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## Merging the Child in Nature: Towards the Greening and Afforestation Project in Light of the Initiatives of Egypt and Saudi Arabia

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## Merging the Child in Nature: Towards the Greening and Afforestation Project in Light of the Initiatives of Egypt and Saudi Arabia

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### Abstract

Awareness and appreciation of nature and environmental sustainability have become global issues. Egypt and Saudi Arabia have contributed to several serious initiatives to participate in the development of feasible solutions to these vital issues. The current research attempted to study the dimensions developed by those initiatives. The research adopted the dimension of education in early childhood and educating children about the issues of nature and the environment by monitoring the practices that take place in four programs implemented in Egypt and Saudi Arabia. The research aims to determine how the relationship between children and nature is rooted, and the consequent appreciation of nature and environmental awareness. The qualitative approach was adopted for the continuous interpretation of the practices of participants in the specific programs. The results found that educational programs that seek to merge nature and the environment in the education of children led to increased knowledge of environmental issues, improved environmental ethics and increased desire to discover, learn, protect and preserve nature. In other words, learning about the environment and nature may have a significant positive impact on the behavior of children's connection to nature and the environment. Nature offers real opportunities for children to grow and learn. In light of the current results, the research recommended the necessity of integrating the traditional approach of the early learning stage with a curriculum on the appreciation of nature and environmental awareness. Also, there is a need to train teachers to work in nature with children and educate the community, especially parents, about the importance of learning in nature for their children.

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### Introduction

Greening and afforestation are the main elements that complement the biological environment. Trees are the appropriate means to stop erosion factors and stabilize dunes, reduce heat and increase the rate of environmental recovery. Also, they are a means of fertilizing soils, combating desertification, reducing air temperature, reducing

humidity and providing a clean healthy environment. In addition, they also help purify the air from dust and filter pollutants. Trees and green spaces in general have a positive impact on enhancing biodiversity and play a role in an ecological balance due to providing shelter for several animals. The benefits of planting trees include not only environmental benefits but also social and economic benefits. Since the early 1960s, people have increasingly recognized environmental problems around the world such as air and water pollution, ozone layer depletion, biodiversity loss, and the greenhouse effect being exacerbated by human activity. Some researchers pointed out that nothing is less than a paradigm shift in environmental awareness, which leads to a reassessment of humanity's status in nature. This is imperative to our survival (Russell, 1988).

The issue of preserving the environment and ecological balance is one of the topics on the scene vigorously, given what the world faces of the environmental pollution that destroys all kinds of life. Egypt prepares for the Green initiative within the framework of the National Strategy for Sustainable Development "Egypt 2030". It aims to change behaviors, spread environmental awareness and urge citizens - especially young people - to participate in preserving the environment and natural resources to ensure their sustainability to preserve the rights of future generations. The initiative also aims to spread awareness of the preservation and management of natural reserves according to international standards to ensure the preservation of the balance of ecosystems and maximize opportunities for economic and social development. The initiative launched by the Ministry of Environment raises awareness of the importance of afforestation, recycling waste, rationalizing food and energy consumption, reducing the use of plastic, preserving marine creatures, reducing air pollution, and protecting nature reserves (Ministry of Environment, 2021). According to Lent (2018), an ecological civilization may be needed before it is too late. This requires reviving the spirit of green growth and rebuilding the foundations of our cultural and economic systems. If we went through an agricultural revolution 12,000 years ago and a scientific revolution in the seventeenth century, ecological civilization is needed now.

Since the problem has become global and needs quick solutions, the Kingdom of Saudi Arabia launched the "Green Saudi Arabia" initiative, in which it adopted several vital projects, including the "Climate Purification Project on Planet Earth". It presented the project at a summit in Riyadh 2020 and pledged a pioneering role in cleaning the planet from dirt and toxic gases. Then, it launched the "Green Saudi Arabia" and "Green Middle East 2022" projects. They include some ambitious work, most notably planting 10 billion trees inside Saudi Arabia and 40 billion trees in the Middle East (Ministry of Environment, Water and Agriculture, 2021).

Hence, the importance of integrating nature and environmental issues in the education of children at an early age emerged to grow a generation keen on the natural environment. It is not enough to run several projects to save the environment. This is not a sufficient solution. There is a need to raise a generation that believes in nature and preserves it and realizes its importance. Looking at the educational curricula offered to young people, whether in Egypt or Saudi Arabia, they are far from nature. They revolve around specific areas such as mathematics, language, arts, and even the field of science is only done within the classrooms. We find children far from what is going on around them in the natural environment through John Dewey's progressive education advocated teaching children about nature, from real beings and things, through art, the use of project strategies, and problem-solving and inquiry (Wardle, 2009). Children are an important part of solving environmental and ecological

problems because their attitudes and behaviors transfer with them into adulthood (Basile, 2000). Also, the literature has not yet provided sufficient insight into what helps children take an interest in the environment or activities or programs that can deepen their connection to nature and environmental awareness (Garner, 2012).

Hence, the importance of the current research emerges. The researchers observed the practices that take place in four programs entitled "Nature Centers" that stem from international initiatives to care for the environment. These programs try to integrate children with nature, teach them about it, and increase their environmental awareness in interesting ways. They include caring for flowers that aim at appreciating the child of nature; the cultivation of the environment that aims to introduce children to the types of crops in their environment and their importance to the environment. They also include gardening and its role in spreading a culture of sustainable development, greening, and afforestation that aim to increase environmental awareness among children and the importance of green spaces and planting trees.

### **Research Questions**

The main question: How can the relationship between children and nature be rooted, and the consequent environmental awareness?

Sub-questions:

- 1- What are the methods used in the four specific programs 'Nature Centers' to merge children into nature and increase their awareness and environmental exploration?
- 2-What information is included in the four programs "Nature Centers" offered to children?

### **Objectives of the Study**

The research aims to explore how learning about nature and appreciating it and environmental awareness are integrated into the education of young children through four programs that take place in nature.

### **Review of Literature**

The literature will help explore humankind's relationship with nature and shape behaviors to contribute to a better understanding of how children are merged into nature through the following themes:

#### **The Initiatives of Egypt and Saudi Arabia**

Despite the great interest in recent years in the developed countries to preserve the environment under the name of "environmental awareness", it is still one of the most important contemporary issues that the developed countries are interested in. Environmental awareness is the first learning outcome that environmental education seeks to achieve in the learner. Environmental awareness includes cognitive, emotional, and skillful components. Environmental awareness represents the first and simplest levels of the formation of environmental trends, which in turn affect the learner's expected behavior toward the environment. It is also one of the indicators in the light

of which it is possible to predict the learner's environmental behavior toward his environment (Sabri, 2016).

### **"Go Green" Initiative in Egypt**

The initiative comes within the framework of the national strategy for sustainable development "Egypt 2030". It aims to change behaviors, spread environmental awareness, and urge citizens - especially the youth - to participate in preserving the environment and natural resources to ensure their sustainability to preserve the rights of future generations. The initiative also aims to spread awareness of the preservation and management of natural reserves according to international standards. This is to ensure the preservation of the balance of ecosystems and maximize opportunities for economic and social development.

The initiative, launched by the Egyptian Ministry of Environment, raises awareness of the importance of afforestation, recycling of waste, rationalizing food and energy consumption, reducing the use of plastic, preserving marine creatures, reducing air pollution, and protecting nature reserves. It also organized the World Youth Forum, 2019 in Sharm El-Sheikh, Egypt. This issue captured the attention of countries and leaders. Egypt, like the rest of the world, faces the challenge of climate change. Therefore, Egypt has put climate change at the top of its priorities. The Ministry of Environment has also taken many measures at the international and national levels to meet these challenges. In addition, the ministry organized a pavilion to display national projects to address the effects of climate change and the ministry's projects in various sectors within the framework of the Ministry of Environment's participation in the World Youth Forum. Furthermore, it presented a documentary film about all these projects such as improving energy efficiency and the national program for converting street lighting to energy-saving lighting systems. It also presented the "Gulf of Oil Project", the "solar energy complex near Aswan", and the "project to develop small-scale decentralized photovoltaic systems" and solar-powered surface water pumping stations for irrigation in the governorates.

Egypt seeks to transform the challenges of climate change into opportunities to achieve low-emission development and increase flexibility and adaptation within the framework of Egypt's sustainable development strategy 2030 through a comprehensive national plan for all development sectors in the country. Sustainable development has become the focus of education in Egypt since the launch of Egypt Vision 2030. Atallah and Al-Khamisi's (2021) study aimed to come up with proposals for the development of green schools as a new educational formula in light of Egypt's vision of 2030. The study recommended the necessity of enhancing the role of green schools to develop sustainable environmental values. Abbas (2018) also identified the readiness of accredited primary schools in Menoufia Governorate to implement green school practices in terms of the essentials that help the implementation and the obstacles that may encounter. The study was applied to teachers to provide some recommendations that may help in implementing these practices. A questionnaire prepared for this purpose was applied to a sample of (315) teachers. The results showed the availability of the essentials for implementing green school practices in schools to a large extent, especially after "the ability of teachers to provide students with green school practices". It came in the first place with a very large degree of availability whereas "supporting courses and activities to implement practices." came in second place. Abdel Hadi's (2020) study attempted to develop a proposed vision for the application of the green school model in primary education institutions in Egypt. The

study reached a proposed vision that included a set of procedures and mechanisms at the level of both the Ministry of Education and the context of primary schools in Egypt. The application of which may lead to a shift toward the green school model, which is one of the most important mechanisms for achieving sustainable development.

### **Saudi Green Initiative**

The importance of environmental awareness has emerged with several conferences at the global level. They came to confirm the importance of the topic, as it was recently announced at the Green Saudi 2030 Forum in March 2021 that the Kingdom follows three official principles that will be included in the education of the community. They are reducing carbon emissions, raising vegetation cover and finally combating pollution (Ministry of Environment, Water and Agriculture, 2021). The Kingdom of Saudi Arabia is committed to making an effective contribution to the global response to climate change. It is currently working on providing innovative solutions to help tackle the climate crisis. With the emergence of renewable energy, the Saudi Green Initiative will support the Kingdom's vision of becoming a leader in the field of sustainability at the global level. It is considered one of the most important energy-producing countries in the world. His Highness Prince Mohammed bin Salman Al Saud launched the "Saudi Green Initiative" and the "Middle East Green Initiative". The two initiatives outline the direction of the country and the region in protecting the land and nature and put them on a road map that has clear and ambitious milestones and contributes strongly to achieving global goals. His Highness the Crown Prince says, "As a leading global oil producer, we are fully aware of our share of responsibility in advancing the fight against the climate crisis, and we will work through the Saudi Green Initiative to raise vegetation cover, reduce carbon emissions, combat pollution and land degradation, and preserve wildlife." The Saudi Green Initiative" (Ministry of Environment, Water and Agriculture 2021, p. 1).

The Kingdom of Saudi Arabia seeks to be the lungs of the Middle East. The initiative will not only stop at greening, but because the climate is a global issue and dealing with the green economy is no longer an option, but rather an urgent necessity at a time when the impact of environmental degradation in the Kingdom is estimated at 90 billion riyals. It is important to foresee solutions based on artificial intelligence in employing natural gains to be supportive of the available solutions such as recycling treated water and benefiting from the capabilities of trees, manographs, or local trees. The benefit of rainwater and seeding is maximized, and the progress is made on a methodological and scientific basis to create a new lung, not only for the Middle East but also for the world" (Ministry of Environment, Water and Agriculture, 2021, p. 8).

The two Saudi initiatives also seek to plant 10 billion trees in the Kingdom of Saudi Arabia during the coming decades. This is equivalent to rehabilitating about 40 million hectares of degraded land. It means an increase in the area covered by current trees to 12 times. The Kingdom contributes more than 4% to achieving the goals of the global initiative to reduce the degradation of land, and wild habitats represent 1% of the global target for planting a trillion trees (Ministry of Environment, Water and Agriculture, 2021, p. 2). The vast lands will be taken advantage to save natural life, reduce disasters and storms, improve the quality of life and storms, create new job opportunities, open up areas in the industry, and ecological balance, and create the future in all its fields and make nature friendly to humans (Ministry of Environment, Water and Agriculture 2021, p. 2).

Schools in the Kingdom are racing to implement the greening initiative. The Saudi Ministry of Education announced the implementation of the initiative in schools. The "My Green School" initiative was launched to stimulate the school community and encourage them in the field of afforestation and the development of vegetation cover. It also launched the "greening and afforestation" camp in kindergartens in Al-Ahsa, whose practices and results will be reviewed in this research.

### **Connection between Nature and Children**

Many of us want to help children learn about the natural world and feel the importance of instilling responsibility for caring for the earth. However, we may not be sure what is appropriate to teach young children and how to promote environmental ethics (Wilson & Wilson, 2007). Understanding and rooting children's environmental attitudes are critical to correcting the environmental degradation of the past two centuries. In time, children will need both the inclinations and the skills to address environmental issues (Garner, 2012, p. 13). The development of environmental ethics should not be left to chance. Some may ask when it is appropriate to tell children that they have a role in "save the earth" - when they are eight, six, five, or even earlier? This question does not come with a simple answer. Parents and early childhood educators often struggle with these related issues (Wilson, 2007). For most conservationists and many parents, it seems clear that it is a good idea to teach children to appreciate the natural world. Connecting to nature supports not only their development and well-being but also the ongoing efforts of humans to conserve the natural world (Larson & Fischer Clayton, 2022).

Children's opportunities to connect with nature are important to preserving the biosphere. This is a letter from the International Union for Conservation of Nature, Children and Nature Connection and other CBD partner organizations in 2018 (Charles et al., 2018). The more children connect to nature, the greater their sense of responsibility towards it, but this connection must be built early. Cheng and Monroe (2012) developed a nature connection index that was tested to measure children's emotional attitudes towards the natural environment. A factor analysis was conducted to explore the various factors concerning the nature index. Also, an analysis was performed to examine the association between the variables. The results indicated four dimensions in the children's connection to nature index (a) enjoyment of nature, (b) empathy for creatures, (c) sense of loneliness, and (d) sense of responsibility.

Children's connection to nature influences their intention to participate in nature-based activities in the future. Children's relationship with nature, their previous experiences with nature, their perceived family values towards nature and their perceived control positively affected their interest in performing environmentally friendly behaviors. Connecting to nature is beneficial for well-being and pro-environmental behavior (Lumber et al., 2017). Chawla (2020, p.3) says my reviews show that children and teens benefit from living close to nature and having adults in their lives who encourage free play and outdoor discovery. When they feel connected to nature, they are more likely to be healthy and well-being, more capable of creative thinking, and more likely to exhibit cooperative helpful behaviors. They are also better able to take action to conserve nature such as feeding birds, saving energy and recycling.

### **Early Childhood and Environmental Awareness**

Environmental education is an educational process that deals with human interrelationships with the environment and uses an interdisciplinary approach to solving problems while demonstrating value (Sawitri, 2017, p. 1). Environmental education defined the objectives of environmental education to help social groups and individuals acquire awareness, sensitivity, knowledge and understanding of environmental problems, pro-environmental values and interests, skills to identify and solve environmental problems, and, finally, provide the opportunity to participate actively. In other words, environmental education helps them learn the necessary skills to identify and solve environmental problems and provides the opportunity to actively participate in environment-related actions (UNESCO/UNEP, 1977).

According to Sawitri (2017, p. 1), the early childhood years are the period of greatest and most important developments in an individual's life. They are generally considered the foundation upon which he builds the rest of his life. However, these early years have traditionally received the least attention from environmental education. While early childhood environmental education can raise children's environmental awareness and shape environmental attitudes, little is known about the effects of environmental education programs on children's pro-environmental behaviors (Iwasaki, 2022). Sawitri (2017) summarized the several daily activities that can be done to educate children in their early years about the environment. Through these activities, the unique characteristics of the tropics and coastal regions can be used to facilitate children's knowledge of nature and the environment. According to Hedefalk et al. (2015) and Pearson and Degotardi (2009), children are surrounded by major global environmental issues such as pollution, climate change, and biodiversity loss. These issues are discussed with children in various media. Therefore, environmental education has become an important field of education. There is a strong need to teach children early on how to act in sustainable ways.

### **Natural Projects**

Within a generation, children's lives have largely moved inward. The free exploration of the nearby natural world was lost even as research indicates that direct experiences of nature in childhood contribute to a lifelong nurturing of nature (Chawla, 2020, p. 619). Chawla (2020, p.636) also emphasizes that children and adults with higher indices of connection to nature show more pro-environmental behaviors. According to Nazaruk and Klim-Klimaszewska (2017, p. 1), teachers systematically introduced a direct educational project in nature in four ecosystems: meadow, forest, park, and zoo. Analysis of the data collected in the research showed that direct cognition affects increasing children's knowledge and skills. Brusaferrero (2020, p.72) suggests that a combination of traditional knowledge-based programming with activities and programs that engage children emotionally concerning environmental issues may be more effective in producing increased environmental awareness than knowledge-based programming alone.

At the Arab level, there is very little literature concerned with teaching children about nature and environmental awareness. There are also no programs for children approved by official bodies such as the Ministry of Education, whether in Egypt or Saudi Arabia, that work to integrate their education into nature. Even the programs presented

in this research are self-efforts of researchers.

The current research is concerned with presenting four programs that take place in nature for children between Egypt and Saudi Arabia. They focus on activating children's connection to nature at the level of awareness of environmental issues and their environmental exploration. The research stems from the principle that children's direct connection to nature enables them to understand it better. This can help to implement solutions to the problems of environmental degradation and ecological destruction to ensure sustainability for future generations. The programs also work to provide environmental learning for children outdoors through scientific fieldwork. They focus on a specific environmental issue: the role of afforestation and greening in combating environmental degradation and caring for and appreciating the environment. An overview of the four programs follows:

*1- Flower care:* This program includes a leader, a kindergarten teacher, (4) assistant teachers, who have experience working in nature with children, a dedicated team that provides accurate information to children, a teacher of agriculture, and a gardener. The program aims to teach children about the growth and cultivation of flowers, their care, and their importance to the environment. The learning took place in the activity hall, nursery and kindergarten garden.

*2- Environmental cultivations:* the program consists of a leader, a kindergarten teacher, (4) assistant teachers, who have experience working in nature with children and an agricultural teacher. The program aims to preserve the environment and spread a culture of sustainable development.

*3- Horticulture:* the program includes a leader, a kindergarten teacher, (4) assistant teachers, who have experience working in nature with children and an agricultural teacher. The project aims to introduce children to plants and their role in preserving the environment and spreading a culture of sustainable development.

*4- Greening and afforestation:* The program consists of a leader, a kindergarten teacher, and (5) assistant teachers. It aims to increase environmental awareness among children by teaching them about the importance of green spaces and trees, planting and preserving seedlings and their role in increasing environmental revival.

## **Method**

### **Research Design**

The qualitative approach was adopted in this study. The role of researchers was to continuously interpret practices in the specific programs.

### **Population and Sample of the Study**

The study consisted of (4) program leaders, (13) teachers who have experience working with children, (200) children between the ages of 7 and 11 years participated and an associate team of specialists. The programs took place in several different locations (activity halls, agricultural land, gardens, flower shops and gardens attached to the kindergarten). The locations differ in several variables including the location of the program, the "Nature

Center”, the leaders, teachers, assistants and the proposed program). For a better understanding, the similarities and differences between these variables within the programs will be studied.

### **Instruments of the Study**

Data were collected through some instruments:

- *Semi-structured interview*: Semi-structured interviews were used to reveal the practices of program leaders, teachers, and support teams for merging children into the natural environment and teaching them about environmental issues.
- *Factors included in the interview*: experience of program leaders and support team in early childhood education and learning about the environment and nature, duration of the program, and size of participants in each program. To explore how program administrators merge children into the natural environment and teach them about environmental issues, understanding these practices will provide young people’s educators with the tools they need to set standards and programs for early childhood environmental education in the Arab world.
- Observations, audio recordings, video clips and photographs were also used.

### **Procedures of the Study**

- 1- Previewing the literature to understand children’s connection to nature, environmental learning, and the factors that help/obstruct this. That there are few projects presented to children to connect them to nature was ensured. The initiatives of Egypt and Saudi Arabia were benefited. The programs have been linked as continuous achievements of initiatives in the early childhood stage.
- 2- Contacting program leaders, scheduling and conducting interviews in an organized manner in the program’s natural environment.
- 3- Documenting interviews and activities with audio recordings and photographs of children, teachers and program leaders (see Figure 1).



Figure 1. Samples of Pictures of Children while Working in Nature

4- Preparing brochures that help to understand the importance of teaching children about nature. The brochures were distributed to parents and schools and included leaflets and plans for activities to be provided in schools, pop up stories with some pictures and information about environmental degradation, the importance of greening and trees, their role in protecting the environment and the importance of environmental learning and connecting to nature (see Figure 2).



Figure 2. Samples of Pop-up Stories designed for Nature and Environment Activities

4- Analyzing the data according to what was done in the interviews and the children's observations. A report was written on each program, then the research questions were answered and interpreted.

## **Results**

The purpose of the research is to explore how the four programs merge children into nature and how they teach them about the environment. The main results obtained from the four programs are previewed.

### **1- What are the methods used in the four specific programs 'Nature Centers' to merge children into nature and increase their awareness and environmental exploration?**

The results of learning in the four nature centers revealed that children's learning about nature and the environment and their problems were more effective if children were merged into nature and learning about their environment at the same time. Children have shown a remarkable response to preserving the environment and caring for plants. In the horticulture program, cooperative learning with children was followed in caring for flowers while working in the garden and painting activities in the activity halls and nature. The ethics of dealing with the environment also appeared in preserving flowers and not picking them. This is one of the children's responses: "While in the garden, the agriculture teacher picked some flower leaves in front of the children to see them closely. The teacher commented on the behavior "right or wrong and why?", The children answered, "wrong", if we need to take leaves, we can take from the fallen leaves on the ground." Teacher, Marwa.

According to Bailie (2012), the combination of early childhood and environmental education is more powerful than being individual and provides opportunities to develop self-regulatory skills. In the programs of flower care, environmental cultivation, horticulture, greening and afforestation, the children had great opportunities to explore nature which contains trees and wide green areas. Cooperative learning was evident in several situations, including

planting small seedlings in the kindergarten garden in cooperation with the agriculture teacher and under the supervision of teachers. Also, that the children were entrusted to the daily care of them was a source of interest to them, especially after the abundant information they learned from the work team. Some of the children’s responses: “The leaves are different, they are not all the same, they are from different trees, some trees smell of spices, the trees are very large, full of green leaves, the trees prevent the dirt from reaching us, the birds live in the trees, we don’t pick flowers, we don’t bother birds till they don’t flee and leave babies.”

The teachers mentioned that using nature to teach the children was much better than learning inside the activity rooms, especially when accompanying the children with the agriculture teacher. Children have acquired various skills while out walking. They learned to be calm outside in the natural world, so they can hear or see something. They are very cooperative, close to each other, grow plants together and exchange tools. The children also developed a great sympathy for different living creatures. They race to take care of the flowers and to grow the seeds. In the greening and afforestation project, the teachers brought seedlings of young trees to all the children, after the activity of “The Tree is the Lung of Nature.” There was prior communication with the parents to help the children plant trees under the activity “In every house a tree”. Later, the parents were contacted, and their responses were interesting about how much their children care about the young seedlings. A parent said, "I asked my child to leave the young seedling for the next day. I do not have time to plant it with him. My child only gave me a lesson on the plant and how it will die if we leave it, and we must plant it in suitable land to live, and give us clean air, and finally, he insisted on planting it." teacher, Rem.

In the four programs, the teachers and children took small plants to care for them in the kindergarten garden. The children also sampled fallen leaves of various colors and shapes, and they all refused to pick leaves from trees or flowers. The children also gained a sense of self-confidence and a sense of place. Successive visits to nature connected the children to living creatures and the green land. Going out to nature was a real pleasure for them (see Table 1).

Table 1. Comparison of Learning based on Nature Specific Programs

Themes	Flower care	Environmental cultivations	Horticulture	Greening and afforestation
Experiences of the leader and team	The program leader and the assistants, who specialize in kindergartens and did not have a great idea of working in nature, so a specialized team was hired	The program leader is a kindergarten teacher, and assistant teachers have experience working in nature with children, an agricultural teacher for specialized	The program leader is a kindergarten teacher, and assistant teachers, who have experience working in nature with children, an agricultural	The leader of the program is a teacher, assistant teachers in the field of kindergarten, who have experience working in nature with children and the work team who has social skills to deal with children and

Themes	Flower care	Environmental cultivations	Horticulture	Greening and afforestation
	consisting of teachers and a teacher of agriculture. The staff is enthusiastic and cooperative.	information and a goal-oriented team.	teacher for specialized information and a child-focused team that provides authentic experiences.	ready to work long hours in nature.
Nature center environment	Work outdoors in parks, activity halls.	Work outdoors in agricultural lands, activity halls.	Work outdoors in agricultural lands, activity	Work outdoors at camp in nature, gardens attached to kindergarten and activity halls.
The time the child spends at the nature center	2 hours in the garden, twice a week for 6 months	A full day per week that the children spend on the agricultural land, with a place prepared for the children to gather and work for a whole year.	A full day per week that the children spend on the agricultural land, with a place prepared for the children to gather and work for a whole year.	Children go to the summer camp for one month and for half an hour every day in the garden of the kindergarten on a continuous basis.
The traditional kindergarten curriculum	A governmental kindergarten that offers the children the traditional curriculum in the activity halls and the kindergarten playground, and there are no activities outside the kindergarten.	A governmental kindergarten that offers children the traditional curriculum in the activity halls and the kindergarten playground, and there are no activities outside the kindergarten.	A governmental kindergarten that offers children the traditional curriculum in the activity halls and the kindergarten playground, and there are no activities outside the kindergarten.	A private kindergarten that provides children with the traditional curriculum in the activity halls and the kindergarten playground, in addition to activities in an agricultural section in the kindergarten that serves the science corner.
Communicating	Workshops for	Meetings with	Meetings with	The camp is held

Themes	Flower care	Environmental cultivations	Horticulture	Greening and afforestation
with parents/community	parents and some guardians to clarify the objectives and benefits of the program.	parents and guardians to influence them to leave their children to agricultural lands for a full day.	parents and guardians to influence them to leave their children to agricultural lands for a full day.	annually and has a good reputation among parents who realize its usefulness as well as the time the children spend in nature.

**2- What information is included in the four programs "Nature Centers" offered to children?**

The natural environment provides unique resources, which the four programs have been able to use for the benefit of children’s education. Children’s walks in parks, farms, orchards, and nurseries for long periods enabled them to learn information about the environment and nature that is difficult to obtain in the activity halls. “The groups of children were able to learn about leaves incredibly. There are countless samples in the natural environment. Children drew many of them in an amazing way that mimics nature. Many details cannot be done in the activity hall (see Table 2).

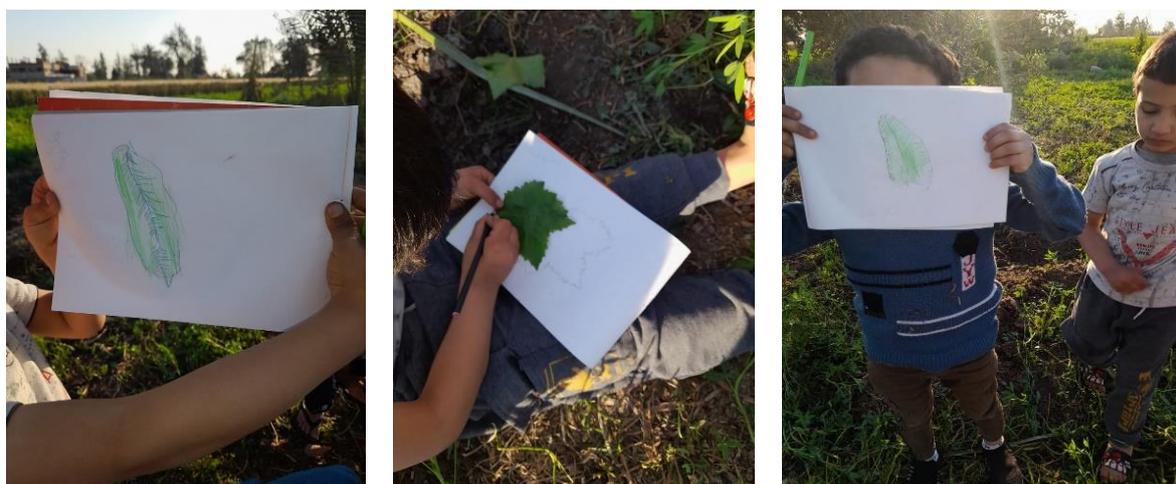


Figure 3. Samples of Children Working in Nature Centers

The objective of the four programs was to focus on plants and their relationship to the environment and nature, but more learning took place than the specific objective. The existence of other variables related to plants made children learn many environmental concepts including the relationship between flowers and insects, the food of birds and farm animals, their living places, agricultural crops, types of vegetables and fruits and planting seasons. Also, they included trying to know everything about plants and help in caring for them, the importance of trees and green spaces for the environment. There has been a big change in the environmental behavior of children. The curriculum of the four programs in nature is a good one, so it should be flexible. This means one can learn about things to see while exploring the natural world (see Table 3).

Table 2. The Natural World and Environmental Learning Curriculum

Themes	Flower care	Environmental cultivations	Horticulture	Greening and afforestation
Program objectives	Teach children about the growth and care of flowers, their importance to the environment and appreciation of nature.	Introducing children to environmental crops, ways of growing and preserving them, how to benefit from them, and their role in preserving the environment and spreading a culture of sustainable development	Introducing children to plants and their role in preserving the environment and spreading a culture of sustainable development	Increasing environmental awareness among children by teaching them about the importance of preserving green spaces and trees, and their role in increasing environmental revitalization.
Nature Centers Curriculum	A flexible program for children that provides information about the types and colors of flowers, their names, cultivation methods, their importance to the environment, the life cycle of flowers, plants, flower cultivation seasons, and activities inside the activity halls.	A flexible program focused on children. It provides information about the common crops in the environment, why they are grown in comparison to others, their importance to the environment and their relationship to living organisms, tracking plants in different seasons of the year, planting some plants, agricultural crops, types of vegetables and fruits, and activities inside the activity halls.	A program focused on children and provides information on agricultural land, tracking plants in different seasons, the importance of green land, the importance of plants, plant change and its impact on the environment and activities inside the activity halls.	A program directed to children, flexible, focusing on providing information on the importance of trees, methods of their growth, and their importance to the environment, especially the desert environment, and the role of trees in combating environmental pollution, planting a seedling, activities inside the activity halls.
Assessment tools	Recording semi-structured interviews, performance rating scale, children's	Observation, performance rating scale, children's work (planting, drawings), video recordings,	Observation, performance rating scale, children's work (planting,	Recording of semi-structured interviews, performance rating scale, children's work (planting young

Themes	Flower care	Environmental cultivations	Horticulture	Greening and afforestation
	work (flower arrangements, drawings, and worksheets), video recordings, photos.	photos. Recording children's questions with the agricultural teacher in the work environment.	drawings), video recordings, photos. Recording children's questions with the agricultural teacher in the work environment.	seedlings), video recordings, photographs. Explaining the causes of environmental pollution through pop up stories
Learning strategies	Cooperative learning and art learning.	Experiential, hands-on, collaborative learning.	Practical performance-based learning in a collaborative learning and learning environment.	Project-based learning, art learning, and collaborative learning.

## Discussion

With a comprehensive look at the programs in question, we note the presence of a description of the programs and their objectives, the experiences of the work team, the daily practices of integrating children into nature and environmental learning, the curriculum, strategies and methods of assessment, and ways of communicating with parents to support the programs (see Figure 4).



Figure 4. Learning in Nature makes Children Happy

The results indicate the importance of teaching children about nature, increasing their environmental awareness, and engaging them in solving environmental problems. This work requires a teacher and staff that combines early childhood specialization and environmental learning for real learning to occur. In the programs in question, three

of them used expertise in the field of environmental work to give children authentic experiences. According to Bailie (2012), teachers must have a background in both early childhood education and environmental education as finding teachers from both backgrounds is difficult. Bailie stated that the combination of early childhood and environmental education is too powerful to be both on its own. Despite the good practices in the four programs, they showed a lack of training and education for early childhood teachers in dealing with nature and environmental problems. Three of them have hired specialists to help them achieve their objectives. This calls for the need to prepare teachers scientifically to integrate nature and the environment into early childhood education. According to Sawitri (2017), the early years are those that have traditionally received the least attention from environmental education.

The integration of environmental education into early childhood education provides opportunities to achieve early childhood goals in all fields while developing ethics in dealing with the environment. Therefore, a flexible curriculum based on nature and environmental learning must be provided in kindergarten, with teacher training, and parents' awareness of the importance of learning about nature and the environment. Wilson (2018) also offers in his book a wealth of ideas on how to enhance creative play and learning in the outdoor environment with an emphasis on interaction with the natural world. According to Copple and Bredekamp (2009), effective early childhood education provides opportunities for children to develop in all areas including social, emotional, cognitive, physical and spiritual development. Effective environmental education provides opportunities for children to learn about the environment immerse themselves in the natural world and become active in the environment (Davis, 1998).

## **Recommendations**

The findings of the current research support the following recommendations. The traditional early childhood curriculum and nature-based learning should be integrated to enhance and sustain environmental awareness. Children need curricula on the environment that provide opportunities to learn about nature in addition to the current curriculum. Also, there is a need to train early childhood teachers to work in nature with children. In addition, a culture of environmental awareness and environmental issues and their importance among parents should be spread to support learning about nature and the environment in early childhood. Moreover, opportunities to play and work in nature are to be provided to increase attachment to the environment and pro-environmental behaviors and confidence in their ability to work. Children's work in nature should be encouraged and art learning strategies, projects and cooperative learning should be activated. Furthermore, the learning environment in kindergartens should be paid attention to. Children need a green space such as a small garden to work in nature and learn about the environment. More research and programs should be conducted on integrating education in nature and environmental awareness to influence children's education and attitudes about pro-environmental behaviors and develop environmental problem-solving skills. It is worth noting that three of the program leaders are on their way to obtaining a master's degree in subjects related to nature, believing in the importance of working in nature with children. The above-mentioned programs will be a continuation of the applied aspect of their studies:

- Arranging flowers using the art of Ikebana to develop an appreciation of nature for the kindergarten child by teacher, Marwa Sayed Muhammad Wadi.

- Horticulture and its role in spreading a culture of sustainable development for a kindergarten child (the village of Burma as a model), teacher, Mennat Allah Salah Talha Al-Matit.
- Kindergarten child's inspiration for storytelling from the natural environment, teacher, Al-Zahra Mohamed Abdel Moneim Alwan.

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