



Journal homepage: <http://www.journalijar.com>

INTERNATIONAL JOURNAL  
OF ADVANCED RESEARCH

## RESEARCH COMMUNICATION

### The Role of Higher Education in Awareness of Climate Changes, Egypt Case Study

**Prof Hamed Abdel Reheem Ead**

Professor of Chemistry, Faculty of Science, Cairo University, Egypt  
Former-Expert at Science Directorate, ISESCO  
Former Cultural Consular, Egyptian Embassy, Morocco.

#### Manuscript Info

##### Manuscript History:

Received: 14 November 2013  
Final Accepted: 28 December 2013  
Published Online: January 2014

#### Abstract

Egypt has considerable expertise and experiences in climate science through collaborative research between independent research institutes and their external partners. The key step forward will be how to unite this expertise with the expertise of Egyptian universities to eventually build a bottom-up regional community of connected educators, researchers, students, practitioners, policymakers and local groups for climate change adaptation. To upgrade the public awareness, there is a need to increase public sensitivity to the environment, development problems, involvement in their solution, and a sense of personal responsibility, greater motivation and commitment towards sustainable development. Many environmental problems are caused by the absence of awareness like the unwise use of resources, all sorts of pollution, imbalance between population growth and available resources, the spread of diseases, and the destruction of land and its abuse. The main objective is to promote broad public awareness as an essential part of education efforts to strengthen attitudes, values and actions, which are compatible with sustainable development. Mass media offers some activities in this area but without any organized plan. The press is doing very little to promote public awareness as shown by various studies. Mosques, churches, clubs, industry, unions etc ... are doing little in fostering awareness among the public.

Copy Right, IJAR, 2014.. All rights reserved.

#### Introduction

At the home of one of the oldest civilization on the planet, Egypt concern about global climate change and its consequences on sustainable development comes as no surprise. Scientific evidence and climatic records have sharpened the focus on the relationship between the concentrations of greenhouse gases in the atmosphere and the rise in global temperature.

Adaptation to climate change has emerged as one of the most important concerns in the global development agenda today. Changes to, and variability of the climate and ecosystems are already being observed by scientists and local communities. In Egypt, with its diverse natural environment and social systems, these changes are affecting different areas in different ways. This poses significant implications for developmental planning. How Egypt adapts, and the solutions it creates to overcome adverse climate change risks, must be developed locally, while being supported by regional and global knowledge and experience. Key to this is an *educated and technically-skilled labour force* that can conduct the necessary research and develop effective solutions to eventually create a truly adaptive and resilient society. Egypt already has a vast pool of human talent; such human capacities can be further cultivated and sustained through dynamic scientific and technical educational institutions.

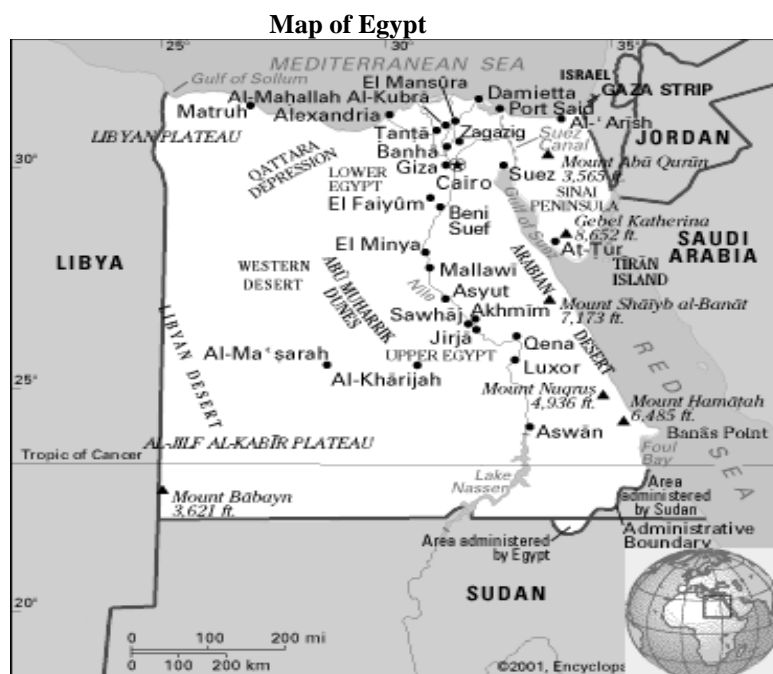
The contributions that the higher education sector can make for climate change adaptation are substantial. It will be Egyptian universities that will produce the highly-skilled human capital and the knowledge needed for tomorrow's climate-risk society.

Egypt has considerable expertise and experiences in climate science through collaborative research between independent research institutes and their external partners. The key step forward will be how to unite this expertise with the expertise of Egyptian universities to eventually build a bottom-up regional community of connected educators, researchers, students, practitioners, policymakers and local groups for climate change adaptation. Ideally, higher education institutions are well-placed to: Conduct applied postgraduate adaptation research in close partnership with implementing government and non-government agencies, as well as local communities.

To upgrade the public awareness, there is a need to increase public sensitivity to the environment, development problems, involvement in their solution, and a sense of personal responsibility, greater motivation and commitment towards sustainable development. Many environmental problems are caused by the absence of awareness like the unwise use of resources, all sorts of pollution, imbalance between population growth and available resources, the spread of diseases, and the destruction of land and its abuse. The main objective is to promote broad public awareness as an essential part of education efforts to strengthen attitudes, values and actions, which are compatible with sustainable development. Mass media offers some activities in this area but without any organized plan. The press is doing very little to promote public awareness as shown by various studies. Mosques, churches, clubs, industry, unions etc ... are doing little in fostering awareness among the publicity.

### Country background

Egypt is located between 22° to 32° North and 24° to 37° East. It is bordered on the west by Libya, on the north by the Mediterranean Sea, on the south by Sudan, and on the east by the Gaza Strip, Israel and the Red Sea. Its coastline extends for more than 3,500 km along the Mediterranean Sea and the Red Sea coasts. The Nile delta coast, which constitutes about 300 km, hosts a number of highly populated cities such as Alexandria, Port-Said, Rosetta, and Damietta.



### Climate change scenarios and synthesis of key vulnerabilities

Egypt's climate is semi-desert, characterized by hot dry summers, moderate winter, and very little rainfall. The country has areas with strong wind, especially along the Red Sea and Mediterranean coasts. Sites with an annual average wind speed of 8.0-10.0 m/sec have been identified along the Red Sea coast and about 6.0-6.5 m/sec along the Mediterranean coast. Average precipitation in the Ethiopian highlands (where much of the water in the Nile originates) is highest in July, August, and September, at 5.4 mm/day, and almost negligible between January and March.

Egypt is a typical example of a developing country which is highly vulnerable to climate change and faces numerous threats to its economic, social and environmental sustainability—including energy, water, and food security. This causes enormous fundamental pressures on Egypt's competitiveness, and presents a growing threat to

national security. These threats are fueled by a growing population and rising associated demand, coupled with the constraints of a finite resource base. These pressures include:

*Energy Security* — Unsustainable use of energy resources is one of the major reasons for environmental degradation and climate change. The consequence is energy scarcity and rising energy prices which increase poverty, strain national budgets and jeopardize Egypt's competitiveness for the future.

*Water Security* — Global warming results in sea-level rise due to the melting of glaciers and arctic ice. Consequently, the world's fresh water resources decline while salt water intrudes into underground reservoirs. Egypt is particularly susceptible due to its low-altitude Nile Delta.

*Food Security* — Limited water and agricultural land coupled with population growth and other factors are creating mounting pressure on Egypt's ability to provide food for its people in the future.

*Climate Change* — Declining precipitation levels, changing weather patterns, and rising seas in the Nile Delta are slowly but steadily making a difficult situation worse, especially in the area of food and water.

*The Need for Jobs* — Egypt's young population is seeking for work, and Egypt needs to generate over one million new jobs every year for its growing workforce.

*The Poverty Gap* — With millions still living under the poverty line defined by the United Nations, Egypt must lift the standard of living for those most in need.

*The Financial Crisis* — the continuing impact is being felt around the world hitting national budgets hard also impacting the availability of investment capital and development aid.

*Companies are very much affected by the scarcity of available resources and they cannot survive in the future if they cannot predict and adapt to major trends like climate change.*

### **Green Transformation in Egypt:**

Existing national strategies in Egypt across sectors and ministries reveal a remarkable awareness of the value of a "Green Transformation" to Egypt's competitiveness and future development prospects.

The Green Transformation consists of an integrated package of technologies, policies, and behavior changes designed to promote greater innovation, efficiency, cost reduction, shock resilience, and job creation by focusing strategic attention and investment on the following areas: *Water Conservation; Energy Efficiency; Renewable Energy; Sustainable Agriculture; Eco-Cities; Eco-Villages; Eco-Tourism; Green Industry; Green Transport; Waste to Energy; Poverty Alleviation Programs; Programs to Increase Equity.*

Many strategy documents include "green" elements such as water conservation, renewable energy, or eco-tourism. However, these existing strategies do not cover the need for a more integrated approach that puts a Green Transformation at the center of planning for economic competitiveness.

Egypt's strategic priorities in the area of Green Transformation should not be framed in terms of marginal savings or efficiency improvements. They need to be framed in terms of job creation, climate resilience, energy independence, poverty reduction, and other major national goals — for these are the benefits that Green Transformation approaches are now known to deliver.

A Green Transformation approach should be seen as a modern, strategic response to Egypt's needs today in an ever more demanding global economic arena, and in the era of global climate change. Egypt still has the opportunity to be a regional and even global leader in the race to create efficient, competitive, "green" economies. In fact, if it does not choose this path future prospects for the country are difficult to put into optimistic terms.

These are some of the consequences Egypt will face if it continues down a conventional development road without integrating a "Green Transformation" approach into its national strategy for competitiveness:

- Loss of energy independence
- Inevitability of conflict over water
- Vulnerability to climate change
- Lost / locked-in capital investment (into non-green assets)
- Threat to key industries such as tourism

The establishment of a national strategy for Green Transformation must begin with a vision – just like many companies have a vision or organizational culture. Key decision-makers as well as ordinary citizens must be continuously encouraged to imagine a better, greener, more competitive future for the nation. Good vision needs to be specific and Egypt's vision should include clear objectives tied to visible and credible strategic pathways for achieving those objectives. They should also include extra-financial indicators for success. The entire program should be supported by continuous public education and communication. Every possible channel and creative means should be employed to keep the vision of a Green Transformation present in the public eye.

### **Climate change education:**

Effective climate change education have an empowering effect on learners, which will give them confidence in their learning and enhance engagement with their chosen discipline through seeing the clear links between their subject and what is seen as one of the most important and pressing topics for society.

An understanding of climate change and sustainability issues can enhance the employability of graduates. Increasingly students studying non-overtly 'environmental' subjects have the opportunity to engage in climate change/sustainability-related education, which is seen by some as an important development in sustainability education. Not only are environmental/sustainability issues of relevance to everybody but there are also increasing employment opportunities within the sustainability sector, which learners may become aware of through an effective climate change education. Emphasis on the emerging opportunities within the environmental sector may also help to engage learners who are more resistant to studying environmental topics. Climate change/sustainability curriculum developments, which focus on practical aspects and strategies to move towards a more sustainable society through the application of sustainability skills and knowledge within industry, have the potential to engage learners who are not normally interested in environmental topics. This in turn will enhance these learners' environmental awareness which may become a transformative process leading to behavioral change. Ideally, higher education institutions are well-placed to:

- *Conduct applied postgraduate adaptation research in close partnership with implementing government and non-government agencies, as well as local communities.*
- *Produce specialists with considerable expertise and knowledge in downscaling global forecasts to the local scale, and can produce impact assessments, and conduct climate modeling and forecasting.*
- *Monitor the changes and collect adequate data over sufficiently long periods of time in order to calibrate and validate climate models and research.*

### **Universities' role of Serving Society**

Aiming to narrow the gap between science and society through outreach, informal education and capacity building, Egypt has launched a Science & Society initiative. It will support university staff and scientists in transferring knowledge to society - with the goals of stimulating a knowledge-based society, promoting development and fostering innovation and creativity among youth. Science and Society stresses the importance of universities providing solutions to the needs and demands of civil society through initiatives that are different from the usual university-industry technology transfer programmes. The initiative includes setting up an online database of educational resources and using television programmes, the internet and printed publications, as well as science festivals and special events, to increase public understanding of science and help scientists communicate about their work and its historical, cultural and economic significance.

In light of the changes and the rapid global transformations, higher education represents great importance to the level of progress and growth of societies. There is a general agreement prevails in literature related to university education, locally and globally - that the University is entrusted by the three main functions, namely: teaching, Scientific research, and community service. Although the function of community service occupies the third rank in this Category, but there is a trend to go to it must become the primary function and even lead to university education. It is worth to mention that there are main elements help universities to perform their various functions in general and their society service functions in particular. One of these elements is university autonomy. There is no doubt that, when university enjoys increased autonomy, it can be more effective and flexible in achieving its aims, and performing its functions. Therefore, the university function of society service may be the most one that is related to its autonomy, as it requires more interaction with society.

### **New University Approach**

- Establishing a sector for society service and environment development affairs in each university led by Vice-president.
- Establishing a council that coordinates the activities of several special units.
- It also suggested that the head of the council is the vice - president of the University for society service and environment development affairs, and that it is composed of the colleges' deputies for society service affairs, and the directors of the special units and centers.
- Many committees stem from this council, some of them are:
  - the committee of performance appraisal and restructuring –
  - the committee of technical, financial and administrative regulations –

- the committee of continuous education and training –
- the committee of applied research and consultations –
- the committee of counseling and enlightenment, the committee of forums, conferences, and symposiums,
- the committee of marketing,
- and other committees that the council sees that they are important to be established.

### Public Awareness in the Initial National Communication in Egypt

The following recommended actions and needs were identified:

- Organization of national campaigns for public awareness on climate change for different sectors.
- Writing and producing specialized radio and TV programs addressing climate change issues.
- Organizing periodic seminars and gatherings for media personnel to brief them on what is new, and what messages EEAA wants to convey to the public.
- Close coordination and cooperation with NGOs working in the field of the environment.
- Establishing links and holding continuous discussions with members of the legislative branch, the People's Assembly and the Shura Council, the Specialized National Committees and the top officials in the Executive Branch through organizing periodic workshops or conferences to which members of the above groups could be invited.
- Cooperating with international organizations, networks and other national focal points for the purpose of exchanging information, material and promotional items.
- The National Environmental, Economic and Development Study (NEEDS) Recommendations: To provide sufficient fund for raising the awareness with climate change impacts and mitigation options, as well as cross cutting issues such as capacity building, new & renewable energy and energy efficiency technology.

### Media & Publications

"Many public awareness programs were implemented through audio & visual media means plus publishing series of books, posters and scientific articles in magazines on the phenomenon of climate change.

- There are now weekly environmental pages in several national daily newspapers such as Al-Ahram, Al Gomhoria, and Al-Akhbar.
- There are several specialized T.V. and radio programs address environmental problems and community participation in solving such problems.
- A number of training courses were given to journalists to help in shaping the thought of civil society towards activating policies and making decisions in this area

### References

1. Ministry of Water Resources and Irrigation (MWRI). *Climate Change Risk Management in Egypt*. Consultancy Report on Developing Climate Change Digital Maps Training Activities. Integrated water resources management component project. MDG fund Millennium Development Goals. UN; 2010.
2. H. M. El-Shaer, C. Rosenzweig, A. Iglesias, M. H. Eid, D. Hillel Atlas of climate change risks on Egyptian coastal lines and due defining policies.
3. Mitigation and Adaptation Strategies for Global Change 1997, Volume 1, Issue 3, pp 233-250 Impact of climate change on possible scenarios for Egyptian agriculture in the future
4. Strzepek, Kenneth M., and David N. Yates. 2000. "Responses and Thresholds of the Egyptian Economy to Climate Change Impacts on the Water Resources of the Nile River," *Climatic Change*, Vol. 46, No. 3, August, pp. 339-356.
5. Shardul Agrawala, Annett Moehner, Mohamed El Raey, Declan Conway, Maarten van Aalst, Marca Hagenstad and Joel Smith, DEVELOPMENT AND CLIMATE CHANGE IN EGYPT: FOCUS ON COASTAL RESOURCES AND THE NILE, Organisation for Economic Co-operation and Development, 2004, COM/ENV/EPOC/DCD/DAC(2004)1/FINAL.
6. The Arab Republic of Egypt: Initial National Communication on Climate Change, Prepared for the United Nations Framework Convention on Climate Change UNFCCC, **June** 1999.