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Perceptions of the environment and wildlife by school students in Egypt

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Abstract

This paper explores the perceptions of school children and adolescents concerning their current environment, and how they would like it to be. Respondents were asked to do two drawings of their environment, one for the present and another for their desired environment. The results revealed a keen awareness of environmental problems, but little concern about wildlife. Differences between current and desired visions showed remarkable results. Artifacts, pollution and population formed their main concerns: few showed wildlife. The drawings showed clear causes to the various environmental problems, and some even suggested solutions. It is essential that a curriculum for schools students be established to introduce children to biodiversity and the interdependence between organisms.

Keywords: schools, students, illustrations, artifacts, pollution, animals, plants, present, future

Introduction

How do children perceive wildlife? And is it part of their lives? A wide consensus exists that human attitudes and behaviour toward nature must be understood, and often influenced, in order to avoid further loss of biodiversity (Kaczensky 1996). To encourage and foster a relationship between children and their environment, we first have to know how or what they perceive about it. Whether grouped by reason of geography, ethnicity, age, gender, schooling, socio-economic status, religious conviction, personal philosophy, or whatever, appreciating how particular groups of people see their environment is of academic interest, of educational value and of importance for wildlife and habitat conservation (Reiss 2001).

Egypt has perhaps the longest record of human-induced habitat change of any country in the world, and has few habitats that can be regarded as unaltered except the deep deserts of the Great Sand Sea. The country has more than 20,000 species of plants and animals, many of which are now endangered, and some endemic. Conservation is therefore a serious issue that should attract our attention, and for this reason alone is worthy of study. Schools play an important role in the formation of positive attitudes towards the environment in young children (Barraza & Walford 2002). Environmental education in schools is an important strategy in achieving environmental protection and improvement. However, it needs to be based on children's understanding of their environment rather than on assumptions of what children know and believe (Loughland *et al.* 2003). In Egyptian schools there is no curriculum concerned with wildlife and nature watching, and it is therefore not surprising that these do not seem part of Egyptian culture.

This study was inspired by Reiss' (2001) work on Bedouin, restricted to the mountainous area around Mount Sinai in Egypt. Reiss' study focused on the Gebaliya Bedouin who "live in a relationship with the land and their environment that is increasingly uncommon for some people". My work uses a similar methodology but on a much wider scale, applying it to school children from various different regions of Egypt, with their different biodiversities and habitats. The aim is to help to design a programme for nature and its conservation by assessing how children perceive the environment, and whether wildlife is part of that perception. No such study has been done in Egypt before, in fact nor in any country of North Africa or the Middle East, despite it being such an important issue.

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Materials & Methods

For sampling purposes Egypt was divided into five regions: Cairo & Giza (urban), the Delta (agricultural), Upper Egypt (Nubian), the Western Desert (Bedouin), and the Sinai - Suez Canal (coastal).

Cairo has a metropolitan population of about 18 million people: it is the sixteenth most-populous metropolitan area in the world, and the highest in Africa. Being the capital means it has most of the industrial activities and the highest job opportunities of the country. This makes it attractive to rural people, and huge numbers migrate to the city for a better life, jobs and education. Cairo's rapid expansion has led to many environmental problems. For example, air pollution is a matter of serious concern, exceeding the WHO and national limits in certain months. Major contributors to air pollution in Cairo are burning of agricultural residues and municipal waste, public and private transport, lead smelters, fertilizer and cement factories (World Bank 2003).

The Delta is a rural triangle extending from Alexandria to Port Said to Cairo. Much of its coast is taken up by the brackish lagoons of lakes Maryut, Idku, Burullus and Manzalah. Because of its fertile soil, agriculture by the fellahin (farmers) is the main activity, who depend greatly on their domestic animals. Fellahin mostly lead a simple life in small houses with tight family and neighbor relationships.

The Western Desert comprises two-thirds of the land surface of Egypt, and includes a number of oases. It is generally desert (not altogether devoid of life), but the oases have spring water and thus are cultivated. We considered the Fayoum to be part of this region, although sometimes it is assumed to be similar to the Delta. The Fayoum receives its water through man-made canals branching from the Nile, and is known for its agriculture and famous for its extraordinary assemblage of fossil animals. Siwa Oasis was called the Place of the Palm Trees, which best describe it even now. The oases are inhabited by people who depend on agriculture and handicrafts, and have a very simple life in direct contact with nature.

North-eastern Egypt was represented by the Sinai peninsula and the area of the Suez Canal. Sinai is rich with many different kinds of wildlife, and its inhabitants are closely related to it. The people of the Suez Canal region depend mainly on fishing and agriculture, especially fruit trees (Ismailia), industry (Suez) and trade in imported goods (Port Said).

Upper Egypt extends from Assiut to Aswan. Its inhabitants are Nubian (Sa'idi) and known for their highly conservative views. Because of the fertile Nile valley, agriculture is the main activity, especially cultivating tropical crops such as sugar cane. Men from Upper Egypt are known to be the best builders in Egypt, and another important activity is tourism.

The sampled students were participants in a semi-annual educational camp for reading, a residential week for students from governmental schools with the highest frequencies of visits to their libraries. The Ministry of Education receives the students from all over Egypt to learn and participate in library activities (discussing books, short-story and poetry writing, acting and poetry recitation). The exercise was not restricted to students with artistic interests, to ensure an unbiased view of all students, and to discard the idea of it being an art competition.

Each student was given an A4 white sheet and a pencil, and asked to answer two questions with their drawings. Firstly, they were asked what the environment was like where they live ('*real*'); drawing took about 15 minutes. After they had finished, students were asked to turn the sheet over to draw the environment in which they wished to live ('*desired*'). We collected a total of 60 sheets: 8 were excluded (one, done by a boy of six years old, contained only 6 fish; another two had input from a teacher; one seemed to misunderstand the question and drew a university; and the other four were done by art teachers). At the end we were left with a total of 100 drawings, since 4 students drew their current environment and wrote on the

back that this was the environment in which they still wanted to live: we decided therefore to count these drawings twice.

The 52 students consisted of: 31 females and 21 males; 12 were primary stage (age range 6-11 yrs), 28 of preparatory stage (12-14) and 12 of secondary stage (15-18); 11 were urban, 12 agricultural, 11 Nubian, 6 Bedouin and 12 coastal.

Drawings were quantified by assessing the presence of six main items: *natural*, including sky and ground (clouds, sun, sea, or rivers); *animals*, divided into wild (e.g. finches, butterflies) and domestic (e.g. goats, donkeys); *plants*, divided into trees and shrubs; *people*, divided into men and women; man-made items (*'artifacts'*) included buildings (houses, mosques, hospitals, etc.), boats, vehicles (buses, trucks, cars) and equipment (brooms, forks, etc.); and *pollution*, which was divided into solid wastes, air and water pollution. We counted every item represented in each drawing.

The data were analyzed using Generalized Linear Models implemented by SPSS, usually with Poisson errors; often there was overdispersion, adjusted using quasipoisson errors.

Results

Table 1 shows the number and the percentage of the items in the first (real) and second (desired) drawings done by the children. Drawings of their current environment were dominated by images of artifacts (mainly buildings and vehicles) and of pollution (mainly solid wastes and air pollution).

The drawings of two boys from different regions (Fig 1a,b) illustrate the dramatic difference between their depictions of where they live now. The first (Fig 1a) from the Delta shows a number of tall buildings with satellite dishes on top, and a factory between two buildings; the sun is hidden behind thick smog, and the curved streets have many cars each belching out smoke. A boy and a girl are near a waste basket, and there is rubbish in the street surrounded by many flies. The second (Fig 1b) from northern Sinai shows a very simple house with palm trees, sun, a flock of birds, the sea with a sailing boat, a Bedouin barbequeing, a goat eating a palm tree, and a man playing music with his flute.

Table 1: The basic quantitative features of the contents of the drawings.

Category	Real	Desired	Category	Real	Desired
Animals	119 (8%)	224 (21%)	Human	212 (15%)	80 (8%)
Wild	113	207	Men	126	67
Domestic	6	17	Women	13	13
			Unknown	73	0
Plants	112 (8%)	320 (30%)	Natural	124 (9%)	150 (14%)
Trees	57	169	Sky	95	121
Shrubs	55	151	Ground	29	29
Artifacts	499 (33%)	290 (27%)			
Buildings	222	153			
Vehicles	117	50	Pollution	388 (27%)	0 (0%)
Boats	19	20	Solid wastes	230	0
Agr. Equip	12	10	Air pollution	104	0
Satellites	16	0	Water pollution	54	0
Others	113	57			
Grand total				1454	1064

Analysis of the drawings of the present environment showed that there were significant differences between the sexes ($\chi^2 = 5.99$, df = 1, $p < 0.05$) and stages ($\chi^2 = 8.03$, df = 2, $p < 0.05$) in the numbers of humans; stages also differed in the number of animals ($\chi^2 = 12.0$, df =

2, $p < 0.005$). Drawings from the different regions had significantly different numbers of animals ($\chi^2 = 42.3$, df = 4, $p < 0.005$) (Fig. 2a) and artifacts ($\chi^2 = 14.5$, df = 4, $p < 0.05$) (Fig. 2b). Ages/stages ($\chi^2 = 6.48$, df = 2, $p < 0.05$) and regions ($\chi^2 = 41.4$, df = 4, $p < 0.001$) gave significant differences in number of pollutants.

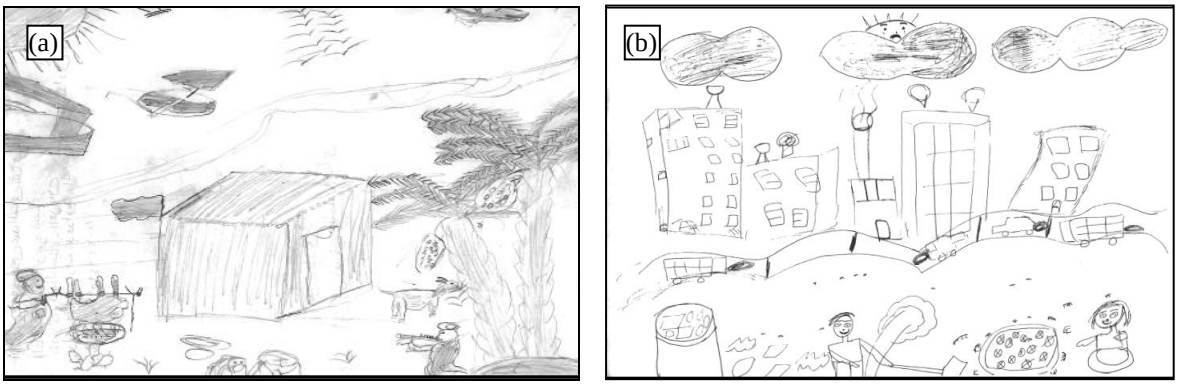

Figure 1: Sample drawings of the present-day environment: (a) by 13 year-old male from the Delta region; (b) by a 15 year-old male from North Sinai.

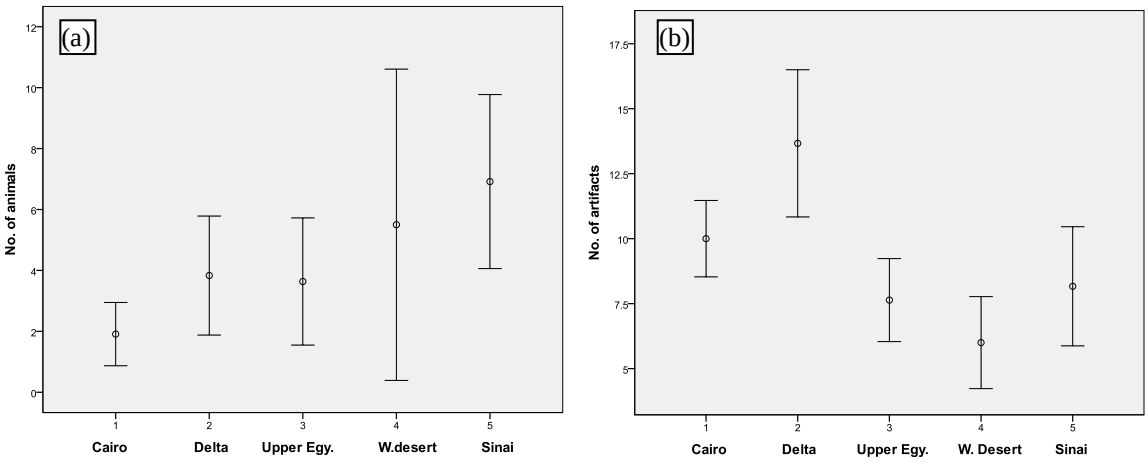

Figure 2: Differences among regions concerning a) animals and b) artifacts, for the present-day environments drawn.

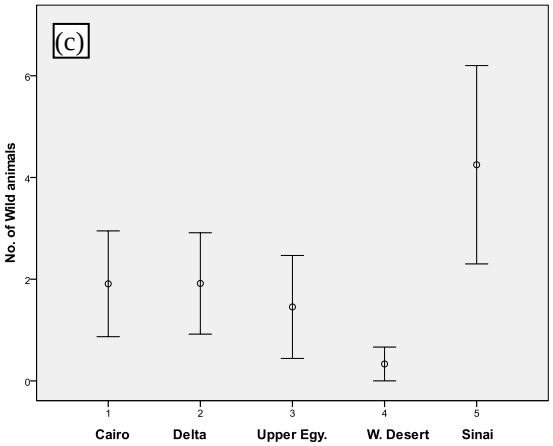

Figure 3: Representations of wild animals in the different regions in the drawings of the present-day environment.

Drawings from the different regions had significantly different numbers of wild animals ($\chi^2 = 4.87$, df = 4, $p < 0.05$) (Fig. 3), men ($\chi^2 = 4.98$, df = 4, $p < 0.05$) and shrubs ($\chi^2 = 21.51$, df = 4, $p < 0.001$). There were age/stage differences concerning sky items ($\chi^2 = 9.11$, df = 2, $p < 0.005$), shrubs ($\chi^2 = 4.14$, df = 2, $p < 0.05$), number of men ($\chi^2 = 5.58$, df = 2, $p < 0.05$), and wild animals ($\chi^2 = 4.51$, df = 2, $p < 0.05$).

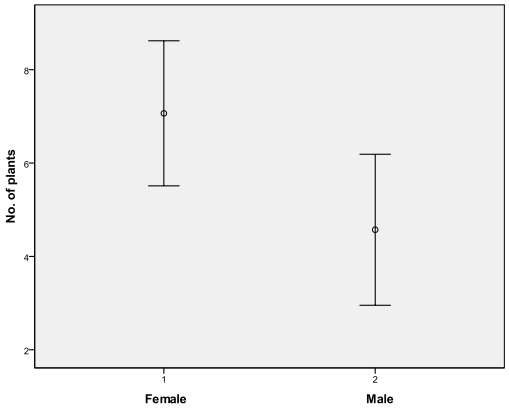

Figure 4: The difference between girls and boys in the number of shrubs drawn in the imagined environment in which they would like to live.

Drawings of the kind of environment in which they would like to live in the future showed an obvious decrease in the number of items, and unsurprisingly no drawings contained anything that counted as pollution. Plants now dominated, along with artifacts and animals. Girls tended to draw more plants than boys ($\chi^2 = 4.89$, df = 1, $p < 0.05$) (Fig. 4).

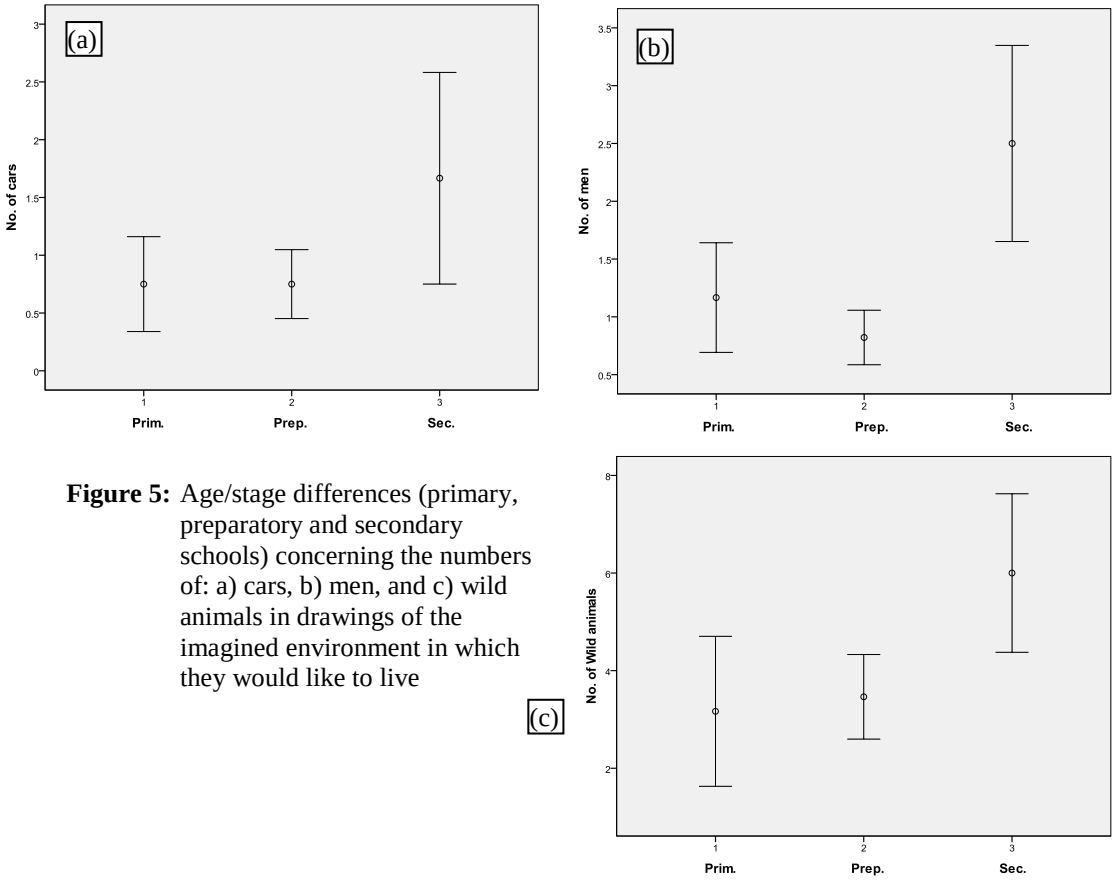

Figure 5: Age/stage differences (primary, preparatory and secondary schools) concerning the numbers of: a) cars, b) men, and c) wild animals in drawings of the imagined environment in which they would like to live

Genders (χ^2 = 6.21, df = 1, p < 0.05) and regions (χ^2 = 6.73, df = 4, p < 0.05) both differed in the number of trees portrayed, and also in the number of shrubs (gender, χ^2 = 45.8, df = 1, p < 0.001; regions, χ^2 = 12.0, df = 4, p < 0.005). Ages/stages showed significant differences in the number of cars (χ^2 = 4.93, df = 2, p < 0.05) (Fig. 5a), number of men (χ^2 = 6.02, df = 2, p < 0.05) (Fig. 5b) and wild animals (χ^2 = 11.7, df = 2, p < 0.005) (Fig. 5c). Each of these items increased with age.

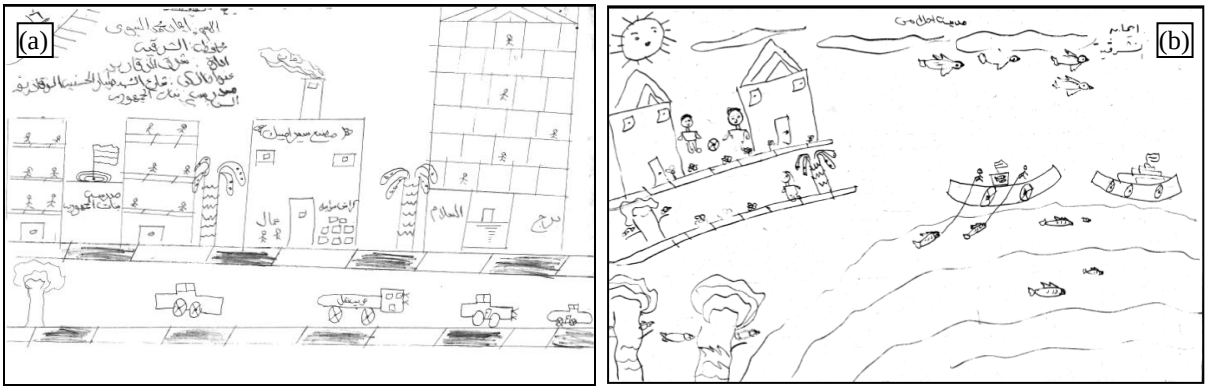

Figure 6: Two drawings by a 12 year-old girl from the Delta, showing (a) the present-day environment and (b) the imagined environment in which she would like to live

In an example of drawings by a girl from the Delta, in her real-life environment (Fig 6a), she shows the busy city: a school, a ceramic factory with fumes coming out of its chimney, a multi-storey building, four cars, two palm trees and a tree. In the imagined desired environment, she dreamt of an environment with single-storey houses, space for children to play, a sea with some fish, clean white clouds, birds on the trees and flying above, roses, trees and boats.

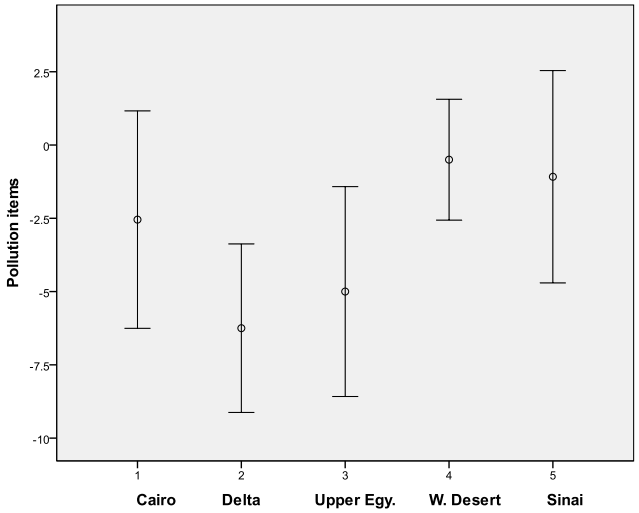

Figure 7: Comparison among regions in the difference in the numbers of pollution items drawn between real and desired environments depicted in the drawings of Egyptian school students.

The statistical comparison of the differences between real and desired environments showed only a couple of significant differences: the largest lies in depictions of pollution, which vanish altogether in the desired environments (all differences were zero or negative) and still show regional effects (χ^2 = 10.6, df = 4, p< 0.05) (Fig.7).

Discussion

This study shows that Egyptian school students are aware of current environmental problems. The most interesting results are shown when comparing real with desired environments. Overall the most striking thing is that the children's imagined drawings contained 30% fewer items. In their drawings of their current environment, there were three elements in particular to which the students were alert: artifacts, people, and most significantly, pollution. Artifacts decreased by 40% in the desired environments, people by at least 25% and pollution vanished completely (almost zero emission and zero disposal). In parallel, the numbers of animals and plants increased at least threefold, and numbers of natural elements by a modest 10%, probably because they occur in fixed numbers (for example, a student would only draw one sun and one river in both drawings).

In Reiss's (2001) results, Sinai Bedouin drawings revealed an abundance of animals and plant life, and a relative paucity of human artifacts. Wildlife and landscape evidently constitute a central component of these children's environment. In contrast, the drawings we collected from the children of other regions showed much less wildlife and much more artifacts and pollution. While the most obvious feature in Reiss (2001) in the drawings of the Bedouin children was the wealth of animals and plants, children of the comparatively urban societies did not represent much wildlife in their drawings. A rather dominant feature in the drawings was pollution, chaos and large numbers of people, especially in those living in Cairo and Giza. In fact, these are the major environmental problems of that region. There were significant differences in the numbers of plants, artifacts, humans and pollution between real and desired environments: children clearly dream of a much quieter and cleaner environment.

Four of the 52 students wished to live in the same environment that they inhabited currently. A 12 year-old girl from Fayoum made a symbolic drawing with a sun, clouds and roses; an 18 year-old male from Ismailia drew children playing football, a number of buildings, a sun, trees, clouds and cars; the others were the only two from North Sinai, and both drew a beach. One was very vibrant with a man barbequeing, a piper and a third person baking bread, with a tent, a goat, a cactus, a flock of birds and three sailing boats; the other seemed a lot quieter, with a man sailing, an umbrella, two palm trees and bird flocks.

Some of the wildlife represented in the drawings were precise, while the majority were not. Images of trees divided into general 'trees' and palm trees, with a larger proportion of the former, which were representations and never specific: one drawing by a 15 year-old girl showed three different tree shapes, but none represents any particular species; another showed a leafy plant on the surface of water.

Children illustrated more wild animals than domestic. Most children drew finches, pigeons, ducks and fish. One 13 year-old boy drew a river with no fish in the 'real' drawing, while in the desired environment (in clear water) he drew four different fish species, two like eels (*Anguilla*), one like the Halfbeak (*Hemiramphus*), and one representing the common *Tilapia*. Four children drew flies, while mice were represented only once, and dogs were shown only twice, one dead and caught in a fishing net in the 'real' drawing, and the other a stray in a busy street. Butterflies were also represented, and once a swan in drawings of the 'desired' environment. Among domestic animals were a goat, cows (in both real and desired environments) and a donkey (in 'desired'), each represented once. While the goat was feeding freely from a shrub, the cows and the donkey were put to work: the cows were in a field helping a farmer (which is still the case on some Egyptian farms), while the donkey was tethered to a cart carrying goods (still common in Cairo).

There were various ecosystems represented in the 'real' drawings, including the Nile or the sea or a lake, depending where the child came from. Children from Giza or Aswan drew the Nile, while those from the Red Sea showed this in their drawings. 16 children drew a marine ecosystem (increasing to 21 in the 'desired' drawings). 13 out of the 16 who drew

water in the ‘real’ environment still drew it in their desired environment, while only three removed it. One 15 year-old male drew a field being cultivated, but did not show any crops. There are two ecosystems not represented in the ‘real’ environment, but appearing in the ‘desired’ drawings: desert (represented once, and containing a factory), and hills (which appeared in three of the ‘desired’ environments).

Ten drawings showed black clouds (three from the Delta, two from Cairo and Giza, three from Upper Egypt, and two from Suez Canal). Even though a major air problem (caused by burning rice straw, a recent serious source of air pollution, especially during autumn), only one drawing showed a fire: other children either showed the clouds as caused by fumes and smoke, or did not show any source at all. The main sources of pollution were car fumes and factory smoke. The drawings also showed water pollution from sources such as ship emissions (shown once), factory emissions (3 times), floating rubbish (3 times) and a floating animal body (twice). Sound pollution was depicted by four children either by drawing a microphone over a building, or showing people shouting. In their drawings of desired environments, some children suggested environmental solutions, such as cars with fume filters and the sun smiling.

The human figures are very remarkable. In general, most drawn figures were men, with rather few women. An explanation might be due to the frequency with which a child sees men; men are always everywhere in the streets, sitting in cafes and running the various shops. In contrast, most women are restricted to the house, especially in rural societies. As a result the image of the dominant man still exists in the Egyptian child's mind. Another remarkable observation is that while most Egyptians are Muslims, and most women wear the hejab (head cover), in the drawings children who drew women mostly showed them without the hejab. The exceptions were two children from rural areas who showed veiled women.

There were some items that occurred in the ‘desired’ drawings which were absent from depictions of the ‘real’ environments of the present day. Among these were the kite, the butterfly and the family, each occurring twice. These may be associated in the minds of the children with happy things. Kites are always used during vacations and on beaches; butterflies are associated with gardens and flowers, which they do not generally see in the urban environment. The family is a symbol of safety and intimacy, both feelings that a clean environment might bring to children.

Mosques appeared only once in the ‘real’ drawings, but increased to be depicted in five different drawings of ‘desired’ environments. One of the children illustrated a man near a mosque, with an arrow pointing to the mosque entrance. Another drew a large mosque and named it. In contrast, satellite dishes appeared four times in the ‘real’ drawings: one child drew one on every building, and then did not show them at all in the ‘desired’ drawing. Korhonen & Lappalainen (2004) show that children in rural areas of Madagascar are measurably aware of environmental issues and can relate them to human activities: children's environmental concerns and demands for action were stronger in deforested areas. Turkish students' views with regard to environmental issues (Yilmaz *et al.* 2004) showed that in general the students felt environmental problems should be confronted in Turkey. But when presented with a range of statements to the effect that a particular environmental issue should take precedence over economic growth, it was often very difficult for students to agree. Older female students exhibited more support for Turkish environmental issues than did male students. Students from families with relatively high incomes, or living in urban rather than suburban areas, displayed more positive attitudes toward environmental issues in Turkey.

Although the drawing technique is simple and may cause bias because in general animals are relatively difficult to draw, even so, it showed its usefulness. That is because the “desired environment” drawings highlight the issues of concern to students, through adding or taking out undesired components from the existing environment. Further studies in the same direction would be very useful to understand fully the factors affecting perception of the wildlife and environment of Egypt.

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الملخص العربى

استقبال ورؤية طلاب المدارس للبيئة والحياة البرية فى مصر

سلمى سامى زلط

مؤسسة الطبيعة والعلم 0 قسم التوعية البيئية – القاهرة – مصر

تناولت هذه الدراسة التعرف على كيفية استقبال ورؤية أطفال المدارس والمراهقين للبيئة الحالية المحيطة بهم بالإضافة إلى رؤيتهم لمستقبل تلك البيئة. تمت الدراسة من خلال قيام الطلاب بعمل نوعين من الرسومات، أحدهما يتناول البيئة التى يعيشون فيها حالياً والآخرى عن البيئة التى يرغبون المعيشة فيها مستقبلاً. أوضحت الدراسة مدى وعى الطلاب بالمشاكل البيئية المحيطة بهم وأيضا أوضحت قصور لحد ما فى معرفة الحياة البرية. لقد أوضحت الدراسة أن هناك اختلافاً كبيراً فى رؤية الطلاب للوضع الحالى والوضع المستقبلي، حيث وضح أن الطلاب مهتمون بشكل كبير بموضوعات التلوث وكل ما قام الإنسان بصنعه وأيضا بالزيادة السكانية، ووضح عدم الإهتمام بالحياة البرية. لقد أوضح الطلاب فى رسوماتهم وبصورة واضحة الأسباب وراء كثير من المشاكل البيئية وأقترح بعضهم الحلول لتلك المشاكل.

أوضحت الدراسة مدى أهمية وجود مقررات دراسية تهتم بتقديم التنوع البيولوجى والحياة البرية وعلاقة الكائنات ببعضها البعض لطلاب المدارس.