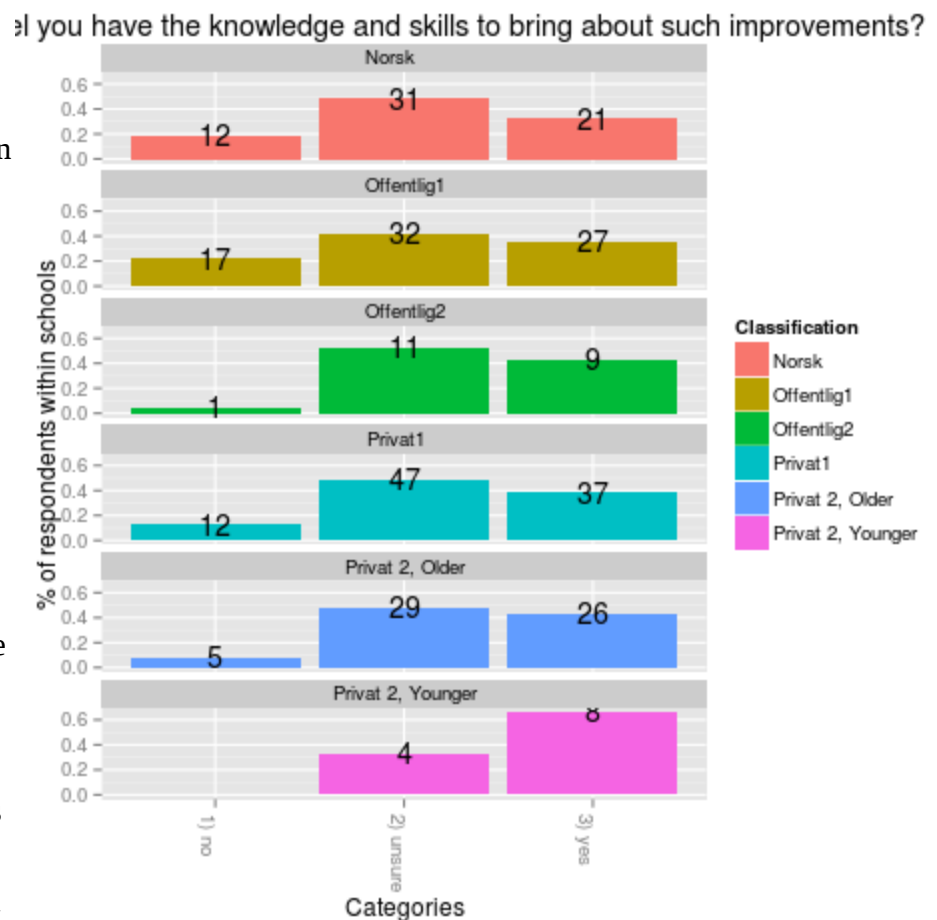


Figure 19: Do you feel you have the knowledge and skills to bring about such improvements?

Have you personally been involved in recycling activities over the past 12 months?

As figure 20 shows, recycling had an almost even amount of yes and no, but a larger percentage of Public 1 students responded negative (82.9%) than Private 1 (34%) and Private 2 (36.7%). In contrast, 89.6% of Norwegians replied yes to recycling, but this is not surprising considering Norway's recycling infrastructure is firmly in place. Gender diversity was not great.

A Private 1 student clarified on her survey, regarding recycling, that she has been involved a little bit in class.

Have / are you trying to reduce water consumption for environmental reasons?

For water saving, again replies were evenly divided between yes and no, with Public 1 students slightly more likely to answer no than students from Private 1 and 2. Interestingly, Norwegians were also not likely to save water with 49.3% replying no and 41.8% replying yes. It is likely that this is due to the abundance of water in Norway. In regards to gender, Lebanese girls were more likely to save (F: 56.1%; M; 44.9%) and boys were more likely not to (M: 51.3%; F: 43.9%).

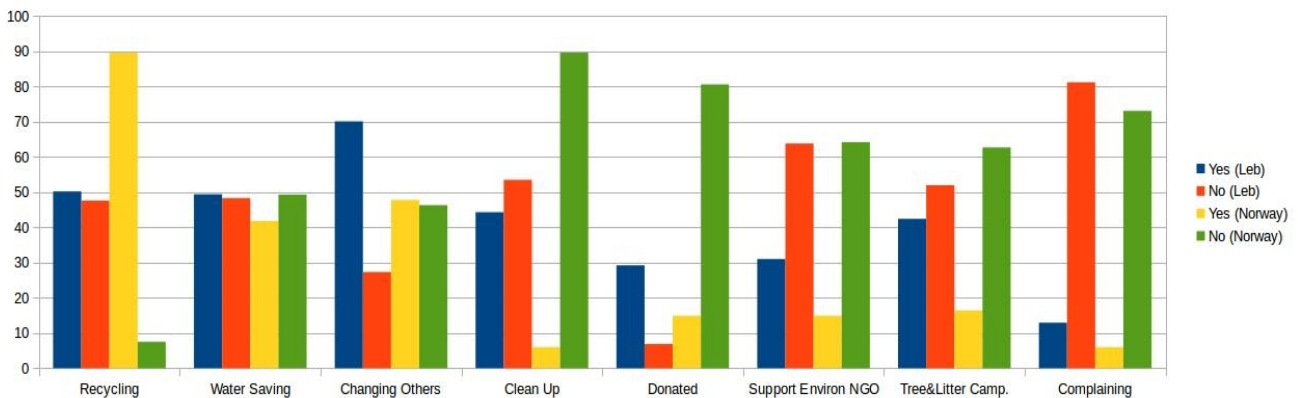


Figure 20: Please write yes or no to the following environmental activities.

Have you tried to encourage others to change actions bad for the environment?

Lebanese students may be very strong in other environmental efforts, but they were quite enthusiastic about encouraging others to change with 70.1% responding yes. This was relatively even across the schools. Norwegian students were less enthusiastic, with an even 47.8% yes and 46.3% no. Gendered, a higher percentage of Lebanese girls responded yes to changing others at 73.7%, with boys at 67.9%.

Have you taken part in clean-up or anti-litter campaigns?

Clean up was not a particularly strong activity, with an averaged 53.5% responding no. Private 1 had a higher percentage of no (64.9%) than the other schools and Private 2, along with the young grades, had a higher percentage of yes (56.7%). Norwegians were much more unlikely to respond no at 89.6%. Minimal diversity was noted between Lebanese boys and girls.

A Private 1 student commented on the survey that these campaigns do not exist in Lebanon.

Have you donated to an environmental group?

Donating to an environmental group also had a high percentage of no at an average of 68.6%, but Private 2 had a higher percentage of yes than the other two schools at 45%. Norwegian students were very unlikely to donate with no at 80.6%. Slight gender variation was noted in that a slightly higher percentage of girls said yes than boys (F: 32.5%; M: 26.9%), and vice versa (no for M: 69.2%; and F: 67.5%).

Have you participated in group or individual efforts outside of your home such as:

* supporting an environmental groups

Again supporting an environmental group was not a strong activity with 63.8% at no. Public 1 students were most likely to say no (82.9%) and Private 2 most likely to say yes (48.3%). Norwegians were more likely to say no (64.2%) and diversity similar to the last question was noted in gender.

Have you participated in group or individual efforts outside of your home such as:

* joining tree planting or litter campaigns

For tree planting and litter campaigns, no was again on the higher side at an average of 52%, but it was Private 1 that had the highest percentage of no at 64.9%. However, Private 2 had a higher percentage of yes at 66.7%, than no. Again, this interesting in light of the fact that Private 2 in Mount Lebanon is located in an area that has been known for its tree coverage and historically for cedars. Also community leaders are concerned about the environment and have taken measures to protect and improve the environment. Norwegians were more likely not to have participated with no at 62.7%. Gender revealed that this activity was of more interest to boys than girls (No responses – F: 57.9% and M: 47.4%; Yes responses: F: 38.6% and M: 45.5%).

Have you participated in group or individual efforts outside of your home such as:

* writing/complaining to the authorities about environmental issues

The issue of complaining was not popular with an average 81.2% saying they did not. Private 1 and Public 1 were relatively even, but Private 2 had a noticeably higher percentage of yes

(25%) than the other schools with one student from Private 2 noting next to her no response that she was trying. Norwegians were also unlikely to complain to authorities (73.1%). Gender was relatively even.

A couple comments were jotted on the survey next to this question. One student at Private 1 wrote no and added, “as if they would listen.” Another student from Public 1 wrote, “even if we did, it would not be taken into consideration”. This seems to echo the complaints regarding Lebanese politics as well as aligning with the low rating of government in the environmental information questions.

The next question was about hindrances to student participation in environmentally friendly activities. As figure 21 demonstrates, most students felt that lack of time (36.9%) was the biggest hindrance to environmental activities. Public 1 students were most likely to identify (48.7%) time as an issue, while Private 1 were more like to say there were no practical options (41.2%). Private 1 (19.6%) and Private 2 (20%) had a slightly higher percentage of students feeling it won't make much difference. Most students did not seem to feel knowledge was an issue as it was only the younger grades where more than 5% wrote that they did not understand what is harmful and what is not.

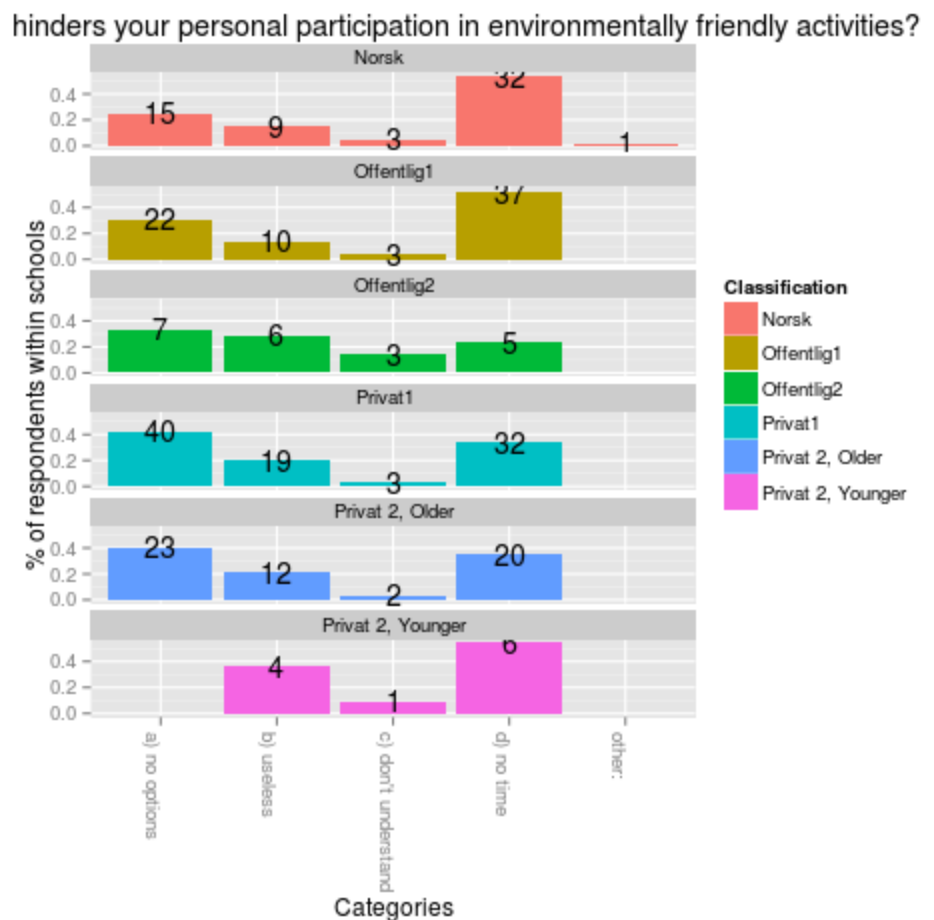


Figure 21: What most hinders your personal participation in environmentally friendly activities?

Norwegian hindrances followed the same pattern as the Lebanese, however Norwegians had a higher percentage saying they did not understand what is harmful and what is not (4.5%), compared to older Lebanese students who averaging 3.4%.

Gender analysis reveals some differences with Lebanese girls more likely to say they have no practical options at 45.6% (M: 25.6%), and boys more like to say they didn't have enough time (M: 41.7%; F:30.7%).

A student in Private 1 added a comment, noting “I don't have time – now”, while another student commented that he didn't care.

VIII. Effort and Discussion

The next two questions asked students to rate their family, and separately their extended family and friends', efforts to conserve the environment. Figure 22 charts both Lebanese and Norwegians' effort. As can be seen, in the two countries, both categories are mostly likely to be rated medium. For

family effort, students at Public 1 and Private 2 had more ratings in medium to high, whereas Private 1 had more ratings in medium to low. The lower grades had more ratings at the extreme ends, with Public 2 having

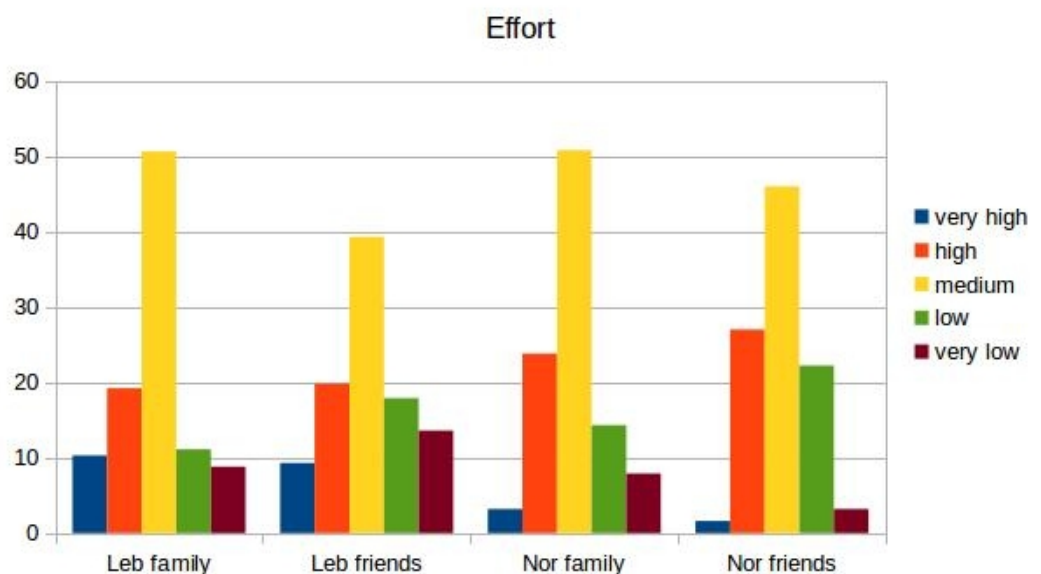


Figure 22: How would you rate efforts to conserve the environment?

47.6% in very high and 28.6% in very low. Norwegians also had more votes in medium to high. Only slight variation was noted between boys and girls.

Extended family and friends' effort was also mostly rated at medium. Again Public 1 and Private 2 were mainly medium with leanings toward high, whereas Private 1 were mainly medium leaning towards low. Again the 8th graders from Public 2 had their highest percentage at very high (47.6%). It is unknown whether this is due to youthful exuberance or the presence of the research and retired environmental teacher in the classroom. Norwegian students roughly followed the average trend of the Lebanese. Gender reveals some diversity, with Lebanese girls leaning more towards low than boys, but also having a higher percentage in very high.

The next three questions ask how often students discuss the environment and what they talk about. The first asks students how often they discuss environmental issues outside of school. The Private 1 and Private 2 responses were relatively homogeneous. However, Public 1 responses were slightly different with daily at 14.5%, weekly 10.5%, and never at 14.5%.

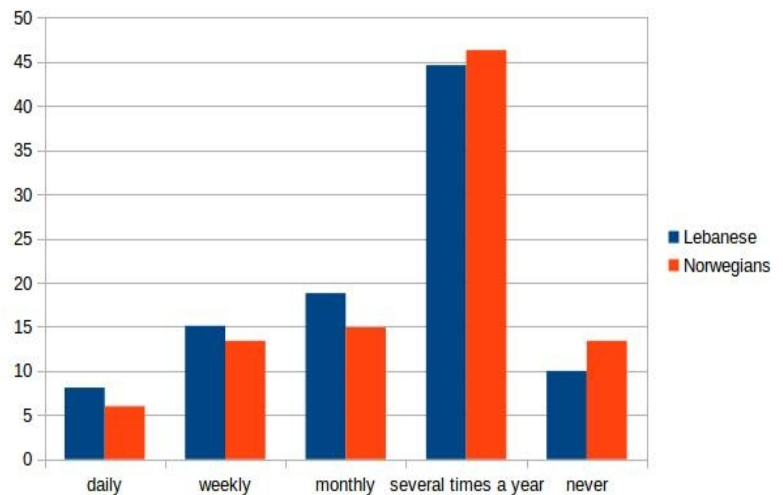


Figure 23: Do you talk about environmental issues with others outside of school?

Figure 23 shows the comparison between Lebanese and Norwegians. Students in Norway were also most likely to say several times a year (46.3%), but were at 13.4% in both weekly and never, and 14.9% in monthly. Gender analysis reveals a higher percentage of Lebanese girls than boys in daily, monthly and several times a year (F: 51.8% and M: 39.7%) with a higher percentage of boys in never (M: 14.1% and F: 3.5%).

One student from Public 1 commented “impossible” by this question.

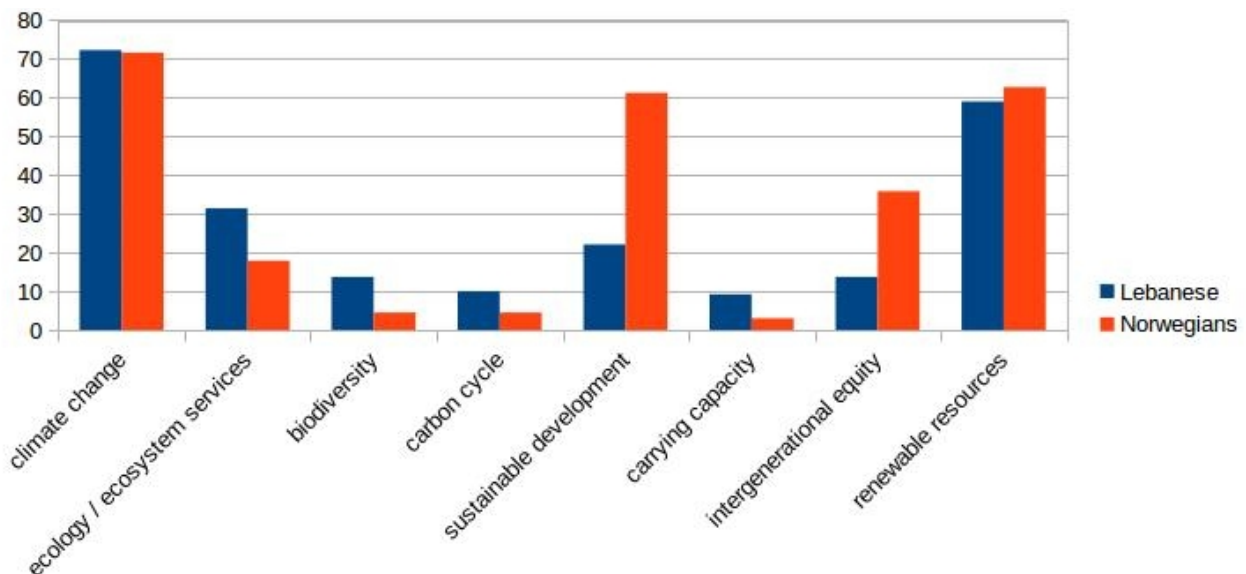


Figure 24: What environmental concepts do you discuss?

The next question asked students what topics they usually discussed. Please note that students could choose as many topics as they wanted, therefore the percentages are for each topics. Figure 24 shows that climate change and natural resources were on average the most popular topics of discussion at 72.3% and 59%. Some diversity was noticed between schools with Public 1 on the

higher end of the scale in sustainable development (35.5%), intergenerational equity (31.6%), and carrying capacity (10.5%), whereas Private 1 was on the higher end of the scale with climate change (84.5%), renewable resource (73.2%), ecology and ecosystem services (40.2%), biodiversity (19.6%), and carbon cycle (11.3%). Private 2 students were most interested in renewable resources (55%) and relatively average in the other topics.

In comparison, Norwegian students were also most interested in climate change (71.6%), renewable resources (62.7%) and sustainable development (61.2%). Norwegians were also quite interested in intergenerational equity (35.8%).

From a gendered perspective, Lebanese girls had a higher percentage than boys in climate change (F: 79.8% and M: 67.3%), ecology and ecosystem services (F: 41.2% and M: 24.4%), sustainable development (F: 24.6% and M: 20.5%) and renewable resources (F: 62.3% and M: 57.1%). Boys were higher in carbon cycle (M: 12.8% and F: 6.1%), carrying capacity (M: 10.3% and F: 7.9%), and one percent higher in intergenerational equity and biodiversity.

A Public 1 student commented on the survey that she discusses cleanliness of public spaces with others outside of school. A similar topic came up in the group discussion with the Public 1 students who said they fear that in the future there will be no green spaces left – that they will become extinct.

The next question asked students how often environmental issues should be discussed in school. Regularly was further defined as 'at least once a week', often as 'at least once a month' and sometimes as 'several times a year'. As figure 25 shows, the highest

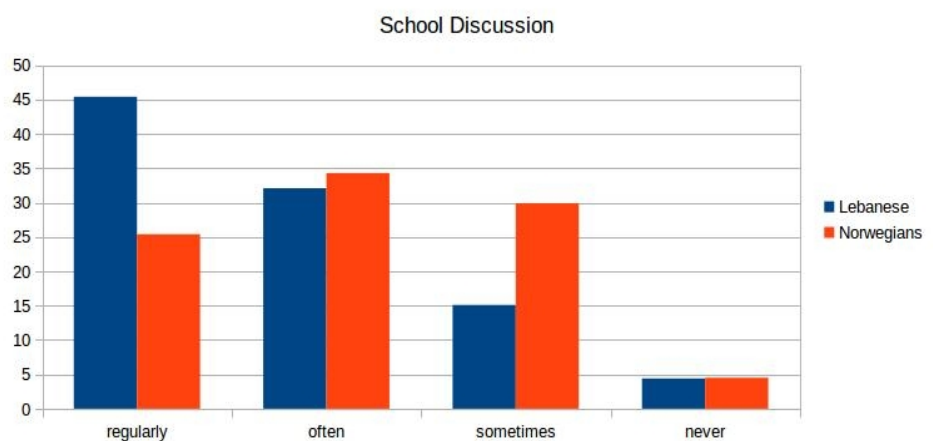


Figure 25: How often would you like environmental issues to be discussed in school?

percentage of students felt that it should be discussed at least weekly. Private 1 students were less enthusiastic about environmental discussions at school with only 33% choosing regularly, while Private 2 came to 56.7% and Public to 51.3%. Private 1 students were higher in often at 43.3% and sometimes 18.6%.

Norwegian students were also less interested with often at 34.3%, sometimes at 29.9%, and regularly at 25.4%. Lebanese girls were more interested in the topic than boys with regularly at F:

47.4% and M: 44.2%, and often F: 36.8% and M: 28.8%. Boys were higher in sometimes (M: 16% and F: 14%) as well as never (M: 6.4%; F: 0.9%).

IX. New Environmental Paradigm

The last part of the survey was comprised of the 15 statements of the New Ecological Paradigm (NEP), which are included below. Figure 26 shows the agreement/disagreement level to each statement averaged for Lebanese students.

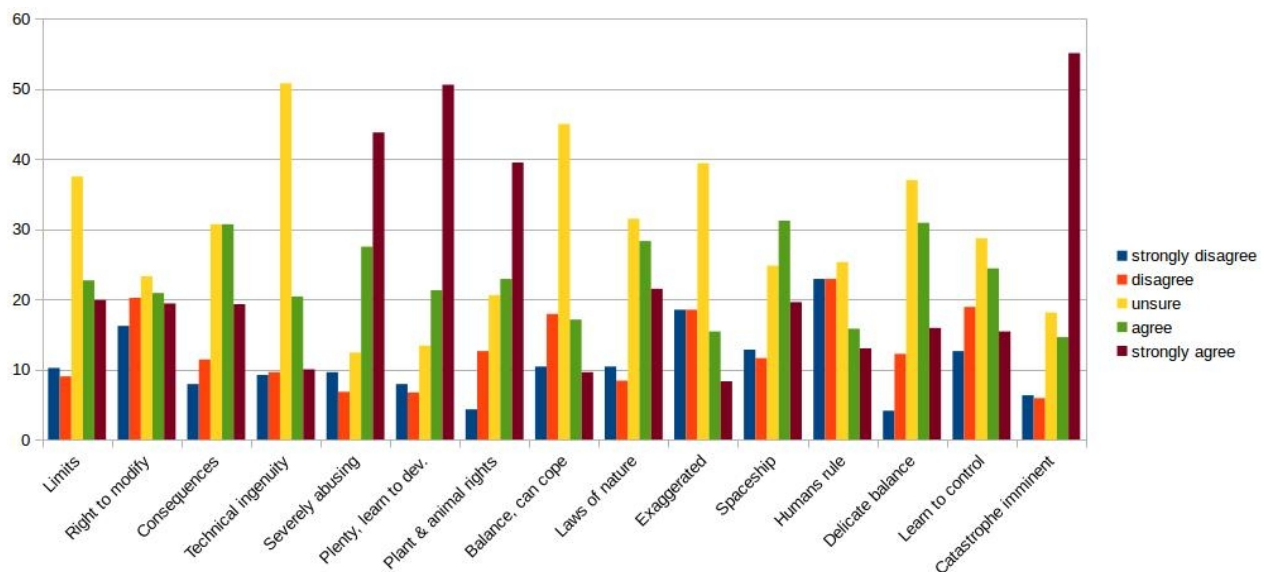


Figure 26: Please indicate the degree to which you agree with each item.

NEP Statements:

1. We are approaching the limits of the number of people the earth and its resources can support.
2. Humans have the right to modify the natural environment to suit their needs.
3. When humans interfere with nature, it often produces disastrous consequences.
4. Human ingenuity will insure that we do not make the earth unliveable.
5. Humans are severely abusing the environment.
6. The earth has plenty of natural resources if we just learn how to develop them.
7. Plants and animals have as much right as humans to exist.
8. The balance of nature is strong enough to cope with the impacts of modern industrial nations.
9. Despite our special abilities, humans are still subject to the laws of nature.
10. The so-called "ecological crisis" facing humankind has been greatly exaggerated.
11. The earth is like a spaceship with limited room and resources.
12. Humans were meant to rule over the rest of nature.
13. The balance of nature is very delicate and easily upset.
14. Humans will eventually learn enough about how nature works to be able to control it.
15. If things continue on their present course, we will soon experience a major ecological catastrophe.

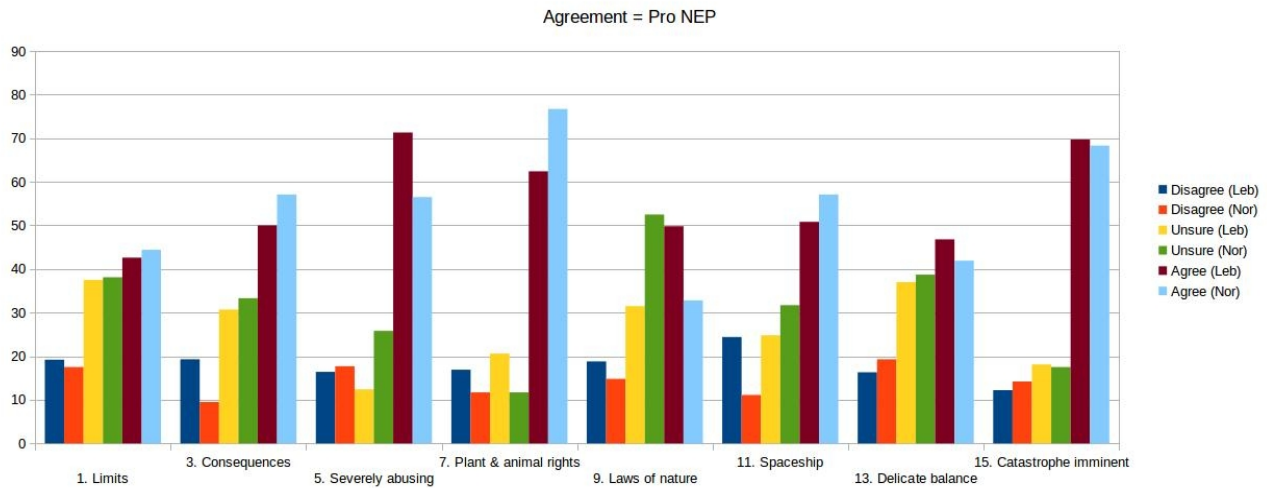


Figure 27: Agreement with the eight odd-numbered items indicate pro-NEP responses.

In order to better interpret the NEP, it is important to know that, “Agreement with the eight odd-numbered items and disagreement with the seven even-numbered items indicate pro-NEP responses. (Dunlap et al. 2000, p.433)” Therefore, the 15 statements have been broken down into two categories: Those which should have higher agreement to be pro-environment and those which should have higher disagreement. The agree/strongly agree categories have been combined, as well as the disagree/strongly disagree in order to allow room in the charts for comparison.

Figure 27 compares the Lebanese average with Norwegians. The figure shows a high percentage of Lebanese students were able to agree with all of the statements, with their being especially in agreement regarding humans abusing the earth (item 5 at 71%), that things on their present course mean an ecological catastrophe (item 15 at 70%), and that animals and plants have as much right as humans to exist (item 7 at 62%). In comparisons, the Norwegians also have a high percentage agreement on all the statements except for number nine, where students are unsure (item 9 at 53%) whether humans special abilities exempt us from the laws of nature.

Lebanese girls and boys had similar views on many issues, and in most issues a higher percentage of girls were in agreement. Two questions show more variety. In statement 1, on limits to growth, less girls are in agreement (F: 36.9%; M: 47.2%) and girls more unsure (45.9%), with boys at 30.6%. Boys were more confident of their answers, whether in agreement or disagreement (M: 21.5%; F: 16.2%). Statement 7, on plant and animal rights, finds 14% more of girls than boys in agreement (F: 70.5%; M: 55.7%). Boys were also more unsure (M: 22.9%; F: 17.9%), and more in disagreement to statement 7 (M: 19.1%; F: 11.6%). (See appendix II for gendered comparison charts.)

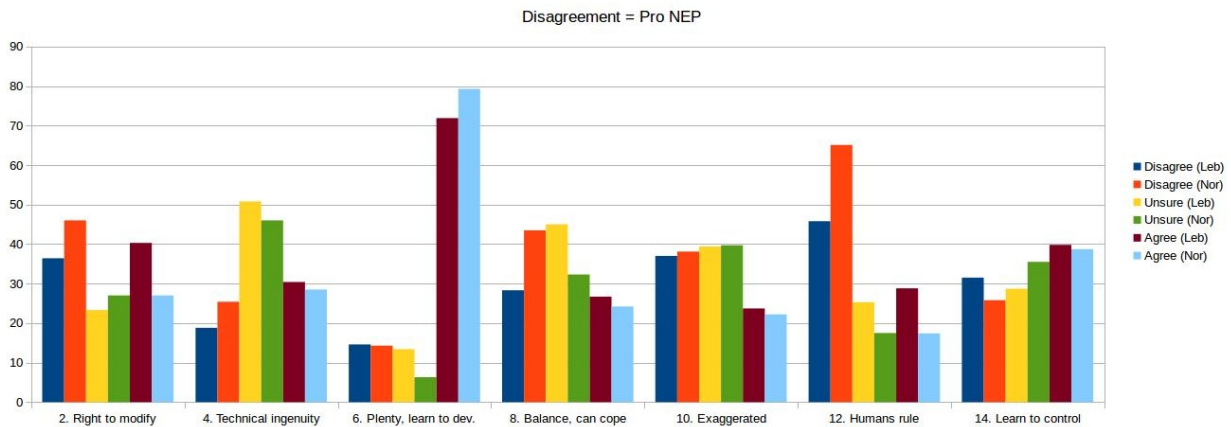


Figure 28: Disagreement with the seven even-numbered items indicate pro-NEP responses.

Figure 28 shows response to statements that should garner a higher percentage of disagreement to indicate pro-environmental attitudes. Here we see much more variety and ambiguity. Lebanese students are particularly unsure about whether human ingenuity will prove sufficient (item 4 at 51%) and are quite certain that earth has sufficient resources, which must only be developed (item 6 at 72%). – Which the Norwegians also agree with (79%). One explanation could be oil. Lebanon has discovered oil in its waters, but has not been able to develop it as of yet. Norway has benefited from oil production for many years, and when reserves ran low, new ones were found.

Gender differences are noticed to some degree as well. Ten percent more boys (19%) than girls (9%) disagreed with statement 6 regarding earth's resources. On item 8, about the balance of nature being able to cope, girls (52.7%) were more unsure than boys (38.4%). Girls were more likely to disagree with statement 10 about the ecological crisis being an exaggeration (F: 41.8%; M: 33%), and boys were more likely to be

unsure (M:43.3%; F: 33.9%). (See appendix for gendered comparison charts.)

The data was further collapsed in order to gain an overview of the environmental leanings

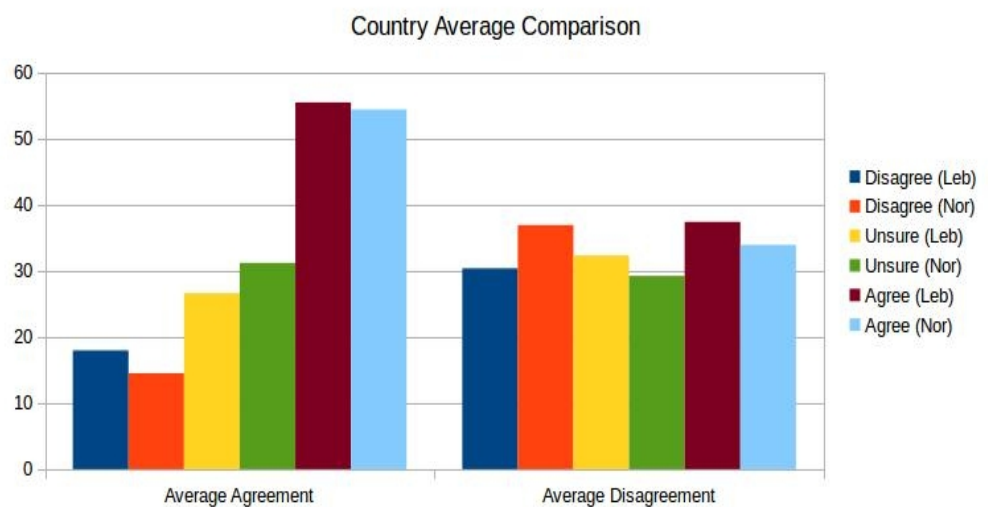


Figure 29: Average agreement = 8 odd-numbered items; Average disagreement = 7 even-numbered items – Comparing Lebanese Schools.

of students according to the NEP. An average was calculated for the three levels of agreement for the eight odd-numbered items, as well as for the seven even-numbered items. The resultant data clearly loses much nuance, but is nonetheless interesting for comparison. The first chart (figure 29) compares Lebanese students with Norwegian. In the first category, Lebanese are slightly ahead of the Norwegians in pro-environmental attitudes, but slightly behind them in the second category.

The comparison of averages for Lebanese schools shows some interesting diversity (figure 30). The school with the highest average agreement with the eight odd-numbered items and the only school whose average disagreement with the seven even-numbered items outweighs its agreement is Private 1.

This is interesting when viewed against the backdrop of this school's lack of environmental education for the surveyed grades. Public 1 has a high level of agreement with the eight odd-numbered statements, but also has the highest percentage of agreement with the seven even-numbered items. Private 2 has the highest level of unsure in both categories of statements.

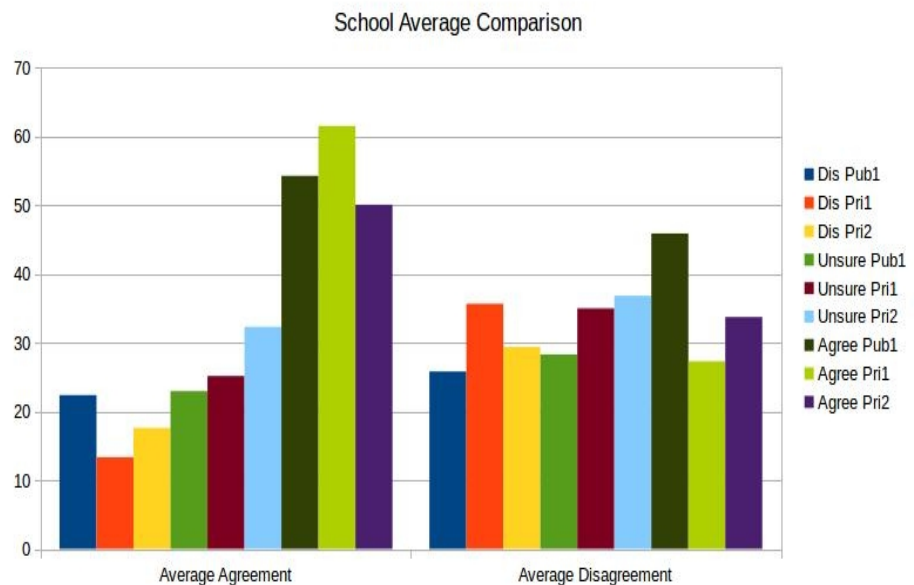


Figure 30: Average agreement = 8 odd-numbered items; Average disagreement = 7 even-numbered items – Comparing Lebanese Schools.

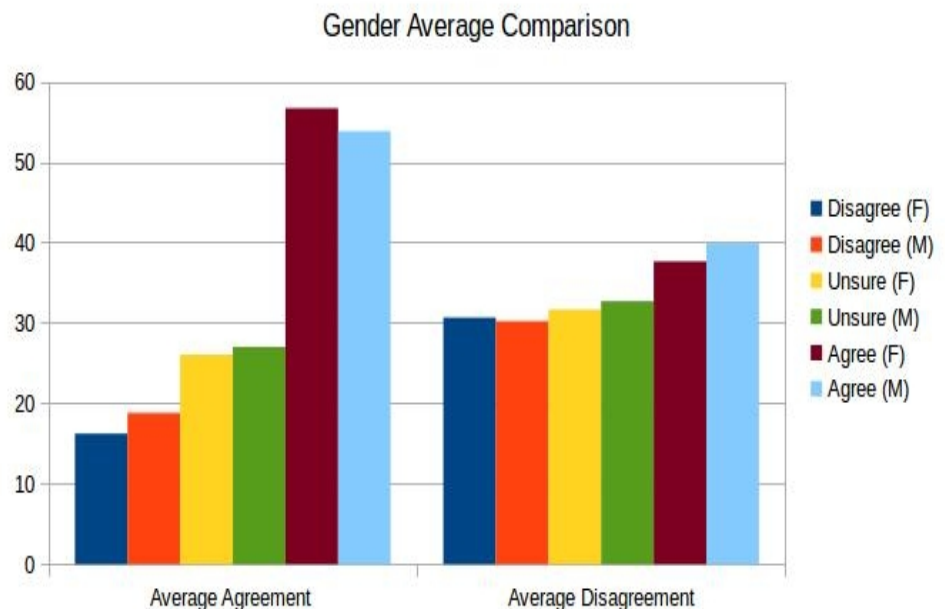


Figure 31: Average agreement = 8 odd-numbered items; Average disagreement = 7 even-numbered items – Comparing Lebanese Girls & Boys.

Comparison of Lebanese gender difference show girls as slightly more environmentally friendly than boys (figure 31). A 3% percent difference is noted between boys and girl in agreement to the eight odd-numbered items, with girls also about 3% less likely to agree to the seven even-numbered items. In both statement categories, boys are slightly more likely to be unsure.

6 Analysis and Recommendations

The environmental education (EE) framework must again be reviewed, to ask whether EE in Lebanon meets the objective:

“Create knowledge and understanding about ecological, social, economic, and political concepts, and demonstrate the interdependence between a healthy environment, human well-being, and a sound economy. (Hoffman & Thomson 2003, p.10)”

Survey results show that Lebanese students are clearly politically aware of the challenges their country faces, as well as aware of environmental problems, both locally and globally. They place importance on care of the environment, even if they do not feel very well equipped to tackle the challenges. Their understanding is of the interdependencies of environment, economy and social well-being does not seem to be as strong, nor their knowledge of specific environmental concepts. The EE incorporated in the Lebanese curriculum since 1998 is perhaps not very easy to implement, however, it clearly has served to provide Lebanese students with some environmental education, and that is a positive sign.

One of the ongoing challenges for EE, in Lebanon and elsewhere, is its inter-disciplinary nature requiring participation from teachers in all subjects. – As well as support from government and society at large. Even with the integrated Lebanese curriculum currently being prepared by CERD, implementation is going to continue to require emphasis from school personnel in order to be effective. This ESD goal of "foster[ing] a sense of responsibility for the state of the environment" (WCED reprint 2009, p.113) is an ongoing teaching challenge. Makki, Abd-El-Khalick and BouJaoude very explicitly detail the need in Lebanon for teacher training, continued monitoring and classroom follow-up in the implementation of EE – in addition to improved curricula (Makki et al. 2003, p.31). Masri highlights this in her ruminations on teaching about environmental issues in a conflict ridden society. She understands why environmental issues are marginalised both by her Lebanese students and her colleagues, but argues that students must be inspired to feel the issues rather than just learn about them as information by rote. Her goal is to inspire students to think deeply on the structural changes needed by "asking the right questions" (Masri 2007, p.239-241).

I. Comparison – Lebanon and Norway

EE has been integrated into the Norwegian national curriculum in all subjects for many years, with environmental educational activities required from kindergarten on (Earth Summit+5

n.d.). – And ESD is classified as advance in Norway (Filho 2010, p.121). In discussing the integration of ESD in the Norwegian curricula, the headmaster of a Norwegian secondary school showed that the curriculum consists of learning objectives (Udir n.d.). The state does not provide textbooks, therefore it is up to school teacher committees to choose privately produced textbooks, which they feel best meet the learning objectives, including ESD, of the state curricula. The National Centre for Science in Education initiated an ESD project called Den naturlige skolesekken (DNS) – literally: the Natural Schoolbag. In an evaluation of the project done in 2014, it was concluded that while the project had positive outcomes in regards to knowledge, student participation and awareness, as well as teacher learning, there was insufficient ownership, with school principals not being greatly involved. They said that once enthusiasm had waned among teachers, such projects became marginalised in schools (Udir 2014). Thus, Norway also faces the ongoing challenge of ESD being dependent on the enthusiasm of individual teachers and school personnel.

Comparison of the survey results provide interesting insight on the differences between students in Norway and Lebanon – as well as between schools. Issues of concern are clearly dependent on the local situation, with political and socio-economic factors having influence. There are, however, some universal concerns, such as education and healthcare. Environmental concerns followed the same pattern of divergence according to region, with some agreement, for example, on air pollution.

Comparing environmental knowledge level between Lebanese and Norwegian students, the later are generally more knowledgeable, having an overall higher percentage score in knowledge and ability to define concepts. However when it comes to environmental attitudes regarding economic growth versus environmental conservation, Norwegians are only slightly above Lebanese and are lower in their desire to improve the environment as well as estimation of their skills to bring about improvement.

Norwegians are markedly lower than Lebanese in participation in environmentally friendly activities – only overtaking Lebanese in recycling, which Norway clearly has the infrastructure for. Interestingly, Norwegians were comparable with Lebanon Public 1 in their identifying time as a hindrance to participation, whereas Lebanese Private school students were more likely to identify 'no practical options' as the hindrance. Norwegians were also less frequent than Lebanese in their discussion of environmental issues outside of school, as well as less interested in regular discussion of the topic in school. The results from the NEP also do not put Norwegians very far ahead of the Lebanese in pro-environmental attitudes. These results are somewhat surprising bearing in mind Lebanon's turbulent history, as in addition to Lebanon's status as a post-conflict state, with a civil

war behind them, they continue to struggle politically and with the ongoing Syrian conflict. This would, presumably, bring to the fore priorities other than the environment specifically for the government, but also for Lebanese youth.

One explanation for this difference in environmental interest could be found in the Norwegian headmaster's reply to a question about change in environmental attitudes among the youth during the course of his career. He viewed Norwegian students as having more knowledge now, but less motivation. He said in years past, students were more politically active and eager to make a change, whereas now there is no disagreement about whether there are environmental problems, but neither is there much motivation to get involved and make improvement.

Here again issues of the environmental Kuznet's curve comes into play. Empirically, it seems that environmental degradation is reduced as economic development increases, although statistical evidence is not as strong (Stern 2003, p.19). In our two comparison cases, clearly environmental degradation has been reduced in Norway, while Lebanon, though not exactly a developing country, is still in the middle of the Kuznet curve facing a number of environmental problems. Yet in regards to motivation, this research exemplifies the need to maintain a focus on the global impacts of environmental degradation and what it means for earth's sustainability. If emphasis wanes, it is hard to know whether developed country youth, who do not see the impacts within their own environment, will find the time to give it the continued attention it deserves.

II. School as Source of EE

The ranking of information source should be specifically highlighted, as diversity in ranking main source of information by Lebanese students could be interpreted as reflecting the level of EE in the school. Private 2, in Aley district, which uses the government curriculum and had a dedicated EE teacher, had 40% of students ranking school as main source of information, with another 28% ranking it second place. Public 1, in Beirut, which uses the government curriculum but does not have an EE teacher, ranked school and television equal at 34% each, with another 30% ranking school second place. Private 1, in Baabda district, which had recycling boxes but no environmental teacher and enough EE to enable students to pass state exams, had 26% ranking school first, with another 30% ranking it second place.

The new curriculum being prepared by CERD could provide a big boost for Lebanese students in addressing the knowledge gap on environmental issues, as well as benefiting teachers, if less time is required to incorporate environmental themes into a weekly plan. This could help improve students' knowledge, as well as perhaps their confidence in school and government as a

source of environmental education.

This, however, is only a partial solution to environmental degradation, as addressing the knowledge gap alone does not ensure that pro-environmental action will follow. Hungerford et al. point out that:

"If we want learners to become actively involved in issue investigation and evaluation as well as active citizenship outside of school it appears rather clear that ***they must own the issues on which they focus and both feel and be empowered to do something about them.*** (Hungerford et al. 2000, p.3; emphasis in original)"

The comments scribbled in survey margins regarding the ineffectiveness of writing letters of complaint to the authorities indicate that empowerment is not realised among Lebanese youth. This is further emphasised by the large percentage of Private school students who chose 'no practical options' as the greatest hindrance to environmental activism.

III. Environmental Infrastructure

The lack of practical options brings us to another important point: lack of environmentally friendly infrastructure. Two anecdotes from interviews highlight this point. The first was related by the teacher at Private 2, in Aley district. The students had enthusiastically participated in a paper recycling campaign, diligently removing staples from paper and flattening cardboard boxes to prepare them for recycling. However, when the teacher called various recycling companies and NGOs, none of them were willing to come and collect the recyclables due to the distance. – Even though the students had collected the equivalent of a roomful. Due to lack of space at the school, eventually they were compelled to move the recyclables outside in the parking lot, where they got wet in the rain – and the teacher continued to try to find someone who would be willing to collect. This, of course, was very disheartening for the students who had participated in the project.

The headmistress of the primary section of Private 1 also described her search for an environmental company to participate in their green campaign. When she finally found an organisation with a good recycling cooperation plan, she scolded the person for their lack of advertising, as he was a former student of their school.

Norwegian students have a great advantage in infrastructure. In addition to recycling infrastructure, an area not discussed in the surveys in which Norwegians have an advantage, is the relatively reliable public transport in urban areas, which offers a viable alternative to driving. These are just two environmentally friendly practical options which are not as readily available to Lebanese students.

Stapp's early definition of EE includes being “motivated to work toward...solutions” as an outcome (Stapp 1970, p.15). As the anecdotes from Lebanese educators shows, lack of infrastructure means that working for solutions is an arduous task and requires much motivation.

IV. Civil Society

The Lebanese state has for many years been plagued by political instability and outside pressure, including the more recent Syrian refugee crisis. Thus, civil society has been forced to fill the gap. They have proved effective in prodding the government's efforts towards a solid National Environment Education Policy and aided schools to some degree in making environmental issues interesting. The surveys reveal that a large percentage of Lebanese students consider environmental groups reliable and accurate as a source of information. Thus it would behove Lebanese civil society to seize upon this confidence in their efforts and further consolidate partnerships with schools, both public and private, to foster environmentally friendly activities among the youth. As UNESCO points out, diversity in ESD methods, including multiple contributors, is essential for a more environmentally sustainable society (UNESCO 2014).

V. Socio-Economic Factors

A major challenge for Lebanese students in environmental issues is the political and socio-economic difficulties Lebanon faces. The group discussions revealed a frustration with politics and the economy, stating that Lebanon has limited land and resources and these resources are being stretched with the Syrian refugee influx. Private 1 students believed that foreign investment is the only thing keeping Lebanon afloat economically. Students at Public 1 stated that Lebanon's environment is an important part of their income, due to tourism. They further stated that tourism provides partial

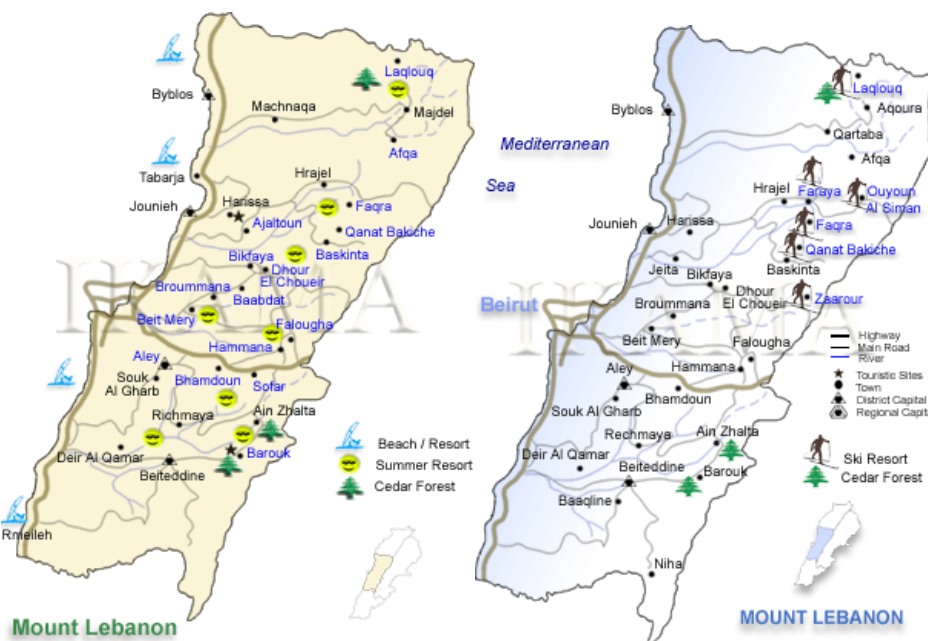


Figure 32: Summer and winter tourist attractions in Mount Lebanon region. (Ikama 2009)

protection for some of Lebanon natural environment, in particular ski and beach resort areas (Figure 32), but tourism also results in pollution of the environment, and therefore they felt long term, better solutions were needed for environmental protection.

In another discussion, a student at Private 1 said that car-pooling was not a viable option in Lebanon, as the social peer pressure is such that parents are expected to drive their children to school. She stated, "If her mother drives her to school, then my mother should too." In contrast, Norwegians consider taking the bus socially acceptable and, in fact, expected for students of all ages. Casual conversation regarding environmental education with other Lebanese revealed that it was considered a secondary concern, with one man describing his nephews who knew plenty about environmental issues, but did not find it relevant and continued to throw trash out of the car window. This seems to echo the afore mentioned studies which describe the difficulty with mainstreaming environmental issues due to the day to day struggles for survival in a politically turbulent society. With all the challenges the Lebanese faced, it is admirable to note the high percentage of students from all schools to rate their desire to improve the environment as strong.

VI. Previous Research on Lebanon

Masri's challenges as an environmental educator in Lebanon have already been mentioned, and they clearly resonate with this research (Masri 2007). Makki, Abd-El-Khalick and BouJaoude's study is interesting as they also focused on secondary students. While their questionnaire was considerably different from this study, their results for knowledge level brought them to the conclusion – that much improvement was needed (Makki et al. 2003, p.27). The results from this study concur, and shows that after ten years there is still a knowledge gap. Also confirmed are their findings regarding students having a predominantly favourable attitudes towards the environment, even though knowledge or skills are lacking (Makki et al. 2003, p.28,30).

Oweini and Hourri's study looked at other factors in analysing Lebanese college students environmental attitudes (Oweini & Hourri 2006, p.97). One factor which they found to be positively correlated with pro-environmental attitudes was "living abroad in countries where there are environmental laws and practices" (Oweini & Hourri 2006, p.97). In their results, they stated "participants who lived abroad for more than three months, regardless of the country of residence, scored significantly higher" (Oweini & Hourri 2006, p.101). Makki, Abd-El-Khalick and BouJaoude's study analysed parental education level and found particularly father's level of education to have a strong bearing on students' environmental knowledge (Makki et al. 2003, p.31). Neither living abroad nor parent's education was an explicit part of this research, but the difference in NEP results

from three Lebanese schools highlight these factors. With the numbers collapsed, the school with the highest average pro-NEP score was Private 1, in Baabda district. This school does not have an environmental club, nor strong EE, however the school includes large numbers of expatriates, Lebanese with a foreign parent, dual nationality or returning expatriate Lebanese – middle to upper class families. Thus factors such as time spent abroad and education level of fathers would seem a strong potential explanation for their scoring higher in pro-NEP attitudes than other Lebanese schools with more EE.

Looking at gender, Oweini and Hourri found only a slight difference, with college males being slightly higher overall (Oweini & Hourri 2006, p.100). However, the other study found girls in 10th grade “had significantly higher knowledge and attitude scores” than boys – although they could not discern an explanation for this from their research (Makki et al. 2003, p.31). In comparison, in addition to general diversity between the genders, this study found girls to be higher in many areas. Diversity was seen in that girls' responses to knowledge level were spread along the scale from high to low, with boys being more certain of at least knowing something. Girls were less likely to skip questions and were more likely to rank environmental groups as main source, as well as best source of information. Gendered opinions on balancing of environment and economy were interesting as girls were both more likely to consider environment more important than economic growth, as well as more confident that economic growth need not be at the expense of the environment. Girls were more enthusiastic about changes needed for improving the environment, such as lifestyle changes, community cooperation, increased legislation as well as a radical restructuring of society – although for the last they were more likely to choose 'agree' over 'strongly agree'. Boys were more likely to be unsure, especially of the last option. More girls than boys had a strong desire to improve the environment, and while less students overall were sure of their skills than their desire, more girls than boys were confident of their skills, with a larger percentage of boys being unsure. Girls were notably higher in three of the categories of participation in environmentally friendly activities, with boys being more likely to participate in tree planting. Girls were more likely to choose 'no practical options' as a hindrance to participation, whereas boys were more likely to choose lack of time. Girls wanted more regular discussion of environmental themes at school than boys, and while there was diversity in opinion on the different NEP statements, overall girls scored slightly higher than boys in pro-environmental attitudes. This study also does not offer a likely reason for this difference.

Another point from Oweini and Hourri's study which is worth noting is their comment on amount of hiking trips per year. They note, "Those who hiked less than four times a year scored higher on actual behavior than those who hiked between five and eight times a year. (Oweini & Hourri 2006, p.101)" This would seem to tie in with the comment from the Norwegian headmaster about

"more knowledge, less motivation". Norway has a cultural concept "friluftsliv" – which is literally translated "free air life" and includes all sorts of outdoor activities: running, hiking, camping, skiing, and weekend/holiday trips to the mountain. These activities are not confined to one age demographic, but are popular with all ages – with gear and clothing for "friluftsliv" being in vogue. The Lebanese visit frequently with relatives in their countryside villages, for example grandparents, but in the group discussion with Private 1 students, they described villages and the mentality there as old-fashioned. Visits centred around food from private vegetables gardens, and students described village life as being very detached and apart from the current generation. The observation on Norwegian students declining motivation to care for the environment may seem counter intuitive, as it would be expected that the popularity of outdoor activity and the natural environment would increase appreciation for it. Explanations for lack of motivation could be familiarity resulting in apathy. – Or it could be tied to the relative ease of current life in Norway which has caused the Norwegian youth, who benefit from earlier generations' struggle, to be dubbed the "dessert generation" (UIO 2010).

VII. Revisiting the Research Questions

How is EE incorporated into the Lebanese state curriculum (state schools)?

The research shows that environmental education has been incorporated into the Lebanese curricula since the late 1990s. In the current curriculum, most EE consists of additional units at the end of sections in various subjects, predominantly science. This is not optimum as it means extra information for teachers to cover in their weekly plan, however, it has provided some EE for students.

How is EE incorporated into other school curricula (private schools)?

The extent to which private schools incorporated EE into their curricula is dependant on the degree to which they followed the state curriculum and recommendations. For Lebanese students, private schools not using the state curriculum provide enough general knowledge EE to enable them to pass state exams, with most EE centred in science. As in other schools, EE is very much dependent on the enthusiasm of individual teachers and school support.

What kind of teaching challenges are there in regards to using EE material?

The current EE format creates additional time demands on teachers, which does not encourage emphasis on environmental themes. It seems this is to be rectified with the new curriculum, as per the 2012 National Environment Education Policy. Environmental educators also face structural and socio-cultural challenges in inspiring student participation in pro-environmental activities. Some ESD educators also face resistance from other teachers.

What kind of impact do teachers/principals feel they have in teaching EE?

Teachers who volunteer their time as environmental educators clearly gain the respect and interest of their students. Students are enthusiastic and, for example, bring recyclables from home to recycle at school or use in projects. Reaction from parents and their level of participation in their children's EE projects is unclear. However, the CERD ESD coordinator said she was pleasantly surprised at the level of participation from mothers in a middle to low income neighbourhood in a cooking oil recycling project she initiated.

What challenges are there for educators in creating an environmentally friendly culture?

Political instability, socio-economic, structural and cultural challenges make focus on environmental issues challenging in Lebanon, especially when societal norms go against environmentally friendly practice.

What are the values and attitudes of Lebanese youth on environmental issues?

The sampled Lebanese youth seem to have done well with the amount of EE that was available to them. They know what issues are important to them locally, both socio-economically as well as environmentally. Their knowledge level leaves something to be desired, but the new curriculum could play an important role in improvement. Participation in environmentally friendly activities is not strong, but for the most part is better than the sampled Norwegians. They have a strong desire to improve the environment, although they are unsure if they have the skills required. Time factors and lack of options play a role in hindering their participation in environmental activities, and they would like more regularly discussion on the environmental themes in school. Through the NEP questions we see that surveyed Lebanese students clearly understand that human impact on our environment has not been positive and that this must be remedied. There were mixed results as to their opinion on whether human ingenuity and technology will be able to solve environmental problems.

7 Conclusion

Evaluating environmental education (EE) in an unstable society, such as Lebanon, is challenging, yet the research aims of the study were largely reached. A basic understanding of the current level of EE in Lebanese school curricula was obtained as well as insight into Lebanese students' views on environmental issues. Considering that few other studies were found on environmental attitudes of Lebanese students, with none taking a predominantly qualitative approach, this was a positive step.

Challenges to this analysis, as mentioned earlier, came from missing data and varied sample size. Further statistical analysis of the resultant data could have been interesting and may have facilitated easier direct comparison with prior Lebanese studies. Further focus group discussions could have provided additional insights into their opinion on environmental education, and it could have been useful to have survey questions that better illuminated their actual knowledge – as opposed to self-described knowledge.

Results from the survey were mixed and therefore it cannot be said that the hypothesis, of a positive relationship between EE and pro-environmental attitudes and skills, is proven. There was a correlation between amount of EE in schools and students who considered school an important source of environmental information, however, both the NEP results and the Norwegian comparison group cast doubt on a linear assumption of more EE equals more pro-environmental attitude and behaviour. This, however, is not particularly surprising in light of past research which acknowledges the disconnect between knowledge and behaviour (Hungerford et al. 2000, p.3).

Political and socio-economic factors in Lebanon make it difficult to predict whether the government's environmental focus will increase, nevertheless basic environmentally friendly infrastructure, such as recycling options and good public transport, are desperately needed to address lack of pro-environmental options. CSOs should also continue to help address lack of ESD opportunities as, when given the chance, Lebanese students show themselves responsive and eager.

IALEI's conclusion regarding the challenges of educating regarding climate change bears repeating, as it can easily apply to the conflicted Lebanese state and challenges the youth face in looking for pro-environmental options:

"[T]his complex and depressing picture can provoke two troubling responses: a passive and paralyzing fatalism or an oversimplification of the many important factors involved". (IALEI 2009, p.14)

The research highlights the influence of the local setting on students views and attitudes. This was demonstrated by Lebanese versus Norwegians emphasis as terrorism as an important

issues, as well as the difference between Lebanese schools in concern level on issues such as deforestation and garbage disposal. This reinforces the idea that ESD cannot be standardised, and implies that customising ESD as per the local culture should be taken to the micro level (UN 1975, p.3). – Which, unfortunately, places even greater demands on ESD educators and teachers.

Much research has discussed ongoing challenges teachers face of motivation, how to implement holistic learning and provide empowerment and ownership for students – both generally and specifically for ESD (Hungerford et al. 2000). Therefore, on the theoretical level, there does not seem much more to contribute to helping students or teachers in such a society, other than encouraging them to continue to strive for improvement. Further research could be done on the gender aspect to gain an understanding of why girls are scoring higher in certain areas and how to further cultivate their interest in environmental issues.

The unexpected results from the Norwegian comparison group bears further discussion and research. Perhaps a further line of inquiry should ask how to keep momentum strong for global issues that are not highly visible in local settings. The challenges that Lebanon faces seem to provide impetus for students to be concerned and increases their desire to improve their environment, even if their knowledge and skills are lacking. Future ESD research could ask: What steps should developed countries take to keeping global environmental issues forefront for the next generation once basic environmental degradation has been addressed? Perhaps increasing international ESD school partnerships could help to sensitise youth in the north and empower students in the global south.

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- group interview 1 – four secondary school students, Private 1, Baabda district
- group interview 2 – six secondary school students, Public 1, Beirut district
- Haber, Myrna Semaan – PhD, Book Author, Plant Author and Systematist, Researcher and Academic, Project Developer and Coordinator, Naturalist and Conservationist, IUCN-SSG Member, Jounieh, Lebanon (<http://www.nhmedit.com/>)
- headmaster – secondary school, Rogaland (Norway)
- headmistress – primary department, Private 1, Baabda district
- Ministry of Environment – head of Awareness Department, Beirut
- retired teacher – education and health officer, environmental club overseer, primary and secondary school, Public 2, Beirut district
- teacher – primary school teacher at Public 2, Beirut district
- teacher – science coordinator and chemistry teacher, environmental club overseer, Private 2, Aley district

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9 Appendix I: Survey

Survey of Environmental Knowledge and Values of Lebanese high school students.

Introduction:

I am a masters student at the Norwegian University of Agder. I am researching environmental education in Lebanon and have requested the participation of your school in gaining insight into the knowledge and values of Lebanese young people on environmental issues. Your and your fellow students survey responses will be compared and analysed and the results will go into my masters thesis assessing environmental education in schools in Lebanon.

Your survey responses will be strictly confidential, therefore please feel free to respond exactly as you feel and think. There is no “wrong” answer. – Just your answer :)

Thank you so much for your time and participation.

(1) Please circle which grade you are currently in at school:

7	8	9	10	11	12
---	---	---	----	----	----

(2) How old are you?

(3) What is your gender? Please circle:

Male	Female
------	--------

(4) Which issues do you think are most important for Lebanon today?

Please select your top three in order of importance (only 3):

1= most important, 2= second most important, 3= third most important.

	Health care
	Education
	Crime
	The environment
	The economy
	Terrorism
	Poverty
	Creation of a fairer and more humane society
	Less unemployment
	More liveable cities
	Prevention of war
	Civil liberties
	Other. Please write:

(5) Here is a list of some different environmental problems. Which problem is most important for Lebanon?
 Please select your top three in order of importance (only 3):
 1= most important, 2= second most important, 3= third most important.

	Air pollution
	Chemicals and pesticides
	Water shortage
	Water pollution
	Household rubbish and garbage
	Climate change
	Cutting down of the forests
	Generation of toxic wastes
	Genetically modified foods
	Endangered plants and animals
	Using up our natural resources
	Other. Please write:

(6) Please indicate which problem is most important globally?
 Please select your top three in order of importance (only 3):
 1= most important, 2= second most important, 3= third most important.

	Air pollution
	Chemicals and pesticides
	Water shortage
	Water pollution
	Household rubbish and garbage
	Climate change
	Cutting down of the forests
	Generation of toxic wastes
	Genetically modified foods
	Endangered plants and animals
	Using up our natural resources
	Other. Please write:

(7) How much do you think you know about the causes of these environmental problems?
 Please circle one below to indicate what you think, where 1 indicates you feel you know nothing at all and 5 indicates you feel you know a great deal. Please circle one only:

	1 = Nothing	2 = Not very much	3 = Something	4 = Quite a bit	5 = A great deal
Water shortage	1	2	3	4	5
Water pollution	1	2	3	4	5
Climate change	1	2	3	4	5
Deforestation	1	2	3	4	5
Generation of Wastes	1	2	3	4	5
Genetically modified foods	1	2	3	4	5
Endangered plants and animals	1	2	3	4	5

(8) Which of the following environmental concepts do you think you could give a definition for? Please tick one.

	I can give a definition.	I have heard of it, but I can't give a definition.	I don't know this concept.
(a) Climate change			
(b) Ecology			
(c) Biodiversity			
(d) Carbon cycle			
(e) Sustainable development			
(f) Carrying capacity			
(g) Intergenerational equity			
(h) Renewable resources			

(9) What has been your main source of environmental information?

Please rank the following from 1 to 6 according to source importance for you with 1= most important, 2= next most important, and so forth.

	Television
	Newspapers
	School
	Family
	Environmental groups
	Government

(10) Which do you think is most reliable and accurate as a source of information on environmental issues?

Please rank from 1 to 6 according to reliability and accuracy with 1= most accurate, 2= next most accurate, and so forth.

	Television
	Newspapers
	School
	Family
	Environmental groups
	Government

(11) Which of the following statements do you agree with? Please tick one box only.

	(a) Lebanon should concentrate on economic growth even if it means some damage to the environment.
	(b) Lebanon should concentrate on protecting the environment even if it means some reduction in economic growth.
	(c) Not sure.

(12) Which of the following statements do you agree with? Please tick one box only.

	(a) Economic growth is bound to be at the expense of the environment.
	(b) It is quite possible to have both a prosperous economy and a healthy environment.
	(c) Not sure.

(13) In order to solve environmental problems, which environmental actions are most important?

Circle the number of your response for each statement using the following scale:

	1 = strongly disagree	2 = disagree	3 = undecided	4 = agree	5 = strongly agree
(a) Personal lifestyle changes are required.	1	2	3	4	5
(b) Communities need to work together.	1	2	3	4	5
(c) More government legislation is needed.	1	2	3	4	5
(d) A radical restructuring of society would be required.	1	2	3	4	5

(14) How would you rate your personal desire to improve the environment? Please tick one.

	1 = Not interested
	2 = Unsure
	3 = Strong desire

(15) Do you feel you have the knowledge and skills to bring about such improvements? Please tick one.

	1 = No
	2 = Unsure
	3 = Yes

(16) Have you personally been involved in recycling activities over the past 12 months? Please tick one.

	1 = No
	2 = Yes

(17) Have / are you trying to reduce water consumption for environmental reasons? Please tick one.

	1 = No
	2 = Yes

(18) Have you tried to encourage others to change actions bad for the environment? Please tick one.

	1 = No
	2 = Yes

(19) Have you taken part in clean-up or anti-litter campaigns? Please tick one.

	1 = No
	2 = Yes

(20) Have you donated to an environmental group? Please tick one.

	1 = No
	2 = Yes

(21) Have you participated in group or individual efforts outside of your home such as: (write "Yes/No" as needed)

	supporting an environmental groups
	joining tree planting or litter campaigns
	writing/complaining to the authorities about environmental issues

(22) What most hinders your personal participation in environmentally friendly activities? Please tick one box only.

	(a) There are no practical options.
	(b) It won't make much difference.
	(c) I don't understand what is harmful and what is not.
	(d) I don't have the time.

(23) How would you rate your personal family's efforts to conserve the environment, with 1 very high and 5 very low? Please circle one.

1	2	3	4	5
---	---	---	---	---

(24) How would you rate your extended family and friends' efforts to conserve the environment, with 1 very high and 5 very low? Please circle one.

1	2	3	4	5
---	---	---	---	---

(25) Do you talk about environmental issues with others outside of school? Please tick one box only.

	Daily
	Weekly
	Monthly
	Several times a year
	Never

(26) What environmental concepts do you discuss? Please tick as many as you discuss.

	(a) Climate change
	(b) Ecology / ecosystem services
	(c) Biodiversity
	(d) Carbon cycle
	(e) Sustainable development
	(f) Carrying capacity
	(g) Intergenerational equity
	(h) Renewable resources

(27) How often would you like environmental issues to be discussed in school? Please tick one.

	Regularly (at least once a week)
	Often (at least once a month)
	Sometimes (several times a year)
	Never

(28) Please indicate the degree to which you agree with each item. Circle the number of your response for each statement using the following scale:

- 5 = strongly agree
- 4 = mildly agree
- 3 = unsure
- 2 = mildly disagree
- 1 = strongly disagree.

(a) We are approaching the limits of the number of people the earth and its resources can support.	1	2	3	4	5
(b) Humans have the right to modify the natural environment to suit their needs.	1	2	3	4	5
(c) When humans interfere with nature, it often produces disastrous consequences.	1	2	3	4	5
(d) Human technical ingenuity will ensure that we do not make the earth unliveable.	1	2	3	4	5
(e) Humans are severely abusing the earth.	1	2	3	4	5
(f) The earth has plenty of natural resources if we just learn how to develop them.	1	2	3	4	5
(g) Plants and animals have as much right as humans to exist.	1	2	3	4	5
(h) The balance of nature is strong enough to cope with the impacts of modern industrial nations.	1	2	3	4	5
(i) Despite our special abilities, humans are still subject to the laws of nature.	1	2	3	4	5
(j) The so-called "ecological crisis" facing humankind has been greatly exaggerated.	1	2	3	4	5
(k) The earth is like a spaceship with limited room and resources.	1	2	3	4	5
(l) Humans were meant to rule over the rest of nature.	1	2	3	4	5
(m) The balance of nature is very delicate and easily upset.	1	2	3	4	5
(n) Humans will eventually learn enough about how nature works to be able to control it.	1	2	3	4	5
(o) If things continue on their present course, we will soon experience a major environmental catastrophe.	1	2	3	4	5

Thank you for taking the time to complete this survey!

10 Appendix II: Additional charts

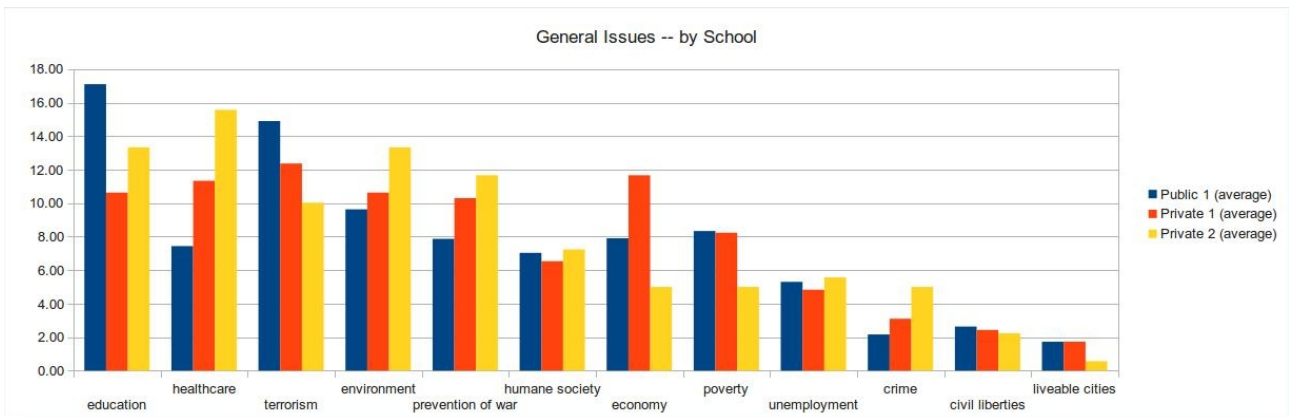


Illustration 33: What issues do you think are most important for Lebanon today?

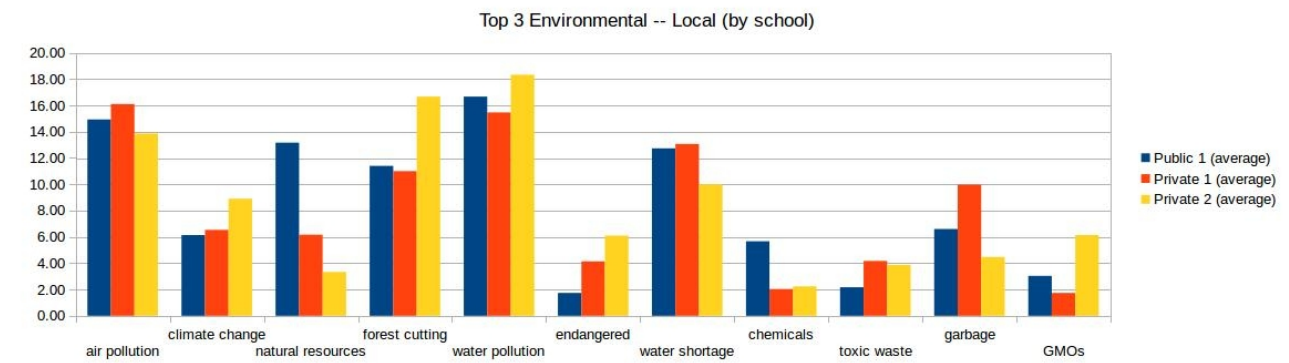


Illustration 34: Which environmental problem is most important for Lebanon?

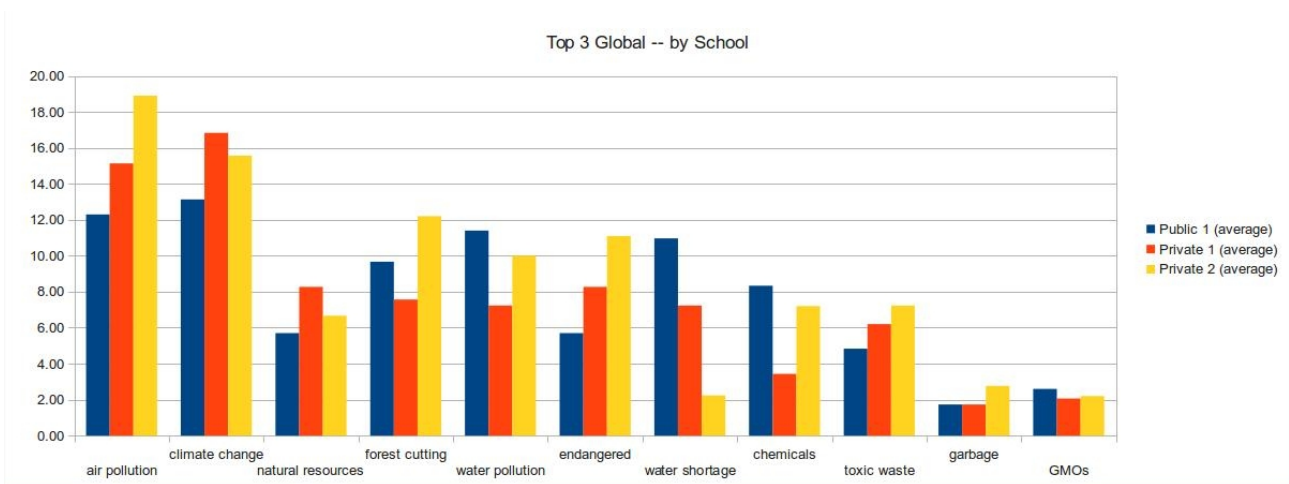


Illustration 35: Which environmental problem is most important globally?

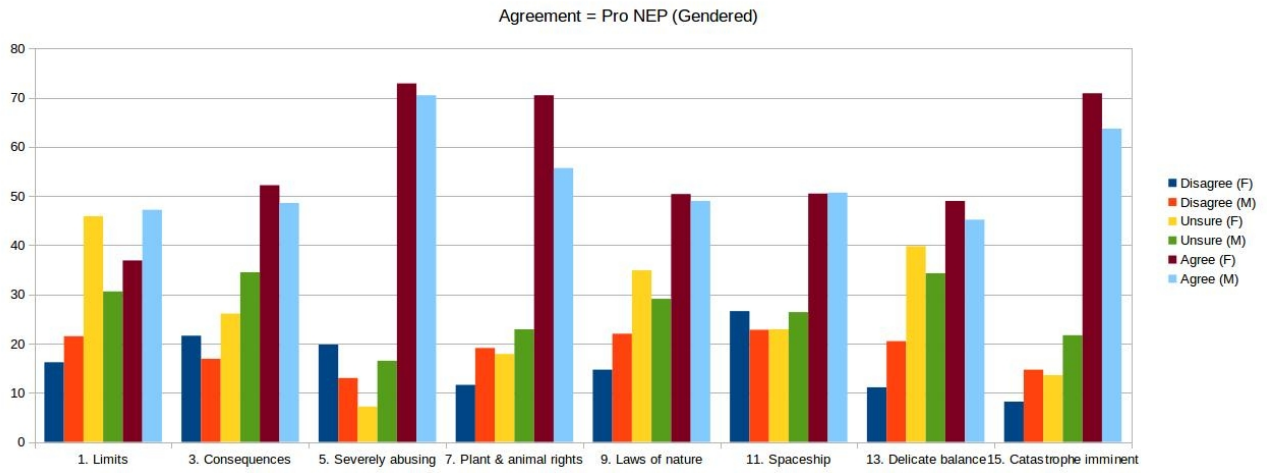


Illustration 36: Agreement with the eight odd-numbered items indicate pro-NEP responses – Comparing Genders

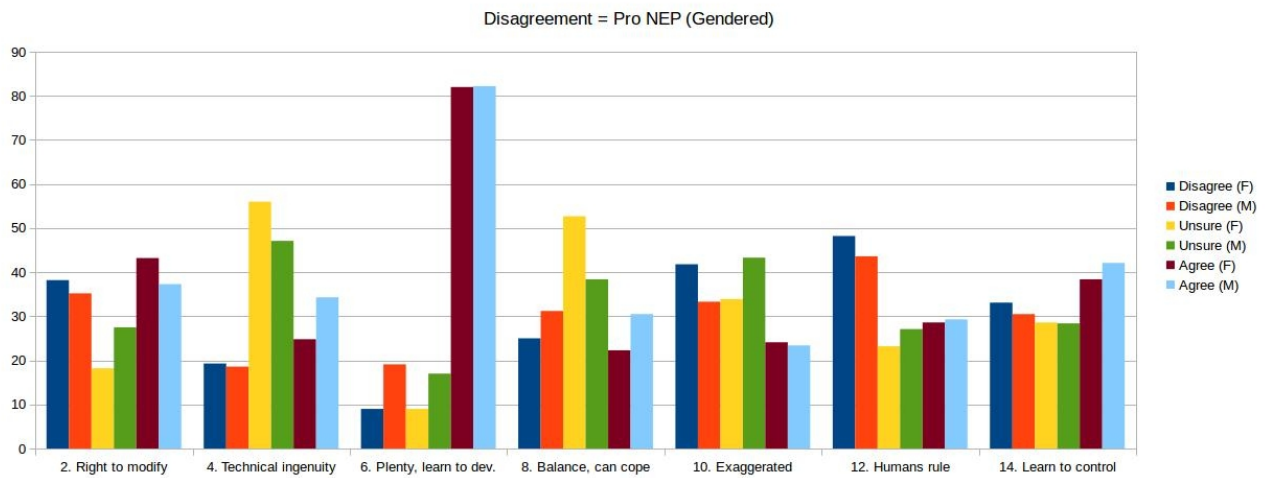


Illustration 37: Disagreement with the seven even-numbered items indicate pro-NEP responses – Comparing Genders