

The International Conference for Environmental Science

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Research

**The Role of Urban Planning in Confronting the Disaster of the Delta
and Coastal Cities Drowning**

Research Summary

The phenomenon of climate change is considered one of the most important global environmental phenomena that have received significant attention recently. It became certain that these changes are too risky to an extent that can lead to disasters. Some American scientists in Colorado University confirm in their studies that almost all deltas for greatest rivers in the world is threatened to collapse and that the Nile river is one of the threatened ones. Egypt is one of the most affected countries to this change and the increase in the sea surface level in a range of 20 to 80 cm will lead to the drowning of around 15% of the delta that has the best cultivating areas. The drowning areas are five: north coast, the coasts of delta, north Sinai, the west coast to Suez canal, red sea and at last the coasts of Al-Mura lakes and Al-Temsah lake, but the most damaged will be the delta coasts so in this research we will list all the meanings and the expressions about the change of climate and then showing the different opinions of scientists with and against this phenomena and the analyzing results of each opinion showing the impact of this phenomena on Egypt on the mean time and in the future, the thing that will open the field to study how the urban planning should face the effect of this phenomena in Egypt in this research.

1- Introduction

The phenomena of climate change is considered one of the most important global environmental phenomenon that have received significant attention recently. It became certain that this changes are too risky to the extent that can lead to disasters on both human and environment aspect. The studies implies that the results of the change of climate started to appear at the end of the twenties century and that its effects increase the mid of this century, which appears as disorders in the climate system, as the reoccurrence of hurricanes and heavy rains, accompanied by floods that never came before, and in unexpected places and irregular times, while drought starts to appear in other areas as well as high temperatures that can lead to the danger of snow melting, and sea level rise. The world today is witnessing high rate temperatures that have never been seen from more than ten thousand years ago.

If the effects and risks of climate change on natural resources such as water, soil, and economic resources; agriculture and industry, and so on ... is having great concerns from the researchers, as for the effects and risks of these changes on construction and specially the environmental construction, did not receive the required attention despite of what could happen as a result of those effects from risks and disasters, and one of the least is that some cities being subject to disappear, and large numbers of people being homeless, as well as the loss of a great construction heritage¹.

Also a U.S. study made by scientists in the University of Colorado that most river deltas of the world of is threatened to vanish and that the Nile river is one of the threatened rivers and that the world is threatened by melting layers of snow areas leading to the rise of sea level and the loss of many islands and a large part of river

¹ - أحمد محمد عبدالله، سالم محمد عبدالله، جامعة حضرموت - المكلا - اليمن، مجموعة بن لادن السعودية - مكة المكرمة - السعودية، ندوة إدارة الكوارث وسلامة المباني في الدول العربية، الرياض، السعودية، ٢٠٠٨م.

deltas and the fourth report of the Intergovernmental Panel on Climate Change which was released at the end of 2007 assures that Egypt is considered one of the world's most affected areas by the effects of climate change and that the rise of the sea level rise by about 20 to 80 cm would lead to the sinking of 15% of the area of the Delta which includes the most valuable agricultural land and the sink of 15% of the area of the Delta, which comprises 30-40% of Egypt's production of food and agricultural production and 50% of industrial production will cause a problem in the provision of food, whether by importation, which is considered as a burden on the national economy or the cultivation of desert and this is very expensive. Also this sinking will also lead to the displacement of around 10 million people at least². Drowning will be in five areas, which are the coast of the Delta, the northern coast, the coast of the Sinai, the western coast of the Gulf of Suez, the Red Sea and the coast of Mura Lakes and Lake Al-Temseh, but the most serious affected the coasts of North Delta.³

1-1 Terminology and scientific concepts mentioned in the research

• The phenomenon of the climate change

Climate change is originally a natural phenomenon that occurs every few thousand years, but due to the increase of human activities, it led to the acceleration of climate change

• Global warming

It is to increase the proportion of gases in the atmosphere, that holds the high temperature which leads to the formation of a cover on the earth and these gases are characterized by their high ability of absorbing the high temperature coming from earth and keep them for a long time, and sending it again to the land which raises the temperature as the earth after sunset launches part of the heat obtained from the sun in the form of infrared rays.⁴ And that is seen as carbon dioxide, methane, which is one of the most important gases in the global warming.

• Kyoto Protocol in Japan

It is a protocol that impose on industrial countries (countries) to reduce emissions of gases GHGs in 1997 in Tokyo – Japan

• Nairobi work plan

It is a program where the African group focuses on planning for the purpose of adaptation so as they would be able to implement scientific basis of adaptations

• Intergovernmental Panel on Climate Change (IPCC)

It is an international organization following to the United Nations, formed of 3,000 climatologists, economists and others. It is considered the scientific authority in the field of studying the global warming and its impacts. It acquired a Nobel Peace Prize for 2007 together with Al Gore because of its efforts.

^٢ - جريدة الأخبار - العدد ١٧٨٧٠ - الصفحة الرابعة - ٢٨ أكتوبر ٢٠٠٩م.

^٣ - جريدة الأخبار - العدد ١٨٢٩١ - ٢٤ ديسمبر ٢٠١٠م.

^٤ - وزارة الدولة لشئون البيئة - وحدة التغيرات المناخية - جمهورية مصر العربية - (مصر والتغيرات المناخية) - يوليو ٢٠١٠م.

• Clean Development Mechanisms in Egypt (CDM)

It is one of the most important mechanisms set by the Kyoto agreement. This mechanism provides a clear commitment on the part of developed countries to carry out projects in developing countries to help them meet the requirements of sustainable development.

2- Different approaches to the issue of sinking of the delta in Egypt

2-1 Opposing opinions to the issue of climate change and the sinking of the Delta⁵

The issue of climate change and global warming and increasing temperatures are just fears and fake fantasies... The evidence are the studies done by meteorologists, and remote sensing that emphasizes that those studies were built on conclusions and scenarios of unreal models, and the most accurate statistical studies for long term predict shows that the temperature will not increase but will fall during the next ten years together with the sea water, which already started two years ago.. together with the general trend of getting rid of toxic gases and the pollution from industry and all gases and that are harmful to humans, the United States comes at the top of the of the countries that pollute the Earth's climate and responsible about 25% of the volume of pollution and nonetheless America refused to enter the Kyoto global agreement .

Where Studies shows that some gases of atmosphere's components are radio active in the range of solar and earth rays and that any change in the concentration of these gases will lead to imbalance in the radiation balance of the Earth system and would lead to change of climate, and the previous studies shows the occurrence of global warming over of the Earth about 0.36 degrees Celsius during the last century, while the average temperature in the southern hemisphere was in stable condition..

In addition, these are the possibilities that is spread by many experts (a common misconception) in the world and adopted by Vice President Al Gore, former U.S. president this team adopts the scenario of drowning parts of the land of the world, including the Delta and the coast of Egypt and the migration of millions but those studies are based upon wrong scenarios, so the global warming and the rise of sea-level were not based on a scientific basis (D / Mohamed Mahmud Isa, head of the Central Department of Meteorology and Climate Research, General Authority for Meteorology)

The Studies shows that a statistical study for the earth's temperature was carried out depending on comparing the results of the astronomical changes, and with calculating the temperatures derived from layers of the north pole snow, this statistical study confirms that the changes that happened in the last hundred years are normal changes that depends on some astronomical changes which affect the amount of solar radiation that reaches the atmosphere, but the general trend of change during the twenty first century shows a drop in the Earth's temperature and not rise in the temperature , and it

⁵ - جريدة الأهرام - العدد 44896 - قضية الأسبوع - ٧ نوفمبر ٢٠٠٩م - ص ٢١.

is clear that the period that was predictable from the study of planets' motion shows a drop of two degrees than the average temperature in 2008 and then it will rise this year, which already happened, as for next year, according to accurate study of temperatures, it will drop about 0.3 degrees till 2019 and then a rise of temperatures till 2020 to reach the temperature of the current year and these cycles are natural, And Studies were carried out on the sea-level rise in the city of Alexandria and the Egyptian Published researches showed that there is a 24-year cycle, where sea surface rises for 12-years and lowers for 12 years and it already started lowering two years ago in the sea level and the fluctuation is 15 centimeters, these data have been measured and available at the Institute of Marine Sciences.

There is a lot of talk about climate the change and sinking of beaches is completely untrue, it is adopted by non-specialists in the world so Egypt should not fall in this trap. Studies confirm that the process of study and calculation of climate change needs to be accurate and very complex calculations; it also needs international cooperation so we are not supposed to run behind some speculations that have no scientific basis, as the current discussions have political dimensions and not scientific ones!!
(Dr/ Mahmud Hussein, head of Marine Sciences)

Also, It takes four years to make climate models of air pollution in Cairo on personal computers with connected networks, so a computer was purchased that is called super computer it can do complex calculations, particularly in the field of rockets and nuclear heads so it is an international taboo, and it already has been installed at the organization after getting it from America with enough terms and guarantees, it is considered the biggest computer of its kind in the Middle East, and will benefit strongly in the work of climate models and it can make complex calculations very quickly and with high precision. And the energies of this computer will be used with a group of stakeholders including the Egyptian universities and research centers and the ministries of irrigation and agriculture, meteorology and through this computer the old and new data processed by the satellites will be collected, as this computer can hold a tremendous amount of data and information (Dr. Ayman Desouki chairman of the remote sensing)

Also the Egyptian satellite will be benefited from in many areas of the environment and studies, especially in following the shores of the Delta, all this data will be downloaded on the computer where it can be requested by some parties to benefit of its monitoring of the sea pollution and oil spills, the benefit of satellite images is increased by the regular use the..... (Dr/ Mohammed Bahy El-Deen Argon, Supervisor of the space program).

2-2 Opinions supporting the issue of climate change and the sinking of the delta (the correct opinion)

The latest report that was published by intergovernmental panel on climate change - IPCC of the United Nations at the end of the year (2007), and that won the Nobel

Prize in the same year for their four reports on climate change since 1992 - confirms this report that global climate change - resulting from human activity has already begun and that the response of the international society will not be quick - is considered a strong evidence that the climate change will be more dangerous in the future than what is now expected (IPCC 2007). The governmental committee studies expects more floods and hurricanes and the rise of sea level to 59 cm till the end of this century

The "World watch Institute" (2007) expects rising of sea levels, by the year 2015, 21 cities out of 33 cities around the world with high rates of population up to 8 million people, are most threatened by rising sea. and Among those cities is Alexandria in Egypt, despite that Egypt has been classified as one of the five countries in the world that are most threatened of the adverse effects of climate change, whether sea level rise or sink parts of the Delta and all that social and economic damage, the issue of climate change has not yet been taken seriously in Egypt .

For sure , in the twenty first century the earth's temperature will rise by three degrees and some studies expects that it reaches two degrees by the year 2035 due to the increase in gas emissions, the thing that will cause melting of snow, rise of the Mediterranean Sea level, threat of sinking a large part of the Delta El-Behira, and Port Said and the coral reefs in Red Sea will turn white in addition to the lack of Nile water and what happened this year of temperature increase is evidence, where it burned nearly 60% of our agricultural production this summer⁶

3- The effects of climate change on Egypt

The concept of climate changed from being an environmental or scientific issue to national security issue, an issue that concerns the whole world .

The warnings in Egypt increased that the climate change may lead to serious environmental disasters. It may lead to the disappearance of coastal areas in the Nile Delta as a result of the melting of snow in the north and south poles, which led to the occurrence of the phenomenon of global warming .

Recently it became familiar in Egypt - and especially after the African Regional Conference that discusses the report of Working Group II emanating from the State Committee for climate change report on "effects of climate change on the world", which was held at the Alexandria Library on April 2007 – that forums and media discusses the danger coming towards the Egyptian Delta that is inhabited by millions of people. That danger might force people leave their areas of residence which they settled in over hundreds of years and migrate to new areas .

Some international institutions for researches such as the “united nations environment programme” (UNEP - 2002) have studied the effect of the expected rise of the sea on the Egyptian coast, where they studied the topographic maps of the area and identified

¹ - جريدة الأهرام – العدد ٤٥٢٨٧ – ملحق أهرام الجمعة – منكرات، (رأى د- مصطفى طلحة) – ٣ ديسمبر ٢٠١٠م- ص ٣.

areas that are most likely at the risk of drowning in case of the sea surface rise up to 0.5 m, where the following became clear:

- Half a meter rise in sea level will lead to the sinking of a large area of coastal land of the Nile Delta, if the necessary precautions for protection were not taken.
- The most affected areas are Alexandria, Port Said, Beheira , Kafr El-Sheikh, South Burullus and South Manzala on the Mediterranean .

Also it is clear from the study of topography of the coastal areas on the Red Sea –that it will also be affected by the Red Sea as a result of sea level rise - particularly in the area of the Mura Lakes and Suez.City.

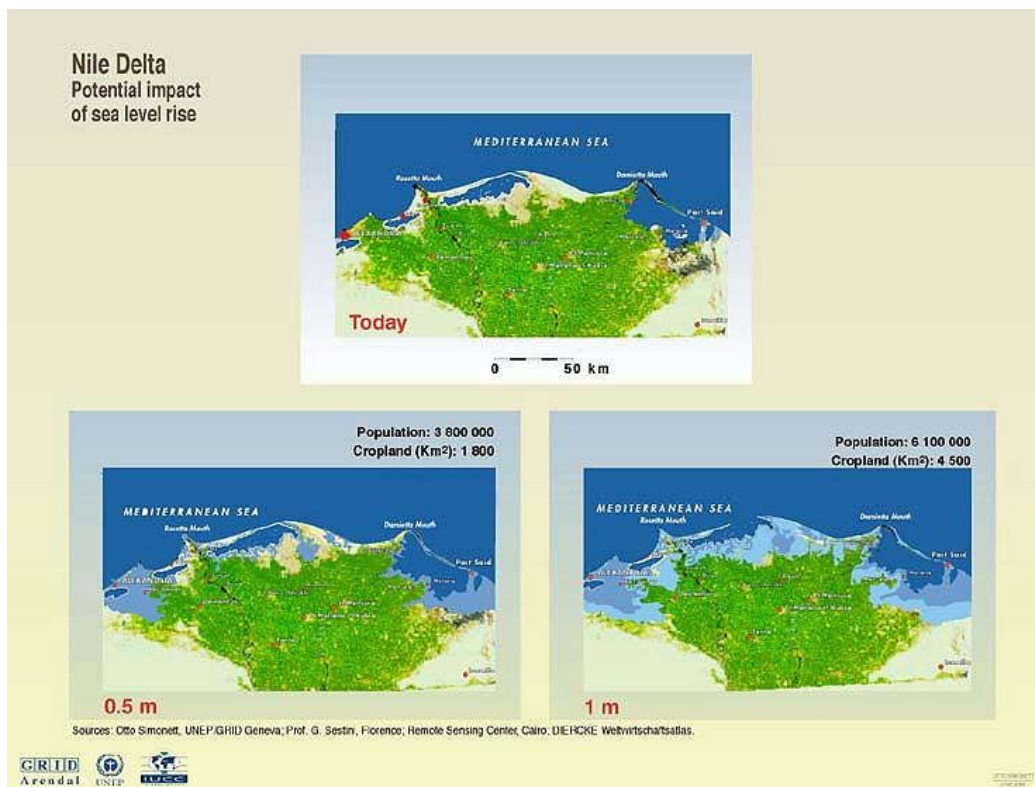


Figure (1) , Nile River Delta in the current situation and the various scenarios by 2050 in case of an increase in sea levels by half a meter.⁷

In the context of evaluating the impact of sea level rise on the Egyptian coasts there are major things that affect the northern coast of Egypt including :

A. Sea-level rise

Through Analyzing the data taken from 6 different beaches in Egypt during the period from 1930 to 1980, it was found that during those fifty years, the sea level rose by about 11.35 centimeters in areas Rashid and Damietta on the Mediterranean coast,

⁷ - منال البطران، المركز القومي لبحوث الإسكان والبناء، (اثر تغير المناخ على مصر وبخاصة على الهجرة الداخلية و الخارجية)، مؤتمر (تغير المناخ و آثاره في مصر)، فندق ماريوت- القاهرة ، جمهورية مصر العربية، نوفمبر ٢٠٠٩ .

also the studies confirmed a retreat in the sea shore in the modern era in comparison with what was in the nineteenth century

B. Land subsidence

This phenomenon results in raise in sea level due to land subsidence as a result of tectonic changes in the earth's crust in the region, and the high rate of pumping groundwater or oil - and this was measured over the last five decades, where it was found that it is about 2 mm / year in Alexandria and 4 mm / year in Port Said .

C. corrosion of the Beach

A phenomenon resulted from wave's corrosion or from the beaches' sea currents and it results in the graduate removal of the sand from an area and putting it in another area. This phenomenon has increased after the establishment of the High Dam due to the loss of ecological balance, which was provided by the amounts of silt on the beach and carried by the Nile water to the beach, a study was carried out through analyzing the area's satellites images in the years 1972/1976/1977/1978 / 1983/1985/1991 and it confirmed the corrosion of Rashid Beach, where the succession of corrosion appears at the point where the river and the sea intersects, and the deposition on the eastern region, also the analysis showed corrosion and deposition in the course of the river itself over the studied past years .

D. Coral reefs whitening in the Red Sea

Rising temperatures results in the loss of coral reefs its distinctive colors and turned into a white color, the Red Sea is considered an intermediate area if compared to other regions in the extent of the affection of the coral reefs .

As for the impact of these climate on the North Delta is inevitable, all the scenarios designed by the Intergovernmental Committee on Climate Change, and other research institutions to coastal side in Egypt lies within the most dangerous zones that will be affected by climate change in the world, the Coastal range in Egypt extends about 3500 kilometers along the Mediterranean Sea and the Red Sea, which comprises about 40% of Egypt's population, and the majority of these populations are concentrated in a small number of cities bordering the coast, such as Alexandria, Port Said and Damietta and Rosetta and Suez. This coastal range is of a great importance in terms of economic, industrial and social aspects .it comprises about 80% of Egyptian Industries, besides the importance of tourism, there is a growing trend for the growth of heavyweights industries such as the establishment of nuclear reactors in some areas of the north coast (such as nuclear reactor in Dabaa), especially after the accident of Fukushima reactor in Japan March 2011 now there is a careful study of the location of nuclear reactors in Egypt .

The danger of the climate change is very clear in the area between the north coast of the Nile Delta and Port Said east and Alexandria in the west, as shown photographs 2.3, a picture was taken on some areas along the northeast coast on the international coastal road in the directions of Alexandria - Rashid - Damietta on 12/24/2010 which describes the start of sinking of some residential areas and which is away from the sea

by 1 km or more in addition to the leakage of sea water from the international coastal road to residential areas opposite to the road and therefore this part is subject mostly to climate change, the most important change is the rise of sea levels due to the decrease of its topographic from one hand, and the nature of the soil on the other hand

The soil of Delta is humid clay, that is characterized with abundance of ground water near the surface and its tendency to drop over time and the precipitation of clay coming from the Nile River, this precipitation and clay represents a natural block for sea water where salt water has the ability to load deposition of rivers on the mouth of the river, and then normal dams arise between the river water and sea water



Figure (2) shows the flood of sea water over the surrounding areas and that is far away about 1.2 km from the international coast road in the north coast



Figure (3) shows the flooding of sea water for urban villages facing the international coastal road in the north-eastern coast.

The more Delta lands gets higher than sea level, the more the natural precipitate crept to the front to cover a larger area of the delta so the delta gets larger and the sea goes backward, and vice versa, the lower the Delta gets, the more the sea water crept to cover a larger part of the North Delta, so Delta area gets smaller. the moist soil of the delta represents 25% of the total moist soil in the 25% of the land area moist soil in the Mediterranean region and produces more than 60% of fish production in Egypt, and the whole area is highly liable to face the negative impact of climate change and include Lake Bardawil – Al-Abiad Bay near Matruh and Almura Lakes Beaches which will result in reducing fishing profession and fishermen migration to other

places in search of other resources for earning their living. There are many areas on the Red Sea coast are also in high risk of facing the negative impact of climate change .

And recent studies in Egypt confirms that parts of the lands of Delta, located around the lakes may has already been salted, and that sea water started penetrating the soil in the northern parts of the delta which ruined the quality and efficiency of underground water - this in addition to dredging operations caused by humans, which led to the reduction of cultivated land .

The Human Development Report for World 2007 - 2008 issued by the United Nations Development Program - (UNDP) warned of the possibility of 6 million Egyptian citizens in north delta being exposed to migration because of floods and rising water levels in the Mediterranean and this because of the accelerated break up in ice sheets .

As follows the results expected by a team of environmental scientists in the world and Egypt - and in order to understand the importance of the situation - for Delta by the impact of climate change during this century to show the losses and damage over time from 2010 until 2050 fall as follows in Alexandria.

Table 1 shows the attitude of delta Egypt as a result of change of climate

Rise in sea level	year	Loss in area	Human loss	Number of lost jobs
18cm	2010	144km	252000	32509
30cm	2030	190km	545000	70465
50cm	2050	317km	1501200	195443

From the above, the developed countries are the main reason behind the global warming and the developing countries are the harmed, Egypt came among 84 countries which are mostly damaged according to a study of the World Bank and thus the Copenhagen summit was held against global warming and Egypt insisted in this summit on the need to oblige developed countries to cut their emissions of gases by at least 40% by 2020 and by at least 80 - 95% in 2050 and according to the measurements in 1990 as the base year.⁸

By the end of Copenhagen summit to climate change on Friday, 18 December 2009 the opinions varied between success or failure, while it was considered by observers half success and half failure, the closing statement of the summit was that the emission of gases should be reduced to 80% until 2050 from their current, but without any obligations or having clear plan or even a hint about penalties for countries that could violate this commitment and without specifying shares for the big countries that are the cause for this emissions⁹ .

[^] - المصدر السابق

[^] - جريدة الأهرام - العدد 44931 (د/ ماجد جورج وزير الدولة لشئون البيئة) - ١٢ ديسمبر ٢٠٠٩م.

[^] - جريدة الأخبار - العدد 17996 (د/ نادر نور الدين محمد) - ٢١ ديسمبر ٢٠٠٩م.

⁹ - جريدة الأخبار - العدد 17996 (د/ نادر نور الدين محمد) - ٢١ ديسمبر ٢٠٠٩م.

The following pictures show the impact of the Copenhagen summit on the world its effect



Figure (4) it shows the demonstrations that took place all over the world to demand action against global warming

4-Confirm the validity of the phenomenon

4-1 on Thursday 27/3/2008 Mother Nature proved practically and clearly that it has begun to revenge for itself from what the inhabitants do to it than where satellite images showed an enormous mass of snow with area that reaches about four times the size of Paris and an area almost as the same as of Northern Ireland began to melt and appeared out cracks, threatening to split from the South Pole because of the global warming caused by increased carbon dioxide emissions, says the world David Vaughan, that The hill is the largest area of ice threatened to split from the mother continent until now, scientists believes that if the rate of separation and melting snow in the poles remains as it is at the current rate, the level of water in the seas and oceans will rise by 1.4 meters by the end of this century or closer than that, note that the country's most affected are the Mediterranean countries and the most affected one is Egypt ,as a result of the rise in sea level of the Mediterranean as the result of global warming¹⁰ .



Figure (5) by a satellite shows the beginning of splitting of wilkins hill at the south pole

¹⁰ - جريدة الأخبار الأعداد ١٧٩٨٥ ، ١٧٩٩١ بتاريخ ٨ ديسمبر، ١٥ ديسمبر ٢٠٠٩ على التوالي.

^{١٠} - جريدة الأهرام - العدد ٤٤٣٠٦ - الصفحة الأولى - ٢٧ مارس ٢٠٠٨م

on 21.1.2010 severe floods occurred in Egypt resembles the floods that occurred in September 1994 and the victims were Upper Egypt Governorates and particularly the city of Aswan, mountains of the Red Sea and the governorate of North and South Sinai, where low and medium clouds increased accompanied with heavy rains that included Cairo city and the coastal cities but in smaller quantities relatively than those rainfall on the rest of the parts together with significant decrease in the temperature that reached 6 to 8 degrees Celsius also with the presence of active wind in some places, which led to the deterioration of vision and the increase sense of coldness, This happened because Egypt was affected by the presence of a Low Pressure Area concentrated on the Red Sea, accompanied with winds most of which are South east loaded with a high percentage of water vapor, this low pressure area coincided with the presence of another low pressure area in the upper atmosphere accompanied by a extremely cold strong air flow coming from North and Central Europe (resulted from the increase in air temperature). This in return caused instability in the weather conditions, in addition to the amounts of low clouds and thunderstorms that moved from the tropic areas to affect the Upper Egypt and the Red Sea coasts in North and South Siani Governorates.

The following images illustrate the impact of climate change on urbanism in Egypt .



Figure (6) the impact of climate change on construction in Egypt (Aswan - Nuweiba - Sinai – Arish)

4-3 Documentary film by Al Gore

It's a documentary film that was produced on year 2006 by Al gore the competitive of George Bosh junior and who won the Nobel Prize for this film on the year 2007

This film confirms the validity of the climate change phenomena by researches and scientific evidences that took years in its preparation, in the film the phenomena was discussed in a scientific way at the global level on the planet, and then on the national level and then on the regional level and then at the city level. But from this film we

can rely on some facts that can help the research, some shots were taken that shows the validity of the phenomenon .

In the following figures (7, 8, 9 and 10) explains the phenomenon of global warming and the rise of temperature in an easy way and how the melting of snow mountains in the world, will lead to a rise in gases on Earth .

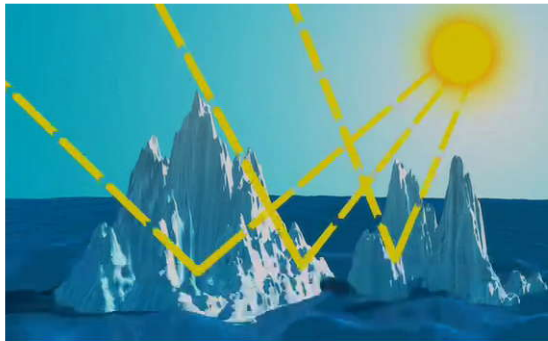


Figure 8 shows the melting of snow

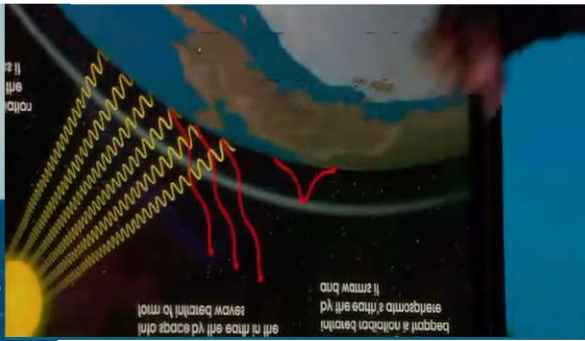
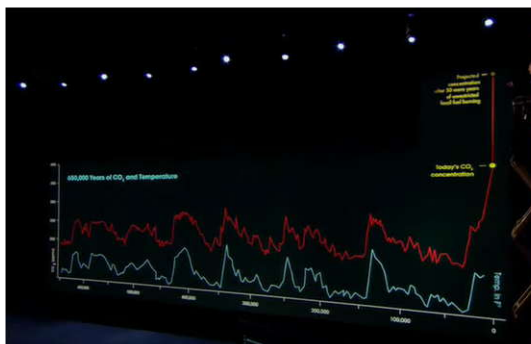


Figure 7 shows the global warming



Form (10) diagram to explain the high proportion of gases over the years



Figure (9) to clarify the so-called water carrier across the ocean and then to the Mediterranean

In Figures (11 & 12) are examples where in diagram (11) it describes the Lake Chad from year 1963 to 2001, which was one of the largest lakes in the world at that time, and started to dry year after year until today it does not exist at all, but its bottom turned to drought as a result of the change in the Earth's temperature .

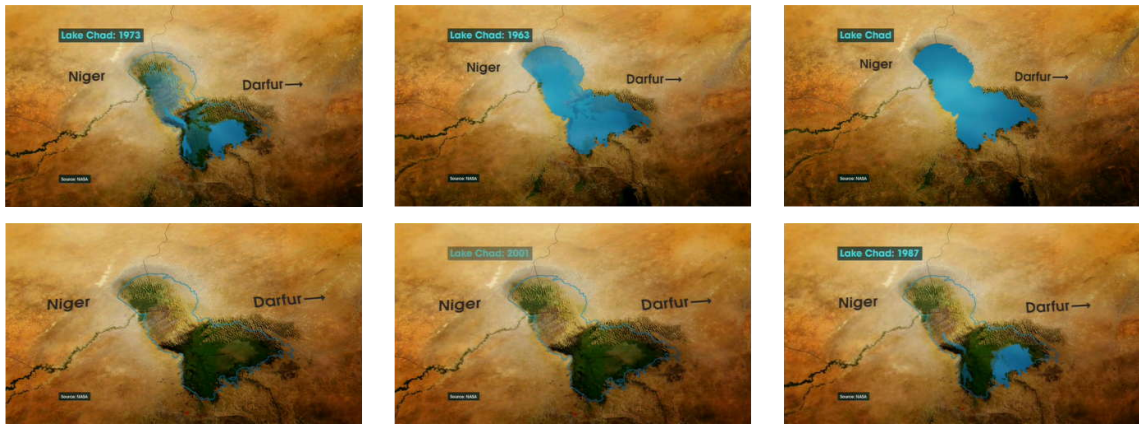


Figure (11) Lake Chad in 1963 and which was one of the largest lakes in the world



Figure (12) Lake Chad now

The examples which confirms the melting snow in as in the figures (13,14, 15), while the figure(16) shows the position of the snow sheet on earth and its decreasing year after year .



Figure 13 snow areas at the past and now

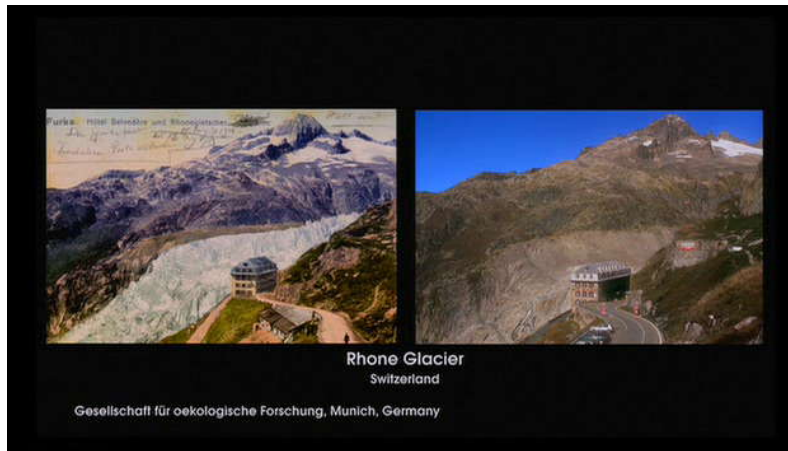


Figure (14) snow areas on the Alps at the past and now



Figure (15) snow areas in Argentina in the past - and now

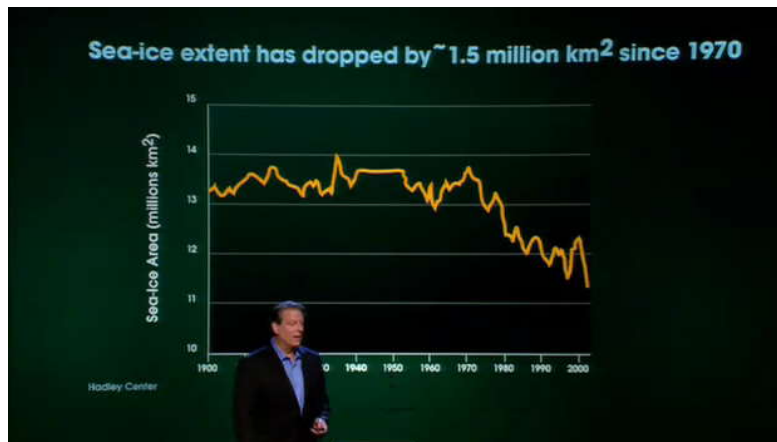


Figure (16) that illustrates the decrease of snow over the years

While figures (17,18,19) explains in a simple way by using a cup of water and some ice the theory of sinking snow mountains and their impact on the land, that some scientists depend on to prove the falseness of the theory, but will be clarified through figure (17) shows Ocean and on it the snow mountains as for figure (18) it shows those mountains when the melt and does not affect the land, according to the theory of while in the case of the existence of these snow mountains on land it melts and its water will go towards the seas and oceans which will raise level of water and that will lead to sinking of some parts of the land as shown in Figure 19 .



Figure (17)



Figure (18) shows the theory of snow melting according to the theory of



Figure (19) illustrate the idea of the melting ice on land melts ice and gets out of the edge of the cup

Finally the film ended with a fact by showing a map of the world to clarify the country's most affected by this phenomenon as in the form (20) and also figure shows that Egypt will be affected by this phenomenon in its north, south and east, and the

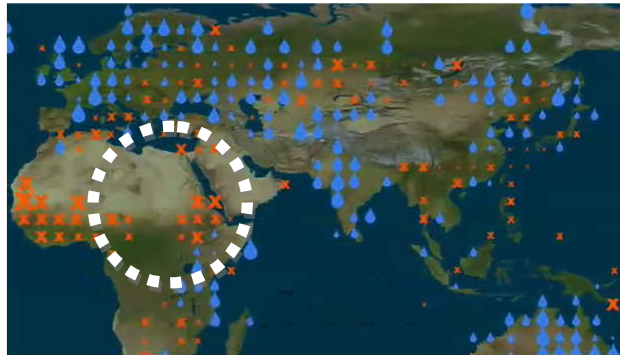


Figure 20 shows the countries that will be affected by these phenomena and as shown Egypt will be highly affected

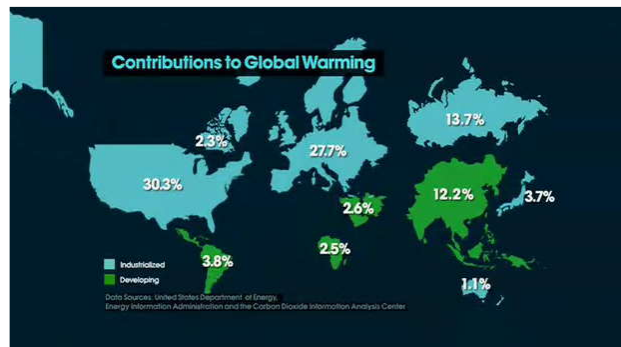


Figure 21 the distribution of continents according to the amount of thermal emission

5- Role of urban planning in facing the disaster of sinking of the delta and coastal cities due to global warming

5-1 introduction

The removal of the cities on the coast and relocation is difficult, if not impossible; due to its historical, cultural, social and economic value also it is inhabited by hundreds of thousands and millions of people who became attached to it.

Through the analytical study of cities of the coast in the coastal regions some ideas can be raised for the role of urban planning in the face of the disaster as follows:

- Stop the growth of cities along the coastal strip and directing it in other directions that are safe direction toward the south and west away from the coast .
- Approval of city subsequent growth strategies, which aimed at the growth of the city safely away from the coast as well as the protection of the surrounding agricultural land and that, is considered as the main economic source

In the case of the development of new cities near coastal areas this precautions should be taken into consideration:

- choosing the locations that is higher than the sea level (more than 3-5 meters above sea level) so as it will not be affected by the phenomenon

- That these sites should be relatively away from the beaches and coasts so that they are relatively safe .
- Natural and manufactured repellants should be done to reduce the power of sea waves .
- For resorts that arise on the coast the waterfronts must be minimized and taking the village away from the coast with the introduction of water bodies be coordinated within these resorts. Bring the sea to the guests. Additionally the establishment of the fenders to be the natural elements and functional .
- Planting trees and parks and green spaces and the use of green color on the road
- Unload some squares and spaces turning it into green areas for human movement within the physical space of the village especially after the villages turning into almost urban cities full of concrete and high floors .
- increase green spaces in the cities of the Republic where the rate reached to 0.10 m² / person, but in some cities and new communities has been applied 4-5 m² / person parks and green spaces at the level of the neighboring group housing - the city level - or gardens regional and use of Green areas to separate neighborhoods from each other .
- Planning open green spaces and not to distort the gardens with closed iron walls so as not to become as green prisons, difficult to use and enjoy .
- Study other solutions to face climate change through three different ways are as follows - :

The first Field: the migration of the population and the loss of land by estimated price is eighth trillion dollar .

The second Field: is the coexistence with the new situation but by changing the people's activity from agricultural to fishing or tourism, industrial or commercial, as in Venice .

The third Field: the confrontation by building concrete bridges and cement plungers on weak areas of the coast and with certain heights, there are 75 km of weak coastline that should be strengthened but most of the areas that needs to be strengthened are in the areas of Burullus with distance 13.5 km and the area of Abu Qir with distance 9 km to be with a 4 meters immersed plungers and a half meters above sea level .

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