

## Assessing climate change awareness influence on Egyptian children

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### Keywords

Climate change (CCH), children problem (CH P), climate change impact, (CCHI), country pressure (CP), climate change awareness (CCA)

### Abstract

*Climate change (CCH) is one of the important issues raised globally lately. Heat, humidity pollution could harm children, cause diseases and death, 85 % of the world's youth live in the developing countries, and Egypt as one of the developing countries its children face a great risk specially with the presence of weak climate change awareness impact. Our research will investigate Egypt climate change awareness (CCA) problem and how it affects Egyptian children, we will try to explore children problems (CHP), due to limited climate change awareness and conclude by emphasizing the importance of having appropriate solution; in term of avoiding negative climate change impact (CCHI) on children in the future.*

### Introduction

Egypt, a developing country with a growth rate of 1.6 percent in 2015, the population of Egypt will exceed 10 million by 2030. According to the World Health Organization 20.5 percent of children under 5, 22.5 percent of men and 46.3 percent of women are overweight, making Egypt one of the world's top 20 overweight nations. Egypt has exceeded the gender parity goal for the completion rate in secondary education (83.4 percent for girls and 74.8 percent for boys) (WHO, 2015). Climate change (CCH) is one of the important issues raised globally lately. Heat, humidity, pollution could harm children, cause diseases and death, 85 % of the world's youth live in the developing countries, and Egypt as one of the developing country, children face a great risk specially with the presence of weak climate change awareness impact. A lot of risks associated with climate change, starting from death rates increase to illness during heat periods. The International Agency for Research on Cancer (IARC) found that 3.7 million deaths each year due to outdoor air pollution, most of it in the developing countries. Earth temperature increased during the past century about 1.5F, global sea level, had been risen about 15-20 centimetres climate change influence seriously

Human wellbeing, global warming cause a lot of damages, according to the World Trade Organization (Oppenheimr and Antilla-Huges, 2016). The World Health Organization (WHO) estimated that about 7000.000 will be died in developing countries from air pollution, as climate changes is responsible to cause a death of 250.0000 per year from Malaria, heat, stresses and malnutrition, 48000 children dies from diarrhea diseases and 95000 from malnutrition (Tanqeer, 2015) between 2030 and 2050 children will be the most effected sector.

### A contemporary study on the causes of climate change in Egypt

Located in the north-eastern corner of the African continent with an area about 1 million square kilometres. The Egyptian terrain consists of a desert plateau interrupted by the Nile valley and delta. It is located in an arid - to semi-arid zone. The coastal zone of Egypt extends for more than 3,500 km and 40% of the population lives there. Most of these people live in and around a number of major industrial and commercial cities such as Alexandria, Port Said, Damietta, Rosetta, and Suez. The Nile delta covers the area from Cairo to the shoreline of the Mediterranean Sea, between the cities of Damietta in the east and Rashid in the west. Hot dry summers and mild winters prevail with

relatively low, irregular, and unpredictable rainfall. (Elsharkawy H, Rashed H, and Reached I, 2009). The most serious problem of climate change in Egypt ; is the coastal problem, due to Aswan high dam construction , sea level was raised, agriculture land was lost due to saline intrusion, beside limited water resources, which caused an overlap of available agriculture land. The result climate change affects labor market in the country. Agriculture sector in Egypt is employing over 30% of its population a high percentage of them are children. Global warming refers to the rise in average surface temperatures on Earth. - As overwhelming scientific consensus, climate change is due primarily to the human use of fossil fuels, which releases CO<sub>2</sub> and other greenhouse gases into the air. -The gases trap heat within the atmosphere, which can have a range of effects on ecosystems, including rising sea levels, severe weather events, and droughts that render landscapes more susceptible to wildfires (ELNahry, 2016). Raising the Mediterranean Sea level by 0.5m by 2050. This will lead to flooding the coastal areas along the Nile Delta.

#### **Exposure to flooding due to sea level rise**

Under a high emissions scenario, and without large investments in adaptation, an annual average of about 2.4 million people is projected to be affected by flooding due to sea level rise between 2070 and 2100. If emissions decrease rapidly and there is a major scale up in protection (i.e. continued construction /raising of dikes) the annual affected population could be limited to about 700 people. Adaptation alone will not offer sufficient protection, as sea level rise is a long-term process, with high emissions scenarios bringing increasing impacts well beyond the end of the century (HDCC, UK, 2014).

#### **Infectious and Vector-Borne Diseases**

In the baseline year of 2008, there were an estimated 2,700 diarrhoeal deaths in children under 15 years old. Under a high emissions scenario, diarrhoeal deaths attributable to climate change in children under 15 years old is projected to be about 10.9% of about 1,000 diarrhoeal deaths projected in 2030. Although diarrhoeal deaths are projected to decline to about 300 deaths by 2050, the proportion of deaths attributable to climate change could rise to approximately 15.2%. (Source: Lloyd, S...2015)

#### **Heat related Mortality**

Under a high emissions scenario heat-related deaths in the elderly (65+ years) are projected to increase to approximately 47 deaths per 100,000 by 2080 compared to the estimated baseline of about one death per 100,000 annually between 1961 and 1990. A rapid reduction in emissions could limit heat-related deaths in the elderly to fewer than 9 deaths per 100,000 in 2080. (Source: Honda et.al...2015).

#### **Child problem due to Climate Change**

Increased temperatures could result in increased heat stress and higher rates of diseases such as skin cancers. Infectious and vector-borne diseases could also be exacerbated by changing weather and rainfall patterns. Specially, child life is more complicated with high temperature; they can't learn play or exercise outdoors, plus smog existence harm children's health. Agriculture sector in Egypt is employing over 30% of its population a high percentage of them are children. Children from poor and rural households are vulnerable to Climate change impacts, they live in unsafe settlements, they have lower access to basic services, air pollution, poor health care, high temperature, water scarcity, poor education, and all the mentioned factors exposed Egyptian children to climate change problems.

#### **Egyptian Government Efforts Concerning Climate Change Effect:**

1. Country has identified a national focal point for climate change with the Ministry of health.
2. The National Communication submitted to UNFCCC includes health implications of climate change mitigation policies .Country has implemented actions to build institutional and tech-

nical capacities to work on climate change impact and health(Climate and health Egypt country profile: 2015).

3. Country should apply new policies concerning climate change and apply renewable energy technologies by using solar and wind to reduce gas emissions.
4. Country should develop public policies in agriculture, sett mentoring and warning systems to predict disasters before accruing (climate change summit at Paris).

### **Objectives of the study**

- To assess climate change awareness (CCA) level influence on Egyptian children
- To discover how climate change awareness information access could impact Egyptian children.
- Based on the outcome of the study, an attempt will be made to prescribe appropriate strategies.

### **Review of Literature**

#### **Climate change and human responsibility**

The warming of the Earth has been changed due to human activities over the past half-century, human emit about 35 billion metric tons of carbon dioxide into the atmosphere per year , the carbon cycle balance changed, this cause air pollution and smog( Oppenheimer and Antilla-Huges,2016), due to a rapid population growth and immigration from rural areas to capital cities, pollution increase, temperature raise lead to water scarcity ; as a climate change result agriculture is under threat , it cause children malnutrition beside people have less drinking water; they have to spend more time and money to collect water from sources farther from their homes. Climate change impacts negatively air quality, 1.6 million people died annually from air pollution more than half of these deaths occur among children under age of five(Aron and Sumuel,2011). World Health Organization declared, in 2012 that violence caused by climate change was about 119,000 deaths, interpersonal violence caused 505,000 deaths, 804,000 people committed suicide. The annual global cost of weather-related disasters ranges from \$90 billion to \$130 billion. (Kousky, 2016).

#### **Climate change problems affect Egyptian children**

The most serious problem of climate change in Egypt ; is the coastal problem, due to Aswan high dam construction , sea level was raised, agriculture land was lost due to saline intrusion, beside limited water resources, which caused an overlap of available agriculture land. The result climate change affects labor market in the country. Agriculture sector in Egypt is employing over 30% of its population a high percentage of them are children. Children from poor and rural households are vulnerable to Climate change impacts, they live in unsafe settlements, and they have lower access to basic services, air pollution, poor health care, high temperature, water scarcity, poor education.

#### **Climate change and children malnutrition:**

In Egypt the levels of rainfall decrease and population increase, it lead us to land degradation; with less agricultural production, it means less food availability, children are impacted by malnutrition. Data indicate that about 25%of Egyptian children under age of five have chronic malnutrition, 7 % of Egyptian children under age of five suffer from acute malnutrition and the highest percentage appears in Upper Egypt due to insufficient household food security and high infection rates(country cooperation Strategy at a glance,2013)

#### **Climate change and Egyptian children health:**

Malaria, one of the biggest killers of children under the age of five, it is expected to be increased from 45 % to 60 % in the next 100 years due to climate change. Egypt has made significant progress on under-five-year child mortality over the past twenty years; less than five child mortality was reduced by 70% (between1990 to 2008).

In 2008, there were an estimated 2,700 children less than fifteen years died from diarrhea, about 1,000 diarrheal deaths projected in 2030 children less than 15 years old .Although diarrheal deaths are projected to decline to about 300 deaths by 2050, the proportion of deaths attributable to Climate change could rise to approximately 15.2% (WHO, 2015) Contaminated water is the major cause of malnutrition and diarrheal disease, which remain a leading cause of children under five deaths. High rates of sleep disturbance and sadness, and other mental health impairments among children accompanied with climate change.

### **Climate Change and Children Education:**

Climate change affects economic outcomes, agricultural and industrial output, labor productivity, health and economic growth. Low economic productivity could affect children's ability to learn, Children who were placed in better physical environments, better sanitation running water and electricity perform better in school. Due to climate changes schooling could be affected. According to the central agency for public mobilization and statistics (compass) with coordination with Unicef Egypt, around 9. 2 million less than seventeen years old of children in Egypt live in poverty, 7.5 million children were vulnerable to it, poverty could push parents to send children to work force and neglect education; highly income families escape from polluted areas; that mean poor families with their children remain in the polluted areas, where children suffer of inequality and climate change vulnerability, lack access to water, housing, food, education and health care and inadequate infrastructure. Children who were impacted by climate change were not able to complete their mandatory education according to previous researches (Akresh, 2016).

### **Research Methodology**

In this research, the researcher has tended to highlight the positivist philosophical approach. Research technique used was survey. The data collection was done through questionnaires. As data collected is also influenced by its external environments and does not exist without individual bias.

### **Population and sampling**

The study conducted in Cairo, Egypt, the population sample was random, targeted families from medium class, primary school teachers, and children physicians, the instrument used in the current study self-developed questionnaires, which contained 20 items and divided into sections, section (a ) demographic variables, section (b) and (c), patterned on a 5 point rating scale , had 10 item each ,section (B) measured the degree of climate change awareness and its impact on children health , section (C) measured how climate change awareness may affect Egyptian children educational and behavioral life The main reasons for choosing this sample were to explore how climate change awareness could affect Egyptian children life, as Egypt one of the developing countries.

### **Hypothesis Formulation**

H0: It is expected that will be a positive relation between climate change awareness level and awareness information accessibility on Egyptian children.

H1: It is expected that will be a negative relation between climate change awareness level and awareness information accessibility on Egyptian children.

### **Data Analysis and Major Findings**

We used a factor analysis as a way to take the mass of data collected and we shrink it to a smaller manageable and understandable data to find the hidden patterns and to show how those patterns overlap as well what characteristics are seen in multiple pattern. Due to the factor analysis is a set of observed variables that have the similar response patterns because they are associated with a variable that isn't directly measured , it helped us to more understand how the climate change information accessibility awareness could affect children we distract it the correlation between two factors.

- The first factor measures the awareness of climate effect on Egyptian children.
- The second factor measures the awareness of information accessibility effect on Egyptian children.

**The component matrix revealed that the following questions**

Land salinity as a result of climate change could impact children health Negatively	,525
Smog as a result of climate change could impact children health negatively	,540
Economic stress accompanied with climate change could affect children Health	,606
Climate change could affect negatively children academic level	,741
Children Stomachaches , vomiting , skin rashes , nausea could be result Of climate change	,671
Children respiratory problems is one of climate change effect	,577
Climate change and population growth could affect children living Level negatively	,704
Climate change could be a reason children heat stroke	,615
Climate change could be reason of children malnutrition	,852
Temperature change as one of climate change effect could raise violence against children	,632
Water contamination as a climate change result could affect children health	,565

- The above questions reduced to a factor that measure the effect of climate awareness on children  
The following questions revealed

Children health could be affected negatively by air pollution	,483
Water scarcity could affect children health	,484
Climate change could affect negatively children behavior	,421
Climate change is not a reason for violence against children	,399

- The above questions reduced to a factor that measure awareness information accessibility effect on Egyptian children.
- The study tested the correlation between the two factors: the effect of climate awareness on children and information accessibility on Egyptian children using Chi- square test as chi square statistic is a measurement of how expectations compare to results. data used in calculating a chi square statistic was random

**Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	<b>5376.000<sup>a</sup></b>	<b>784</b>	<b>.000</b>
Continuity Correction			
Likelihood Ratio	<b>1284.090</b>	<b>784</b>	<b>.000</b>
Linear-by-Linear Association	<b>.000</b>	<b>1</b>	<b>1.000</b>
N of Valid Cases	<b>192</b>		

a. 841 cells (100.0%) have expected count less than 5. The minimum expected count is .08.

The result revealed that our hypothesis is .000 less than .005

Which mean that the effect of climate awareness on children and information accessibility on Egyptian children positively significant.

### **Conclusion**

A greater number of children live in poor households; they face challenges that increase their exposure to climate change impacts. Egypt is a semi desert climate, dry summer, moderate winter with a little rainfall; country temperature changes from 0 C to 4 C, this high temperature may raise violence as heat is one of the aggression reasons, children impacted by this violence. On the other hand The Lake of electricity in developing countries and the cost of using or owning air condition make difficult to reduce this heat which could lead to raise violence rate.

Climate change and urbanization are connected; people migrate from unusable land; seeking employment opportunities in cities, urbanization lead to city problems due to non-availability of infrastructure and services to cope with the population growth. Rising sea levels lead to land salinity, which might threaten groundwater sources. Once water is contaminated, people rely more on unsafe sources. This could have a particularly deleterious effect on health specially children's. Climate change could be accompanied with disasters; Egyptian government and community must collaborate to help reducing climate change effect specially its effects on children.

They should have an active approach in generating awareness, policies and plans concerning climate change impacts. Egyptian government and community should clarify the climate change impact on poverty, health, economic shocks, stresses, population growth, scarce resources and urbanization. In 1992 Egypt NGO's directed more than 60% of its grants to small climate change projects; this was contributed mainly to awareness and field training (Hegazy, 2005).

Climate change, through higher temperatures, land and water scarcity, flooding, drought and displacement, negatively impacts agricultural production and causes breakdown in food system. These disproportionately affect those most vulnerable to hunger and can lead to food insecurity. Vulnerable groups risk further deterioration into food and nutrition crises if exposed to extreme weather events. Without considerable efforts made to improve climate resilience, it has been estimated that the risk of hunger and malnutrition globally could increase by up to 20 percent by 2050 (Climate and Health Country Profile: 2015).

### **Strategies for Improvement**

- Egyptian government should adopt effective awareness climate change campaign to minimize climate change effect specially on children (diarrhea and malnutrition) , all governmental sectors and communities should collaborates to apply the awareness programs
- Education institutions in Egypt should go green , and it should participate in national awareness strategies
- International climate change agreements implementation will help reduce climate change impact in Egypt.

### **Limitation of the study**

- The research is limited due to lack of data in the country concerning this specific topic.
- The research is limited to segment of middle class in Cairo only. Sample size was very small due to shortage of time.
- Further researches recommend it, to measure the impact of climate change policies on Egyptian children as one of the developing countries.
- Further research should cover all Egypt provinces not Cairo only.
- The paper is more in a development stage.
- As data collected is also influenced by its external environments and does not exist without individual bias.

**Direction for future research**

1. A study can be made further to access the impact of climate change on the elderly population in Egypt.
2. A study can also be conducted to understand the impact of climate change on pregnant women.

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