

# ENVIRONMENT IN ARAB SCHOOL CURRICULA

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## I. INTRODUCTION

Environment is quickly becoming an integral part of education in schools across the Arab region, with varying success in different countries. Environmental concepts in schoolbooks have long been largely limited to personal and community cleanliness, general nature knowledge – mainly on animals, insects and plants – and some basic natural phenomena like the water cycle. But the emergence of new environmental challenges at an unprecedented rate in recent years, has led to the inclusion of new concepts and approaches in the curricula of Arab schools.

The role of education in protecting the environment and preserving natural resources has become more recognized. This mandated a new approach to old topics and the inclusion of new topics in school curricula. Natural resources, biodiversity and ecosystems reflected the interlinkages among various environmental challenges. Pollution and waste gained more prominence, and the management of dwindling natural resources led to the introduction of concepts such as ecological footprint into school curricula.

While the concepts of climate change and sustainable development have become standard in the textbooks of most Arab countries, green economy, green growth and ecological footprint are still lacking. Still, these concepts have been spotted in places where they might have been least expected, such as ecological footprint as part of the geography curriculum in Syria, and green economy as part of the new high school programs in Lebanon.

## II. INTEGRATING ENVIRONMENTAL CONCEPTS IN COURSES AND CLASSES

Environmental knowledge and concepts are communicated to students in the formal classroom curricula, as well as through extracurricular activities. A survey carried out by Arab Forum for Environment and Development (AFED) during the first half of 2019, based on school textbooks and curricula supplied by Arab ministries of education, found that the environmental topics most popular in Arab schools are ecosystems, pollution, natural resources and sustainable development. In

contrast to the inclusion of the rather new topic of sustainable development, the survey found that climate change was absent or not adequately discussed in 40 percent of the countries covered. Natural disasters, which are impacted by changes in environmental conditions and themselves exert critical impact on the environment, were virtually absent from the curricula of half of the countries, and weak in the other half where the concept was covered briefly. Classes in which environmental concepts were covered most were grade 5 – the last of the elementary level – and grade 11, before the last year at the high school level. Grade 6, the first intermediate class, was the weakest in coverage of environmental concepts.

**Geography, social sciences and civics courses** included items on ecosystems, natural resources, biodiversity, sustainable development and pollution. These came mainly under the topics of family, good citizenship, environmental protection, impact of economic activities on the environment, demographic changes, water and waste management. The sequence of civics courses specifically tackled these issues under the general topic of social responsibility, including sustainable consumption.

**Natural, earth and life sciences** courses integrated ecosystems, pollution and climate change concepts in topics about health, nutrition, living organisms, energy, water and air. In several cases, natural resources were integrated in **mathematics** at the elementary level by utilizing examples like number of trees, volume of water and consumption of electricity in calculation exercises. **Health education** courses hosted items on food safety and pollution, under the topics of environmental health, health awareness and personal hygiene.

**Language** courses, mainly Arabic, English and French, were widely used to integrate a variety of environmental concepts, mainly those related to nature, pollution and environmental responsibility in general. Environmental texts are not limited to elementary reading books, but have also been spotted in literature textbooks, and selected texts were used in some instances for literary analysis, especially in Lebanon, Syria and Morocco.

Environment was covered in **religious studies** courses from the perspective of preventing

*This chapter analyses data collected and compiled by AFED research team during the first half of 2019, based on textbooks used by schools in the Arab region, supplemented by detailed course curricula provided by ministries of education in 10 Arab countries. To facilitate comparison between countries, which use dissimilar names to identify different school grades and levels, we classified the grades in this chapter between 1 and 12. This comprises 3 general levels: elementary (1-5), intermediate (6-9) and secondary (10-12).*





pollution and using natural resources in a sustainable manner, based on the belief that human beings are custodians of God's nature gifts, and should thus preserve them. It has been noted that environmental topics in religion courses were concentrated in the lower grades. Climate change and sustainable development are still absent from religion courses at Arab schools.

Based on the AFED survey of curricula and textbooks in schools in selected Arab countries, an analysis was prepared to show areas of strength and weakness, in view of bridging the gaps and enhancing the system. The analysis covered the status of eight main environmental topics in Arab school curricula, namely: ecosystems, pollution, natural resources, climate change, solid waste, biodiversity, sustainable development and natural resources.

## 1. ECOSYSTEMS

The common elements related to ecosystems in school curricula in the countries surveyed focused on plants, animals and nature reserves. They

mainly reviewed biotic and abiotic elements, sources of threat to the ecosystems, alongside the food chain and the food pyramid.

Shortcomings were observed in addressing issues such as oceans and global ecosystems, including the Polar Regions, as well as the lack of a balanced distribution of topics among scientific and literary courses and different grades.

At the country level, many components of ecosystems are addressed in the Egyptian curricula between grades 4 and 7 in social studies and science, grade 2 in Arabic and religious education, and in grade 12 in geology and geography. Among the most prominent titles related to ecosystems included in the Egyptian curricula are the mutual influence between man and the environment, the role of man in the emergence of environmental problems, classification of organisms, the energy pyramid and the food network.

In Lebanon, school curricula cover most aspects of ecosystems, evenly distributed among various grades and courses. They are addressed in grades

## AL-BIA WAL-TANMIA MAGAZINE: A ROLE MODEL FOR ENVIRONMENTAL EDUCATION

### Raghida Haddad

Al-Bia Wal-Tanmia (Environment & Development) magazine has changed public perception of the environment in the Arab world, fulfilling a great need for a credible source of environmental information in Arabic. Established by Najib Saab in 1996, as an independent private initiative, it was the first region-wide magazine on environment, with a monthly circulation of over 38,000 in 22 countries. Its articles were syndicated to 14 Arab newspapers, bringing environmental information to a wider spectrum of readers. In 2006, it was the initiation platform of the Arab Forum for Environment and Development (AFED), the regional organization with a mission to advance environmental policies and action in Arab countries, based on science and awareness. It eventually became AFED's official magazine.

In 2017, after 20 years of publication, Al-Bia Wal-Tanmia ceased the print edition and turned online. Alongside the monthly magazine, the internet portal [www.afedmag.com](http://www.afedmag.com) publishes daily news and commentaries and hosts the complete archive of the magazine since 1996, in addition to AFED's annual reports on the State of Arab Environment, representing the largest reference on environment in Arabic. It also links to the magazine's environmental education website [www.afedecoschool.org](http://www.afedecoschool.org), which includes sections on key environmental issues, with audiovisual material that can be downloaded for use in schools.

The portal attracts over 1.5 million visits per month, and the magazine Facebook page has more than 1.3 million followers.

Although Al-Bia Wal-Tanmia has become a major reference for decision makers in Arab countries, its most prominent success was the environmental movement it created in schools, involving students in environmental action. The magazine is a main source of environmental information for students and educators, and its articles and commentaries are used in curricula and formal examinations.

AFED and Al-Bia Wal-Tanmia developed a comprehensive environmental education program, supported by the handbook *Environment at School*, available in print and online. The program includes developing national curricula and teacher training workshops. Building on this program, a new *Environmental Guidebook for Arab Schools* was developed in 2019, including emerging issues such as green economy, sustainable consumption and SDGs.

The magazine organized annual school competitions under the theme "A Better Environment Starts with You," involving more than 150,000 students and their teachers in environmental work. Training workshops on environmental education were organized for more than 2000 teachers in several Arab countries. This education program helped create hundreds of environmental school clubs.

Al-Bia Wal-Tanmia established the Youth Environment Parliament: 50 elected students from 50 schools, guided by a teachers committee, were involved in field visits, writing reports, and discussions with municipalities, officials and civil society for better environment in their communities.

The magazine produced a quarterly wall chart called *Green Bulletin*, distributed to schools free of charge. It also produced educational TV Programs and documentaries, and published environment books for different age groups.

Al-Bia Wal-Tanmia has won international environmental awards, including Global 500 from the United Nations Environment Program (UNEP) and Zayed International Prize for the Environment. UNEP citation stated that "this influential magazine is used in schools and universities and sponsors over 400 environment clubs. It created a pan-Arab environmental movement that accomplished what official bodies in the region could not develop over the years."

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2 and 5 in science and geography, grade 1 in English, grades 1, 10 and 12 in civics, grades 7 to 12 in earth and life sciences, and in grade 7 in physics and chemistry. The Lebanese curricula focus on forests in terms of their role and classification and the factors contributing to increased plant diversity, classification of animals, their habitat and extinction, and nature reserves. The wide variety of the curriculum is not complemented by enough experiments and extracurricular activities.

In Bahrain, the concept of ecosystems is addressed in four grades at the elementary and intermediate levels, in the subjects English and social studies. The most prominent topics are: forests, deserts, mountains, fauna and their habitat, seas and oceans, weather and global biodiversity.

Syrian curricula tackle ecosystems in science, social studies and geography in grades 2 to 10. Topics include conservation of the ecosystems and natural resources, livestock and nature reserves, alongside water and natural resources in general. Syrian curricula include ecosystems in the agricultural sciences for some grades.

The UAE curricula tackle ecosystems within the first three elementary classes in Arabic, social studies and civics. The focus is on animal and plant diversity in the UAE, nature reserves, climate and diversity of local habitat.

In Jordan, ecosystems are addressed in grades 2 to 8 in science courses, in grade 9 in physics, chemistry, earth and life sciences, and grades 10 and 11 in earth and life sciences. The curricula cover a variety of global topics, with a focus on the local ecosystems.

Ecosystems are strongly included in the science and English courses of the Tunisian curricula. This concept is taught in grade 8 within earth and life sciences, grade 10 in geography, and in grade 5 in general sciences. While local topics are adequately covered, there is shortage of material on the global status of ecosystems.

In Saudi Arabia, ecosystems are addressed in grades 3 to 6 in the science curricula. The most important topics are interrelations and cycles of ecosystems, especially water, biodiversity and soil. The concept of ecosystems is largely confined

to the science curriculum and not integrated in other courses. Practical activities are lacking.

Iraqi curricula address ecosystems in grade 7 in science, grade 10 in life sciences, grade 11 in social sciences, grade 1 in religious education, and grades 10 to 12 in art education, Arabic and literature. Focus is on the conservation of the marshlands, the Euphrates and other endangered local habitats. While these topics are evenly distributed and adequately addressed, other systems such as seas and mountains are weak.

The Moroccan curricula cover ecosystems in grade 12 in life and land sciences, grade 10 in history and geography, and between grades 4 and 10 in Arabic and French. Ecosystems are intertwined with biodiversity, and some topics are not treated in a comprehensive manner.

## **2. POLLUTION**

Four basic aspects about pollution have been emphasized in the curricula of the countries covered in the study: definition of pollution and its types, sources and causes of pollution, and how individuals can help to fight it. Types covered mainly include air, water and soil pollution, and to a lesser extent food, noise, plastic and radioactive pollution. Some topics are insufficiently discussed, and the distribution among various courses and grades is not balanced.

At the country level, the Egyptian curricula deal with pollution in grade 6 in social studies, grade 9 in science, grade 5 in religious education, grades 7 to 10 in English, grade 12 in geology and environmental sciences, and in grade 11 in geography. Pollution issues in the Egyptian curricula are linked to the local situation, mainly related to the impact of rapid population increase, causing air pollution from traffic jams, water pollution due to excessive discharge of waste, and soil pollution due to intensive food production practices. Some types of pollution, such as radioactive, biological and chemical, are not sufficiently addressed.

In Lebanon, pollution is included in grades 1 to 6 in the science curricula and in geography for most grades. Texts on pollution are included in Arabic, French and civics for most grades, as well as in earth and life sciences. Pollution of water,

## GREEN SCHOOLS PROGRAM IN KUWAIT

### Jinan Bahzad

The Kuwait Environmental Protection Society (KEPS) launched the Green Schools program in 2011. Since then, the program annually serves over 80 schools in Kuwait at all levels. KEPS has developed this program as part of its environmental awareness strategy, in view of building the capacity of students and teachers and to spread positive thinking towards the environment.

The program aims at raising the level of environmental awareness among students and promoting good behavior towards the environment at community level, and in schools in particular. It encourages students and teachers to participate in voluntary work in the environmental field, based on the understanding and appreciation of environmental values and principles. It builds capacity in auditing, monitoring and managing environmental impacts, and teaches students through demonstration activities and field trips. The program provides teachers with the opportunity to learn new methods and techniques for better delivery of environmental education in the classroom. Moreover, the program supports the establishment of environmental clubs for students, and organizes workshops for teachers catering to various levels and courses.

The themes of the Green Schools program include: climate change, with a focus on sea level rise and coastal threat, and the impacts of high temperature; wildlife in Kuwait, covering plant diversity, nature reserves and wildlife management; Kuwait's marine environment, particularly coral reefs and the impact of sea level rise, based on the first national communication report; solid waste management, including optimization, disposal and recycling, alongside school security and safety measures. Other themes covered by the program are biodiversity, local and migratory birds, freshwater and rationalization of consumption, renewable energy – particularly applications of solar energy – and environmental health.

During the 2018-2019 academic year, 86 primary and secondary schools, both public and private, participated in the Green Schools program. In cooperation with the General Authority for the Environment, a campaign



was launched to raise awareness on climate change and its effects, as well as a campaign on environmental protection law, in cooperation with the Environmental Defense Committee of the Kuwaiti Lawyers Association and the Environment Police Division of the Ministry of Interior.

During its eighth edition the program rolled out many activities, which were characterized by the dynamic participation of the competent authorities and researchers. They included actions to support the conservation of coastal biodiversity, rationalization of water consumption, climate change, environmental protection law, and the establishment of environmental clubs in schools. The program seeks to develop legal awareness and to encourage the implementation of environmental laws, mainly through such environmental clubs. By starting with students and teachers, the program hopes to spread environmental awareness to parents and the larger community.

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sea, air and soil are covered, alongside chemical, biological and bacterial pollution. Major local sources of pollution are discussed, such as solid and liquid waste, power generation and cars. The inclusion of thermal water pollution and radioactive pollution is unique in the Lebanese curricula.

In Bahrain, the concept of pollution is addressed in grade 12 in social subjects, commercial and social sciences, grades 1 and 7 in religion, and in grades 2 to 6 in English. While the stress is on waste, cleanliness and proliferation of insects, noise pollution is also included. There are several texts on pollution in the English language textbooks, but the presentation of the topic is imbalanced among different grades and courses.

In Syria, pollution is addressed in grades 3 to 11 within social studies, geography and science. Special attention is placed on soil contamination. Light pollution is unique to Syrian curricula, which are characterized by a balanced distribution of pollution topics among science, social studies and civics in various grades. However, air pollution and water pollution, which are common challenges, are not adequately covered. In the UAE, the concept of pollution is addressed

in grades 1 to 3 in social studies. Main topics include the individual's responsibility for cleanliness, traffic congestion and the UAE's efforts to reduce pollution. The UAE curriculum emphasizes individual responsibility to reduce pollution and the country's efforts to solve pollution problems. However, this concept is generally limited to the social studies courses.

Pollution in Jordan is addressed in grades 1 to 8 in science, grade 9 in chemistry and life sciences, grade 10 in chemistry, and in grade 11 in earth and life sciences. The main topics are noise pollution, protecting water from pollution, the impact of fertilizers and pesticides on the environment, biological weapons and wastewater treatment, and the impact of pollution on the spread of cancer. The Jordanian curriculum highlights water pollution and modern technological methods of purification, biological pollution and the use of biological weapons. While the concept of pollution is well integrated into scientific subjects, it is almost absent from others.

In Tunisia, pollution is addressed in grade 1 in life and earth sciences. The main topics are the dangers of water pollution, ways of protecting water resources, industrial pollutants, maintaining

the safety of water sources, diseases resulting from water pollution and ways of prevention, and the impact of oil extraction on the environment. While the Tunisian curriculum discusses water pollution in detail, it is weak in other aspects.

In Saudi Arabia, pollution is included in grades 1 to 4 in family education, grade 8 in science, and in grades 11 and 12 in geography. The Saudi curriculum focuses on the efforts of the individual and the state to address the problem of pollution, but it is deficient in dealing with pollution in science courses.

In Iraq, pollution is addressed in grades 4 to 7 in social sciences, grades 9 to 12 in chemistry, grade 10 in life sciences, grade 8 in science, grades 2, 3 and 8 in English, grades 2 and 3 in religion, grade 7 in Arabic, and in grades 10 to 12 in arts. The curriculum includes: the right to a clean environment, the role of citizens in preventing pollution, and the carbon footprint. Iraq's pollution-related curricula focus on the role of individuals, the carbon footprint, environmental rights and duties, and social environmental responsibility.

Moroccan curricula are characterized by addressing pollution in Arabic language courses using prose and poetry that promotes a cleaner environment.

### 3. NATURAL RESOURCES

Arab schools' curricula tackled natural resources by defining them and listing their types and classification, distinguishing between renewable and non-renewable ones. The role of man in preserving natural resources was highlighted, while the concept of resource management was not adequately covered in most instances.

The Egyptian curricula address natural resources in grades 6 to 9 in social studies, grades 4 to 7 in science, grades 3 to 5 in Arabic, grades 1 to 3 in religion, grades 8 to 10 in English, grade 10 in geology and environmental sciences, and grade 11 in geography. Main areas of interest are renewable and non-renewable resources, food, rationalization of consumption, degradation of rangelands and forests, decline of fresh water, fossil fuels and minerals, and management practices. The topic of natural resources in

the various grades and courses in the Egyptian curricula is diverse, where theoretical and applied aspects are linked.

In Lebanon, natural resources are taught in grades 1 to 9 in science, grades 3 to 11 in geography, grades 3 and 7 in Arabic, grades 2, 4, 8, 9, 11 and 12 in English, grades 1, 3, 7, 10 and 12 in civics, grades 9 and 10 in mathematics, grades 1, 7 and 8 in French, and grade 11 in social sciences and economics. The most prominent topics on natural resources in Lebanese curricula are soil, water, food production, plants, forests, animals and various energy sources. Topics are diverse, with balanced integration in various grades and courses.

Natural resources are covered in Bahrain's curricula in grade 11 in social studies, grades 1, 2, 3 and 7 in religion, grades 2, 3, 4 and 8 in English and grade 10 in civics. The main topics are the preservation of water, marine life, and the role of man in preserving resources. The theme of resource management is often mixed-up with biodiversity and pollution.

In Syria, natural resources topics are included in most grades in social studies and geography, in grades 2, 3 and 5 in sciences, grades 1, 2 and 4 in Arabic, and in grades 4 to 6 in agricultural courses. Soil, water, regeneration of resources, marine and ocean assets and forests are among the most prominent topics, while energy sources are not adequately covered.

The concept of natural resources in the UAE is addressed in most grades between 2 and 11 in social studies, and in grade 3 in Arabic. The most prominent topics on natural resources are plants, their types and uses, water in the UAE, seas and oceans, conservation of non-renewable natural resources, energy sources, future energy trends, and water and food security in the Gulf countries. The UAE curriculum emphasizes individual responsibility in conserving natural resources and the UAE's resource management efforts. The natural resources topics in the UAE curricula are rich and diverse, but mostly covered in social studies.

In Jordan, natural resources are introduced in grades 1 to 8 in science, grades 10 and 11 in physics and life sciences, grade 10 in chemistry, and in





grades 9 and 11 in earth and life sciences. The main topics are water conservation, innovative clean water sources, deforestation, renewable energy, pressure of population increase on resources, and the leading wind and solar projects in Jordan. The Jordanian curriculum includes an extensive presentation of energy sources, with a focus on renewable energy projects in the country.

Natural resources are addressed in Tunisia in grade 11 in earth and life sciences and in grade 10 in geography. The main topics are: means to protect water resources, extraction of phosphates and the relationship between man and nature. Tunisian curricula focus on the economic return of natural resources, including minerals.

In Saudi Arabia, the concept of natural resources is tackled in grades 1 to 6 in family education, grades 1 to 8 in science, grades 11 and 12 in geography, grade 1 in Arabic, and grades 4 to 7 in social studies and civics. The main topics are rationalization of water and energy consumption and preserving marine and terrestrial environment. The focus

of the Saudi curricula on rationalization of consumption reflects a new approach to resource management, particularly water and energy.

Iraq integrated natural resources in social sciences in grades 4 to 7, in grades 11 and 12 in chemistry, in grade 8 in science and life sciences, in grades 9 to 12 in English, and in grades 10 to 12 in art. The main topics are energy sources, with a focus on renewables, preservation of the resources through rationalization, and utilizing art to preserve natural resources. The Iraqi curriculum is unique in linking art to natural resources.

As in other topics related to nature and environment, the Moroccan curricula heavily include natural resources in Arabic and French courses, stressing respect of nature and environmental protection.

#### **4. CLIMATE CHANGE**

Climate change is part of Arab school curricula in four main subtopics: the concept, the causes, the manifestations, and facing its impacts. The

role of human activity in increasing greenhouse gases is discussed, especially as a result of intense industrialization and the high demand for fossil fuels. It also covers the consequences of climate change, such as diminishing potable water, declining agricultural yields, loss of soil fertility, spread of pests and diseases, rising seas and increased droughts, extreme floods and storms. It proposes solutions to reduce the impact of climate change, including reducing the reliance on fossil fuels as a primary source of energy, and using renewable energy. Energy efficiency is not well discussed as a way to reduce emissions. Climate change is not adequately incorporated in the curricula of Tunisia, Saudi Arabia, Morocco and the UAE.

The Egyptian curricula tackles climate change in grade 7 in social studies, grade 8 in science and English, and grade 12 in geology and environmental sciences. Highlights include global warming and the causes and consequences of climate change. Acid rain and the erosion of the ozone layer are often mixed up with climate change, which causes confusion. While the Egyptian approach to climate change addresses concept, causes and results, it does not address

the role of individuals in mitigating the causes.

In Lebanon, climate change is addressed in grades 1, 2 and 3 in science, grade 1 in civics, grades 9 and 10 in mathematics, and grade 11 in chemistry. The Lebanese curricula contain a comprehensive presentation of the subject, integrating the concept of climate change in all grades, starting with the first elementary classes. However, the inclusion of the topic in geography, Arabic and English curricula is weaker than in other subjects.

In Bahrain, the coverage of climate change is confined to grade 11 in social studies. In Syria, climate change is discussed in grade 11 in social studies and geography, but is marginal in science, Arabic and agriculture courses.

In Jordan, climate change is addressed in grade 7 in science, grade 9 in physics, grades 9 and 11 in chemistry and life sciences, and grade 10 in earth and life sciences. In addition to basic information, emphasis is placed on the importance of the atmosphere for sustaining life on earth, soil acidity, ocean acidification, reducing air pollution



from acid rain, and the effect of rising river water temperatures on river organisms. It is noted that climate change is absent from social studies in the Jordanian curricula. In Iraq, the concept of climate change is addressed in grade 8 in English and science.

## 5. SOLID WASTE

Arab school curricula addressed solid waste by reviewing its sources, methods of management, collection, transport, processing, and responsible recycling. It also offered a classification of different types of waste, and transforming parts of it to compost, or applying waste-to-energy technology, which is an advanced type of incineration. It has been noted that reduction from the source and re-use of solid waste are largely neglected.

The Egyptian curricula address solid waste in grades 1 and 2 in religious education, grade 7 in English, and grade 12 in geology and environmental sciences. Recycling, environmental conservation, protection and hygiene are among the highlighted topics.

In Lebanon, solid waste is discussed in grade 6 in science, grades 4 and 5 in geography, and grades 4 to 8 in civics. The main topics include the definition of waste and disposing of it in designated areas, disposal methods, refraining from throwing waste in forests, and solid waste treatment and recycling.

In Bahrain, solid waste is addressed in grades 2 and 4 in English courses. In Syria, waste is included in grade 10 in social studies and geography, grades 2, 4 and 11 in science, and grade 4 in agricultural courses. The main topics were the safe disposal of waste through the construction of a sanitary landfill, waste sorting, recycling and composting to produce organic fertilizer. The UAE curriculum addresses the subject in grade 1 in social studies, and in Jordan solid waste is addressed in grades 4 and 5 in science. Main topics are composting and paper recycling.

In Saudi Arabia, the concept of solid waste is introduced in grades 3 and 6 in family education and grade 8 in science. The main topics are street cleaning, waste recycling and solid waste disposal. In Iraq, solid waste is included in grade 8 in social science, grade 10 in chemistry, and in

grades 8 and 12 in English. In addition to the common general topics, the Iraqi curriculum includes topics on the waste remnants of war and landmines, in addition to chemical waste.

## 6. BIODIVERSITY

Biodiversity has been addressed in Arab school curricula starting with definition, significance and major problems – mainly the dangers of extinction. The curriculum in each country includes sections on the national natural reserves and discusses their role in supporting life on earth. National legislations and international treaties on the conservation of biological diversity are not adequately discussed, and in some cases entirely absent.

In Egypt, biodiversity is included in grades 6 to 8 in social studies, grade 8 in science, grades 1, 2 and 4 in religion, grades 1 and 2 in Arabic, grade 9 in English and grade 12 in geology and environmental science. The most prominent topics are natural reserves, animal welfare, classification of living organisms, adaptation and continuity of life, and the risk of extinction. The Egyptian curriculum focuses on the threats to local biodiversity and reviews the status of a number of local nature reserves.

The Lebanese curriculum covers most aspects of biodiversity in several grades and courses. The concept of biodiversity is included in the science curricula in grades 4 and 7, in geography in grade 9, in English in grade 4, in social sciences and economics in grades 10 and 11, and in English in grade 8. The main topics are natural reserves, protection of fauna and flora, forest fires, forest biodiversity and ecological balance. The Lebanese curriculum intricately links the subject of biodiversity to the local environment.

In Bahrain, biodiversity is introduced in grades 3 to 7 in English courses. In addition to the general titles, the Bahraini curriculum includes a presentation on the local Al-Areen sanctuary, and focuses on marine organisms. It also highlights the role of the World Wildlife Fund (WWF). The Syrian curriculum covers biodiversity in grade 7 in social studies and geography, grades 9 and 10 in science, grade 4 in Arabic and grade 5 in agricultural courses. Topics include the conservation of natural resources,



## ENVIRONMENTAL EDUCATION IN ABU DHABI

### Ahmed Baharoon

Despite its harsh desert environment, Abu Dhabi, and in fact the entire United Arab Emirates, is home to a surprisingly rich variety of wildlife, flora and fauna. However, the recent boom in Abu Dhabi's economy and population has placed a tremendous strain on this delicate ecosystem.

The Environment Agency – Abu Dhabi (EAD) strives to minimize this strain of development on the environment, by ensuring a sustainable natural environment for human well-being. Part of our success comes from raising awareness that leads to a change in behavior. The principles of the United Nations Decade of Education for Sustainable Development (DESD) inform and inspire much of our work in this regard.

Over the years, we have launched many groundbreaking initiatives and participated as an enthusiastic partner in programs developed by other agencies and private individuals, examples of which are included in this overview.

#### Promoting Eco-Literacy

The Enviro Spellathon program ran for over 15 years, educating a whole generation of young people in basic eco-literacy. Over 92 percent of schools participated in this program, with a total reach of 1.8 million children. Between 2001 and 2016, participating students increased from 45,000 to 180,000. The program has since been integrated into the curriculum of schools under the Ministry of Education. (<https://sustainableschools.ead.ae/SSI/partners>)

#### Forum for Voicing Students' Environmental Concern

Launched in 2001, the Annual Environment Competition aligns with the United Nations theme for World Environmental Day (observed annually every 5th of June). The Competition, created exclusively for all United Arab Emirates (UAE) schools, targets students from kindergarten to universities. Over 3,000 schools have participated in the competition since 2001. (<https://sustainableschools.ead.ae/SSI>)

#### Awareness to Action

The Sustainable Schools Initiative (SSI), launched in 2009

and sponsored by BP, builds schools' capacity to help them: assess and address their environmental impact through eco-audits; empower students to turn environmental awareness into action through eco-clubs; build educators' capacity by training the trainers; and expose students to 'hands on' experience about the environment through field trips. Furthermore, the initiative encourages schools to reduce their ecological footprint and increase their 'ecological handprint'.

The initiative has led to many concrete achievements, including:

- 67 percent of registered schools compost their organic waste
- Over 92 percent of registered schools recycle their paper, plastic and metal waste
- 88 percent of registered schools undertake partial recycling of electronic waste
- 65 percent of registered schools reuse or recycle their white and grey wastewater
- 60 percent of registered schools use energy efficient equipment and technologies
- 19 percent of registered schools have initiated the use of renewable energy
- 78 percent of students in registered schools use shared transport
- 85 percent of registered schools have started growing native plants
- 97 percent of registered schools have reduced their water use
- 93 percent of registered schools have reduced their bottled water usage  
(<https://sustainableschools.ead.ae>)

#### Empowering the Youth for a Better Environment

The Sustainable Campus initiative (SCI), a program sponsored by Borouge, targets UAE youth aged 19 to 25. Outcomes include:

- 21 colleges and universities participating in the initiative
- 201 liters as average water consumption per day per capita
- 706,868 Kg CO<sub>2</sub> generated by routine energy per day
- 134 Kwh as average energy consumption per day per capita

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- 754 Kg as average waste generated per day
  - 98,833 m<sup>2</sup> as average green area in campus.
- (<http://www.sustainablecampus.ae>)

### Addressing Regional Water Woes

EAD is UNESCO's international coordinator for water education in the Arab world. It has developed the Arab Water Education Program, from which 12 Arab countries are benefitting. In the UAE, the program is supervised by EAD and the UAE UNESCO Office.

### Fishermen's Program

EAD conducts awareness campaigns with fishermen on many issues, communicating with them in Arabic, English, Hindi, Bengali, Urdu, Tamil, Malayalam and Gujarat. EAD also offers trainings in sustainable, traditional fishing methods.

Additionally, we supported Emirates Nature (formerly Emirates Wildlife Society – WWF) in a widespread consumer, restaurant and retailer awareness campaign. The campaign included the introduction of sustainable species and retail labeling to reduce demand for at-risk species.

### Divers

EAD works with recreational and professional divers, helping them to maintain the environment as well as the livelihood of marine animals. Working with UNEP, Save Our Seas and the Emirates Marine Environmental Group, we developed educational lectures and participatory programs for coral monitoring and underwater clean-ups.

We raise awareness and encourage divers to report marine creatures in distress, saving the lives of many endangered species such as the whale shark, dugong and hawksbill turtle. Additionally, we work with organizations such as Emirates Wildlife Society WWF and UNEP to collate and disseminate data on endangered species and distribute this information among the diving community.

### Farmers and Landscapers

EAD regularly disseminates information in Arabic, English, Urdu, Bangali and other languages, to farmers and landscapers. This is complemented by hands-on workshops illustrating problems and offering solutions, such as a newly introduced drip feed sprinkler system that reduces water consumption by as much as 46 percent.

With government and private sector partners, we have



trained 6,000 farms to adopt an irrigation system that can reduce consumption from 1,500 liters to 300 liters per palm tree per day: a saving of over 80 percent. In conjunction with the Department of Planning and Municipalities, we have also developed guidelines for villa owners for environmentally sensitive gardens that minimize irrigation water use.

### Falconers

We work with the falconry community to encourage sustainable practices for falconers. Also, our falcon hospital conducts tours for students and tourists, bringing them into contact with the cultural significance of falconry and the threats to its sustainability. The tours annually attract over 12,000 visitors.

### Religious Preachers

Islam is the prevalent religion of the UAE and many of its teachings speak directly to environmental issues. Islamic preachers – Imams – are highly trusted, respected members of society, and as such are valued partners in ensuring holistic approaches to sustainability. EAD therefore works with the General Authority of Islamic Affairs and Endowments (AWQAF) to incorporate sustainability messages inspired by the Quran into Friday sermons. Many mosque ablution areas also have messages educating worshippers on preventing water wastage.

### Development of Resource Materials

To aid its various environment education and awareness programs, EAD has produced a plethora of resource materials. They include over 140 separate resource materials just for teachers.

## AFDC: SUPPORTING ENVIRONMENTAL EDUCATION AND AWARENESS IN LEBANON

### Sawsan Bou Fakher Eddin

The Association for Forests, Development and Conservation (AFDC) is a Lebanese non-profit, non-governmental organization that aims to achieve sustainable development and conservation of natural resources, with a focus on forests. It works with an integrated management approach, by building technical and scientific capacities and raising awareness with the help of local communities and the public and private sectors.

Through its Environmental Education Program, AFDC aims to create a positive attitude towards the environment among young generations and within local communities. More specifically, AFDC works on:

- Building the capacity of schools' approach to environmental challenges and constraints, and the integration of the concept of nature conservation and sustainable development within school programs.
- Establishing effective partnerships with the Ministry of Education and the Center for Educational Research and Development (CERD) to update the National Strategy for Environmental Education.
- Integrating the Environmental Education Curriculum in new schools' curricula to reflect the main environmental threats and challenges such as climate change, resiliency and sustainable development.
- Creating long-term partnerships with schools to monitor attained results and draw lessons to ensure sustainability.

Since its establishment, AFDC has been one of the leading NGOs tackling environmental education, with different partners including NGOs, academic institutions and public authorities. In 2011, AFDC entered a partnership with the Ministry of Education to develop the National Strategy for Environmental Education, which was subsequently adopted in 2012. Consequently, AFDC has worked in close cooperation with CERD – the national center responsible for the development of national curricula – to evaluate the integration of environmental education concepts within

the existing educational curriculum, dating from 1997, and to propose a new curriculum accordingly. As a result, a new Environmental Education Curriculum for Cycle I (Grades 1, 2 and 3) and Cycle II (Grades 4, 5 and 6) was developed, that will be integrated into the updated national curriculum by 2020.

In addition to the work being done at the level of schools with the Ministry of Education and Higher Education, AFDC works on developing effective tools to promote environmental education and raise awareness about different environmental challenges, such as solid waste management. In this regard, it implements the "Awareness on Wheels" project, in which a mobile unit conducts educational tours at schools and communities to raise awareness about the importance of adopting an integrated solid waste management approach and to highlight good practices. Finally, the AFDC developed "Sanjoub", a forest-fires awareness mascot to make awareness on forest fires in schools and communities more fun and accessible.



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the environmental variety of seas and oceans, extinction, and natural reserves.

The UAE curriculum addresses the concept of biodiversity in grades 2, 6, 8 and 9 in Arabic, and in grades 1 and 5 in social studies and civics. Biodiversity-related titles in UAE curricula focus on natural plants, different species and benefits of natural diversity. The curriculum also highlights UAE natural reserves, with a presentation on the “UAE Tree Planting” initiative. In Jordan, biodiversity is included in grades 2, 7 and 8 in the science curriculum and in grades 10 and 11 in life sciences. The Jordanian approach focuses on the role of nature reserves in safeguarding biodiversity, with ample examples of protected areas in Jordan.

Biodiversity in Tunisian curricula is part of grade 8 in earth and life sciences, and grades 5 and 6 in the general sciences. In Saudi Arabia, biodiversity is addressed in family education courses at various levels, in grade 5 in Arabic, and in grades 5 and 7

in social sciences and civics.

## **7. SUSTAINABLE DEVELOPMENT**

The school curricula in the surveyed Arab countries examine the concept of sustainable development through the sustainability of resources, problems that threaten development and the role of the state in achieving sustainable development. It also addresses the prospects of development in Arab countries. The topic is characterized by general information, while the sustainable development goals (SDGs), adopted in 2016, remain absent from the curricula, as well as ambitious national development plans announced in several countries over recent years, which embrace the principles of sustainability. The notion of sustainable development is still absent from the curricula in some countries.

The Egyptian curricula deal with sustainable development in grade 5 in social studies, grade 12 in geology and environmental sciences, and grade

## ENVIRONMENTAL EDUCATION WITHIN THE SAUDI GREEN INITIATIVE

### Saiyed Al-Khouli

As part of the Green Initiative to spread environmental knowledge in Saudi Arabia, the General Authority of Meteorology and Environmental Protection (GAMEP) launched a program to promote environmental education in pre-university educational institutions in 2008. They did this in cooperation with the Ministry of Education, the Center for Environment and Development for the Arab Region and Europe (CEDARE) and the Saudi Environmental Society (SENS). The program outputs included setting models for environmental education materials.

The Environmental Education Program is one of the important mechanisms for promoting environmental work in Saudi Arabia. The program merges the environmental dimension into the educational process and promotes the practical skills necessary for positive participation in sustainable development activities and projects, together with civil society and the public sector. The Green Initiative aims to mainstream sound environmental concepts and interlinked elements as essential impetus in different areas, for stimulating positive environmental practices. This contributes to building youth leadership skills that can be applied towards responsible environmental practices through understanding and utilizing modern technologies, while keeping up with the global changes.

Some of the main objectives of the executive program for environmental education include: raising awareness among members of the education sector, their families and communities; developing the spirit of cooperation and team work to carry out environmental projects at the local level; enhancing appreciation of the environmental components; and acquiring skills that help achieve sustainable development goals at the local level.

The program's activities and components – represented in the educational kits and their contents such as books, publications and other related training tools – were designed based on Saudi Arabia's solemn commitment to international decisions and recommendations in the field of environmental education. The aim was to distribute these kits to teachers and students in secondary schools throughout the country. The program includes training

teachers and environmental education supervisors on the practical implementation of the initiative's activities through continuous coordination and cooperation with the Ministry of Education, the Saudi Environmental Society and concerned partners – especially international organizations, civil society organizations and non-governmental organizations – in the various stages of implementation.

The program's slogan was My Environment is My Life, considering that a healthy and clean environment results in a good and safe life, and also signifies purity, loveliness and beauty, goodness and tranquility. We learn from the environment about the environment and for the environment, to build up environment supporters. The program emphasized its conformity with international decisions on the environment, sustainable development and the principles of environmental education. It based its contents on six main characteristics: justice and accuracy, depth, skills building, a pragmatic approach to action, learning process integrity and ease of use.

#### The Education Kit

The materials of My Environment is My Life were designed to suit the training processes and methods, in accordance with Saudi Arabia's commitment to international decisions and recommendations in the field of environmental education. The materials adopted positive and active learning, and learning by doing, which leads to positive interaction with knowledge and the available data. The main components of the program resulted in producing two kits for teachers and students. The first kit includes the Environmental Education for Sustainable Development textbook, guidelines for evaluating environmental education materials and a collection of books that support the initiative's activities. The second, which is the environmental education kit for students, includes seven environmental activity books, wall panels, demonstration posters, and supplementary tools for the implementation of activities.

The other components of the program include a set of posters with pictures of various fauna and their habitats in Saudi Arabia, as well as the most serious risks that endanger them, a map of natural reserves' sites and guidelines on energy conservation at home and in school. Other products include postcards with pictures

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of the most important endangered flora and fauna, landscapes of the most important natural reserves, geological formations, water springs and valleys, with an invitation encouraging people to visit these sites and to preserve them.

The program also includes a component of establishing school environmental libraries that contain books for adults and for young students. Books are selected to correspond with current topics to encourage reading,

researching and acquiring more knowledge and information.

Coping with the developments and changes in institutional work regarding the environment, there is continuous action to integrate the initiative with the Saudi Vision 2030 and the programs concerned with the realization of the Sustainable Development Goals and to translate the Green Initiative into electronic programs, while retaining its practical aspects.





11 in geography. Among the most prominent topics covered are modern technologies for development, the future of development in the Arab world, the economics of growth and development, population and socio-economic challenges, and sustainable tourism. The Egyptian approach focuses on the difference between traditional economic development and sustainable development, and the proper management of natural resources to achieve sustainability.

Sustainable development in Lebanon is addressed in several grades in geography, grade 5 in English, grade 3 in Arabic, grades 1, 2, 6, 7, 9 and 10 in civics, and grade 12 in life sciences and earth, social sciences and economics. The main topics are: development concepts, relation between development and environment, and techniques of environmental assessment of projects. The topics are characterized by a rich variety and a balanced distribution among several school levels. Green economy is part of the curricula at the high school level. In Bahrain, sustainable development is part of commercial science in grade 11 and in grades 9 and 10 in civics.

The Syrian curriculum focuses on the sustainability of resources, by presenting the

concept of sustainable development in grades 5 to 8 in social studies and geography, grade 5 in science, and in grades 5 and 6 in agricultural courses. The topics include sound investment in nature's assets, harnessing and conserving natural forest resources, soil sustainability, water sustainability and rationalization of water and energy use, with a focus on renewable energy.

The UAE curriculum addresses sustainable development in grades 5, 8 and 10 in social studies and civics. It focuses on green economy and human development, with a presentation of national initiatives in this area. The curriculum also includes examples of UAE efforts to achieve sustainable development.

In Jordan, the concept of sustainable development is introduced in grade 11 in earth and life sciences. The concept is taught in the Tunisian curricula in grade 11 in earth and life sciences, grade 10 in geography, and grade 3 in general sciences, with a focus on rationalization of consumption. In Saudi Arabia, sustainable development is addressed in grades 9 and 12 in social education and geography. The Moroccan curricula include sustainable development in grade 12 in history and geography, and grade 11 in English.

## 8. NATURAL DISASTERS

The presentation of natural disasters in Arab curricula includes some common elements, revolving around the definition of natural disasters, their causes and consequences, and the role of man and society in reducing their impact. Some topics lack sufficient treatment, such as the frequency of natural disasters and human factors that may contribute to their aggravation. Natural disasters are entirely excluded in the curricula of some countries, such as Lebanon, UAE, Tunisia and Morocco. Even in countries that deal with natural disasters in their curricula, the treatment remains inadequate.

The Egyptian curricula tackle natural disasters in grades 7 and 8 in social studies, grade 12 in geology and environmental sciences, and grade 11 in geography. Highlights include the concept of natural hazards, water and wind hazards, environmental hazards, earthquakes and volcanoes.

In Bahrain, natural disasters are introduced in grade 8 in English. The Syrian curriculum addresses the concept in grade 10 in social studies and geography. The topics related to natural disasters within the Syrian curriculum include the recession of Dead Sea water levels and soil erosion.

In Jordan, the concept of natural disasters is addressed in the upper classes in physics and life and earth sciences. The Jordanian curriculum highlights the role of technology in monitoring natural disasters, introducing the environmental applications of remote sensing.

Natural disasters are addressed in Saudi Arabia in grades 7 and 9 in social studies and civics, and grade 11 in geography. Topics include disaster imaging from space, population migration from their natural habitat due to natural disasters, and early warning technology to detect natural disasters. It also highlights Saudi aid to countries affected by natural disasters.

The Iraqi curriculum addresses the concept of natural disasters in grade 9 in physics, grade 10 in chemistry, and grade 7 in Arabic. One of the topics is the relationship between disasters, diseases and epidemics.

## 9. OTHER ENVIRONMENTAL CONCEPTS

Arab schools' curricula deal with some other environmental concepts as well. In Egypt, environmental tourism is highlighted in the fifth grade in social studies. In Syria, the environmental impact of wars is included in grade 8 and genetic engineering is part of the grade 10 social studies and geography curriculum. The environmental footprint is introduced in grade 6 in social studies, the welfare tax and organic agriculture in grade 10 in science.

The curriculum of social studies and civics in the UAE includes a variety of environmental concepts, such as environmental responsibility in grades 1, 2 and 4, environmental security in grade 3, hydroponics and green economy in grade 8, resource management in grade 9 and water and food security in grade 11. Arabic language curricula in the UAE also include environmental responsibility in grade 6, recycling of paper in grade 7, and the disposal of plastic in grade 11.

In Jordan, science curricula include sections on fires, overfishing and overgrazing in grade 4, gray water and environmental awareness in grade 6 in science, and remote sensing in grade 10 in physics. Saudi curricula include healthy home in grade 5 in family education, and consumer habits in grade 8, while social studies and civics cover health damage caused by fast food and sugars.

## III. CONCLUSION AND RECOMMENDATIONS

Environmental concepts have been gaining ground in the school curricula in the Arab region, although big differences exist among countries regarding topics included, the depth of contents and methods of delivery. Pollution, natural resources and biological diversity still represent the common elements in school curricula, but other issues have been included in the last 20 years, such as climate change and resource management. With the global adoption of the sustainable development approach, green economy, green jobs and green buildings are topics that have been recently included in Lebanese curricula, while

ecological footprint became part of the curricula in Syria, the UAE and Jordan.

Among topics included in the curricula in various Arab countries are food security, plastic pollution, energy and water efficiency and waste management. The UAE introduced the topic of water security alongside food security. Renewable energy became part of the curricula in most Arab countries. Across the region, environment topics are no longer restricted to science, geography and civics books, but have started to become part of other subjects including languages, literature, history and economics.

In most cases, curricula covered aspects of personal action to protect the environment and to preserve and enhance natural resources, such as instructions to consume water and electricity in a sensible manner, recycling and tree-planting. Environment is widely becoming part of art education in Arab schools, mainly demonstrated in painting, and to a lesser extent music and theater competitions with environment themes. While fieldwork and nature expeditions are organized at a smaller scale, they started to be part of environmental education in some Arab countries. In few countries, students are encouraged to engage in community work to champion environmental causes.

The environmental content of the curricula needs to be strengthened in depth and breadth. Environmental aspects in school curricula should be discussed in the context of the Sustainable Development Goals (SDGs), in such a way to relate environment to the social and economic aspects. Sound management of natural resources, to achieve sustainability, should be given priority. This can be achieved through the introduction of the concept of ecological footprint, alongside options for green growth, with a focus on Arab countries. Big challenges facing the region such as water scarcity, desertification, drought, marine pollution and dangers of sea-level rise due to climate change, have to become a central part of the curricula. Extracurricular activities and community work should also be enhanced. Ultimately, environmental content in school curricula should be designed to adequately prepare students to be responsible citizens, to provide them with sufficient knowledge to place them on the right path for higher education.

## NOTE:

Data has been collected from school text books and ministries of education, as well as from material provided to AFED by the concerned ministries. Results have been compiled in tables 1 - 17.

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