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Workshop on “Building Climate Resilience in the Nile Delta; Urban Water Management for Effective Solutions.”

*16TH – 17TH OF JUNE 2013, CAIRO, EGYPT
Egyptian Water Partnership*



TENTATIVE AGENDA

WORKSHOP ON

BUILDING CLIMATE RESILIENCE IN THE NILE DELTA URBAN WATER MANAGEMENT FOR EFFECTIVE SOLUTIONS

16TH – 17TH OF JUNE 2013, CAIRO, EGYPT

Day 1, 16th of June 2013

9:30 - 10:00 REGISTRATION

10:00 - 10:45 **OPENING SESSION: *Welcome Speeches and Introduction***

H. E. Dr. Mahmoud AbuZeid, Egyptian Water Partnership (EWP), President
H. E. Dr. Mohamed Bahaa ElDin, Minister of Water Resources and Irrigation.
H. E. Dr. Abd Elkawy Khalifa, Minister of Potable Water & Sanitary Drainage.

10:45 - 11:00 **COFFEE BREAK**

First Theme *Issues and Challenges*

11:00 - 11:20 Challenges facing the Nile Delta, Eng. Mohamed ElRawady, (EWP)

11:20 - 11:40 Sea Water Intrusion in Coastal Groundwater Aquifer of the Nile Delta, Dr. Madiha M. Darwish, (NWRC)

11:40 - 12:00 Natural and Man-Made Systems for Coastal Protection in the Nile Delta, Dr. Ibrahim ElShenawy.

12:00 - 12:20 Solid Waste Disposal in Waterways, Dr. Ashraf Hebash, (MWRI)

12:20 - 12:40 Gamasa Hurricanes, Mr. Wahid Soaudi (Egypt Metrological Authority)

12:40 - 1:40 Open Discussions

1:40 - 3:20 **LUNCH**

Five Working Groups

3:20 - 4:20 Working groups discussions on the First Theme: Introduction, Issues and Challenges

4:20 - 4:35 **COFFEE BREAK**

4:35 - 5:00 Presentation of The Working Groups.



Day 2, 17th of June 2013

Second Theme National & Local Plans affecting Deltas in Africa

- 9:30 - 9:50 Egyptian Delta Alliance Wing, Dr. Ibrahim ElShenawy (NWRC).
9:50 - 10:10 2017 National Water Resources Plan; Facing the Challenges, Dr. Mamdouh Ahmed Antar (MWRI)
10:10 - 10:30 Nigeria Delta Case Study, Eng. Clement Onyeaso Nze, (Nigeria Water Partnership)
10:30 - 10:50 2030 Strategic Vision for Wastewater Reuse in Nile Delta Governorates, Dr. Khaled AbuZeid (CEDARE/EWP)
11:10 - 11:30 The National Climate Change Adaptation Strategy, Dr. Mohamed Ismail (EAAA)
11:50 - 12:10 2030 Alexandria Integrated Urban Water Management Plan, Dr. Khaled AbuZeid (CEDARE/EWP)

12:10 - 12:30 COFFEE BREAK

Five Working groups

12:30 - 2:10 Working groups discussions on the Second Theme: National & Local Plans Affecting Deltas in Africa

2:10 - 3:30 LUNCH

Five Working groups

3:30 - 4:30 Working groups discussions on the Second Theme: National & Local Plans Affecting Deltas in Africa

4:30 - 4:45 COFFEE BREAK

4:45 - 5:00 Presentation of The Working Groups

1. OPENING SESSION:

The Workshop on Building Climate Resilience in The Nile Delta; Urban Water Management for Effective solutions was launched by The Egyptian Water Partnership (EWP), which was organized in the framework of partnership and cooperation between EWP, Global Water Partnership (GWP) and the Netherlands International Development Program (DGIS) to develop a global program of action for sustainable development of delta ecosystems worldwide. The workshop was held at the Intercontinental City Stars Hotel during the period from 16th to 17th of June, 2013.

The opening ceremony was inaugurated by H. E. Dr. Mahmoud AbuZeid, President, Egyptian Water Partnership (EWP), H. E. Dr. Mohamed Bahaa ElDin, Minister of Water Resources and Irrigation and H. E. Dr. Abd Elkawy Khalifa, Minister of Potable Water & Sanitary Drainage and Dr. Khaled AbuZeid, General Secretary, Egyptian Water Partnership.



DR. KHALED ABUZEID, GENERAL SECRETARY, EGYPTIAN WATER PARTNERSHIP, greeted the ministries and welcomed all participants to the workshop and he highlighted the main points that would be presented during the two days workshop. Some of which were Challenges facing the Nile Delta, Sea Water Intrusion in Coastal Groundwater Aquifer of the Nile Delta, Natural and Man-Made Systems for Coastal Protection in the Nile Delta, the wheat crop production per meter cubic of water on the international level, the solid waste disposal in waterways in the Delta, Hurricanes and storms that faced some of Delta Governorates, National and Local Planning; 2017 National Water Resources Plan; Facing the Challenges, 2030 Strategic Vision for Wastewater Reuse in Nile Delta Governorates, 2030 Alexandria Integrated Urban Water Management Plan, The National Climate Change Adaptation Strategy, and the Nigeria Delta Case Study which would be represented by the Nigerian Water Partnership as a kind of experience exchange under the umbrella of the Global Water Partnership and Delta Alliance.

Dr. AbuZeid explain that during the two days workshop there will be working groups on the followings; Delta Challenges, and Facing Challenges so that to conclude the recommendations in the Building Climate Resilience in The Nile Delta; Urban Water Management Programme which will be represented to Deltas Alliance Wing and Global water Partnership.

Finally, he concluded his brief greeting words by expressing his gratitude and he wished the participants fruitful discussions and sustainable results.

Then, he introduced the other speeches beginning by H. E. Dr. Mahmoud AbuZeid, Egyptian Water Partnership (EWP), President, H. E. Dr. Mohamed Bahaa ElDin, Minister of Water



Resources and Irrigation and H. E. Dr. Abd Elkawy Khalifa, Minister of Potable Water & Sanitary Drainage.

H. E. DR. MAHMOUD ABUZEID, EGYPTIAN WATER PARTNERSHIP (EWP), PRESIDENT, welcomed all the participants and then he addressed some characteristics of deltas in regions and mentioned some of the challenges facing the Nile Delta in Egypt, This besides the impact on human settlements and welfare of societies. Some of the action plans of the environmental conventions (such as the Ramsar Convention on Wetlands, the UN Convention on Biodiversity and the UN Convention to Combat Desertification) do contain elements that could also be part of an adaptation strategy for Egypt. For instance, measures to alleviate desertification or conserve coastal ecosystems are likely to make the country more resilient to climate change.

Then, Dr. Abuzeid talked about the adaptation to Coastal Zone Risks and the adaptation to Socio-Economic Impacts. Stating that it is important to note that many, if not all, of the adaptations for water resources and other sectors can be justified without consideration of climate change. Egypt's extremely limited water supplies, combined with the continuously growing demand, make more efficient use of water and enhancement of supplies imperative.

At the end, he concluded, that water management strategies to increase climate resilience and ensure water and food security and livelihoods in coastal delta areas requires a mix of policy reforms and scaling up of investments. Progress should be made towards integrating "climate-smart agriculture" into broader development and growth programs. Improving agricultural water management and watershed management, and addressing sea-surges, salinity and coastal flooding is a must. The particular challenges of livestock, fisheries, and deforestation should be given utmost attention.

And he also mentioned that in this concern, the Arab Water Council, acting as a Regional Coordinator with activities extended on both regional and international scale, works hard towards mobilizing societies to face all this package of challenges in an efficient and effective way, with the ultimate aim of achieving sustainable development.

Finally, Dr. Mahmoud wished the participant all the best of luck in the workshop deliberations.

H. E. DR. MOHAMED BAHAA ELDIN, MINISTER OF WATER RESOURCES AND IRRIGATION, greeted the ministers and welcomed the entire participants. He expressed his deep pleasure to attend this workshop.

H. E. stated the current water status in Egypt and the challenges facing Egypt due to increase in population and in return cause increase in the demand for drinking water. As the share per capita of water resources in Egypt has decreased from 1460 m³ year 1977 to 640 m³ year 2012.

Dr. Bahaa also pointed to the current pollution of all the water resources passages due direct or indirect drainage of wastewater (sewage, industrial, and agricultural), which affects the public health and the environment.

Also, the climate change is one of the major challenges that faces the water sector in Egypt, which affects the annual income of the Nile water that reaches the Lake of Naser and the water agricultural demand due to expected increase in temperature degrees.

He mentioned that the MWRI is developing and managing the water resources to provide all the water needs through a number of water dynamic policies to maximize the usage of the water resources.

He also mentioned that the National Water Resources Plan (NWRP) is an updating of the water policies and plans which main principle is Integrated Management of Water Resources.

H. E. explained that the NWRP main objective is to development of new water resources and to increase the usage efficiency of the available water resources.

Then, he talked about the necessity of reuse of wastewater (agricultural and treated sewage), that to decrease the difference between the non renewable water resources and the water needs in the different sectors.

One of the main concerns that the ministry had adopted is the reuse of agricultural drainage through mixing the agricultural drainage with the water in canals which is called mixing mediator which permits the reuse of wastewater without affecting the effecincy of drinling water stations.

He also briefed that the current usage of treated wastewater is to cultivate wooden forests, Jatropha ,and Jojoba wooden trees and he stated the importance to expand the usage of treated wastewater in different crops under the necessary supervision.

Last but not lease, he concluded that Egypt moves from the concept of water abundance to water scarcity, that's why all the concerned sectors have to work on increasing the efficiency of water usage, rationalization of water resources, and reuse of treated wastewater without affecting the environment.



At the end, H. E. Dr. Bahaa acknowledged all the participants and wished them fruitful discussions.



H. E. DR. ABD ELKAWY KHALIFA, MINISTER OF POTABLE WATER & SANITARY DRAINAGE, greeted the ministers and expressed his pleasure to attend the opening of this valuable workshop. H. E. Mentioned some main points concerning the wastewater drainage and water supply. Some of which are redistribution of the governmental fund support to ensure that it reaches the poor people, he also said that the sanitation drainage network in Egypt needs 80 billion to extend the facilities and services to all those who has no access to clean drinking water and adequate sanitation services, those are about 42 Million i.e. 50 % of the current population.

He talked about the allocation breakdown of the budget (8 billion EGP) which is one third for the networks, one third for lifting the wastewater, and one third for wastewater treatment.

He also mentioned that there is a need to construct 300 Station and there is a necessity need for the involvement of the private sector and the civil society.

H.E. mentioned that the civil Society has a great share in establishing some of the networks directly and that the holding company give the technical support only.

And he also stated that there is a potential of investment in Upper Egypt through planting the land surrounding the treated wastewater plants and of course usage of the treated wastewater. At the end he stressed on the main problem nowadays in Egypt which is the adequate sanitation services.

He ended his speech by wishing the participants a fruitful and successful workshop.

2. FIRST DAY:

ENG. MOHAMED ELRAWADY, BOARD MEMBER, EWP presented Challenges facing the Nile Delta by showing the 4 main delta-issues in delta which are:

- Competing and escalating demands: Different sectors are competing over water, with the growing population and the evolving industry, the agricultural sector is facing a growing competition. The sector of the highest national consumption, in itself also has competing demands of its own, especially between upstream and downstream farmers.
- What are the 4 main delta-issues in your delta? (Cont'd)
- Water Quality Degredation and Pollution: caused by Inadequate treatment of municipal and industrial waste water.
- Ground Water Depletion and Sea Water Intrusion: caused by excess pumpage of groundwater and excessive granting of well permissions.
- Coastal Shore Erosion and Sea level rise.

Then, he addressed measures to deal with these issues including; EWP was part of a nation wide dialogue on treated wastewater reuse as a measure for decreasing competition over conventional water resources, facilitated the establishment of water treatment plants and low cost sanitation schemes in rural areas of the Nile Delta, organized a seminar on the future of water in Egypt, and coordinated a focus study and organized workshops on industrial areas' water impacts in the delta.

Then, he added that EWP was also a part of a future planning process for the coastal city of Alexandria that depends entirely on the Nile, developing what has been known as the Alexandria 2030 Integrated Urban Water Management (IUWM) plan. One of the main objectives of that plan is reducing the pressure on the Nile Delta by developing non-conventional water resources where possible.



Eng. ElRawady mentioned organizing the process was through; constantly in contact with decision makers and different stakeholders, continuously facilitating technical Dialogue through workshops, disseminating knowledge through publications, organizing awareness campaigns and public events, developing project concept notes and proposals and giving awareness presentations.

He also explained some of the difficulties like lack of harmonization between different sectors, which is emphasized the most by mismatching Water, Agricultural, and Urban development policies.

At the end, he suggested the following; watch for trends of urban encroachment on Deltas, monitor pollution sources and water quality and identify all competing uses and get stakeholders consensus on ranking them by priority.

DR. MADIHA M. DARWISH, MINISTRY OF WATER RESOURCES AND IRRIGATION –EGYPT presented in detail the Annual Water Resources in Egypt, Role of Groundwater to the Country, Groundwater management issue and constraints, Challenges related to WRM, Development area in Egypt, SWI in the Nile delta aquifer, Solutions to stop increments of SWI.

She stated the Groundwater Management-Issues and Constraints by explaining that the estimation of groundwater potential is an important step that should be carried out carefully prior to planning groundwater development. However, potential may be affected (positively or negatively) by the applied management technology and constraints/issues facing groundwater use and allocation. An effort is made in this section to classify development technologies and major issues facing groundwater development and management. Moreover, potential functions of aquifer systems are discussed as a mean to support allocation decisions.

Dr. Madiha mentioned the challenges; First Set: Population Growth by showing the followings; Population growth against constant quota from the Nile, Population growth against a constant inhabited physical area, Uneven distribution of water resources over the country physical area and Population growth against a decrease in arable land. Second Set: Inappropriate management of Groundwater and Related Water Resources by showing the followings; Poor control on wells drilling, Poor control on flowing wells, Sustainability of non-renewable groundwater, Allocation of groundwater to uses does not make use of the comparative advantage, Inappropriate rain water harvesting techniques, and Inappropriate protection works from flood risks.

Third Set: Climate Change by showing the followings; Less rainfall on the Nile basin resulting in less water reaching Aswan, Sea water rise and resulting sea water encroachment to the coastal aquifers, Cycles of drought and high rainfall on the coastal areas, Cycles of flash floods and drought in wadis

Fourth Set: Pollution by showing the followings; Poor awareness with respect to groundwater pollution (confusion between pollution of water wells and the whole storage in various aquifers, Water supply is not accompanied by sanitary drainage and treatment, Uncontrolled reuse of agricultural drainage, Uncontrolled dumping of solid wastes, and Poor protection of well heads and well proper (drinking water wells).

- Research budget and funds should be increased to cope with the national and international crisis regarding climate change and its impacts and adaptation studies.
- Building co-operative mechanism to integrate all efforts
- Awareness program and media campaign
- Regional monitoring and observation system
- Regional data base and knowledge exchange system
- Regular Maintenance program for protection structures
- The following aspects are recommended to be covered in further studies for the coastal zones:
 - Potential impacts on land and groundwater salinity
 - Potential impacts on patterns of waves and currents
 - Potential impacts on erosion and accretion systems due to currents, waves, and wind actions
 - Potential impacts on lakes ecosystems
 - Potential impacts on water resources and drainage systems
 - Potential impacts on fisheries due to changes expected in current patterns
 - Potential impacts on infrastructures and natural resources of the coastal zone of the Nile Delta
 - Potential impacts of climate changes on evaporation from oceans and seas open waters and their role in reducing SLR
 - Potential impacts of temperature increase on phyto-plankton role in absorbing CO₂ and generating O₂.

DR. ASHRAF HEBASH, MINISTRY OF WATER RESOURCES AND IRRIGATION (MWRI) – EGYPT. He started by mentioning that the Ministry of water resources and irrigation spares no effort in the development and modernization of laws containing the different water uses and to prevent pollution and preserve waterways and drainage and irrigation facilities and maintenance, as well as facing problems in the management of water resources in Egypt, notably the limited water resources are currently available with surge in population, in addition to the deteriorating environmental conditions relevant to water as a result of pollution. Despite the seriousness of the problems facing Egypt in the field of water, there are ample of opportunities which gives hope to improve water management and to overcome the difficulties involved with all the different devices and also through the application of Act No. 48 of 1993 on the protection of the River Nile from the Nile River and waterways from pollution, law No. 12 of 1984 on irrigation and drainage, and law 4/1994 for the environment

Main axes of the water policy suggested by Egypt until 2020 by explain the role of the ministry in the maintenance of the waterways and canals, he mentioned in details the mechanical, manual, and biological maintenance.

Then, Dr. Ashraf explained the main sources of water pollution which is represented in industrial drainage, sewage drainage, agricultural drainage and solid disposal.

MR. WAHID SOAUDI, GENERAL MANAGER, ANALYSES, FORECASTS AND OFFICIAL SPOKESMAN OF THE EGYPTIAN METEOROLOGICAL AUTHORITY, First, he simplified the definition of cyclones which are storms (aerobic movements) helical, usually arise over the sea or the tropical oceans and is heading towards land causing destruction to everything that stands in their way and continue for several days and is often the most destruction to the beaches.

Then, formation of a hurricane as when it heats water in a tropical sea to temperatures ranging from 27 to 28 degrees centigrade works to heat the adjacent air layer, and the heated air pressure reduced, expands and rises to the top and the low pressure region are attracted by the winds of the high pressure surrounding it blowing from every direction which leads to evaporation of water, the steam rises to the top of the Central light cold air.



He also mentioned statistics for some hurricanes and showed maps of surface and upper-before and during the Gamasa hurricane affected counties and cities in the North of the country, including the area of Gamasa in dakahlia governorate with a surface low pressure coupled with winds NNE at high temperature and with a high percentage of water vapor due to the presence of another low pressure in the upper atmosphere jet stream, accompanied by very cold resulting in severe instability in weather.

Formed Cumulus clouds thunderstorm accompanied by heavy rains, hail and the clouds accompanied by upward air currents and other downside resulting winds Very high speed over 50 knots, about 90 km/hour, the wind is violent and destructive to buildings, ceilings and columns, this is what actually happened on the area of Gamasa.

KIA issued a meteorological warning to all State sectors, including the media, on the morning of 09-5 Wald-2013 confirmation of atmospheric releases and past this warning, at least for 72 hours and had been warned of bad weather to coastal cities and some provinces face maritime and Northern Sinai.

At the End, Mr. Waheed mentioned some important recommendations which are:

- To announce weather bulletin at least three times a day.
- To announce the weather forecasts by Messrs. air specialists due to their ability to deliver information.
- The establishment of hot lines for direct communication between the Egyptian Meteorological Authority, the Middle East News Agency to disseminate weather warnings as soon as possible through the print and broadcast media.

- Establishment of a crises committee composed of members of the the meteorological-news section of the radio and television, Union-Ministry of Interior-Ministry of defense, Ministry of irrigation, and any other concerned facilities
- Rebuild the watershed in the appropriate places in the areas concerned by the heavy rainfall and sometimes where rainfall for torrents

3. SECOND DAY:

DR. IBRAHIM ELSHINAWY, DIRECTOR OF COASTAL RESEARCH INSTITUTE (CORI), NATIONAL WATER RESEARCH CENTER (NWRC), MINISTRY OF WATER RESOURCES & IRRIGATION (MWRI), started by explaining Delta Alliance which is an international knowledge-driven network organization with the mission of improving the resilience of the world's deltas. Delta Alliance brings people together who live and work in deltas. They can benefit from each other's experience and expertise in order to contribute to an increased resilience of their delta region.

He also briefed that the in June 2011, the international network organization of Delta Alliance has become a legal entity by establishing the Foundation "Delta Alliance International". Delta Alliance International is managed by an International Governing Board and an Advisory Committee which main task is to advice the Governing Board on strategic and operational issues. The International Secretariat is based in the Netherlands and is amongst others responsible for supporting the International Governing Board and the Advisory Committee. A Wing is a network of organizations in a specific country or area, which is dealing with delta-related issues.

A Wing must be recognized and admitted to the Foundation by the International Governing Board. Currently, Delta Alliance International includes 10 wings.

Dr. Ibrahim highlighted the mission which is to improve the resilience of deltas worldwide, through the strategy of which; envisioning and defining resilience for deltas, measuring and monitoring resilience, reporting and creating pressure to improve resilience, providing inspiration to improve resilience and providing assistance to improve resilience.

DR. MAMDOUH AHMED ANTAH, MINISTRY OF WATER RESOURCES AND IRRIGATION, (MWRI) PRESENTED THE 2017 NATIONAL WATER RESOURCES PLAN; FACING THE CHALLENGES, OBJECTIVES, COMPONENTS, AND TOOLS. He started by explaining the IWRM Concept in NWRP; Water Supply and Demand Management, Water Quantity and Quality Management, National Water Resources Plan (NWRP), Economic, Environmental and Financing Aspects of Water Programmes, Institutional Reforms and new active roles of water actors at all levels, Legal Amendments and Enforcement of water laws and regulations, Involvement of all stakeholders at all stages (Participatory Approach), and NWRP is a National Collaborative Plan, NOT MWRI Plan.

He briefed the NWRP phase I Main Objective which is Development of the National Water Resources Plan (NWRP), that describes how Egypt will safeguard its water resources in the future (till 2017), both with respect to Quantity and Quality, and how it will use these resources in the best way considering the socio-economic and environmental aspects.

While (NWRP – CP) Phase II; The overall objective of the NWRP-CP is to assist the various functional actors and implementing agencies involved in the implementation of NWRP 2017 at central and de-central level in order to facilitate the efficient and timely implementation of the NWRP.

Dr. Mamdouh briefed the NWRP Main Accomplishments which can be itemized as follows:

- Operational Coordination Platform
- Collective Planning Framework
- Capacity Development and Training
- Governorate Water Resources Plans (GWRPs) for the three pilot governorates
- Water Status for Egypt: Annual Report
- Web Site
- Functional Monitoring and Evaluation System (M & E)
- Comprehensive Decision Support System (DSS)

NIGERIA DELTA CASE STUDY, ENG. CLEMENT ONYEASO NZE, (DIRECTOR, ENGINEERING HYDROLOGY), NIGERIA HYDROLOGICAL SERVICES AGENCY& NATIONAL PROJECT COORDINATOR NIGER-HYCOS/NIGER BASIN AUTHORITY (NIGERIA WATER PARTNERSHIP), started by presenting A BRIEF on THE RIVER NIGER: River Niger is the third longest river in Africa that takes its source from the Fouta Djallon highland in Guinea at an approximate altitude of 800m, before traversing over a distance of about 4,200km to empty into the Atlantic Ocean in Nigeria. The initial catchment area of the Niger basin was about 2,000,000km² covering 10 countries including Algeria, but as a result of desert encroachment, the catchment was reduced to an active catchment area of about 1,500,000km² with the exclusion of Algeria.

The remaining 9 countries covered by the basin's active catchment areas are namely; Benin, Burkina Faso, Cameroun, Cote D'Ivoire, Guinea, Mali, Niger, Nigeria and Tchad.

These Countries formed the Niger Basin Authority (NBA) initially as River Niger Commission (RNC) in 1964 with the view to fostering cooperation among its member countries in the use and management of the basin's resources among others. The RNC was changed to the NBA in 1980 with additional mandates for the enhancement of effective integrated water resources management and development of the basin in all fields notably: energy, water resources, agriculture, animal rearing, fish breeding, transportation, communications and industry.

Then, Eng. Nze briefed that the Delta area of Nigeria commonly referred to as the Niger Delta region lies at the south southern end where the main rivers of Nigeria (Niger and Benue) empty their waters into the Atlantic Ocean and is made up of nine (9) states

Over 80% of the wealth of Nigeria comes from the crude oil deposits in the Niger Delta region. Yet, it has suffered untold devastation since oil exploration and exploitation began in the area in the late 1950's. Oil prospecting, exploration and exploitation in the Niger Delta

- The Egyptian wastewater re-use code that prohibits using secondary and tertiary treated wastewater for edible crops.
- The Irrigation & Drainage Egyptian law that prohibits conveyance of any level of treated wastewater through irrigation canals.
- Obstacles and Institutional Constraints (2)
- The Environmental & health regulations & laws.
- The generation of new water demands by the wastewater companies due to directing the collected wastewater to Wood and Bio-fuel tree plantations.
- The anticipated competition over treated wastewater by the irrigation sector that needs to satisfy national water demands, and the agriculture sector that needs to satisfy agriculture expansion plans, and the water and wastewater sector that needs to generate income from treated wastewater produced to cover its operation and maintenance costs.
- The risk of not being able to market the agriculture products for export to neighboring markets such as the EU and the Gulf states due to the use of treated wastewater.
- The Health & Environmental hazards associated with improper handling of the different levels of treated wastewater by users.

Then Dr. Khaled stated the Proposed 2030 Strategic Directions which are; to maintain existing forest expansion areas of 2011 without further expansion and direct future treated wastewater to Agriculture Expansion areas, to modify Wastewater Reuse Code to allow for expansion in permissible agriculture crops cultivation on treated Wastewater according to international standards (e.g. new WHO guidelines), to develop governorate specific plans by matching Agriculture expansion plans with urban development plans, WSS plans, and Water Resources Management plans, and to embrace an out of Valley scenario for Urban Expansion.

At the end, Dr. Abuzeid proposed Inter-ministerial agreement and role of concerned ministries as listed below:

- Ministry of Agriculture and Land Reclamation role is to Select the crop composition according to the wastewater reuse code and water quality, to allocate the areas that can be cultivated in cooperation with the HCWW and MWRI, to supervise and controlling the agricultural process, to put and applying the laws to prevent violations of farmers, to control the reuse of treated sludge in agriculture according to law 254 for year 2003 and to control and supervise the quality of organic fertilizers.
- Ministry of Industry and Foreign Trade role is to regularly compile and disseminate data that shows quality and quantity of water usage and disposal from the factories, to prevent untreated industrial disposal into water bodies, to register all

Then, Dr. Ismail mentioned in brief the Human role in strengthening the global warming; Many theories since the mid-nineteenth century Showed that certain gases to the atmosphere of the Earth like carbon dioxide, methane and nitrous oxide due to trap heat and contribute to the heating of the earth. At the beginning of the twentieth century gave Swedish scientist Arrhenius idea that emissions of greenhouse gases in the atmosphere would lead to higher temperatures and thus climate change on the planet if Although the idea of the impact of humans on the Earth's temperature occurred a hundred years ago almost, but scientists did not they could only confirm this phenomenon since a relatively short period. Scientists confirm that humanitarian activities and since the Industrial Revolution Horn of nineteenth-contributed and are still in the strengthening of global warming through the secretion of large amounts of greenhouse gas atmosphere such as carbon dioxide resulting from the burning of fossil fuels such as coal shale oil to generate the energy needed by the human development.

Then, he is stated importantly the proposals for combating climate change as shown below:

- Logical solution optimized to address climate change is to stop emissions significantly (solution includes matters related to the global economy).
- The text of the Kyoto Protocol (1997) on the general principles to stop emissions of greenhouse gases. At a meeting in Bonn, 23/7/2001, approved more than 180 countries of the Kyoto Protocol and made him a legal treaty, but the United States pulled out of the climate negotiations and did not sign the Kyoto Protocol in Bonn meeting, and the United States has produced more than a quarter of contamination world carbon dioxide.
- Forestry and changing agricultural practices.
- Guided by the use of traditional energy sources.
- Reduce dependence on fossil fuels as the primary source of energy and seek forward to providing clean energy sources (renewable energy production from wind, water and sun).
- Recycling & walking and the use of mass transportation and reduce consumption (Turning Down) and lights-out time of departure (Switching Off) and change behaviors.

After wards, he briefed the preventive measures ; to reduce the risk of flooding and reduce the pace of this matter requires speed to take the necessary measures to control high groundwater levels are as follows: immediately stop of domestic exchange in groundwater in all the villages of the provinces of the Delta and the work covered drainage systems to reduce groundwater levels and all coastal cities, to reduce leaching rates of irrigation water to groundwater through the use of modern irrigation methods alternative to flood irrigation methods or a few crops farming water consumption with improve networks of agricultural drainage, the Expansion in groundwater use the alternative to surface water in irrigation operations, the use of groundwater to irrigate landscaping Channel and Delta cities, and water re-use and recycling to reduce waste and reduce its negative effects.

At the end, he concluded that the preventive measures can be through The expansion in the construction of waves walls along our coasts especially in North low of them and in front of the watercourses and the Nile Delta will not be with the effectiveness meaningful protection from flooding coastal areas unless it is to control the continuing rise in groundwater levels to those areas which may increase the problem complex to include flooding the coastline groundwater.

Dr. Khaled AbuZeid, Regional Water Resources Programme Manager, CEDARE and General Secretary, Egyptian Water Partnership, He presented the 2030 Alexandria Integrated Urban Water Management Plan, by stating the current condition in Alexandria Governorate which are; 4 Million Inhabitants (2011), Alexandria accounts for about 5.5% of Egypt's Population and for almost 8% of the country's GDP, It embraces a coast line of 70 kilometers and is home to 40% of Egypt's industrial establishments, The Nile River supplies over 95% of Alexandria's water demand and The city receives rainfall of less than 200 mm/year.

He also stated that concerning the Strategic Planning in a Nutshell that Ten studies were prepared, covering the base for the strategic planning team to develop a plan for the year 2030; eight of them are directly related to water supplying/saving options. and the the data were collected for the city water resources covering the history of the water system in Alexandria, describing the current and future water demand as well as the activities and responsibilities of different stakeholders including Ministry of Water Resources and Irrigation (MWRI), Alexandria Water Company (AWCO), Alexandria Sanitary Drainage Company (ASDCO), and other institutions involved in water management. A vision for water demand management in the City of Alexandria was developed and formulated by the Learning Alliance (LA). Possible scenarios for the anticipated future water system in Alexandria City were described. The potential amounts of water that may be made available by eight strategic options to satisfy future water demand were studied. The strategies were evaluated, costed, and ranked.

Dr. AbuZeid ended his presentation by stating the Strategic Options for GROUNDWATER POTENTIAL, STORM WATER POTENTIAL, WATER DEMAND MANAGEMENT POTENTIAL; it was proven that 20 MCM could be made available annually by minimizing physical and commercial losses from pipe network, Increasing the drinking water tariff gradually could save 60 MCM annually starting from 2030; this amount corresponds to the value of monetary savings resulting from an average tariff increase of 5%, and Maximizing household water use efficiency is estimated to save 44 MCM annually, WASTEWATER REUSE POTENTIAL (900 MCM/YR), AGRICULTURAL DRAINAGE REUSE POTENTIAL, SEA WATER DESALINATION POTENTIAL; It has been shown that if sufficient funds are available, the maximum amount of desalinated water could reach up to 777 MCM annually starting from 2030, based on the needs of some particular coastal areas. The locations where the desalinated water can be used have also been determined. Moreover, a desalination system that could produce up to 2.13 MCM of desalinated water daily has been proposed, 366 units of the proposed system will be needed to produce the above mentioned daily amount. URBAN WATER REUSE POTENTIAL; Three strategic alternatives have been assessed, these are Grey water reuse, roof water reuse, and road water reuse, the Aquacycle model has showed that these options could introduce 23, 14, and 25 MCM annually to the Alexandria water budget respectively.

4. RECOMMENDATIONS:

After 2 days of presentations, working groups, and discussions, the workshop participants came out with the following recommendations:

- The necessity of directing national subsidy to sanitation instead of less deserving sectors such as transport.
- The importance of public private partnerships in bridging the sanitation financial gap by building 300 additional treatment plants. There are specific areas in Upper Egypt where agriculture on treated wastewater have been foreseen, these areas represent a good opportunity for investors.
- The importance of changing the cropping patterns in the Nile Delta as a strategic Climate Change adaptation measure. Crops with high tolerance to salinity should be introduced to agricultural areas close to the Mediterranean.
- The importance of developing Integrated Coastal Zone Management (ICZM) plans for all coastal governorates and cities, these plans should consider natural coastal protection measures such as sand dunes, along with other structures such as seawalls. The plans should also consider the protection of the coastal highway.
- The importance of developing coastal protection policies that go in line with ICZM plans, such policies should specify a distance from the coast where no further development will be permitted.
- The necessity of prohibiting building new cities targeted for one million inhabitants or more.
- The importance of studying the effects of dams at the Nile upstream countries on Egypt's water resources.
- The importance of strategic and efficient use of renewable and non-renewable groundwater resources, and the introduction of new strategic measures that include artificial aquifer recharge.
- The Necessity of updating the national hydrographic database and maps.
- The importance of having accurate data that is consistent among different water related sectors.
- The utmost necessity of data sharing and coordination of activities between different national water related sectors.
- The necessity of applying modern irrigation.
- The necessity of manufacturing seawater desalination equipment locally.
- The importance of making alternative energy sources available by manufacturing solar energy production equipment locally.



- The importance of applying law 48 for 1982 with some modifications that could create more flexibility for treated wastewater reuse in agriculture.
- The need to apply the fundamentals of "Green Economy".
- The need to consider the establishment of clusters of low cost treatment plants, especially in small villages.
- The utmost importance of having an advanced Monitoring and Evaluation system.
- The importance of precisely studying potential projects related to the Qattara Depression.
- The importance of developing regional and local numerical models to assess climate change impacts on the Nile Delta.
- The importance of rehabilitation of both Nile branches for navigation.
- The importance of rehabilitation of a great number of pumping stations along the Nile.
- The necessity of technical capacity building across the whole water sector, especially with respect to crisis management.



ANNEXES

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BUILDING CLIMATE RESILIENCE IN THE NILE DELTA URBAN WATER MANAGEMENT FOR EFFECTIVE SOLUTIONS

16th – 17th of June 2013, Cairo, Egypt

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MEDIA COVERAGE



ELAHRAM NEWSPAPER

18 JUNE 2013



PRESENTATIONS



Enabling Delta Life in (The Nile Delta, Egypt)

1

What are the 4 main delta-issues in your delta?

- Competing and escalating demands:** Different sectors are competing over water, with the growing population and the evolving industry, the agricultural sector is facing a growing competition. The sector of the highest national consumption, in itself also has competing demands of its own, especially between upstream and downstream farmers.



What are the 4 main delta-issues in your delta? (Cont'd)

- Water Quality Degredation and Pollution:** caused by Inadequate treatment of municipal and industrial waste water.
- Ground Water Depletion and Sea Water Intrusion:** caused by excess pumpage of groundwater and excessive granting of well permissions.
- Coastal Shore Erosion and Sea level rise.**



What measures are you preparing / did you take to deal with these issues?

- EWP was part of a nation wide dialogue on treated wastewater reuse as a measure for decreasing competition over conventional water resources.
- EWP facilitated the establishment of water treatment plants and low cost sanitation schemes in rural areas of the Nile Delta.
- EWP organized a seminar on the future of water in Egypt.
- EWP coordinated a focus study and organized workshops on industrial areas' water impacts in the delta.



What measures are you preparing / did you take to deal with these issues? Cont'd

- EWP was part of a future planning process for the coastal city of Alexandria that depends entirely on the Nile, developing what has been known as the Alexandria 2030 Integrated Urban Water Management (IUWM) plan. One of the main objectives of that plan is reducing the pressure on the Nile Delta by developing non-conventional water resources where possible.

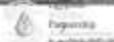


How did you organize / are you organizing the process for developing this?

- Constantly in contact with decision makers and different stakeholders.
- Continuously facilitating technical Dialogue through workshops.
- Disseminating knowledge through publications.
- Organizing awarness campaigns and public events.
- Developing project concept notes and proposals.
- Giving awareness presentations.



EWP Website



أنشطة ميدانية



شمنديل



أشليم



What was the most difficult part in your process so far?

- Lack of harmonization between different sectors, which is emphasized the most by mismatching Water, Agricultural, and Urban development policies.



What 3 suggestions do you have for a country that is just starting to think about their delta?

- Watch for trends of urban encroachment on Deltas.
- Monitor pollution sources and water quality.
- Identify all competing uses and get stakeholders consensus on ranking them by priority.



**Workshop on
Building Climate Resilience in The Nile Delta Urban
Water Management for Effective solutions**
16th – 17th of June 2013, Cairo, Egypt

Sea water intrusion in the Nile delta aquifer

By
Prof. Dr. Madiha Mustafa Hassan
Ministry of water resources and irrigation -Egypt

Contents

- Annual water resources in Egypt
- Role of Groundwater to the Country
- Groundwater management issue and constraints
- Challenges related to WRM
- development area in Egypt
- SWI in the Nile delta aquifer
- Solutions to stop increments of SWI
- Conclusion and recommendations

Annual Water Resources in Egypt

- 1- River Nile (55.5 BCM)
- 2- Groundwater
 - *Groundwater in Nile Valley and Delta(4.5 -8.4bcm)*
 - *Groundwater in the Desert area ,Sinai &western desert*
- 3- Drainage water reuse 3.5BCM(1997)-
7.4BCM(2017)
- 4- Treated wastewater
- 5- Rainfall and flash floods in Wadis(1.3BCM)
- 6- Desalination of sea water or brackish groundwater(50MCM)



Importance of groundwater to the country

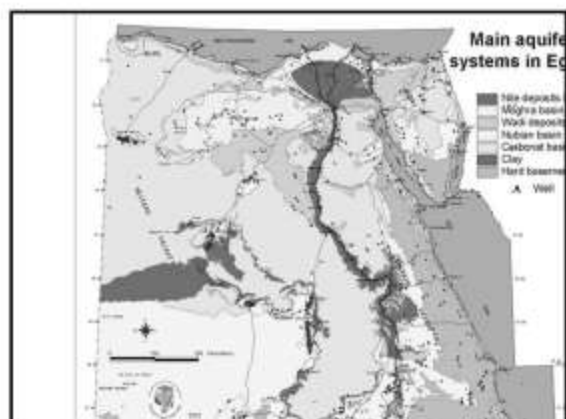
Water resources in the country can be summarized as follows:

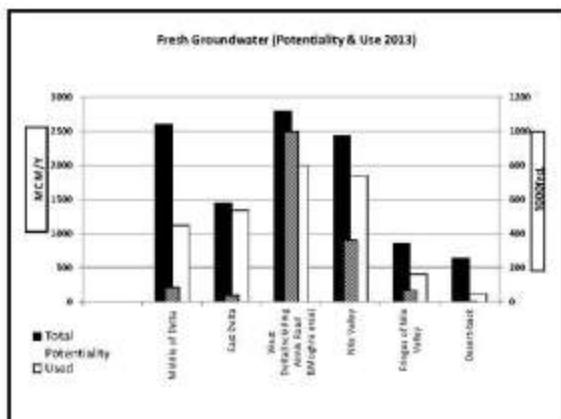
- A system related to the Nile...One point delivery at Aswan Dam.
- Groundwater systems...Distributed with different characteristics and potential.
- Flash Flood in Wadis...Localized but with a wide distribution.
- Rainfall...Scarce, Uncertain, Irregular

نسبة المياه الجوفية بالمقارنة بحصة مصر من مياه النيل



نسبة المساحة المتزعة على المياه الجوفية = 20% من المساحة الكلية





Groundwater Management-Issues and Constraints

- Estimation of groundwater potential is an important step that should be carried out carefully prior to planning groundwater development. However, potential may be affected (positively or negatively) by the applied management technology and constraints/issues facing groundwater use and allocation. An effort is made in this section to classify development technologies and major issues facing groundwater development and management. Moreover, potential functions of aquifer systems are discussed as a mean to support allocation decisions.

Table 1. Possible Functions of Aquifers

Aquifer System	Function Use					
	Large scale irrigation	Small scale irrigation	Industrial	Domestic	Constructive use	Storage
Nubian sandstone	Current	Current	Potential	Potential	Potential	Potential
Nile alluvium	Current	Current	Current	Current	Current	Current
Hard rocks	Potential	Potential	Potential	Potential	Potential	Potential
Coastal	Potential	Potential	Potential	Potential	Potential	Potential
Wadi deposits	Potential	Potential	Potential	Potential	Potential	Potential
Mudflats	Potential	Potential	Potential	Potential	Potential	Potential
Carbonate	Potential	Potential	Potential	Potential	Potential	Potential

Legend: Current (light grey), Potential (dark grey)

Table 2. Classification of Groundwater Management Technologies

Aquifer System	Technology					
	Desalination	Artificial recharge	Deep wells	Shallow wells	Skimming	Surface water harvesting
Nubian sandstone	Current	Potential	Potential	Potential	Potential	Potential
Nile alluvium	Current	Current	Current	Current	Current	Current
Hard rocks	Potential	Potential	Potential	Potential	Potential	Potential
Coastal	Potential	Potential	Potential	Potential	Potential	Potential
Wadi deposits	Potential	Potential	Potential	Potential	Potential	Potential
Mudflats	Potential	Potential	Potential	Potential	Potential	Potential
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Legend: Current (light grey), Potential (dark grey)

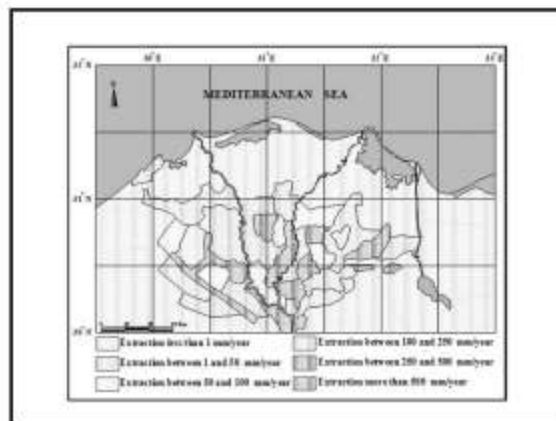
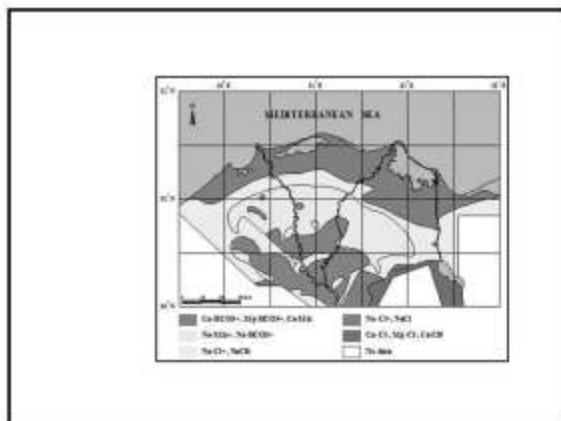
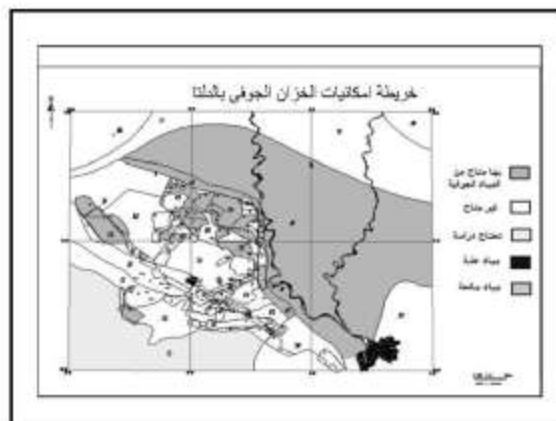
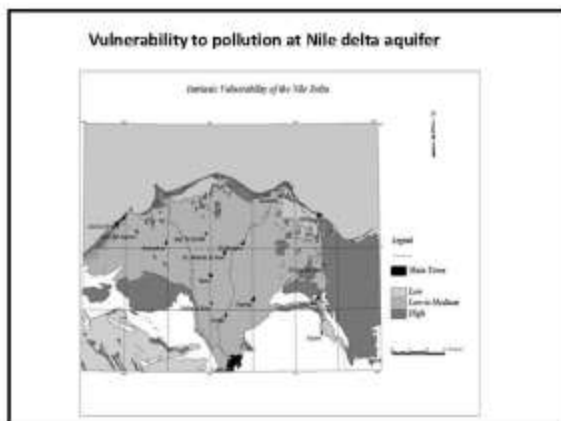
Table 3. Classification of Management Issues

Aquifer System	Management Issue			
	Groundwater lowering	Groundwater rise	Salinization	Pollution
Nubian sandstone	Current	Potential	Potential	Potential
Nile alluvium	Current	Current	Current	Current
Hard rocks	Potential	Potential	Potential	Potential
Coastal	Potential	Potential	Potential	Potential
Wadi deposits	Potential	Potential	Potential	Potential
Mudflats	Potential	Potential	Potential	Potential
Carbonate	Potential	Potential	Potential	Potential

Legend: Current (light grey), Potential (dark grey)

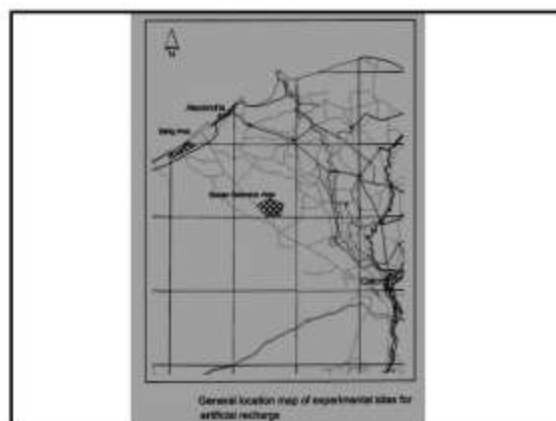
Challenges

- First Set: Population Growth**
 - Population growth against constant assets from the Nile.
 - Population growth against a concentrated habited (vital) area.
 - Uneven distribution of water resources over the country physical areas.
 - Population growth against a decrease in arable land.
- Second Set: Inappropriate management of Groundwater and Related Water Resources**
 - Poor control on wells drilling.
 - Poor control on flowing wells.
 - Sustainability of non-renewable groundwater.
 - Allocation of groundwater is less than the value use of the comparative advantage.
 - Inappropriate rain water harvesting techniques.
 - Inappropriate protection works from flood risks.
- Third Set: Climate Change**
 - Less rainfall on the Nile basin resulting in less water reaching Aswan.
 - Sea water rise and resulting sea water encroachment to the coastal aquifers.
 - Cycles of drought and high rainfall on the coastal areas.
 - Cycles of flash floods and drought in wadis.

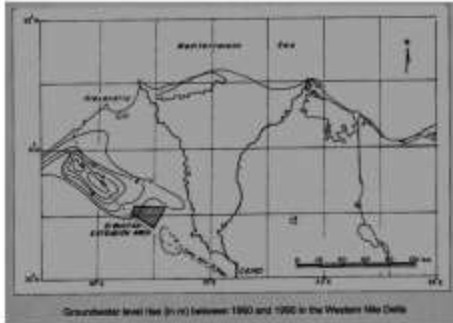


CLASSIFICATION OF ARTIFICIAL RECHARGE POTENTIALITIES IN EGYPT ACCORDING TO AREA, SOURCE AND OBJECTIVE

AREA (Region and example of location)	SOURCE OF RECHARGE WATER AND OBJECTIVE OF ARTIFICIAL RECHARGE				
	(Shallow) surface water	Surface water	Regular Nile flow	Excess Irrigation water	Agricultural drainage water
COASTAL AREAS					
WESTERN DESERT * Bahig, El Bahariya Canal area ** Mainly brackish, saline and Saline		1. Storage 2. Percolation 3. Storage		1. Storage 2. Infiltration 3. Storage	1. Purification 2. Storage
MIDDLE REEF * Bahig, Bahariya ** Mainly brackish, saline and Saline	1. Storage 2. Percolation 3. Storage				
WESTERN DELTA * Bahig, Bahariya ** Mainly brackish, saline and Saline					
MIDDLE DELTA * Bahig, Bahariya ** Mainly brackish, saline and Saline					
EASTERN DELTA * Bahig, Bahariya ** Mainly brackish, saline and Saline					
NILE DELTA AND VALLEY FRINGES * El Bahariya ** El Bahariya Extension Area *** El Bahariya - Bahig		1. Storage 2. Percolation 3. Storage		1. Storage 2. Infiltration 3. Storage	1. Purification 2. Storage
NILE BANKS AND ALONG CANALS * Bahig, Bahariya ** Mainly brackish, saline and Saline				1. Purification 2. Storage	
WESTERN DESERT * Bahig, Bahariya ** Mainly brackish, saline and Saline		1. Percolation 2. Storage			1. Purification 2. Storage



Uncontrolled artificial recharge in Egypt

امكثات حصاد مياه السيول والامطار
(تقدير مبدئي)

المنطقة	الهطول المطري والسيل مليون م ³ / سنة	امكثات الحصاد الملي م ³ / سنة
الساحل الشمالي الغربي	625	100-80 (14%)
شمال سيناء	353	80-70 (21%)
جنوب سيناء	280	50-30 (14%)
الصحراء الشرقية	613	30-20 (4%)
اجملي	1871	270-200 (12%)

تقييم مبدئي لمخزون المياه الجوفية غير العذبة

الموقع	العوض / لتكوين	المحتوى الكلي لإصلاح جزء مليون متر مكعب	المخزون مليون متر مكعب
الموازل المصرية	وديان - حجر جيري	أكثر من 2000	2
حواض الوادي والفتا والساحل الشمالي	النبيل	أكثر من 1500	4
غرب الدلتا	الغبرا	أكثر من 3000	1
الصحراء الغربية	الحجر الجيري	أكثر من 3000	5
الصحراء الشرقية وسيناء	الحجر الرملي التوبي	1500 - 3000	100
اجملي الجمهورية	كل الاحواض		112

Conclusion and recommendations

The main source of water in Egypt is the Nile, which originates outside the country. Rainfall is very limited with respect to its geographical and temporal distribution and rates. The other source of fresh water is the groundwater that represents about 20% of the available fresh water resources.

The impact of the expected climatic changes will pose additional stress on the ecological and socio economic system on Egypt which already under pressure.

The rain in Egypt is very rare the max annual density is 200 mm near the coast and it decrease inland until it reach zero near Cairo, part of this rain infiltrate and recharge the aquifer or used as a supplemental irrigation, the rest runoff to the sea unless there is rainwater harvesting project.

Recommendations

- Continuous update of the hydro geological study (potentiality)
- Awareness program for the investors (Safe yield well license)
- Enforce the regulations and the guideline for better management
- Check the impact of the existence development of the groundwater level
- Increase capacity building(tool kit)



Thank You

2) العناية البيئية:



تم دافع تلك العناية ليعبر لتبني •
 حد لها الخط على الزيادة الطبيعي
 بالتفاني في الحفاظ على المسير وكل في
 وجه بعض الخلل الناجم في تنفيذ نظام
 على المجر والتبني وذلك للحفاظ على
 بلوغ والصرف في المياه الجوفية وذلك
 بالتفاني لتقليل الخطر وعدم توفر الخدمة
 لمرحلة في بعض الأعمال وذلك في مجال
 لواقع في أعمال (إنه المفضل لقطب
 جوي يندبه في تطوير الطرق المراد النقل
 لسببها بتطبيق استخدام المعدات الخاصة
 وعلى الطرق المسدود

3) العناية البيولوجية:



عمر البيئية البيولوجية باستخدام النباتات
 لها كثر القرون قديما ولما انقضاء على
 المفضل لتبني بعض أساليب المورث المفضل
 انصهر هو لم نوع التمسك كثر كغير على
 المفضل المورث لتبني المخلوقات ، وبذلك
 أساليب المورث بكافة (100 كم) أكثر وأن
 أبرز الأثر المصنوع على المورث بزوح من
 (10 - 15) متر ولكن بعض المورث لمناج
 أبرزها بزوح من (40 - 60) حرام

مصادر التلوث

تتفرع مصادر التلوث بالمجاري المائية في التالي:

- الصرف الصحي.
- الصرف الصناعي.
- الصرف الزراعي (نتيجة استخدام الأسمدة والمبيدات)
- المخلفات الصلبة.

1) الصرف الصحي



يعد التلوث البيئي الناتج عن مخلفات الصرف
 الصحي في حدود (100-150) مليون كغ
 من مخلفات الصرف يوميا في مصر على حد
 تقريبا حيث أن كثر من التلوث على تربة
 مياه المجر التي يمر وتحت الأرض المتكاثرة

التلوث: الصرف الصناعي



تعد التلوث من المخلفات الناتج عن المصانع
 المصنعة ليشترط أن تكون في المصانع الأولية
 لسهولة التخلص من المخلفات دون قدر كبير
 من الضرر ولذا هناك المصانع التي تصنع
 على من المواد الخطيرة ويحتاجون بعض
 الآليات والوسائل من أجل التخلص من مخلفات
 من المياه كمثل (مياه) في المصانع المصنعة
 تلك المصانع على التربة تدهور المياه السطحية
 (1) المجر والمياه (2)

تلوث: الصرف الزراعي



تعد مخلفات المصانع التي لها أثر السام
 والمبيدات وذلك المزارع التي يتم فيها من
 التربة في المزارع التي تترك في التربة
 على لا في المزارع المصنعة ، على المزارع
 المصنعة التي تترك في التربة المزارع على
 في مجالها يتم التخلص من المخلفات
 كالتالي:

1) التخلص من المخلفات الصلبة



معظم كثر ما يتم تجميعها بالمجاري
 المصنعة في حقل من مخلفات - تلك
 المخلفات المصنعة التي تتراكم في المصانع
 المصنعة المصنعة والمخلفات المصنعة
 والمخلفات وتتراكم والتي يتم في وضع
 المزارع المصنعة على المزارع المصنعة
 المزارع المصنعة التي يتم التخلص من المخلفات
 المصنعة



توجد محطة في جميع أنحاء من
القوى والكثير. وإن تكلفه حتى
العملة في حرم سوريا لمصر في
على جنبه في الوقت الحالي، وإن
عند 55 فقط وقد علم سوريا
بمصرية التي العامة



بمصرية التي العامة
لقد تم حاداً وتقدم التي زيادة تكلفه
لعملة في حرم سوريا لمصر في
على جنبه في الوقت الحالي، وإن
عند 55 فقط وقد علم سوريا
بمصرية التي العامة

وإن حوالي 55 فقط العامة التي لعملة
55% بد بعضها الكثير مع
والعملة لعملة تزداد بين جميع ما
بأنه عملة التي عملة التي لعملة

صراحيه القوي على الجبل قد بدأت على هيئة القوية خاصة
الأسماك وذلك لأن كثرة الحرارة بالبلاد عن الحد. التي تتسبب
التي 48 سنة 1982
والاقتصاد في السنوات الأخيرة زيادة نسبة التلوث في فرع، حيث تلتفت
من التوسع في الفرع السعة الجارح وروبعه أكثر من أربعة
بصرف مصرف جاشرة على فرع، حيث أن جانب مصفاة
بصرف زراعي وصحي وصناعي، وهو ما أثر بتزايد على نوعية
بيئته خاصة عند سفح التربة، ومن أخطر هذه المصروف هو
بصرف الزهوي التي يعمل كمكب كبير تملأ الصرف الصحي تصل
إلى أكثر من 12 مليون متر مكعب سنوياً
مقوم بعض الجهات والصنعة والأعمال نظف مصفاة الصرف
الصحي والصناعي في الفرع الجوفي مما يبرز على نوعية مياهه
حيث تفضل مناطق كثيرة بالدولة على استخدام المياه الجوفية في
التي في الجانب الأخرى

المخاطر البيئية الناتجة عن التلوث؟
جنب التلوث في حرم سوريا لمصر التي لعملة في التوسع
المخاطر في التربة أو في المصفاة أو الزراعة وقد تمت التربة
أيضا تفتت المصروف من خلال صرف مصفاة الصرف الصحي في
المصروف بين مصفاة كما أن المصروف مع التلوث مع المصروف المصفاة
إذ في التلوث 48 سنة 1982 على المصروف المصفاة المصفاة وقد
بأنه في ذلك أن تم طلق في المصفاة أيضا المصفاة المصفاة
بصرف الزراعي كانت تصب حوالي 7 مليار متر مكعب سنوياً في شبكة
لوزن وتتمتع في المصفاة المصفاة المصفاة كما أن المصروف المصفاة
التي في المصفاة المصفاة المصفاة المصفاة المصفاة المصفاة
بمحافظة في المصفاة المصفاة المصفاة المصفاة المصفاة
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تطوير الزراعة في حرم سوريا لمصر التي لعملة في التوسع
بعد التلوث في 48 سنة 1982، في لوزن في حرم سوريا لمصر التي لعملة
المصفاة المصفاة المصفاة المصفاة المصفاة المصفاة
هذا التلوث صرف مصفاة المصفاة المصفاة المصفاة المصفاة
والصنعة المصفاة المصفاة المصفاة المصفاة المصفاة
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وتتبع عن التلوث والقوة العامة بشبكة الفرع المصروف زيادة
تتألف المصفاة المصفاة المصفاة المصفاة المصفاة
التلوث التي تقوم بها الوزارة الفرع هو مصفاة المصفاة المصفاة
وإزالة كما أن المصروف التي تتلصق بها بعض الجهات من المصفاة
الفرع التي تمركزت المصفاة... وهذا طولاً مقلقة جداً والتلوث
المصفاة المصفاة المصفاة المصفاة المصفاة المصفاة
بالمصفاة التي تتلصق معها والمصفاة تتلصق في المصفاة المصفاة
المصفاة المصفاة المصفاة المصفاة المصفاة المصفاة
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التكامل بين الوزارات والأجهزة المختلفة لحماية المجاري المائية من آثار التلوث



مكتة نظمت الوزارة برامج لمرصد والمتابعة لوجبة المياه بصيرة لمد العالي، ونهر النيل وفرع، والخراف والمصارف والمياه الخفيفة لمرقية أي تغير يحدث لوجبة المياه والعمل على إزالة السميات لتعوير نوعية وقد قامت الوزارة بإنشاء شبكات رصد ونوعية نوعية المياه من خلال 300 موقع قياس لنوعية السطحية و 250 نقطة مراقبة لنوعية لوجبة يتم من خلالها قياس جميع العناصر الطبيعية والكيميائية والميكروبيولوجية وفقاً للمبادئ في المياه بصفة دورية ومن ثم يمكن تحديد مصدر التلوث والعمل على إيقافه.

مفرد شاركت الوزارة بالتعاون مع وزارة الإسكان والهيئات العربية ووزارة الزراعة والمتصالح الأراضي في إعداد لائحة القسري لإستخدام مياه الصرف الصحي المعالجة في الزراعة (كود رقم 501-2005) وتم الإضفاء فيه على دليل منظمة الأغذية والزراعة (FAO) ومنظمة الصحة العالمية (WHO) وغيره من برامج أوروبية وعربية كمرجع أساسي.

كما بدأت الوزارة في تطبيق نظام مشاركة المتفاعلين في التشكيل من خلال إنشاء مجالس المياه لتكون مسؤولة عن إدارة وتوزيع المياه على مستوى الترع القريبة التي تعاني السخا، والحد من التلوث ووقف إلقاء المخلفات الصلبة في المجاري المائية هذا بالإضافة إلى إنشاء وحدة لتوعية والإعلام المائي وإقامة حملات توعية لحد من التلوث والتدري على المجاري المائية.

مضروورة الإلتزام لمرصد والمصنع وجميع المنشآت بالقوانين الخاصة بحماية المجاري المائية وحماية البيئة وخفظة القانون 48 لسنة 1982 والقانون 4 لسنة 1994 لتحسين تعديل القوانين الحالية لتكون أكثر الإلزام عن طريق وضع معايير الصرف الملائمة وتنقيط العقوبات على المخلفات حسب نوع وحجم الملوثات بصرف لمواجهه المتغيرات الإضماعية والإقتصادية التي طرأت على المجتمع واستخدام التكنولوجيا الأقل تكلفة لوقف تلوث المجاري المائية.

ممساعدة المصانع لتوفير أوضاعهم ومعالجة صرف مخلفاتهم وفقاً، وتوفير الإعدادات اللازمة لمنظومة المخلفات لمعالجة بقرى.

محدد جهة أو هيئة تتولى شراء منتجات مصانع لتدوير مما يساعد على توفير فرص عمل وتشجيع بقرى إستدامة المنظومة.

مفعيل دور إدارة المخلفات لمعالجة تنقيداً لقرار السيد رئيس مجلس الوزراء والتي أشادت بالتعاون بين وزارتي البيئة والتنمية المحلية لمرقية وتقديم الدعم الفني للمحافظات في عملية التخلص الآمن من القمامة.

ممن تشريع يسمح للمحافظين بالتعاون بالامر المباشر مع شركات النظافة والمستثمرين للتخلص من القمامة.

الخلاصة والتوصيات للحد من الآثار الخطيرة للصرف الصحي والصناعي والمخلفات السائلة عن نهر النيل والترع والمصارف الزراعية والأرامل من الحكومة والقطاع الخاص والمجتمع المدني في حماية المياه من التلوث والتوعية البيئية لتطابق على نوعيتها وذلك على النحو التالي:

لدور الدولة

متمثلاً في وزارة الموارد المائية والري والبيئة والزراعة وغيرها من الوزارات والهيئات الحكومية الأخرى لعمل الآتي:

مأخذ كافة الإجراءات اللازمة لتطبيق القوانين الخاصة بحماية المجاري المائية.

معمل الاحتياطات اللازمة لمنع تسرب مياه الصرف الصحي في مياه نهر النيل.

مالتشديد على عدم صرف مخلفات المصانع سواء كانت سائلة أو صلبة في المجاري المائية.

مإنشاء مراكز قياسات ثابتة على المجاري المائية لمرقية التلوث الذي يطرأ عليها.

لدور لمجتمع المدني والقطاع الخاص

متمثلاً في المؤسسات الخاصة والمساعد والجمعيات الأهلية:

مترعيم وتجريب لقاه لحوارات البيئة في نهر النيل.

معدم لقاه للحوارات والمخلفات والمرك الصلبة والبلاستيكية في نهر النيل.

مترشروعي صحي بين القلاحين.

مترشروعي الزراعي بين المزارعين حيث يتم تشجيع بعدم غسل الأتوات ومعدات رش المبيدات الحشرية في مياه نهر النيل، والمجاري المائية.

مترعيم استخدام مجرى المياه في الإستخدامات لأحاطة التي يقوم بها البعض مثل غسل الأواني والملابس وتنظيف الحوانات والإستحمام في مياه نهر النيل.

مالتوعية بضرورة خفض مياه الشرب عن طريق عدم إستعمال المياه في الإستخدامات السريعة للمياه مثل رش الشوارع وغسل السيارات بكميات كبيرة من المياه.

مالميزورة لزراعة بالمواظفة على تخصيص الأراضي المطلوبة لإنشاء مصانع تدوير القمامة بقطاع لوجبتها ومساحتها وفقاً للمتطلبات الخاصة بكل جهة حيث إن الصحة العامة أعلى وأهم شيء.

مفعيل القوانين وتنفيذها على المخالفين من خلال المساهمة للمحافظين مع الأجهزة المعنية.

متمقديم الدعم الفني للمحافظات لتشغيل مصانع تدوير القمامة المتوفرة حالياً ويمكن إسناد مهمة التشغيل والصيانة لمنظمات المجتمع المدني والمستثمرين من القطاع الخاص.

مهمضروورة تكاليف جميع الجهات في إيجاد البدائل السريعة لمنع إلقاء المخلفات في الترع والمصارف وتوفير الخدمات اللازمة بالفرق المنتمية لجميع المخلفات في جميع القرى خاصة المنطقة على الترع والمصارف وتنظيف التكنولوجيات الملائمة لتدوير القمامة.

ممرعاة الدور الإعلامي نحو التوعية وتسلية الضوء على التجارب الناجحة في هذا المجال كما يمكن إضافة توعية داخل المناهج التعليمية بالمر بطبيعة المختلفة.

الخاتمة

إن الجهد المبذول للحد من مخاطر التلوث بالمجاري المائية في مصر يتطلب المزيد من الجهد وتضافر جميع العقول والسواعد المصرية والعمل الذؤوب في المجالات المختلفة لتمهيد الطريق للحفاظ على مياها من التلوث وخطورته .

كما ولا يجب ان ننسى بضرورة دور المشاركة المجتمعية ومنظمات المجتمع المدني للعمل جنباً الى جنب مع المنظمات الحكومية لمواجهة المشكلات البيئية الناتجة عن التلوث وتغيير سلوكيات المجتمع تجاه البيئة

وفقنا الله واياكم لخدمة مصرنا الحبيبة وحمايتها من كافة الاخطار التي تحدث بها.

التباطين

• قيام الباحثين في مجال المياه والنهر والتلوث وغيرها بعمل ابحاث في جميع مجالات المياه وقياس جودة المياه .

• ابتكار اساليب جديدة لتنقية المياه ذات جودة عالية وتكلفة بسيطة .

• محاولة اختراع اسمدة ومبيدات أقل ضرراً بالمياه والأراضي الزراعية والمحاصيل .

• ابتكار اساليب جديدة لمعالجة مخلفات المصانع سواء كانت سائلة أو صلبة أو غازية وإعادة تدويرها مما يقطع من استخدام تلك المخلفات والترويج منها أيضاً وبذلك تقوم الشركات والمصانع الأخرى بالتقدم الي استخدام مثل هذه التكنولوجيا .

• نشر تلك الأبحاث التي توصلوا اليها للمجتمع لتوعيته بأهمية استخدام تلك الأدوات .

طلاب الجامعات


على جميع طلاب الجامعات أن يكونوا ايجابيين نحو المجتمع وتلك بتوعية المجتمع الذي يعيشون فيه بما توصل اليه من معلومات في دراسته بالجامعة . وهنا يجب على الطالب أن يدرك أهمية المياه وما هي أنواع التلوث وما هي سبل الوقاية والعلاج حتى يقوم بتوصيل تلك الأفكار والمعلومات الي مجتمعه .

بالإضافة بتوعية الطلاب لمجتمعه بأهمية التعاون مع الوزارات المختصة والجمعيات الأهلية في كافة الأنشطة للحفاظ على الثروة المائية ومنع التسويفات التي تؤدي الي تلوث المجاري المائية




شكرا
إستماعكم




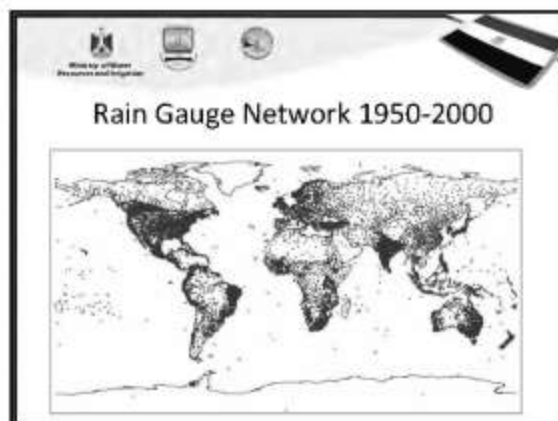


Nile Delta Coastal Works

Ibrahim Elshinnawy
Director of Coastal Research Institute (CoRI), Egypt



IPCC Considers the Nile Delta as one of the vulnerable areas of the world (Populated Deltas)


Mediterranean Hydrological Factors

Area = 2.5 million km²
Max Depth = 4400 m
Ave Depth = 1500 m
Water Vol. = 3.7 million km³

Water body comprises 3 layers with different temperature and salinity profiles

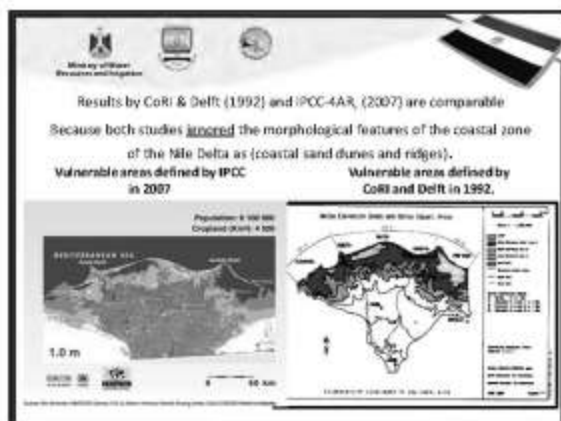
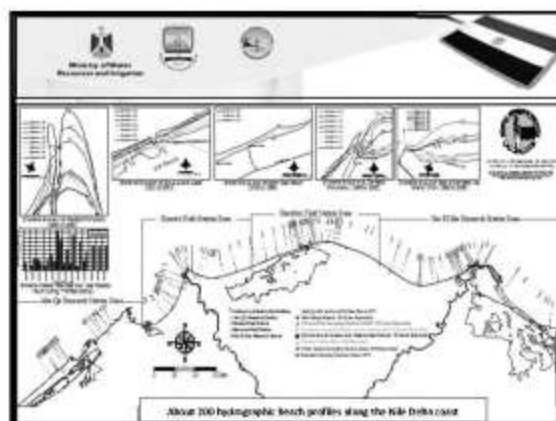
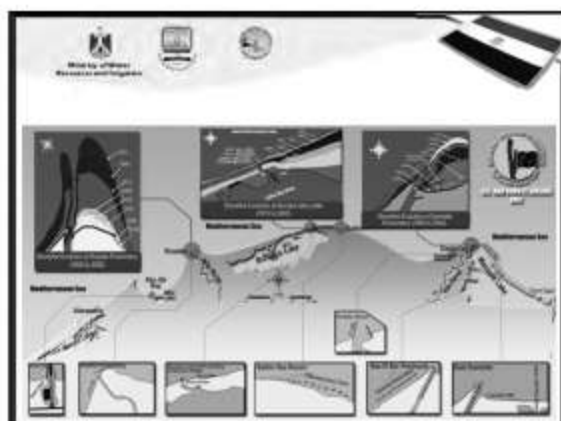
- Surface layer (75-300 m depth)
- Intermediate layer (300-600 m depth)
- Lower layer (more than 600 m depth)



Mediterranean Annual Water Balance

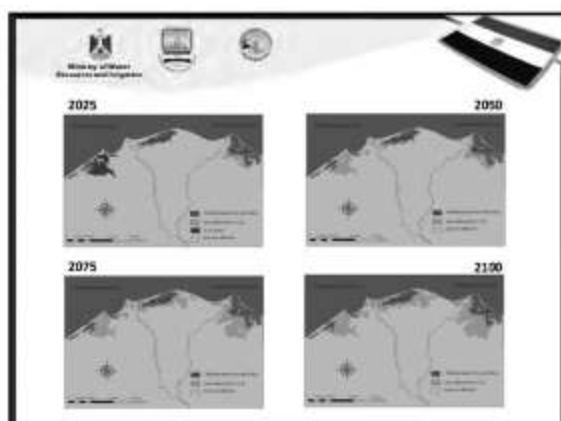
Evaporation	4144 km ³
Income	
rainfall	1000 km ³
River flow	230 km ³
Black Sea flow	152 km ³
Total Inflow	1382 km³
Deficit	2762 km³

This deficit is compensated by 40,000 m³/s from Atlantic Ocean through Gabal Tarek straight in an anti-clockwise flow as water level in eastern side of the sea is 80 cm lower than that in the ocean due to increased evaporation rates difference.



Expected SLR Till 2100 by Projected Increase in Air Temperature (A1F1 Scenario)

Year	2025	2050	2075	2100
Temperature (°C)	1.2	2.2	3.2	4.0
ASLR at Alexandria	13.0 (cm)	34.0 (cm)	55.0 (cm)	72.0 (cm)
ASLR at Al-Burullus	14.75 (cm)	37.5 (cm)	60.30 (cm)	79.0 (cm)
ASLR at Port Said	27.9 (cm)	68.8 (cm)	109.6 (cm)	144.0 (cm)



Total affected area and its percentage to the Nile Delta area (A1F1 scenario)
(With Mohammed Ali wall and zero level for lakes borders)

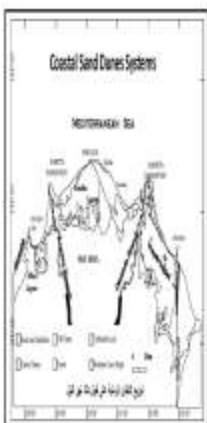
Year	2025	2050	2075	2100
Total Area Affected (km ²)	701	766.5	2348	2938
Total % of the Nile Delta Area	2.8	3.1	9.4	11.75



Protection Systems

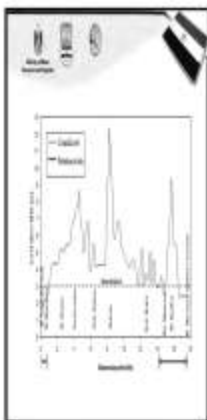
Natural and Man-made systems

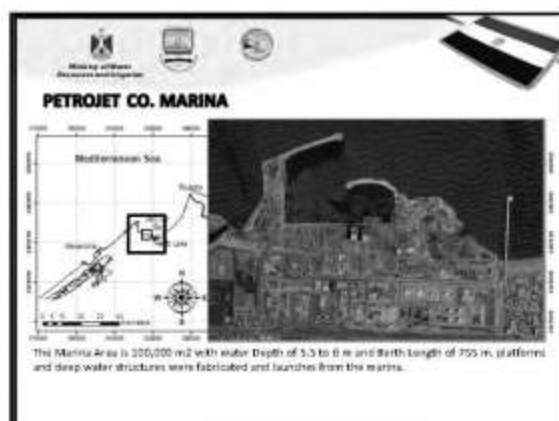
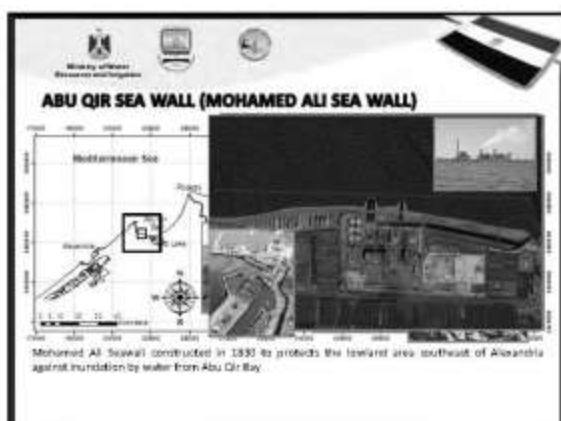
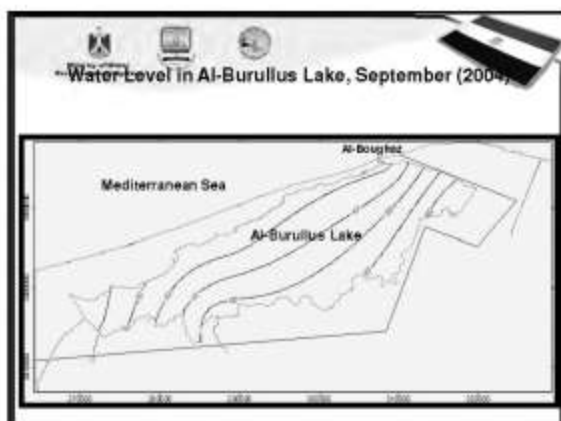
- Coastal Sand Dunes
- The Embankments of Al-Salem Canal
- Boards of the Coastal lagoons
- Mohammed Aly Sea Wall
- Protection Constructions
- Sea Front Cornish of Alexandria
- International Coastal Road

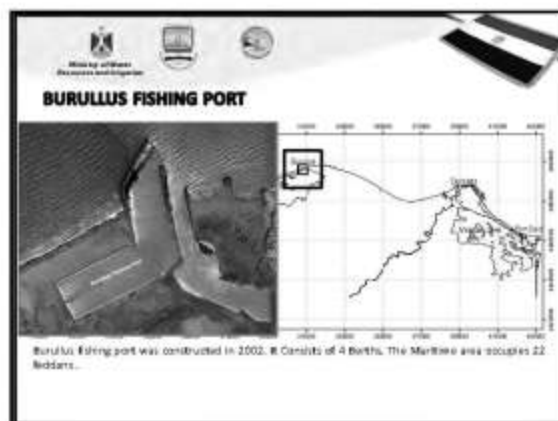
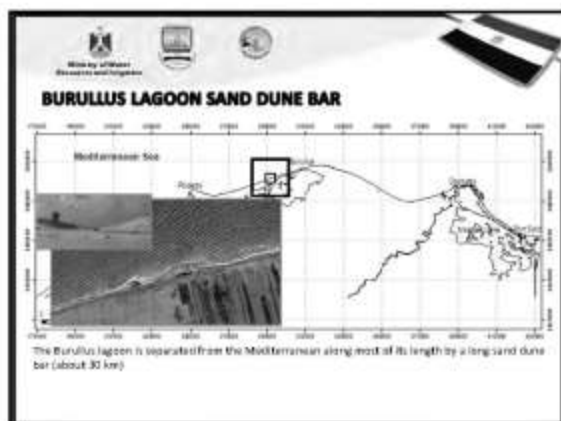
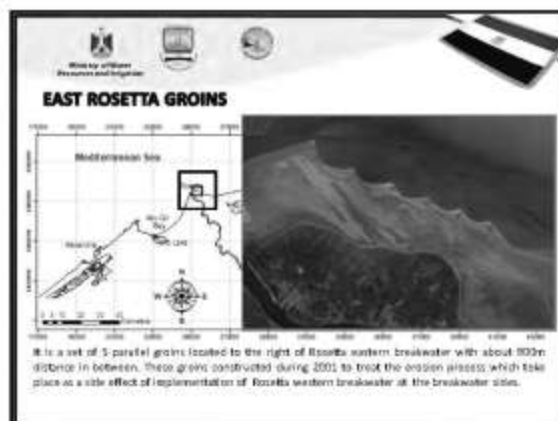
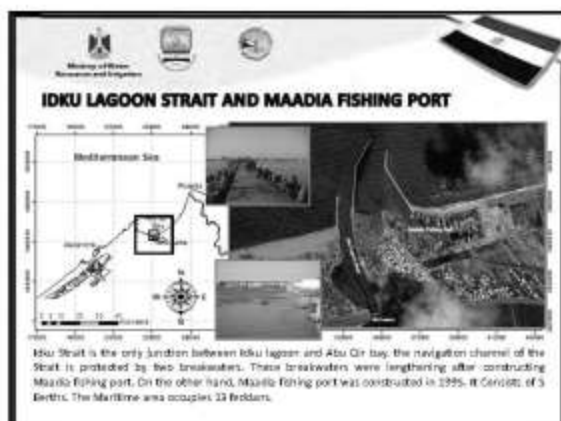


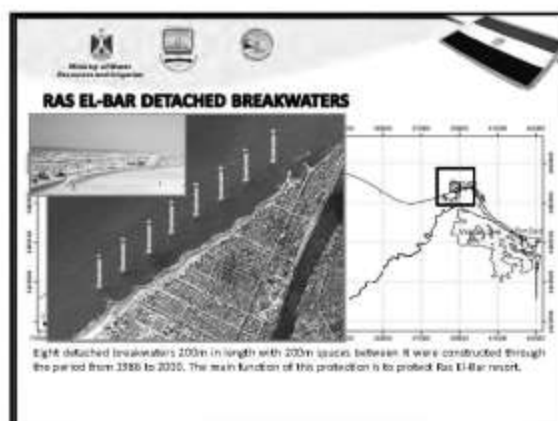
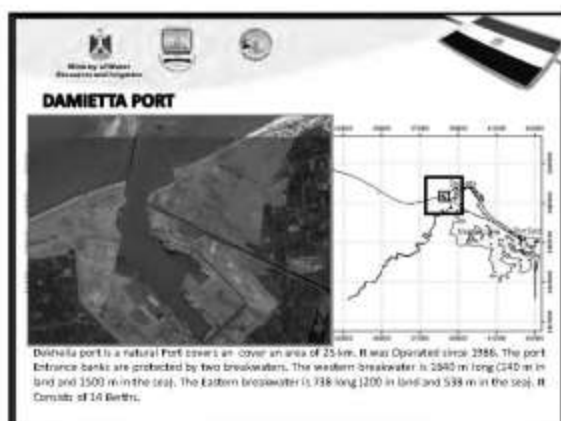
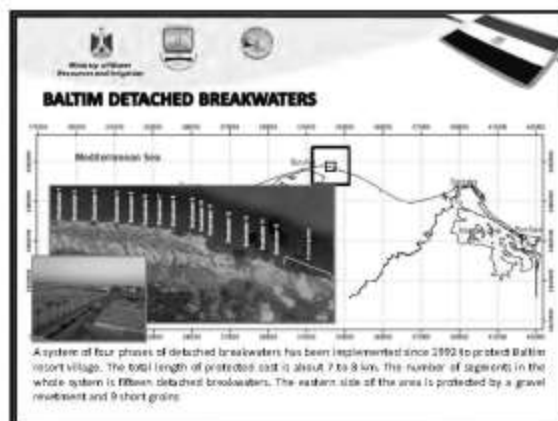
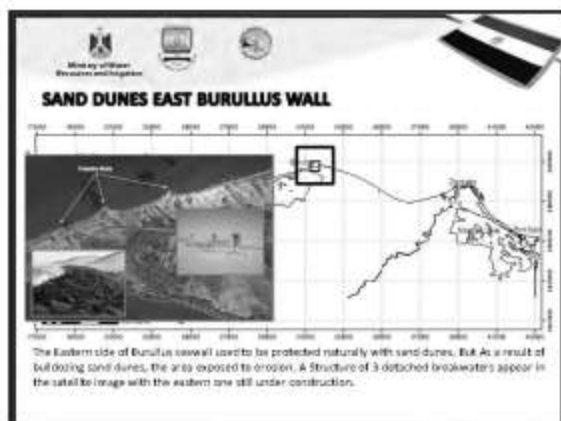
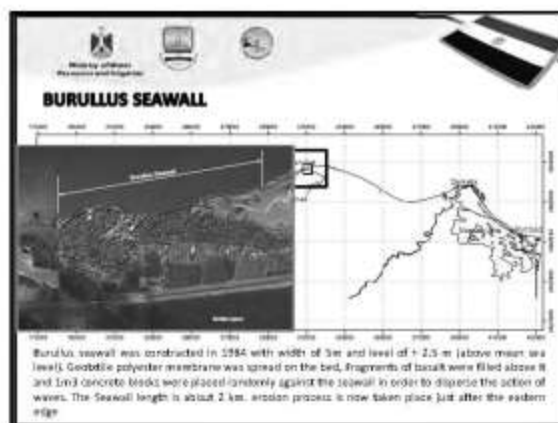
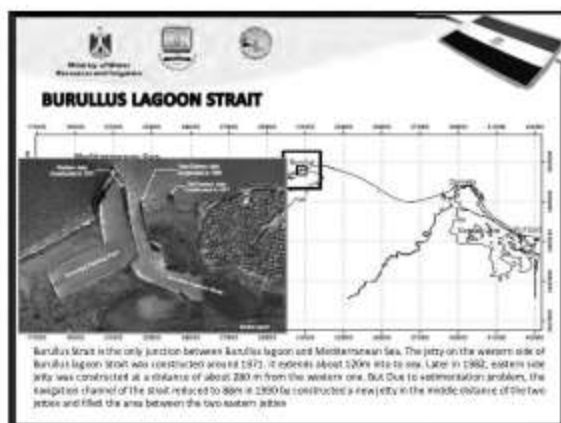


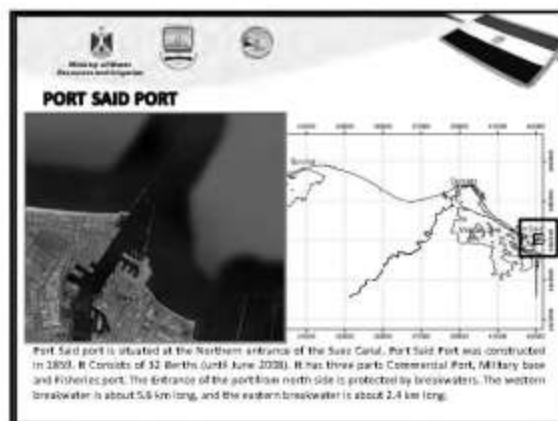
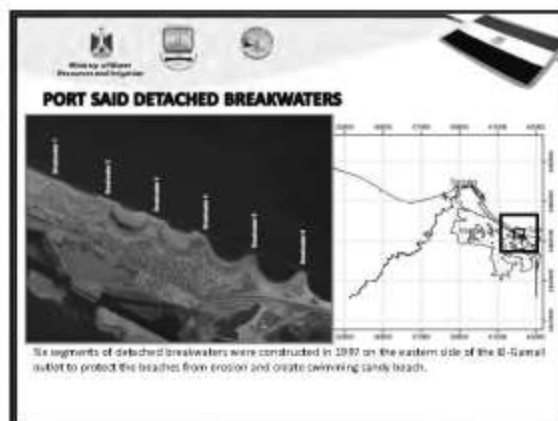
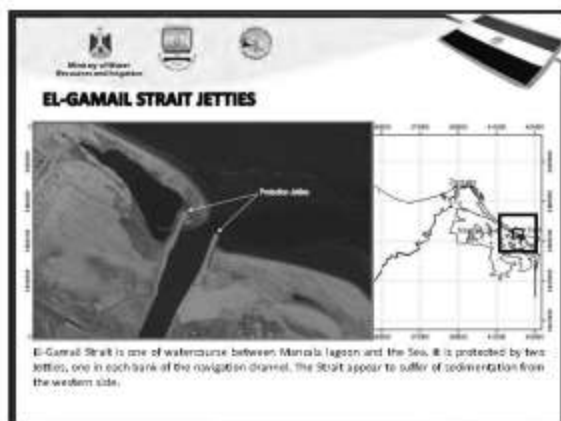
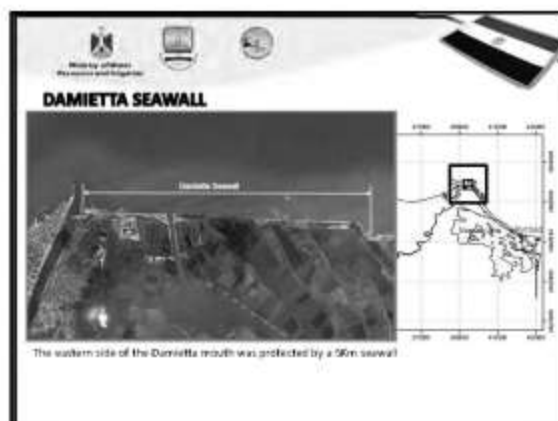
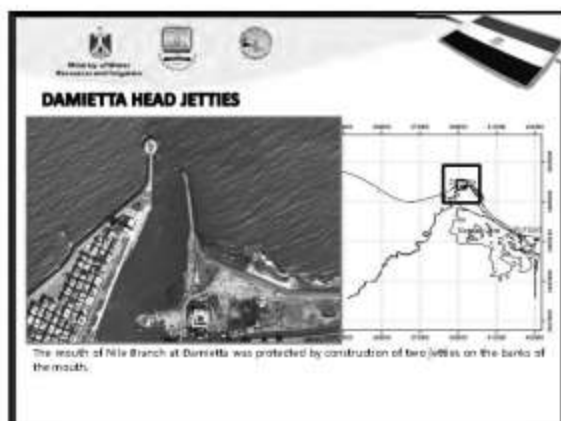
Section Number	Distance from the beginning of Al-Salem Canal (km) and the 1000m Coastal Road (km)	Differences in Level between the canal bank and the water table
1	0	2.5
2	11	2.8
3	16	2.2
4	27	3.4
5	38	3.0
6	43	5.8

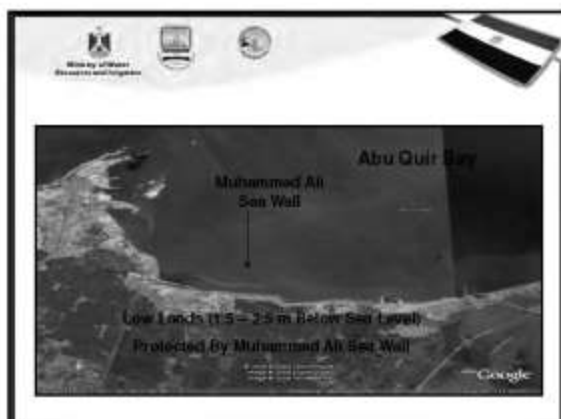


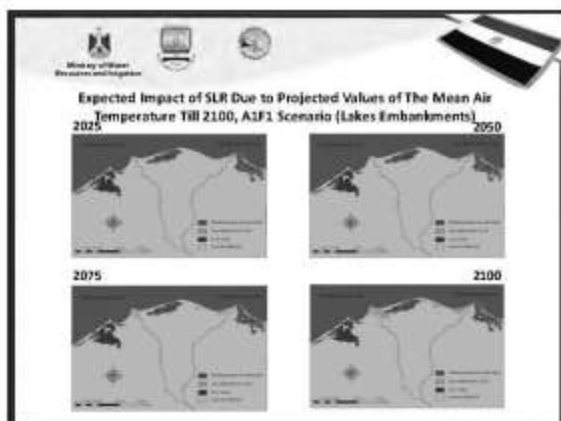
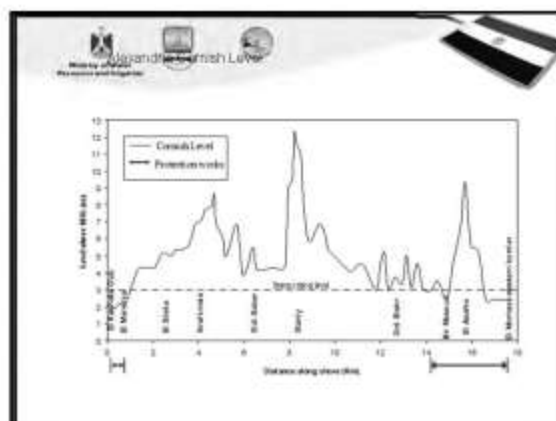






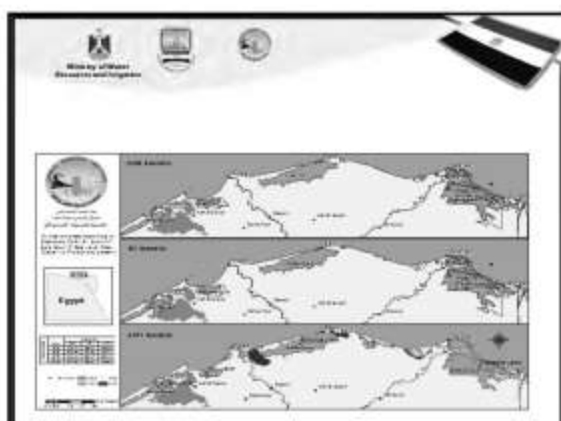


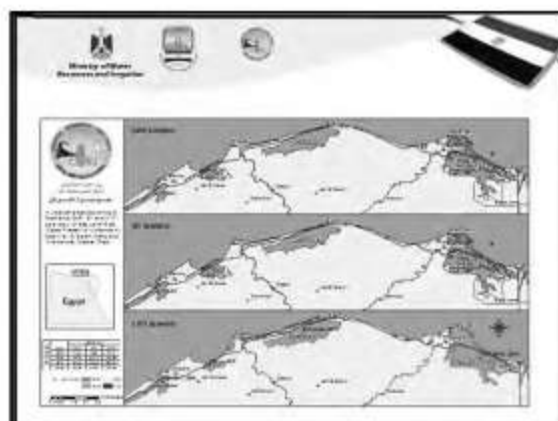
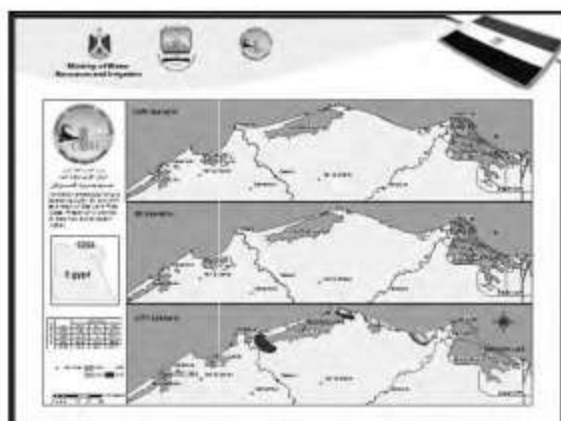




Total affected area and its percentage to the Nile Delta area (A1F1 scenario)

Year	2025	2050	2075	2100
Total Area Affected (km ²)	152.86	256.27	450	761.4
Total % of the Nile Delta Area	0.61	1.03	1.8	3.01





Effect of Coastal Protection on decreasing vulnerability to climate change

Area type (in thousands of hectares) or % of the present of different coastal resources

Scenario	Year	Area (km ²)	Percentage %	Water table (m) (100)	Protection %	Saline land	Protection %	Estimated Coastal land	Protection %
SAR	2025	371.72	0	2.38	99.33	2.28	99.02	2.38	99.02
	2040	387.99	0	26.20	97.30	24.65	97.30	22.83	97.75
	2075	403.21	0	58.28	94.98	22.60	94.98	24.32	96.37
	2099	427.93	0	88.80	91.30	21.80	91.40	40.88	90.76
R1	2025	391.12	0	11.74	97.98	11.74	97.98	9.31	98.48
	2040	411.21	0	41	95.21	41	95.21	32.44	94.70
	2075	447.17	0	79.64	87.90	77.40	89.28	39.80	90.34
	2099	480.82	0	90.92	80.42	80.42	87.78	37.97	89.73
R2	2025	409.48	0	28.20	98.21	28.20	98.21	27.18	98.52
	2040	438.17	0	107.78	96.38	117.74	96.68	142.40	96.11
	2075	492.41	0	170.08	88.04	169.09	88.18	107.11	78.77
	2099	539.28	0	248.71	80.18	248.71	80.02	110.11	71.79

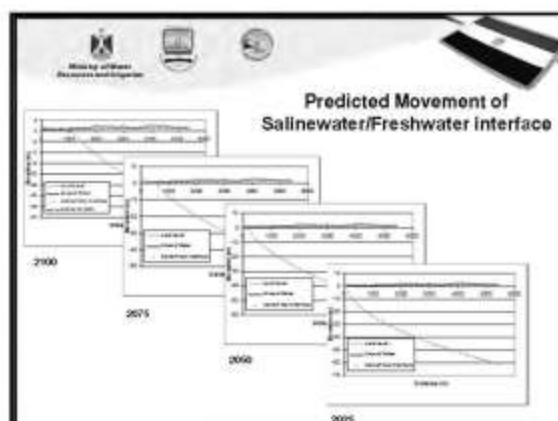
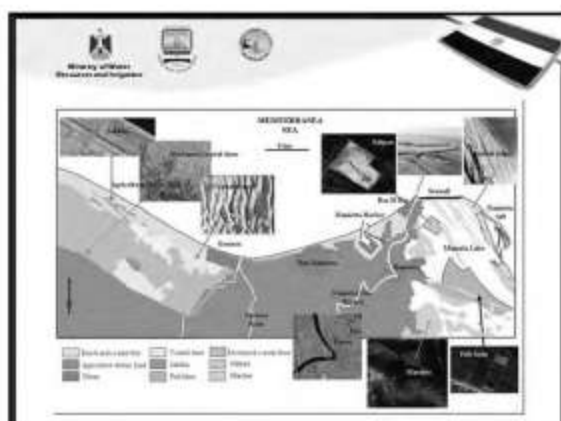
Adaptation to the Impacts of Sea Level Rise in the Nile Delta Coastal Zone, Egypt, 2009-2012

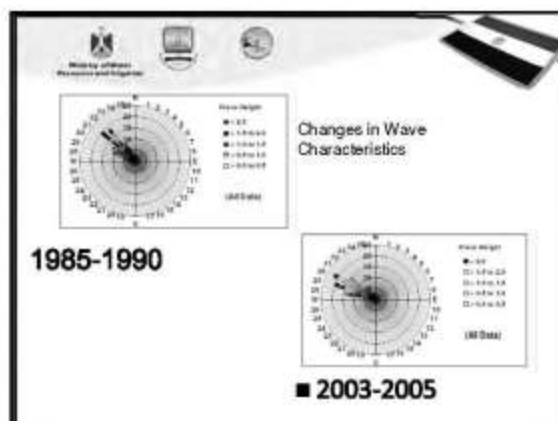
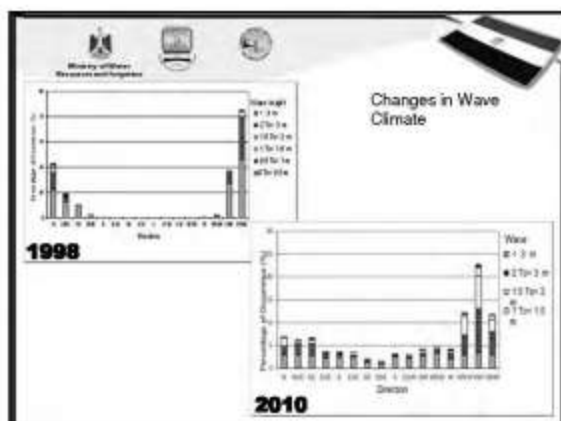
Funded by International Development Research Centre (IDRC)

Main Objective

Research project addresses vulnerability assessment and adaptation options for potential impact of SLR in coastal zone

Case study application in Ras ElBar - Gammasa Region





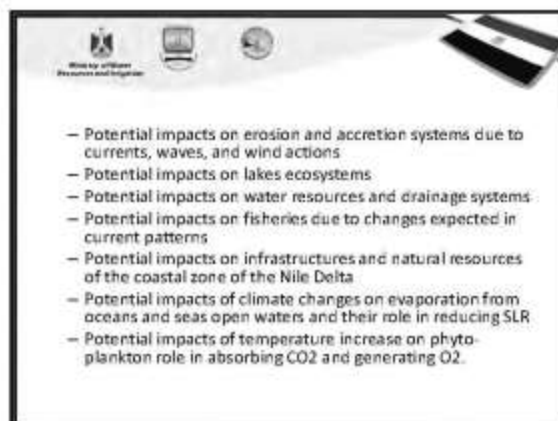
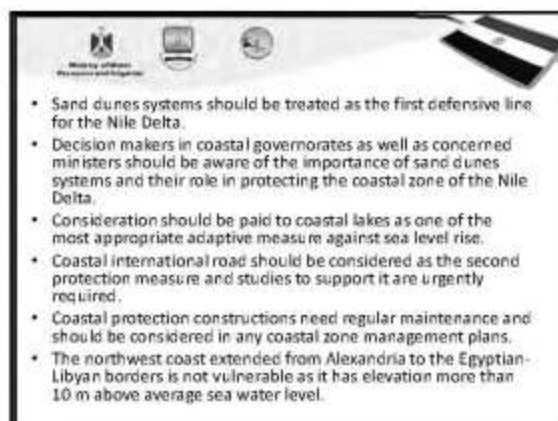
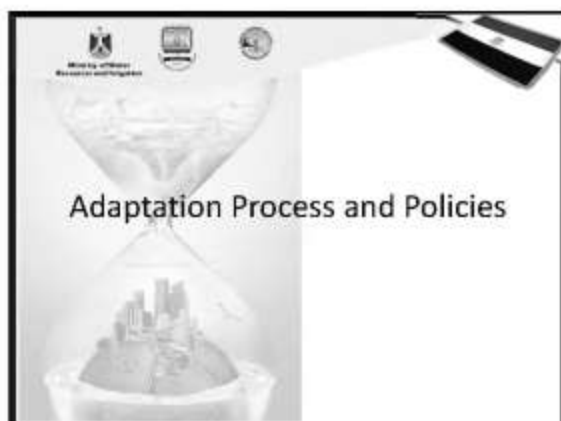
Ministry of Water Resources and Irrigation

Changes in Wave Climate

Wave Climate	1998	2010
Significant wave height	0.94 m	1.31 m
Average wave height	0.5 m	0.76 m
Predominant wave direction	North NorthWest (NNW)	NorthWest (NW)
Average storm height	2.75 m	3.46 m
Total duration of storms	1.6 day/year	3.5 day/year
predominant storm direction	North	NorthWest







أولاً : تعريف مبسط للأعاصير

- هي عبارة عن عواصف (حركات هوائية) حلزونية ، تنشأ في العادة فوق البحار أو المحيطات الإستوائية ، وتنتج نحو اليابسة مسببة الدمار لكل ما يعترض طريقها وتستمر لعدة أيام وفي الغالب يكون أشد الدمار على الشواطئ.

وحيد سعودي

مدير عام التحاليل والتنبؤات الجوية
والمحدث الرسمي للمهنة العامة للأرصاد
الجوية

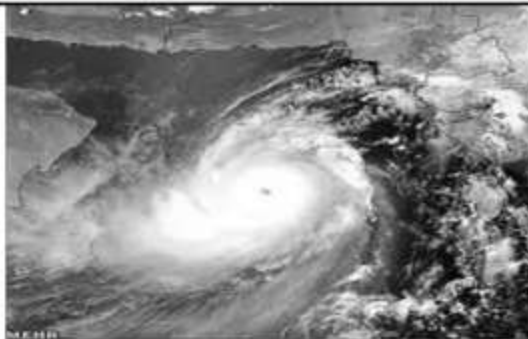
مقدم ومعد النشرات الجوية للأذاعة
والتلفزيون المصري
seoudiwaheed@yahoo.com

إحصائيات لبعض الأعاصير

- أقوى إعصار حلزوني: إعصار "هنري" في شمال غرب المحيط الهادي في شباط من ديسمبر عام 1961، والذي بلغت سرعته رياحه 342 كيلومترًا بالساعة.
- أسرع الأعاصير الحلزونية تكوّنًا: إعصار "هورست" في شمال غرب المحيط الهادي في شهر سبتمبر 1983، زادت سرعته رياحه 56 كم/ساعة في خلال 6 ساعات، ووصلت إلى 138 كم/ساعة في خلال يوم واحد.
- أطول موجة ناتجة عن إعصار حلزوني: موجة كان ارتفاعها 13 متراً في إعصار "بيلست باي" بأمريكا عام 1899.
- أضعف إعصار حلزوني: إعصار "تب" في شمال غرب المحيط الهادي في أكتوبر 1979، والذي بلغ قطره 1100 كم.

كيفية تكون الأعاصير

- عندما يسخن الماء في البحار الإستوائية الي درجة حرارة تتراوح بين 27 إلى 28 درجة مئوية فإنه يعمل على تسخين طبقة الهواء الملاصقة له، ويتسخن هذا الهواء فيتمدد ويرتفع الي أعلى ويكون منطقة ضغط منخفض تنجذب اليها الرياح من مناطق الضغط المرتفع المحيطة فتتهب عليها من كل اتجاه مما يؤدي الي تبخر الماء بكثرة وارتفاع هذا البخار الخفيف الي أعلى وسط الهواء البارد.



مثال لإعصار استوائي

- أصغر إعصار حلزوني: إعصار "تريسي" بأستراليا في ديسمبر 1974، والذي بلغ نصف قطره 50 كيلومترًا فقط.
- أطول إعصار عمرا: إعصار "جون" في شهري أغسطس وسبتمبر من عام 1994، والذي استمر لمدة 31 يوم.
- أكثر الأعاصير تسببا في وفيات: إعصار بنجلاديش عام 1970، والذي تسبب حسب لكل التقديرات في وفاة أكثر من 300.000 مواطن.
- أكثر الأعاصير دمارا: إعصار "اندرو" عام 1992، والذي أصاب جزر "الباهاما"، وولاية "فلوريدا" و"لويزيانا" الأمريكيتين، والذي قُدرت خسائره بـ 26.5 بليون دولار أمريكي.

كيفية تكون التورنادو TORNADO

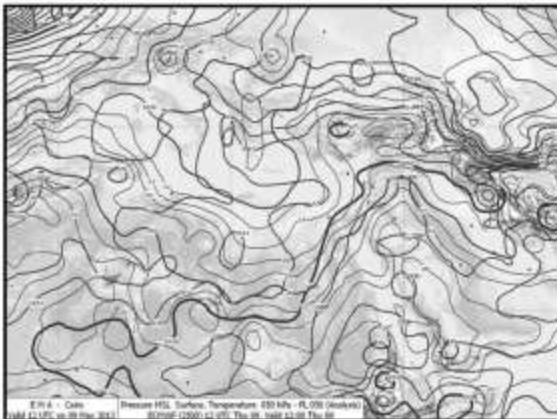
- يعتبر إعصار التورنادو من أكثر العواصف الجوية تدميراً، فالمنطقة التي يمر عليها تبدو وكأنه قد حدث بها زلزال عثيف
- ترجع الطاقة الهائلة للتورنادو و السرعة المدمرة للرياح التي ترافقه إلى صغر مساحته و شدة الانخفاض المفاجئ للضغط الجوي ، فأغلب أعاصير التورنادو لا يزيد قطرها عن 2 كيلو متر كما يتناقص الضغط الجوي فيها إلى 800 او 600 مللي بار داخلية ليكون قيمة الفرق في الضغط الجوي ما بين داخلية وخارجية حوالي 250 إلى 450 مللي بار و تصل سرعة الرياح المصاحبة له إلى 500 كم / ساعة .

- وجدير بالذكر بأنه في بعض الحالات النادرة يصاحبها ما يعرف باسم التورنادو (النكباء) التي ضربت الولايات المتحدة و نتج عنها دمار هائل وهي تسمى أحيانا بالأعاصير القمعية.

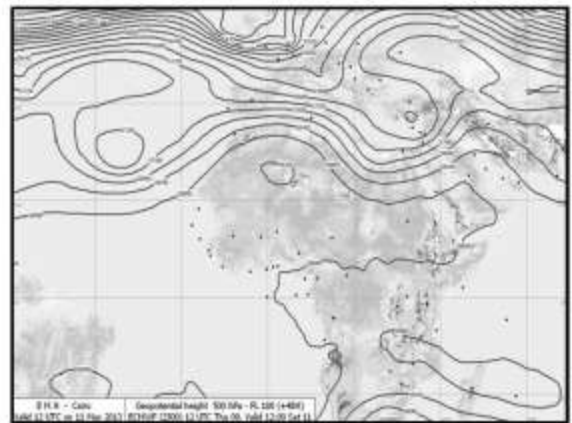
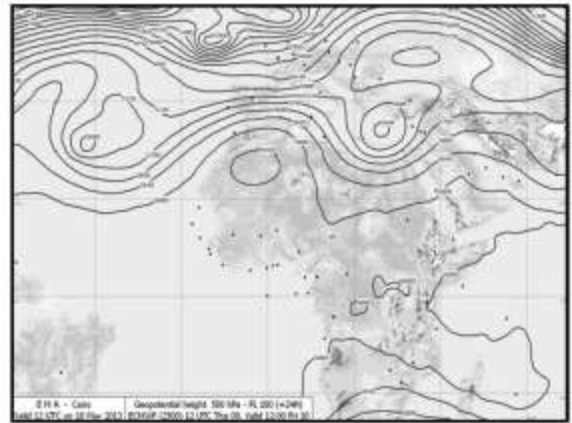
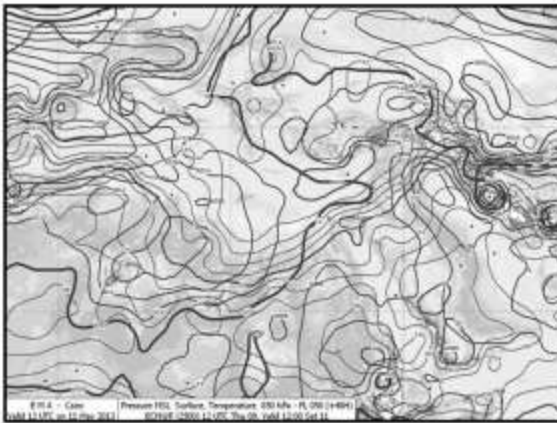
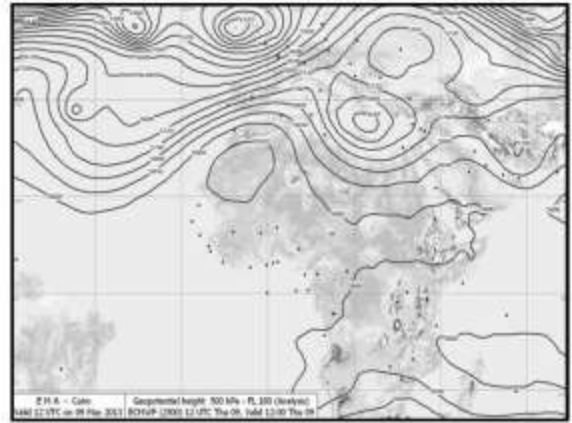
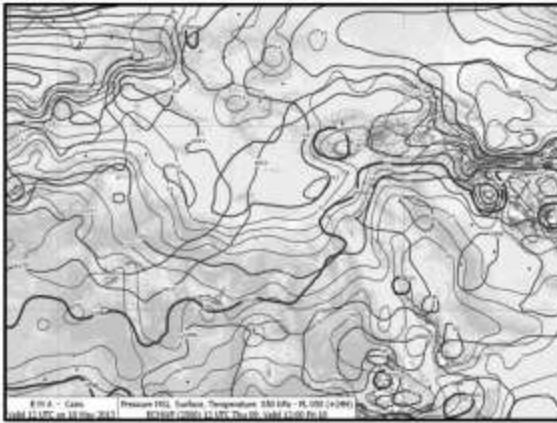
• دراسة تفصيلية لما حدث في جمصة يوم 10-5-2013



التورنادو يظهر كقمع متدلي من سحب المزن الركامي



- الخرائط السطحية والعلوية قبل واثناء اعصار جمصة



دور الهيئة العامة للأرصاد الجوية قبل حدوث الطقس الغير مستقر على جمصة

- أصدرت الهيئة العامة للأرصاد الجوية تحذير جوي لكافة قطاعات الدولة بما فيها وسائل الاعلام صباح يوم الخميس الموافق 09-05-2013 تأكيداً للنشرات الجوية الصادرة والسابقة لهذا التحذير وعلى الأقل لمدة 72 ساعة وقد تم التحذير من سوء الأحوال الجوية على المدن الساحلية وبعض محافظات الوجه البحري وشمال سيناء.

تفسير الحالة

- تأثرت محافظات ومدن شمال البلاد ومنها منطقة جمصة بمحافظته الذقالية بوجود منخفض جوي سطحي كان مصحوباً برياح جنوبية شرقية مرتفعة في درجة حرارتها ومحملة بنسبة عالية من بخار الماء ونظراً لوجود منخفض جوي آخر في طبقات الجو العليا مصحوب بتيار نفاث شديد البرودة مما أدى إلى حالة عدم استقرار شديد في الأحوال الجوية
- تكونت السحب الركامية الرعدية صاحبها سقوط الأمطار الغزيرة والبرد وهذه السحب يصاحبها تيارات هوائية صاعدة وأخرى هابطة ينتج عنها رياح ذات سرعات عالية جداً تتجاوز الـ 50 عقدة أي حوالي 90 كم/ساعة تقريباً . هذه الرياح عنيفة ومدمرة للمباني والإستق والإعصدة الكهربائية وهذا ما حدث بالفعل على منطقة

جدول الاربعة ايام ليوم 2013-5-10

المنطقة	الطقس	الرياح	الأمطار	الرطوبة	الحرارة	الضغط
المنطقة الشمالية	مغيم جزئياً	شمالية	لا يوجد	70-80	15-25	1010-1015
المنطقة الوسطى	مغيم جزئياً	شمالية	لا يوجد	70-80	15-25	1010-1015
المنطقة الجنوبية	مغيم جزئياً	شمالية	لا يوجد	70-80	15-25	1010-1015
المنطقة الساحلية	مغيم جزئياً	شمالية	لا يوجد	70-80	15-25	1010-1015
المنطقة الغربية	مغيم جزئياً	شمالية	لا يوجد	70-80	15-25	1010-1015
المنطقة الشرقية	مغيم جزئياً	شمالية	لا يوجد	70-80	15-25	1010-1015

التحذيرات والنشرات ليوم 2013-5-10

التحذير الجوى ليوم 2013-5-10

بيان بحالة الطقس على جمهورية مصر العربية

- يتوقع خبراء الأرصاد الجوية أن تتعرض مدن ومحافظات السواحل الشمالية وشمال سيناء لحالة من حالات عدم الاستقرار في الأحوال الجوية
- فيها تتكاثر السحب الممطرة والرعدية ونشاط للرياح المثيرة للرمال والأتربة تصل لحد العواصف على هذه المناطق وذلك اعتباراً من يوم غد الجمعة الموافق 10/05/2013 مما يؤدي بدوره إلى انخفاض الرؤية على الطرق لأقل من 1000 متر وقد تصل كميات الأمطار لحد السيول على سيناء... لذا تهيب الهيئة بالسادة المسؤولين عن هذه المناطق إتخاذ التدابير اللازمة للحد من الآثار الناجمة عن سوء الأحوال الجوية.

النشرة الجوية ليوم 2013-5-10

المنطقة	الطقس	الرياح	الأمطار	الرطوبة	الحرارة	الضغط
المنطقة الشمالية	مغيم جزئياً	شمالية	لا يوجد	70-80	15-25	1010-1015
المنطقة الوسطى	مغيم جزئياً	شمالية	لا يوجد	70-80	15-25	1010-1015
المنطقة الجنوبية	مغيم جزئياً	شمالية	لا يوجد	70-80	15-25	1010-1015
المنطقة الساحلية	مغيم جزئياً	شمالية	لا يوجد	70-80	15-25	1010-1015
المنطقة الغربية	مغيم جزئياً	شمالية	لا يوجد	70-80	15-25	1010-1015
المنطقة الشرقية	مغيم جزئياً	شمالية	لا يوجد	70-80	15-25	1010-1015

في النهاية يمكن وصف حالة عدم الاستقرار في الأحوال الجوية التي أثرت على منطقة جمصمة بمحافظة الدقهلية يوم الجمعة الموافق 10/05/2013 كانت عبارة عن إعصار قمعي لا يزيد نصف قطره عن 500 متر وبلغت سرعة الرياح فيه لحوالي 55 عقدة تقريبا 100 كم/ساعة وذلك من خلال خرائط توزيعات الضغط السطحية وطبقات الجو العليا ومن خلال أيضا صور الأقمار الصناعية .

• ويمكن الاتصال بالهيئة على مدار ال 24 ساعة للاستفسار عن الأحوال الجوية على التليفونات الآتية 26849859 – 26842473

• تم إرسال هذا البيان الجوي لجميع وسائل الإعلام المرئية والمسموعة والمقروءة يوم الخميس الموافق 09/05/2013 تأكيدا لنص النشرات السابقة .

شكرا لحضراتكم

أهم التوصيات

- 1- إذاعة نشرة جوية على الأقل بمعدل ثلاثة مرات يوميا .
- 2- بقدر الأمكان إذاعة النشرات الجوية من قبل لجانة الأخصائين الجويين المتخصصين نظرا لظرفتهم على توصيل المعلومة .
- 3- تكون هناك خطوط ساخنة بين الهيئة العامة للأرصاد الجوية ووكالة نباء الشرق الأوسط بهدف نشر التحذيرات الجوية بأسرع مايمكن من خلال وسائل الأعلام المقروءة والمسموعة والمرئية .
- 4- تشكيل لجنة أزمات مشكلة من أعضاء من هيئة الأرصاد الجوية – قطاع الأخبار باتحاد الإذاعة والتلفزيون – وزارة الداخلية – وزارة الدفاع – وزارة الري ...على أن يمكن إشغالة أي أعضاء آخرين متخصصين في هذا الخصوص .
- 5- إعادة بناء المخبرات في الأماكن المناسبة في المناطق المعنية بسقوط الأمطار القوية بها والتي تصل فيها أحيانا كميات الأمطار لحد تسويل

Water Resources Management Programme

Alexandria 2030 IUWM Strategic Plan

Khaled AbuZeid, Ph.D, PE, PMP, CEDARE
Mohamed Elrawady, MSc, CEDARE
Tamer ElHakim, BSc, CEDARE

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Introduction

- > 4 Million Inhabitants (2011)
- > Alexandria accounts for about 5.5% of Egypt's Population and for almost 8% of the country's GDP.
- > It embraces a coast line of 70 kilometers and is home to 40% of Egypt's industrial establishments
- > The Nile River supplies over 95% of Alexandria's water demand
- > The city receives rainfall of less than 200 mm/year

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Land Use

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Strategic Planning in a Nutshell (1)

- > Ten studies were prepared, covering the base for the strategic planning team to develop a plan for the year 2030; eight of them are directly related to water supplying/saving options. The studies are:
 - Groundwater Potential
 - Stormwater potential
 - Water Demand Management Potential
 - Waste Water Reuse Potential
 - Agricultural Drainage Reuse Potential
 - Sea Water Desalination Potential
 - Urban Water Reuse Potential
 - Nile Water Availability
 - Climate Change Impact
 - Financial Sustainability and affordability assessment

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Strategic Planning in a Nutshell (2)

- > Data were collected for the city water resources covering the history of the water system in Alexandria, describing the current and future water demand as well as the activities and responsibilities of different stakeholders including Ministry of Water Resources and Irrigation (MWRI), Alexandria Water Company (AWCO), Alexandria Sanitary Drainage Company (ASDCO), and other institutions involved in water management.
- > A vision for water demand management in the City of Alexandria was developed and formulated by the Learning Alliance (LA).

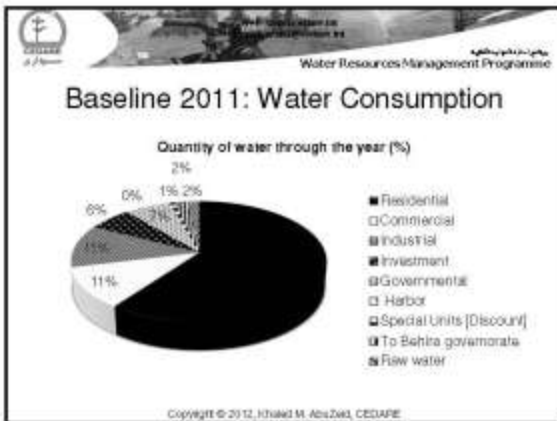
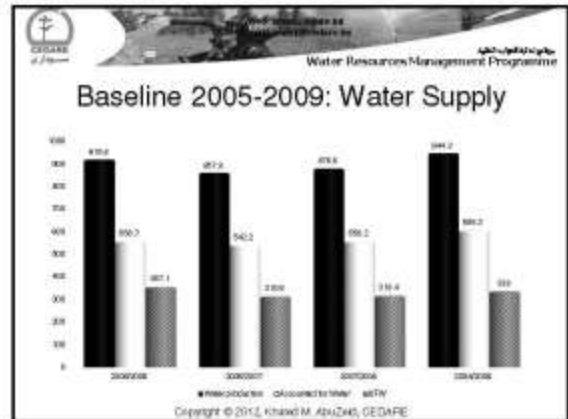
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Strategic Planning in a Nutshell (3)

- > Possible scenarios for the anticipated future water system in Alexandria City were described.
- > The potential amounts of water that may be made available by eight strategic options to satisfy future water demand were studied.
- > The strategies were evaluated, costed, and ranked.

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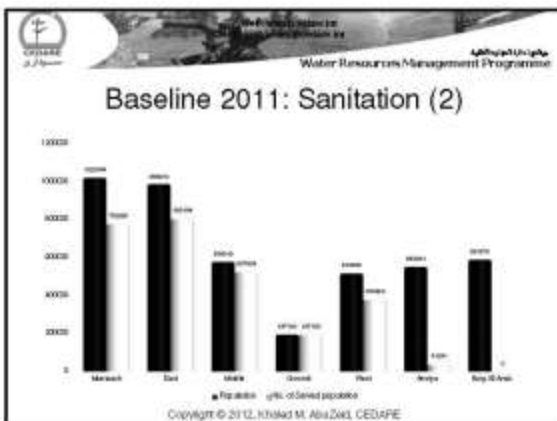


Water Resources Management Programme

Baseline 2011: Sanitation

- > The total length of the sewerage systems is about 750 km of various diameters ranging from 200 mm to 2750 mm
- > The existing annual wastewater treatment capacity is 395 MCM
- > Existing wastewater treatment plants receive the collected wastewater through 80 pump stations of different capacities

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The 2030 Alexandria Water Vision

'We envisage a city where a available water resources are managed in an integrated manner, with the participation of all citizens, and are used effectively for development within a framework of environmental sustainability, where all citizens have access to high quality (according to national standards), reliable, sustainable, and a affordable water and sanitation services and benefit from a clean and healthy environment.'

SWITCH Learning Alliance, 2007

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Strategic Options: Groundwater Potential

No.	Aquifer	No. of Wells	Present Extraction m ³ /year
1	Coastal Aquifer	373	1,573,590
2	Nile Delta Aquifer	190	2,702,830
3	Railot aquifer	752	26,808,830
Total		1315	31,085,250

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Strategic Options: Storm Water Potential

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Strategic Options: Water Demand Management Potential

- It was proven that 20 MCM could be made available annually by minimizing physical and commercial losses from pipe network.
- Increasing the drinking water tariff gradually could save 60 MCM annually starting from 2030; this amount corresponds to the value of monetary savings resulting from an average tariff increase of 5%.
- Maximizing household water use efficiency is estimated to save 44 MCM annually.

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Strategic Options: Wastewater Reuse Potential (900 MCM/yr)

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Strategic Options: Agricultural Drainage Reuse Potential

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Strategic Options: Sea Water Desalination Potential

- It has been shown that if sufficient funds are available, the maximum amount of desalinated water could reach up to 777 MCM annually starting from 2030, based on the needs of some particular coastal areas. The locations where the desalinated water can be used have also been determined. Moreover, a desalination system that could produce up to 2.13 MCM of desalinated water daily has been proposed, 366 units of the proposed system will be needed to produce the above mentioned daily amount.

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Strategic Options: Urban Water Reuse Potential

Three strategic alternatives have been assessed, these are Grey water reuse, roof water reuse, and road water reuse, the Aquacycle model has showed that these options could introduce 23, 14, and 25 MCM annually to the Alexandria water budget respectively.

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2030 DEMAND

Category	CURRENT SITUATION		2030	
	Year 2010	Year 2030	Year 2010	Year 2030
Domestic	81.78	270	81.78	270
Industrial	11.2	40	11.2	40
Commercial	8.72	30	8.72	30
Governmental	6.73	24	6.73	24
Public	2.33	8	2.33	8
Unaccounted for	1.2	4	1.2	4
Unaccounted for	1.2	4	1.2	4
Sub-TOTAL	122.96	416	122.96	416
Water Reuse	0	0	23	23
Sub-TOTAL	122.96	416	145.96	439

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Summary of Baseline 2011

Annual Alexandria Water Balance

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Meeting Multiple Objectives

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IUWM Plan Timeline

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Thank you for your attention

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Vulnerability & Adaptation to Climate Change in Egypt

Prepared by
Dr. Mohamed Ismail Ibrahim
 Vulnerability & Adaptation
 Management General Director

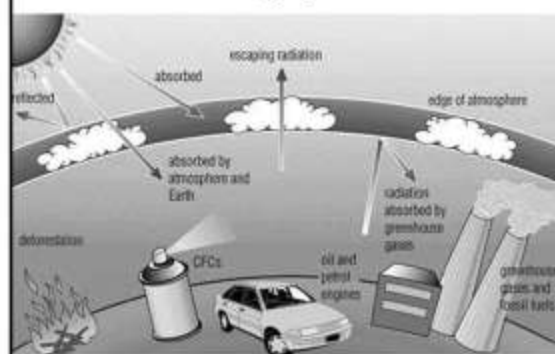
Content

- Climate change phenomenon
- Vulnerability of Egypt to climate change
- Adaptation to climate change

introduction

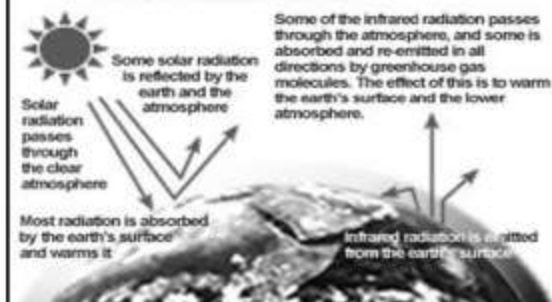
Egypt's large and dense packed population makes the country extremely vulnerable to climate change. Egypt does not produce enough food to feed its current population. Its water resources also are rather limited. Moreover, The studies have indicated that the following areas are the most vulnerable in order of severity and certainty of results: agriculture, coastal zones, aqua-culture and fisheries, water resources, human habitat and settlements, and human health.

Climate change phenomenon



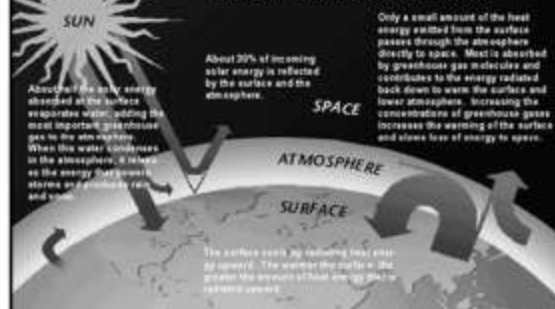
Climate change phenomenon

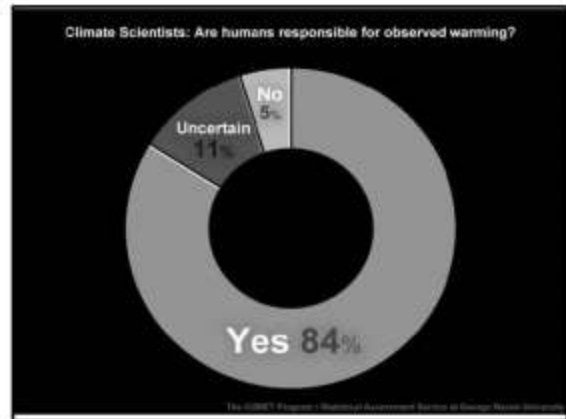
The Greenhouse Effect



Climate change phenomenon

The Earth's Greenhouse Effect





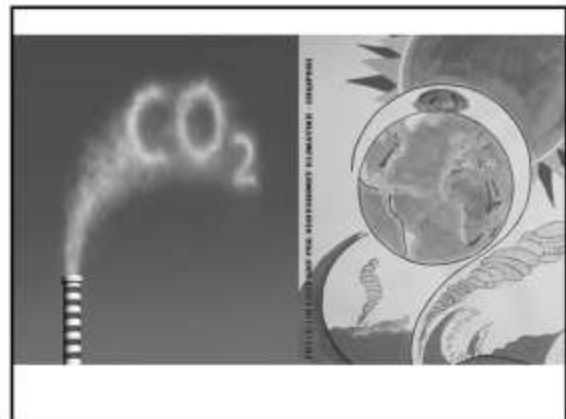
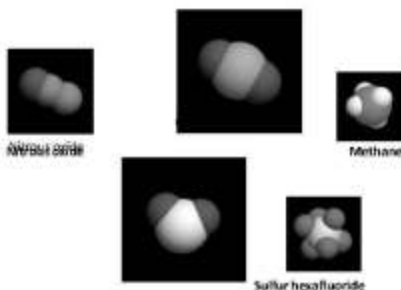
Greenhouse Gasses GHG

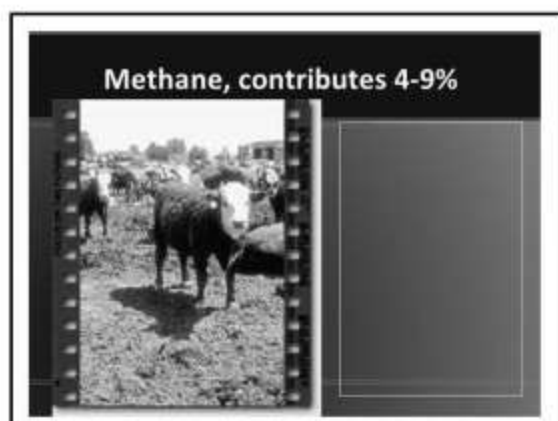
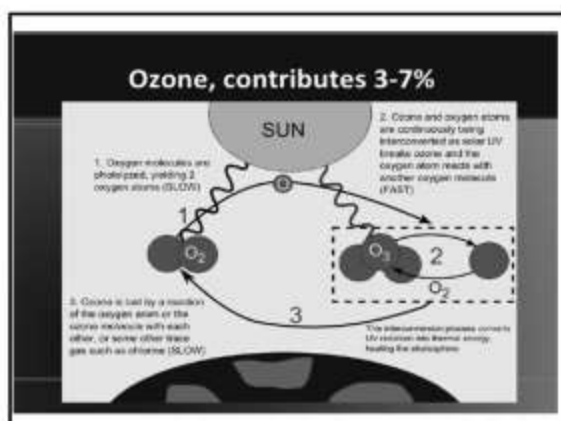
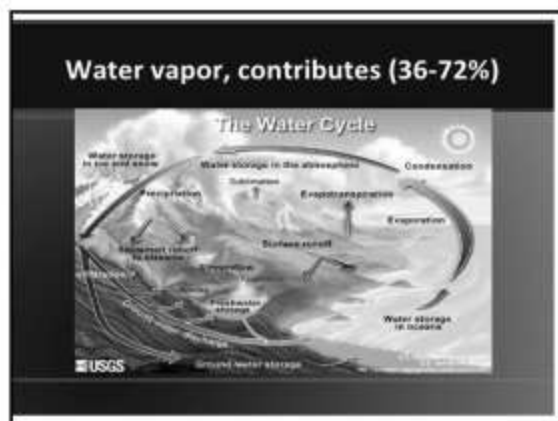
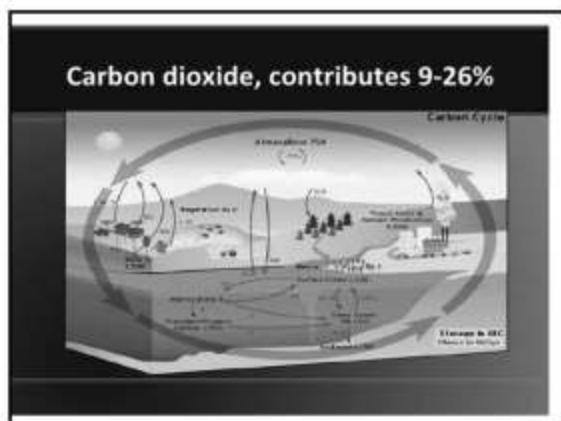
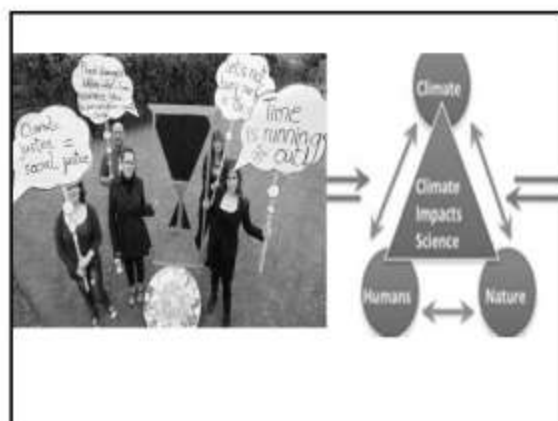
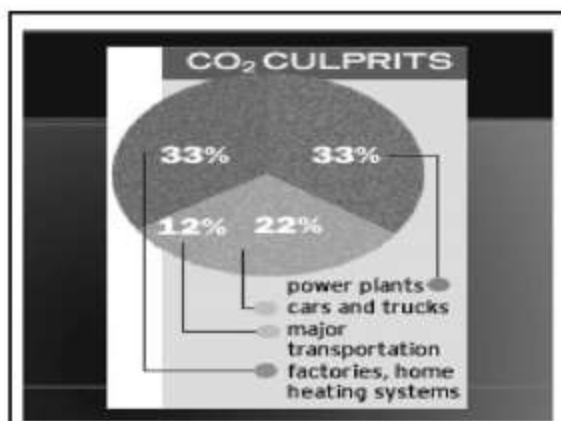
- Its gases have the unique property as absorb part of the infrared reflected by the surface of the Earth and contribute thereby to heat the planet's surface in the same way that heats the greenhouses used in the field of agriculture, and some greenhouse gases present naturally in the atmosphere, such as water vapor, carbon dioxide and methane, is that human activities such as the use of oil fuel and coal and the uprooting of trees contributed to an increase in the concentration of these gases in the atmosphere and is what has contributed and is still in the strengthening of global warming and therefore high rates of temperature on the surface of the earth.

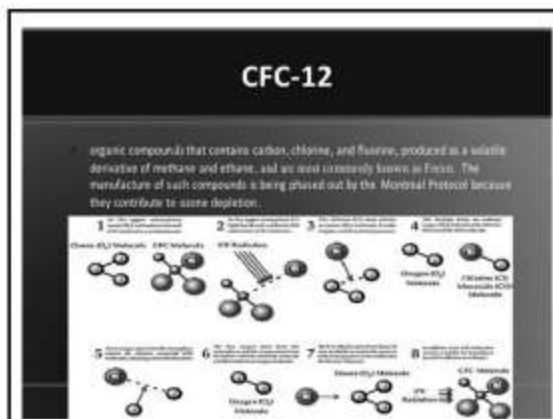
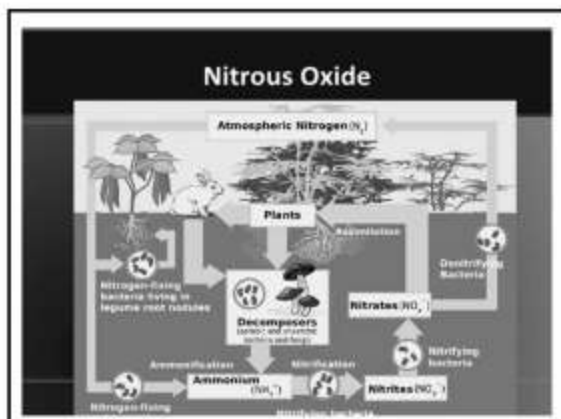
Greenhouse Gasses GHG

- Greenhouse effect is a phenomenon confined to atmosphere, some of the sun's energy to heat the earth and maintain a moderate climate.
- Carbon dioxide is one of the main gases that contribute to the doubling of this phenomenon is produced during the burning of coal, oil and natural gas in power plants, cars and factories, etc., in addition to deforestation widely.
- Other greenhouse gases that affect are: Methane from rice farms, cattle breeding, waste landfills, occupancy mines and gas pipelines.
- CFCs (Chlorofluorocarbons) responsible for the erosion of the ozone layer.
- Nitrogen oxides.

Greenhouse gases

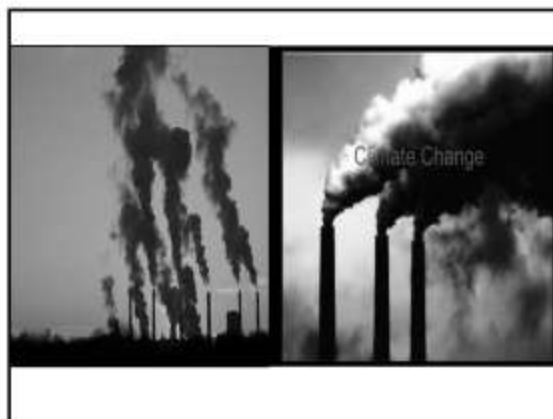






Human role in strengthening the global warming

- Many theories since the mid-nineteenth century showed that certain gases in the atmosphere of the Earth like carbon dioxide, methane, and nitrous oxide do trap heat and contribute to the heating of the earth. At the beginning of the twentieth century, the Swedish scientist Arrhenius proposed the idea that emissions of greenhouse gases in the atmosphere would lead to higher temperatures and thus climate change on the planet. Although the idea of the impact of humans on the Earth's temperature occurred a hundred years ago, almost, but scientists did not confirm this phenomenon since a relatively short period.
- Scientists confirm that human activities since the Industrial Revolution have contributed and are still contributing to the strengthening of global warming through the secretion of large amounts of greenhouse gas into the atmosphere, such as carbon dioxide resulting from the burning of fossil fuels such as coal, shale oil, to generate the energy needed by human development.



CO₂, CO₂, San k Gnawa?

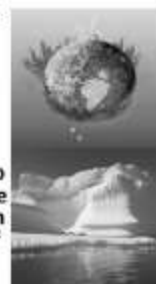


Vulnerabilities



Melting ice due to climate change

- The high average temperature of the earth's atmosphere lead to the melting of the ice, whether at the poles or in the higher mountains or in Oceans North and South.
- Melting ice lead to increase the proportion of solar radiation absorbed from the Earth's surface, so that the glaciers reflect 80-85% of the amount of solar radiation incident on and so will accelerate the increase of atmospheric temperature.



What to expect ... As a result of climate change??!!

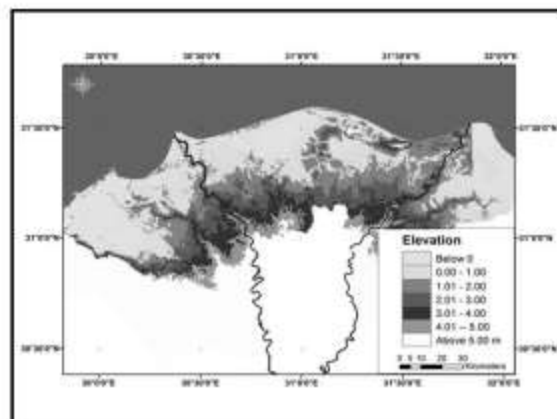
Ice Breaker (for all of us)



Sea Level Rise

- The temperature increased over the past 100 years is about 0.7 ° C and believed that the sea level has risen between 10 - 15 centimeters.
The figures which were accepted by the participants in the climate change conference probability of high temperatures between 1.4 - 4.5 degrees Celsius over the next hundred years, and sea-level rise between 20 - 140

Some coastal low lying land could be inundated in the Nile Delta.



Inundated area

Governorate	Inundated area %		
	AIFI (59 cm)	Rahmstorf (50 - 140 cm)	Pfeffer (80 - 200 cm)
Al Dakahlia	15.74	36.95	47.01
Al Behairah	18.72	29.34	33.32
Alexandria	23.75	25.91	26.69
Damietta	32.65	71.76	94.79
Kafr Al Sheikh	27.08	57.27	67.81
Port Said	38.86	61.95	74.75

Inundation by land subsidence

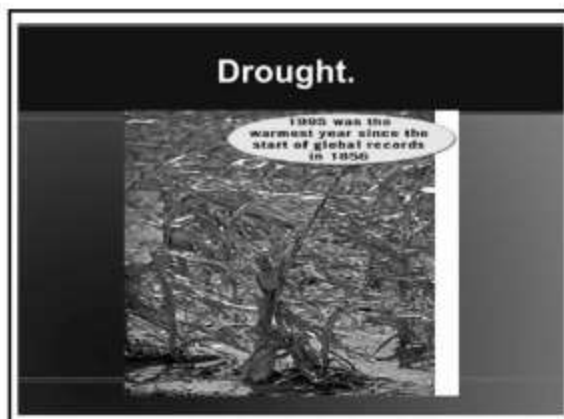
Governorate	% of Governorate area
Al Dakahlia	12.44
Al Behairah	12.90
Alexandria	21.41
Damietta	29.74
Kafr Al Sheikh	17.19
Port Said	17.08

What to expect ... As a result of climate change??!

- Although it is difficult to predict the effects of high temperature and sea level rise in the specific area, but there are many expectations:
Flooding large areas of the coastal plains, which is considered one of the best agricultural land in the world.
- Floods for some cities as some islands may disappear, and in some cases, small island developing States and forever.
- Vulnerable the coastal installations (Coastal Constructions) such as bridges, water barriers and Utilities also will increase the erosion of beaches.
- Saltwater intrusion (Saline Water Intrusion) to aquifers (Aquifers) and scarcity of water resources. Will increase the number of people who suffer from a shortage of drinking water within 50 years from 5 billion to 8 billion people.
- The difficulty of agriculture in arid regions and increase the high temperatures of the demands on irrigation.

What we expect also?

- Reduction in agricultural crop and thus shrinking food stocks.
- Eliminate a lot of Forests .
- You'll also find some species they are in an environment where the environment not having enough time to adjust.
- Declining soil fertility and worsening as the erosion change citizen of plants and increased drought and changing rainfall patterns will lead to the exacerbation of desertification.
- A lot of disorder ecosystems (Ecosystems) and Biodiversity. Spread of pests (Pests) and disease-carrying insects (Mosquitoes) that transmit malaria.
- The accelerating frequency of climatic disasters such as high droughts, floods, storms and other than harms communities and their economies.



Where the Climate Change More Affect ?

- The developing countries more vulnerable to climate change than the rich countries (Developed Countries), where the poor people in poor countries are the ones who will be exposed to greater risks due to increased volatility and sudden climatic patterns (such as floods, droughts, and do not have the ability to confront).



Adaptation

Proposals for combating climate change

- Logical solution optimized to address climate change is to stop emissions significantly (solution includes matters related to the global economy).
- The text of the Kyoto Protocol (1997) on the general principles to stop emissions of greenhouse gases. At a meeting in Bonn, 23/7/2001, approved more than 180 countries of the Kyoto Protocol and made him a legal treaty, but the United States pulled out of the climate negotiations and did not sign the Kyoto Protocol in Bonn meeting, and the United States has produced more than a quarter of contamination world carbon dioxide.
- Forestry and changing agricultural practices.
- Guided by the use of traditional energy sources.
- Reduce dependence on fossil fuels as the primary source of energy and seek forward to providing clean energy sources (renewable energy production from wind, water and sun).
- Recycling & walking and the use of mass transportation and reduce consumption (Turning Down) and lights-out time of departure (Switching Off) and change behaviors.

Preventive measures

- First: To reduce the risk of flooding and reduce the pace of this matter requires speed to take the necessary measures to control high groundwater levels are as follows:
immediately stop of domestic exchange in groundwater in all the villages of the provinces of the Delta and the work covered drainage systems to reduce groundwater levels and all coastal cities.
Reduce leaching rates of irrigation water to groundwater through the use of modern irrigation methods alternative to flood irrigation methods or a few crops farming water consumption with improve networks of agricultural drainage.
Expansion in groundwater use the alternative to surface water in irrigation operations.
The use of groundwater to irrigate landscaping Channel and Delta cities.
Water re-use and recycling to reduce waste and reduce its negative effects.

Preventive measures

- The expansion in the construction of waves walls along our coasts especially in North low of them and in front of the watercourses and the Nile Delta will not be with the effectiveness meaningful protection from flooding coastal areas unless it is to control the continuing rise in groundwater levels to those areas which may increase the problem complex to include flooding the coastline groundwater.



First Of All

Realize that THERE IS CLIMATE CHANGE.

Wag kayong in denial. :D



SECOND

Personal Efforts



Turn off lights and other appliances

At home

At school

At work



Lesser air con

Walk instead of drive



THIRD

Nation wide effort

Urban Planning

Garbage management



FOURTH

Global Effort

Alternative Fuels

Co2 reduction

World Peace >



This Our Life



Our Nature
Is Our
Source of
Life

Esikyun Carlo Jung
(Missionary Society of St. Columban)



Thank You



Building Climate Resilience in The Nile Delta

Egyptian Delta Alliance Wing

Ibrahim Elshinnawy

Director of Coastal Research Institute (CoRI)
National Water Research Center (NWRC)
Ministry of Water Resources & Irrigation (MWRI)

What is the Delta Alliance?

- Delta Alliance is an international knowledge-driven network organization with the mission of improving the resilience of the world's deltas.
- Delta Alliance brings people together who live and work in deltas. They can benefit from each other's experience and expertise in order to contribute to an increased resilience of their delta region.

Why Delta Alliance?

- The experiences and research from across river deltas must be shared, and collaborative research must be undertaken to support delta regions in responding quickly and effectively to their mounting challenges.
- Solutions for the complex problems faced in river delta regions will not be found in one discipline alone, but in combining the knowledge of both hard and social sciences.
- Integration of knowledge across disciplines, sectors, and regions will yield new and critical insights into how best to improve the overall resiliency of river delta regions worldwide.

Idea

- In spring 2010, Delta Alliance conducted a survey among its members to explore their expectations of an international delta network.
- Several questions were asked, amongst others concerning the means of communication within the network, membership of the network and funding.

Organization

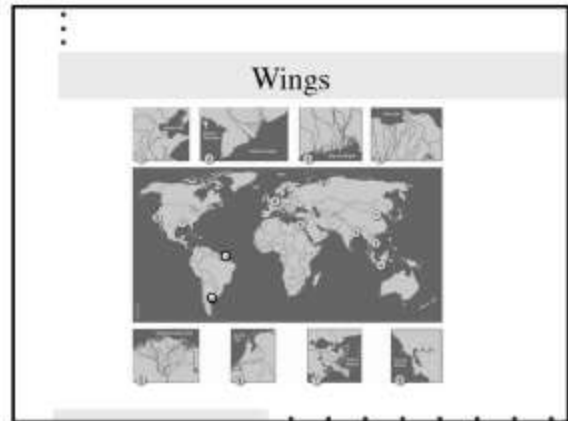
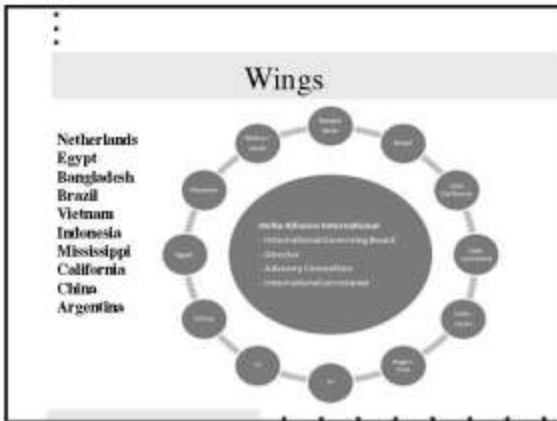
In June 2011, the international network organization of Delta Alliance has become a legal entity by establishing the Foundation "Delta Alliance International".

- Delta Alliance International is managed by an International Governing Board and an Advisory Committee which main task is to advise the Governing Board on strategic and operational issues.
- The International Secretariat is based in the Netherlands and is amongst others responsible for supporting the International Governing Board and the Advisory Committee

Wings

A Wing is a network of organizations in a specific country or area, which is dealing with delta-related issues.

A Wing must be recognized and admitted to the Foundation by the International Governing Board. Currently, Delta Alliance International includes 10 wings



Mission and Strategy

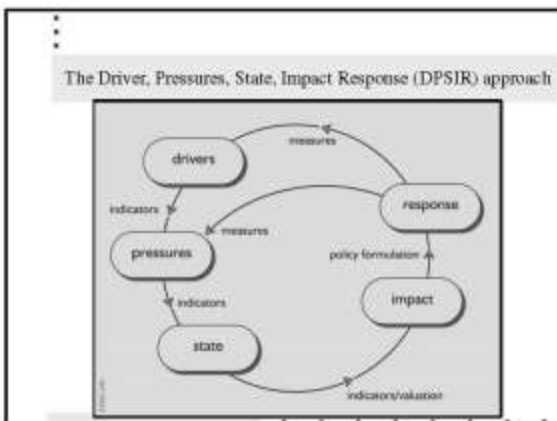
Mission:
To improve the resilience of deltas worldwide

The strategy is to:

- *envisioning and defining resilience for deltas*
- *measuring and monitoring resilience*
- *reporting and creating pressure to improve resilience*
- *providing inspiration to improve resilience*
- *providing assistance to improve resilience*

The Driver, Pressures, State, Impact Response (DPSIR) approach

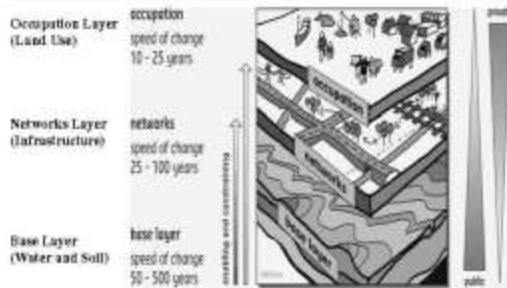
- The DPSIR framework helps in finding the root causes of environmental problems, the so-called drivers.
- These are mostly found in the broader societal context (e.g. population growth is a major driver of many environmental problems).
- But also natural phenomena could act as important drivers.
- Also global environmental and economic developments, such as climate change and international oil and commodities markets are important drivers for change.



Drivers of change

- Population growth
- Economic development
- Subsidence
- Technological development
- Climate change

Pressures and state of the delta: the Layer model



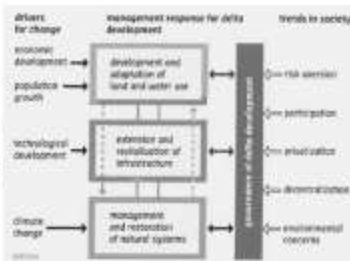
Delta management responses and Governance

Using the Layer model as a starting point, it becomes clear that there are three main response themes on which delta management could focus, i.e.

- The development and adaptation of land and water use (occupation layer),
- The extension of infrastructure (network layer), and
- Management and restoration of natural systems (base layer)

Delta management responses and Governance

This concept provides the framework for the assessment of delta development and management responses used for the comparative overview of deltas.

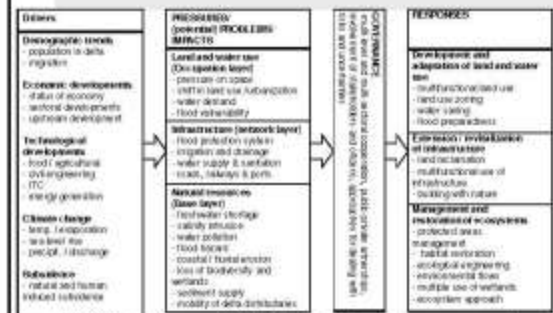
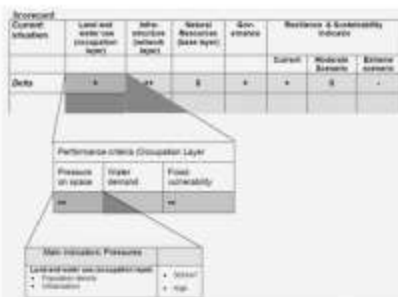


Governance Strength

The governance structure of deltas may be strengthened through different ways:

1. Promoting a better co-operation between different levels and sectors of government taking into account trends of decentralization and the need for (national) coordination.
2. Facilitating the cooperation between government and the private sector taking into account trends of privatization but also the need to safeguard the public interest.
3. Better involving stakeholders and citizens in development and management issues to promote the societal acceptance of development projects as well the long term sustainability of development projects (arrangements and incentives for maintenance).
4. Creating arrangements for dealing with uncertainties and sharing of risks (insurance).

Relation between indicators, performance criteria and scores for deltas



DRIVERS	Main indicators
Demographic trends - population in delta - migration	<ul style="list-style-type: none"> number of people and growth rate migration trend in delta (annual percentage total)
Economic developments - status of (total) economy - sectoral developments - upstream development	<ul style="list-style-type: none"> per capita GDP, growth rate, % contribution by delta total sectoral growth rate unemployment rate (damaged) dams in main tributaries in the estuary
Technological developments - food / agricultural - civil engineering - ITD - energy generation	<ul style="list-style-type: none"> Percentage of GDP spent on innovation and research in each sector
Climate change - temperature / evaporation - sea level rise - precipitation / discharge	<ul style="list-style-type: none"> Downscaling of global (RCC scenarios) change of temperature / evaporation change of sea level (mm/year) change of precipitation (mm/year) or river discharge (mm³)
Sustainability - natural and human induced sustainability	<ul style="list-style-type: none"> index of sustainability (e.g. Gearing, Green Water Deficit or its opposition) index of sustainability / resilience
PRESSURES/PROBLEMS	Main indicators

DRIVERS	Main indicators
Land and water use - pressure on space - shift in land use / urbanization - water demand - food sustainability	<ul style="list-style-type: none"> number of inhabitants, population density, change in land value % urban area, urbanization rate water deficit / number of days with interrupted water supply % area vulnerable to flooding / number of vulnerable people value of vulnerable assets
Network / Infrastructure - food protection system - irrigation and drainage - water supply & sanitation - roads, railways and ports	<ul style="list-style-type: none"> flood risk (return level), % of delta protected (high-medium-low) % of delta under irrigation % of infrastructure which needs to be upgraded number of floods or flooding days per year % people with access to water supply, % untreated waste water water sanitation rate index* density of infrastructure, number of ports / volume of goods
Natural resources - freshwater shortage / salinity intrusion - pollution - food hazard - coastal erosion / water table - biodiversity loss	<ul style="list-style-type: none"> number of droughts or drought days per year / % of delta with salinity problems % of polluted areas (pests, soil, air) frequency of storms (storm surge) / frequency of extreme river discharge, food hazard level (high-medium-low)

DRIVERS	Main indicators
sediment supply - mobility of delta communities	<ul style="list-style-type: none"> annual loss of land (m²/year) / average erosion rate (m/year) total area of sediments / % of wetlands protected by flooders biodiversity index (e.g. LPI)* soil erosion in catchment (t/ha/year) fluvial sediment transport (Mton/year) river discharge (seasonal and variability) % of sediment trapped in wetlands sustainability of dykes / embankments along delta distributaries
GOVERNANCE	Main indicators
multi level and multi sectoral cooperation	<ul style="list-style-type: none"> existence of integrated plans (delta plan, water adaptation plan etc.) existence of inter-institutional committees, multi scale level committees etc.
public-private partnerships	<ul style="list-style-type: none"> number of PPPs scale of PPPs (geographic, budget, time scale)
involvement of stakeholders and citizens	<ul style="list-style-type: none"> existence of legal instruments for participation (e.g. public planning instruments) number of NGOs involved in planning and decision making
approaches for dealing with risks and uncertainties	<ul style="list-style-type: none"> existence of adaptive management, adaptation strategies etc. (long term) existence of risk management, emergency systems etc. (short term)

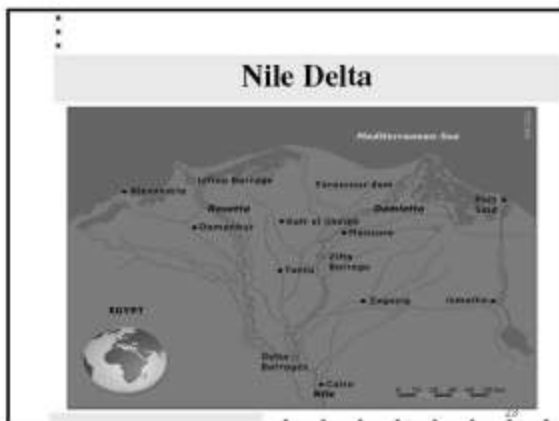
Scorecard

The idea behind a scorecard is to present a highly aggregated evaluation of the state of the delta, without the need to go through background data and analyses.

Besides the current situation two development scenarios are recognized:

Scenario 1, moderate perspective 2050: moderate economic growth (1.2%, Regional Communities-scenario) and related medium technological developments, combined with medium climate change and sea level rise (to be determined by expert)

Scenario 2, extreme perspective 2050: high economic growth (1.7%, Transatlantic Market-scenario) and related high technological developments, combined with high climate change and sea level rise (to be determined by expert)



Summary of drivers of change

Demographic trends
About 40 million inhabitants are living in the Nile delta. The population density is about 1000 inhabitants/ km² with a growth rate of 2% per year.

Economic developments
Results of the economic and financial performance indicated a great improvement during FY 2006/2007 and first quarter of FY 2007/2008. Egypt's economy achieved a growth rate of 7.1% which is the highest growth rate in the preceding 10-year period.

Summary of drivers of change

Tourism used to represents 11.3% of GDP, 40% of the total Egypt's non-commodity exports and 19.3% of Egypt's foreign currency revenues.

The industrial sector's contribution to the GDP in 2006/07 was around 17.2%.

The agriculture sector accounts for roughly 14.8 % of GDP. Also, agriculture contributes about 30% to Egypt's commodity exports, which makes it a major revenue-generator. And, of Egypt's overall labour force, 30% works in the agricultural sector, mostly in the Nile delta.

The economic importance of the Nile delta comprises industrial centers, commercial and fishing harbours, large urban areas, tourism centers, agriculture activities, gas and oil production, and fisheries

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Summary of drivers of change

Climate change:

SLR, salt water intrusion leading to problems with soil and water salinization, erosion and accretion, and changes in wave and current patterns.

Subsidence:

The coastal zones of the Nile delta is tilting with rates vary from 0.5 to 4.0 mm/year eastward.

Technological developments:

In the field of hydraulic engineering, coastal engineering, hydrodynamics, and water management many research programs of NWRC, research institutions and universities have been carried out.

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Research Gaps

- Multi-disciplinary research to study climate change impacts and resilience across the different layers and sectors of the delta.
- Socio-economic impacts of the climate changes, especially to the most vulnerable communities and sectors.
- Impacts of sea-level rise on soil and water salinity, agriculture, wetlands ecosystems and fisheries, patterns of waves and currents, and drainage infrastructure
- Impacts of climate changes on water resources, water requirements, and agriculture

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Summary of pressures in Occupation layer

pressure on space

With half of Egypt's population of 80 million living in the delta and a population growth rate of nearly 2% on available space is the main issue of the Nile delta

vulnerability to flood

River floods are minimized through the High Dam and coastal storms are rather mild.

freshwater shortage

The entire country is dependent on Nile water inflow. As demands continue to rise, freshwater shortage will increase in the future.

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Research Gaps

- Land Use and Land Cover change models. Appropriate models for SLR as well as climate change and ecosystem issues, including vegetation changes and loss of ground surface to permanent sea water flooding
- Spatial planning – How can we optimally integrate the water management and sea flooding protection safety infrastructure into spatial planning concepts?
- Water use and treatment in industry, domestic and agriculture – Which innovations are needed in industry, domestic and agriculture for treatment and more efficient water use?
- What are opportunities of using natural protectorates areas for water retention in salinity areas?

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Summary of pressures in Network layer

Ageing infrastructure

The extensive irrigation and drainage system is stretched to its limits; there is a constant need for efficiency improvement

Summary of pressure in Network Layer

Research gaps

- Could wetlands function as blockades against salinization of groundwater and salt water intrusion?
- Water efficiency improvement in times of climate change
- Rehabilitation of water and drainage control/pumping structures
- How to develop more environmental friendly constructions for coastal protection infrastructure?
- Development of ICZM (recently IWCZM)
- What are opportunities for recharging drainage water into coastal groundwater aquifers to minimize sea water intrusion?

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Summary of pressures in Base layer

Coastal erosion

Due to Aswan dam most of the Nile sediments are trapped in Lake Nasser. Sediment balance at the coast is disturbed, leading to coastal erosion

Loss of biodiversity

As the bird-rich coastal lagoons are at the end of the system, their water quality is threatened by salinization and pollution.

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Research gaps

- How can we use natural processes for land reclamation and sustainable delta management?
- Which morphological and ecological changes are currently occurring in the delta and are their rates changing?
- A detailed picture of future climate-change related changes (sea-level rise, wave and current patterns) is needed for planning adaptation of infrastructure. Especially levels of uncertainty in predictions need to be quantified.
- Rate of erosion and measures for coastline protection.
- An ecological model should be developed to observe the change in wetlands bio-diversity due to human intervention.
- A well calibrated and validated salinity model of sea water intrusion should be developed to understand the existing situation and to analyze the impact of climate change and sea level rise on salinity and its consequences on agriculture, fisheries, drinking water and biodiversity.

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Research gaps

- Climate change impacts on the Nile Delta. Information is needed by coastal managers to adapt to climate change, including inland, coastal and near-shore water quality, inland flooding, coastal erosion and patterns, wave and current patterns, saltwater intrusion, wetland loss and beach loss, and socio-economic impacts.
- Liquefaction, groundwater level rise impacts, subsidence due to pumping, instability of foundations with water level rises, and sea defenses failure.
- More interdisciplinary research needs to be done into the loss/change of biodiversity and the relationship between lack of sediment and land subsidence and coastal erosion.

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Research gaps

- Digital Elevation Model is highly needed for the whole Nile Delta.
- Periodical soil surveys as a basis to establish fertilizer rates, continued restoration and maintenance of agricultural drainage systems, as well as for installing new drainage systems where needed
- Development of community programs to turn these waste materials into inputs (fertilizers, water, energy), possibly combining it with agricultural waste, for local reuse (cradle to cradle).

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Summary of governance issues

Cooperation between (scale) levels and sectors of government

Integrated Coastal Zone management is badly needed. This will require a further development of the institutional situation with regard to the mandate of national and local authorities to control and manage coastal developments.

Cooperation between government and private sector

Increasing private public participation (PPP's) is one of the policies of the Government.

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Summary of governance issues

Involvement of stakeholders and citizens

- Although the Government of Egypt has realized the importance of stakeholders and citizens involvement in decision making process to increase public acceptability, the involvement is limited.
- The involvement of stakeholders and citizens is relatively higher at local level, whereas at the provincial and national levels are less.
- A new master plan for the coastal zones is still far from community participation

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Summary of governance issues

Approaches for dealing with risks and uncertainties

- To reduce loss of lives and land, Egyptian Government has implemented a comprehensive plan to manage the shoreline of the Nile delta.
- There is a growing attention for awareness rising on climate changes impacts.
- Vulnerability of coastal zones to inundation due to sea level rise has been studied and many observation processes have been practiced.

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Research gaps

- A linked management approach that sees the river basin and coastal area as one interdependent system should be developed.
- Salinity is an important factor for agriculture, drinking water and fisheries. Salinity forecast system needs to be developed for the coastal area as sea level rise impacts threaten soil and groundwater quality.
- Adaptive management techniques need to be improved through better education and legal instrumentations.
- Data collection, monitoring and evaluation system requires improvement. Work on integrating policies and initiatives of National plans are required.

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Research gaps

- Water pollution is a challenge for sustainable development plans in the Nile Delta as well as the coastal wetlands due to insufficient roles and laws.
- Improve the accuracy of climate changes impacts prediction.
- Measures to reduce risks: local knowledge and awareness.
- Enhance roles of provincial and local authority/officials.
- Legal reform and institutional setup are needed.
- Integrated Coastal Zone Management Plan needs to be initiated.
- Development of programs to improve the living standards of the rural inhabitants, and reducing poverty rates in the rural areas.

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Nile Delta Scorecard

Delta	Land and water use (occupation layer)	Infrastructure (network layer)	Natural Resources (base layer)	Governance	Rural Resilience & Sustainability indicator
Current Situation 2010	--	0	-	0	-
Scenario 1 moderate 2050	-	0	-	0	-
Scenario 2 extreme 2050	--	-	--	0	--

Scorecard:
resilience/sustainability: ++ (very good), + (good), 0 (medium), - (low), -- (very low)

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Clarification notes on the ND score card

- The current situation in the Nile delta can be described as close to moderate rather than low. The pressures on the occupation layer and the base layer will increase due to population growth and economic development in the country.
- Furthermore, climate change and sea level rise will make the situation worse unless mitigation measures will be deployed and adaptation strategies planned.

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Clarification notes on the ND score card


- The most critical issues will be related to increased salinization due to sea water intrusion, droughts in the Nile Basin and water resources management in the Nile Basin countries.
- Unless technological developments and Governance aspects are significantly improved, the overall resilience and sustainability indicator will significantly decrease in the future.

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THANK YOU




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INTRODUCTION

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Delta Resilience Workshop
Cairo, June 16th-17th, 2013

2030 Strategic Vision for Wastewater Reuse in Egypt

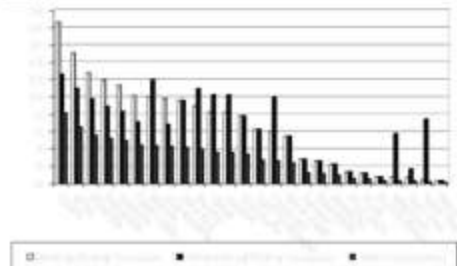
Khaled AbuZeid, Ph.D, PE, PMP, CEDARE
Mohamed Elrawady, MSc, CEDARE
Tamer ElHakim, BSc, CEDARE

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Population Distribution Scenarios 2050

Millions




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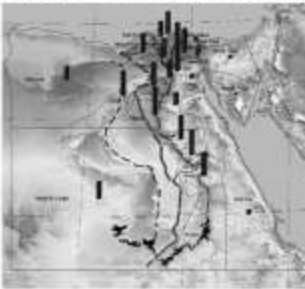

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CURRENT SITUATION IN EGYPT

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Water Demand Second Scenario 2050



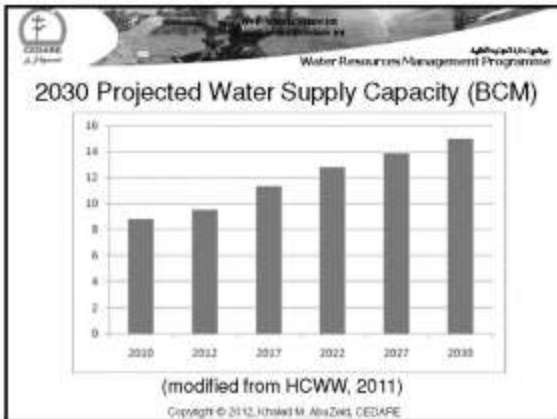
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Water Demand First Scenario 2050



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WATER SUPPLY

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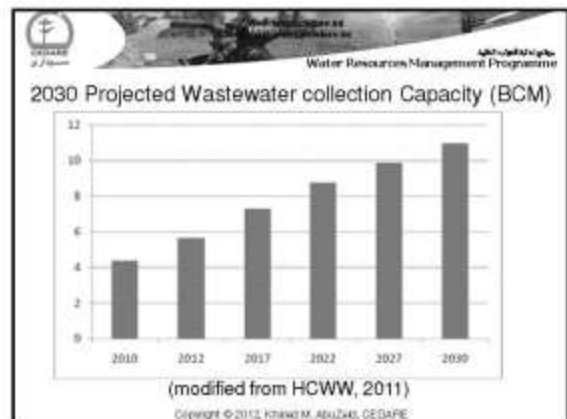
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WASTE WATER

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- Water Resources Management Programme
- ### Municipal Water Status
- > Current annual municipal water production from the Nile: 6.62 BCM/year
 - > Current annual municipal water production from groundwater: 1.38 BCM/year
 - > Current annual municipal water production from desalination: 61 MCM/year
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- Water Resources Management Programme
- ### Wastewater Status
- > The annual produced wastewater amounts to 6.5 BCM, which is about 81 % of the total produced domestic water.
 - > About 5.5 BCM of wastewater is collected
 - > About 44% of the nationally produced wastewater is not treated, which is equivalent to 2.85 BCM.
 - > 3.65 BCM of wastewater are treated annually, 0.73 BCM of which (20%) are treated primary treatment, and 2.92 BCM (80%) are treated secondary treatment.
 - > The wastewater collection network has a total length of 39,000 KM.
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- Decree No. 603/2002 for minister of agriculture , which prohibits the use of treated and untreated wastewater in irrigating conventional plants , but allows its use in wood trees , ornamental trees , and fuel-production trees (ex jatrova , jujoba. ...). (However, it can be argued that the decree somehow contradicts with the reuse code)

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Grade	Agricultural Group	Permitted Crops
A	AG 1: Plants and trees grown for primarily for timber villages and hotels	Citrus, date, fig, olive, grape, leucantheum, geranium, ornamental palm trees, flowering shrubs, bearing bushes and trees, wood trees, and shrub trees
	AG 2: Plants and trees grown for primarily for residential areas of the new cities	Citrus, date, fig, olive, grape, leucantheum, geranium, ornamental palm trees, flowering shrubs, bearing bushes and trees, wood trees, and shrub trees
B	AG 3: Flower Plant Group	Impatiens
	AG 4: Trees producing fruits with flowers	On condition that they are produced for processing purposes such as: olives, mango, date palm, and avocados
	AG 5: Trees used for green walls around cities and ornamentation of highways or roads	Cassia, candelabra, olive (bearing palm trees), eucalyptus, and other trees
	AG 6: Herbs and Plants	Bearing plants of wood trees, ornamental plants and shrub trees
	AG 7: Trees and Cut Flowers	Local olive, night rose, carnations, g. glaberrima
C	AG 8: Herb Group	Flax, yam, alfalfa, etc.
	AG 9: Shrubs for the production of oil	Japanese medlar
	AG 10: Ornamental in Open	Apple, cedar in plant, and others
	AG 11: Wood Trees	Maple, candelabra, and other wood trees

Fermissible Agricultural groups by grade (Reuse Code, 2005)

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Obstacles and Institutional Constraints

- The financial resources required to increase the national coverage of wastewater collection, and to upgrade the level of treatment.
- The proximity of potential arable land to wastewater treatment facilities and the different physical conditions surrounding each treatment plant.
- The environmental and health concerns and perception associated with using treated wastewater for agriculture.
- The Egyptian wastewater re-use code that prohibits using secondary and tertiary treated wastewater for edible crops.
- The Irrigation & Drainage Egyptian law that prohibits conveyance of any level of treated wastewater through irrigation canals.

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OBSTACLES AND INSTITUTIONAL CONSTRAINTS TOWARDS ACHIEVING STRATEGIES

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PROPOSED STRATEGIC VISION FOR WASTEWATER REUSE IN EGYPT TILL 2030

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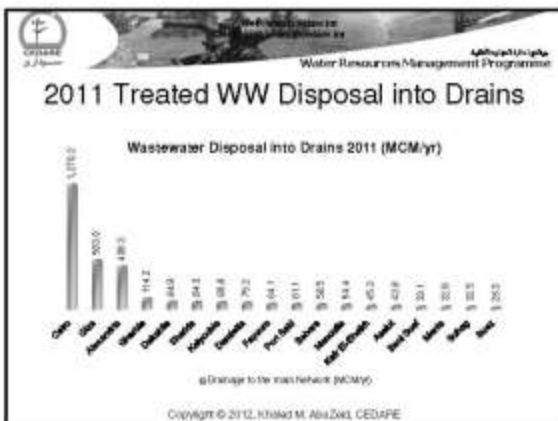
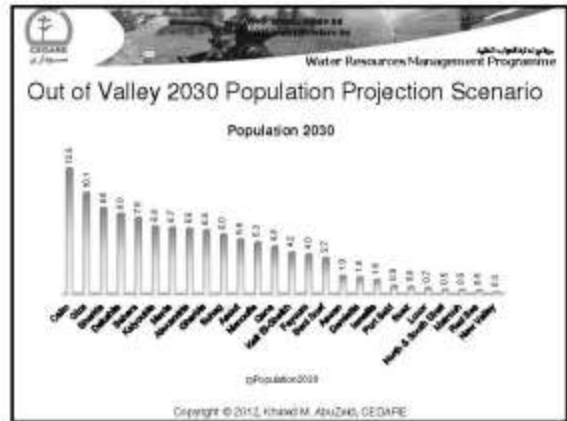
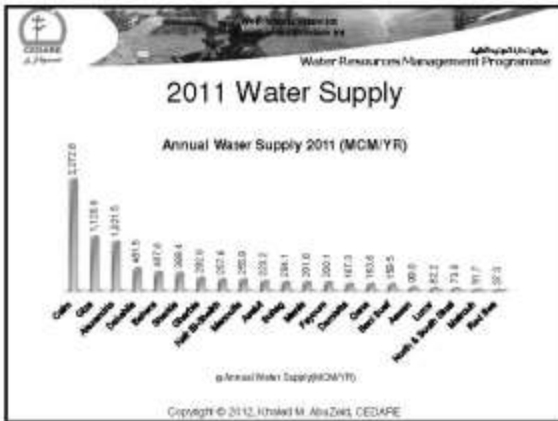
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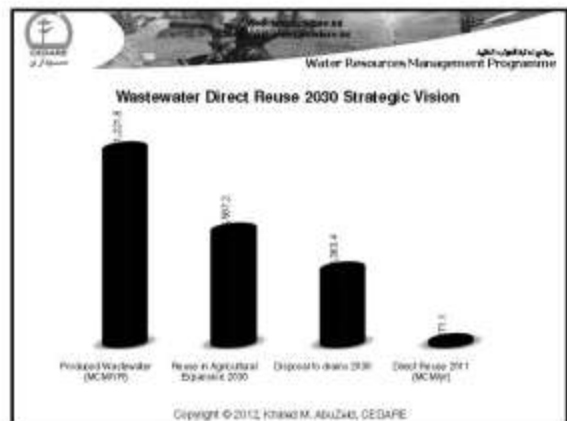
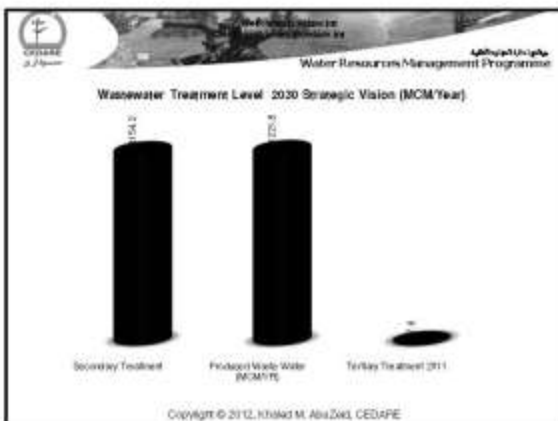
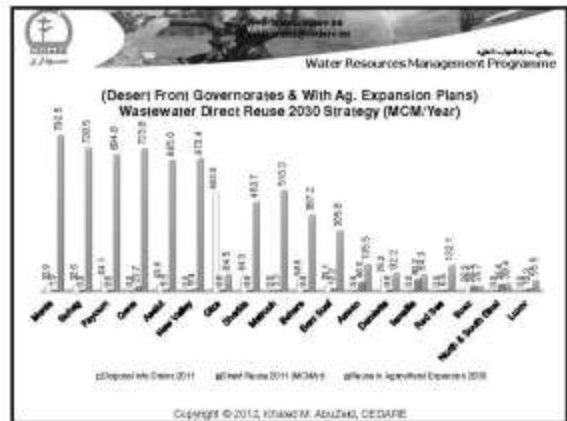
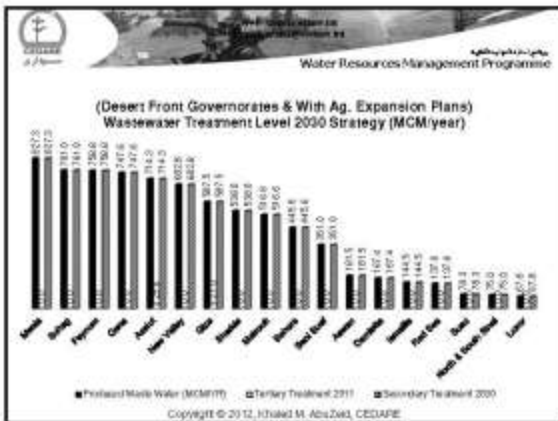
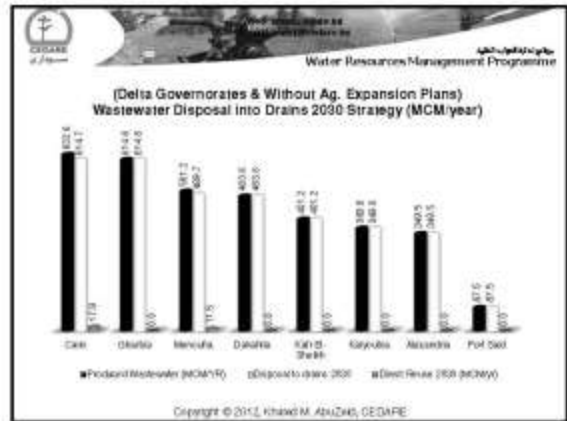
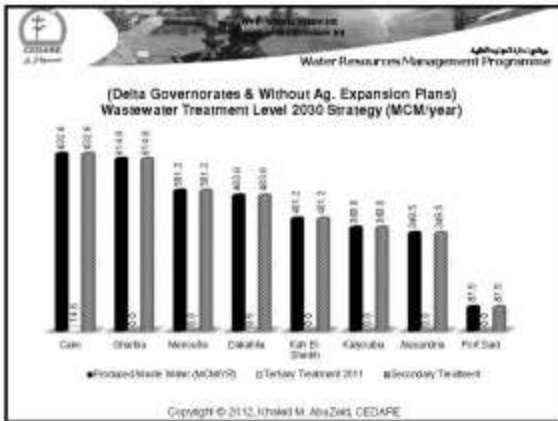
المركز القومي للمياه
Water Resources Management Programme

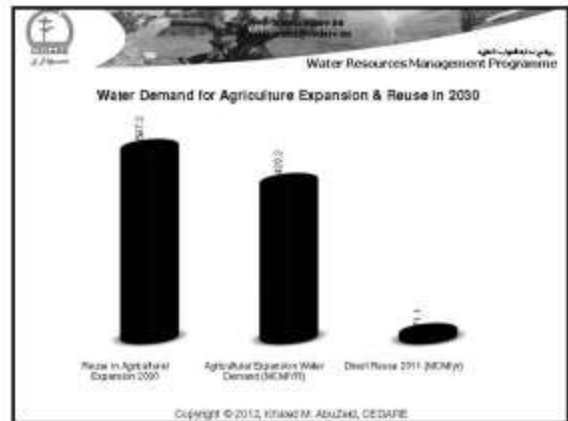
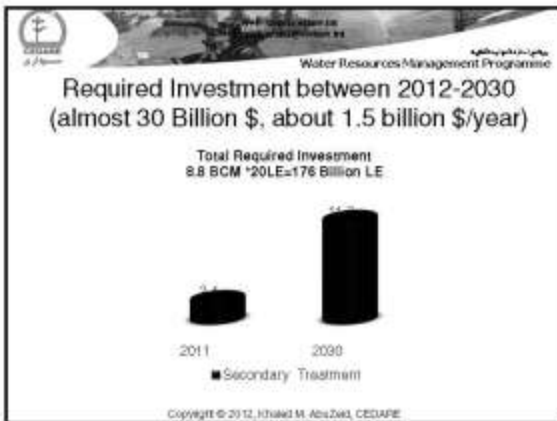
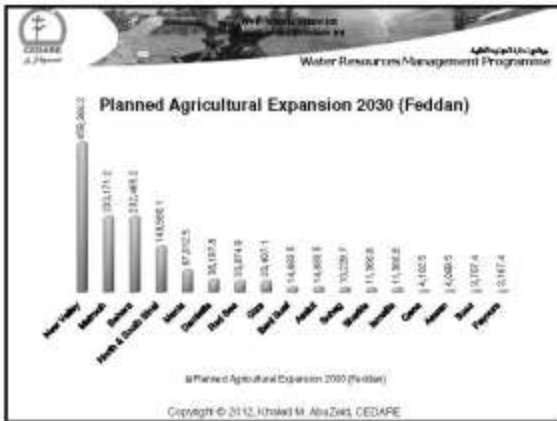
Obstacles and Institutional Constraints (2)

- The Environmental & health regulations & laws.
- The generation of new water demands by the wastewater companies due to directing the collected wastewater to Wood and Bio-fuel tree plantations.
- The anticipated competition over treated wastewater by the irrigation sector that needs to satisfy national water demands, and the agriculture sector that needs to satisfy agriculture expansion plans, and the water and wastewater sector that needs to generate income from treated wastewater produced to cover its operation and maintenance costs.
- The risk of not being able to market the agriculture products for export to neighboring markets such as the EU and the Gulf states due to the use of treated wastewater.
- The Health & Environmental hazards associated with improper handling of the different levels of treated wastewater by users.

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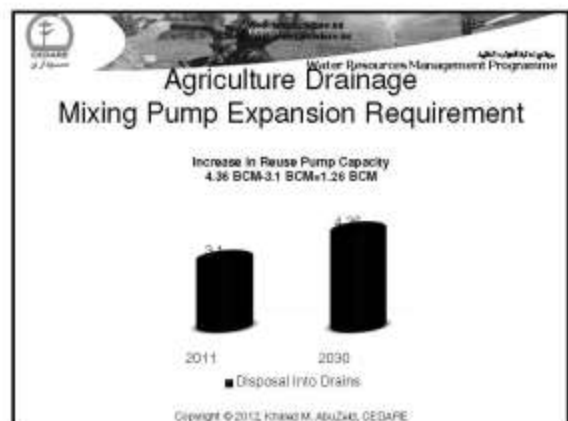




Water Resources Management Programme

PROPOSED INTER-MINISTERIAL AGREEMENT & ROLE OF CONCERNED MINISTRIES

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 Water Resources Management Programme
 برنامج إدارة الموارد المائية
Ministry of Industry and Foreign Trade

- > To regularly compile and disseminate data that shows quality and quantity of water usage and disposal from the factories
- > To prevent untreated industrial disposal into water bodies
- > To register all nonregistered factories.
- > To ensure the existence of treatment plants inside the factories before giving the required license for the factories to operate.
- > To ensure the operation of the treatment units in the factories at license renewals.

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 Water Resources Management Programme
 برنامج إدارة الموارد المائية
Ministry of Agriculture and Land Reclamation

- > Selecting the crop composition according to the wastewater reuse code and water quality.
- > Allocating the areas that can be cultivated in cooperation with the HCWW and MWRI
- > Supervising and controlling the agricultural process.
- > Putting and applying the laws to prevent violations of farmers.
- > Controlling the reuse of treated sludge in agriculture according to law 254 for year 2003.
- > Controlling and supervising the quality of organic fertilizers

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 Water Resources Management Programme
 برنامج إدارة الموارد المائية
Ministry of Health and Population


- > To supervise the quality control and quality standards of the treated wastewater.
- > To supervise the quality control of the treated wastewater used in agriculture.
- > To supervise the quality control of the treated industrial wastewater quality drained in water ways.

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 Water Resources Management Programme
 برنامج إدارة الموارد المائية
Ministry of Environmental Affairs

- > To confirm the operation of the treatment plants inside the factories.
- > To monitor the industrial effluents water quality
- > To make sure appropriate treatment is included in EIAs and Strategic EIAs of industrial zones

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 Water Resources Management Programme
 برنامج إدارة الموارد المائية
Thank you for your attention

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 Water Resources Management Programme
 برنامج إدارة الموارد المائية
Ministry of Drinking Water and Sanitation Services

- > To specify the land areas to be cultivated directly or indirectly by treated wastewater in cooperation with the Ministry of Agriculture.
- > To regularly indicate the treated wastewater quality and quantity that should drain into agricultural drains and that could be directly reused
- > To confirm the operation status of the treatment and to control the quality standards of treatment
- > To explore agriculture reuse investment opportunities to share costs
- > To allocate and supervise the industrial wastewater drainage to the sanitation network.

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إسلام زينة حجابنا الجمال في التكليف

1- لا لبس العادي عندنا فيه ابتداء من
 قبل ذلك

2- حجابنا من قبله حجابنا
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