THE AMERICAN UNIVERSITY IN CAIRO
100 YEARS | SCHOOL OF GLOBAL AFFAIRS AND PUBLIC POLICY
GAPP 10 YEARS of Excellence

THE PUBLIC POLICY HUB

Climate Governance in Egypt

Prepared by
Hamsa Hefny
Mahmoud Mukhtar Ahmed Elmakkawe
Manar Moustafa AbdelKader Ramadan

Supervised by
Dr. Shahjahan Bhuiyan
Associate Dean of Undergraduate
Studies & Administration
Department of Public Policy and Administration
The School of Global Affairs and Public Policy
The American University in Cairo

2019

Climate Governance in Egypt

Prepared by*
Hamsa Hefny
Mahmoud Mukhtar Ahmed Elmakkawe
Manar Moustafa AbdelKader Ramadan

Supervised by
Dr. Shahjahan Bhuiyan
Associate Dean of Undergraduate
Studies & Administration
Department of Public Policy and Administration
The School of Global Affairs and Public Policy
The American University in Cairo

2019

* Names listed in alphabetical order

Published by The Public Policy HUB
The School of Global Affairs and Public Policy
The American University in Cairo

Project Director:
Dr. Laila El Baradei, Professor of Public Administration

Project Co-Director:
Dr Shahjahan Bhuiyan, Associate Professor of Public Administration & Associate Dean of Undergraduate Studies & Administration

Project Manager:
Mohamed Kadry, MPP

Project Coordinator:
Waleed El Deeb

Table of Contents

List of Abbreviations:

CAPMAS: Central Agency for Public Mobilization and Statistics
CCRM: Climate Change Risk Management Program
GoE: Government of Egypt
GHG: Greenhouse Gases
EEAA: Egyptian Environmental Affairs Agency
INDC: Intended Nationally Determined Contribution
NGOs: Non-Governmental Organizations
SDS: Sustainable Development Strategies
SLR: Sea Level Rise
TAP: Transparency, Accountability and Participation
UNEP: United Nations Environmental Program
UNFCCC: United Nations Framework Convention for Climate Change

I. Executive Summary

Egypt is highly vulnerable to catastrophic consequences resulting from climate change. The degree of Egypt's vulnerability is relatively high for the extreme sensitivity of the Nile river flow to the heat waves and sea level rise. This makes Egypt exposed to the critical impacts by the repercussions of climate change in terms of food and water security. This paper attempts to understand the issue of climate change adaptation in Egypt by focusing on governance as the main umbrella under which all players and actors tend to operate and interact.

The paper presents a detailed introduction to the contexts in which climate change takes place, discussing the different settings, interventions, and factors that might be relevant to the issue. Section I presents a detailed introduction to the catastrophic consequences of climate change in Egypt, international agreements for adaptation and efforts the country exerted to align adaptation agreements tothe local context. This section concludes critiques of the national adaptation strategies based on the authors' analysis and interviews with the Ministry of Environment officials.

Section II offers a set of three policy alternatives for decision makers to effectively enhance climate governance in the country. The first option proposed investing in awareness and advocacy for the sake of attracting attention to the topic and creating public momentum, with specific focus on integrating climate concepts in the different education levels. It includes an overview of the efforts exerted/ to be exerted in order to ameliorate public awareness of the issue. The second policy option focuses on capacity building among civil workers in state foundations, as well as Non-governmental Organizations (NGOs) and private sector to enhance their technical skills and expertise in terms of combating/avoiding the undesirable and negative effects of climate change. Programs are tailored according to each sector's context. The third alternative is to focus on the Transparency, Accountability and Participation (TAP) governance model founding principles in the government's mission to understand climate change through political and legislative measures that aim to increase the degree of public exposure and involvement in the process of making climate-related policies and decisions.

In section III, the paper offers a set of recommendations primarily tailored for the third option, being recommended by the authors as the most holistic adaptation policy option. In the recommendation section, some customized suggestions are also highlighted concerning the first two options.

The paper builds on secondary resources from the Egyptian government reports, published local strategies, and UN studies. It also refers to results of interviews with officials in the Ministry of Environment in order to understand Egypt's development plans that are aligned with international adaptation agreements and to touch upon the status of climate governance in Egypt based on official references. Recommendations were built on filling the gap in the list of objectives put by the "National Council of Climate Change Adaptation" and achieving the TAP governance model.

II. Problem Statement

The world's climate is changing and the impacts are already being observed at both global and local levels. Climate change is a natural phenomenon that happens at very low rates affecting the ecosystem. Nevertheless, since the industrial revolution in the late 18th century, human activities greatly disrupted the natural balance of the ecosystem. Human beings did not only exploit and degrade the planet's natural resources, but also intervened significantly and contributed to the gradual change in climate.

In consequence of the overuse of fossil fuels and deforestation, the normal percentage of Green House Gases (GHG) has increased significantly, leading to global warming. The direct result of this has been a rise in the average temperature of the planet, leading to a sequence of climate events. This includes extreme weather conditions, increasing temperatures, melting polar icecaps, sea level rises (SLR), severe droughts, and flooding resulting from the redistribution of rainfall patterns. These new dynamics are key elements in changing the global water map. Such events may lead to significant socioeconomic and environmental losses. Climate change indeed is a challenging problem to any government as it poses a serious threat, among other things, to food security and national economy. Let us look in depth at the problem in the Egyptian context.

Climate Change Risks in Egypt

Egypt is Africa's most populous country, with 97.5 million capita (CAPMAS, 2017), and also the 87th most vulnerable country facing the threat of climate change. Yet, it ranks at 73rd in the world when it comes to lack of preparedness to face climate change (Climate Change Profile, 2018). The high population growth and rapid urbanization, together with the climate change arising impacts, put serious stress on water supplies. This leads further to threats towards food security, human health and biodiversity. Egypt's quickly increasing urban centres will be struggling to deliver fundamental services such as housing, health care, education, sanitation, and energy, particularly with the climate effects forecast. Productive lands will also be pressured to increase yields, aggravating water shortages as the country progressivelysenses the climate change effects.

Moreover, Egypt is particularly susceptible to climate change and its negative effects, with 98% of the population and most of its facilitiesfocused along the Nile River, its delta, and the northern and eastern coasts. This is expressed in the Nile flow variability, changing weather patterns, and increasing SLR and salt intrusion. Climate change will increase the interactive impact of political, economic, and demographic forces by acting as a risk multiplier.

The Sea level rise and the heavy correlation between climate change and the Nile river flow are two of the most significant factors leading to the high vulnerability of Egypt to climate change. The country is surrounded by the Mediterranean Sea to the North, where it lies at a low altitude to sea level, putting the whole area under the threat of Sea Level Rise (SLR). This will consequently give rise

to flooding, affecting the groundwater quality in the coastal aquifers (EEAA, 2016). Further implications will be the increase of soil salinity, degrading its fertile quality and leading to the erosion of coastal barriers. Additionally, an SLR of 0.3 meters will lead to the migration of at least half a million inhabitants and 70,000 subsequent job losses spanning various sectors (Green Climate Fund, 2017). Second, the Nile and its Delta were identified as one of the world's three most extremely vulnerable hotspots under climate change conditions (IPCC, 2007). Its flow is highly sensitive to rainfall and variations in temperature.

Temperature change impacts rainfall, which is foreseen to decrease by 7% on the coastline by 2030 (Climate Change Profile, 2018). Predictions on evapotranspiration rates, defined as "the sum of evaporation and plant transpiration from the Earth's land and ocean surface to the atmosphere", claim that "climate change will take the form of fluctuations in levels of precipitation resulting in changes in temperature". Thus, there will be a growing need for dams in upstream countries. Water scarcity, storms and heat waves will influence the crop yield production, thus imposing a great threat to the national food security.

Taking a closer lens, the role of the Nile River in Egypt's food and water security is pivotal. Hence, the imposition of climate change cannot be overlooked. The Nile is responsible for supplying Egypt with 95% of its water demand, in which 85% of it is used in agriculture (Climate Change Profile, 2018). The Nile Delta forms more than 50% of Egypt's agricultural land and supports 80% of Egypt's fish farming demands. The Nile itself supplies water for domestic activities, industry, power generation, cooling of machinery and power plants and transport between Nile Valley cities (Green Climate Fund, 2017). For such an interconnected role in diverse sectors, the Nile is of great concern when considering the effect of climate change on Egypt's water quota and food security.

Rising temperatures, precipitation variability and increasing heat stress on crops are the potential results of climate change. These factors act as challenges of closing the rapidly growing gap between the limited water availability and the mounting demand for water in agriculture and in various economic sectors.

Thus, management of practices and irrigation methods is a crucial intervention for climate change adaptation in Egypt to maintain or increase the productivity of irrigation water use (Crop output/ Unit of water consumed) (IPCC, 2007)

Agriculture and welfare losses are foreseen and will be restricted by water availability. For Egyptian economy, agriculture accounts for an estimated 14.5% of GDP and 28% of all jobs. It is also the main water-using sector in Egypt, consuming 80% of Egypt's water quota (Egypt-Country Profile, 2018). Agricultural production is projected to decrease by 8% to 47% by 2060, with agricultural employment cuts of up to 39%, according to a UNDP study. Agricultural welfare losses are projected to range from 40 to 234 billion EGP in 2060 due to the impacts of climate change (UNDP, 2013).

All these factors threaten 50% of Egypt's economic activities in agriculture, fisheries and industries in which water acts as a main component. Other impacts include issues regarding the sailing of ferries on the Nile, effects on coral reef growth and integrity, saltwater intrusion and submersion of monuments on the north coast, and socioeconomic losses due to all-mentioned impacts, all of which will negatively impact tourism and biodiversity (EEAA, 2016).

International Conventions Tackling Adaptation

From a global lens, UNFCCC provided a solid background for all international efforts, aiming to minimize the factors and consequences of climate change, and tackle the issue from a multidimensional perspective. In 1997, the Kyoto Protocol the world's first greenhouse gas emissions reduction framework; committed its parties to international binding emission reduction targets. Egypt signed the agreement in 1999 and was ratified in 2005 as a non-contributor to global carbon emissions by less than 1% of the global emissions, thus, had no binding targets to carbon reduction. Egypt has also submitted three National Communications to the UNFCCC in (1990, 2010, and 2016). The Second National Communication addressed the vulnerability and adaptation of different industries in Egypt to prospective climate change effects. The Third National Communication updated the evaluation of vulnerability and adaptation, focusing on biodiversity and tourism. Egypt also recently signed the Paris Agreement on Climate Change in April 2016 and has ratified the agreement in September 2017.

However, the requirements stated in the Paris Agreement were different. All signing parties had to commit themselves to cutting down carbon emissions by declaring national strategies guiding to the announced carbon reduction targets.

This pressured the Egyptian government to draft the Intended Nationally Determined Contribution (INDC) in 2015 which entailed the first detailed plan and mitigation scenarios for every sector affected by climate change. Egypt pledged to invest 73 billion EGP in environmentally based projects and initiatives between 2020 to 2030. Different sectors in Egypt's INDCs included water, agriculture, coastal zones, health, tourism and energy (UNFCCC, 2015). In other words, it has indirect enforcement regulations to encourage countries to follow their INDCs. "As an example of this, some countries allow only goods with 'Low carbon product' and 'Carbon emissions' label to be imported. Those new global economic standards, guides Egypt to step into following green economy regulations and to bind to its INDC pledge of the Paris agreement". (Elewa, 2019).

Local Action towards Adaptation:

On the national level, 1999 marked the first time that Egypt shed light on its required adaptation plans, climate impact actions and vulnerabilities in the 1stUNFCCC National Communication. This was subsequentlymodified in the second 2010 National Communication (Arab Republic of Egypt, 2010b). The first communication plan concentrated solely on emission reduction strategies.

The second communication suggested intersectoral strategies and actions that would contribute to the adaptation efforts. A number of institutional agreements have been created over those 10 years to tackle climate change-related problems, with more focus on adaptation and mitigation (Abutaleb, Mohammed and Ahmed, 2018).

In 2007, "The National Committee on Climate Change" has been established by the Prime Minister Decree no. 272 and was led by the Minister of Environment. The committee included representatives from the technical ministries - besides the Ministry of Environment - like, the Ministry of Water Resources and Irrigation, and the Ministry of Agriculture and Land Reclamation. It also included representatives from functional Ministries like the Ministry of Foreign Affairs,Ministry of Electricity and Energy, Ministry of Petroleum, Ministry of Trade and Industry, Ministry of Local Development and Ministry of Defense.

The committee was concerned with developing mitigation and adaptation strategies to address the phenomenon of climate change. Moreover, it was required toreview and activate a National Strategy for Climate Change with the preparation of plans and programs in both long and short terms, in order to be integrated into national action plans for development in Egypt (EEAA, 2016). In 2011, the National Committee and its Information and Decision Support Center issued a 167-page National Strategy for Adaptation to Climate Change and Disaster Risk Reduction, that contains adaptation plans tailored to every geographic region of Egypt. The most affected regions would include Governorates of the North Coast including Alexandria, MarsaMatrouh, Damietta, Portsaid, and the entire Delta region. Farmers and people working in tourism are among the heavily impacted actors. Media and civil society are among the key players when it comes to dealing with the issue and communicating its severity to the public alongside the steps necessary to be taken to alleviate the consequences anticipated.

Alignment of Climate Adaptation with National Vision:

Egypt Vision 2030 was later established in 2015 along with the global Sustainable Development Goals (SDGs). The vision considers three sustainability dimensions as references; social, economic and environmental. This is reflected in a set of governmental policies and procedures that contemplate a growing interest in changing towards green economy and reducing carbon emissions as part of the state's overall commitment to the Paris Agreement, Egypt's INDC. This highlighted climate threats in the sectors of agriculture, health, water scarcity, energy, coastal zone management, national heritage and tourism. This later paved the way to develop the National Adaptation Program (NAP), while highlighting possible adaptation actions in each of those sectors.

The latest version to combine efforts in climate change adaptation and mitigation came three years after announcing Egypt's vision 2030. "The National Council of Climate change" was formed by the Prime Minister Decree number 1912 in 2015 and went into implementation in May 2019. The Prime Minister is to be

the president of the council, with a membership of 9 ministries instead of 7 members existed on the 2011 National Committee (Elewa, 2019). The council consists of 3 departments: the Supreme Committee, the Executive Office and the Technical Working Group. The decree also states that meetings should be at least annually or in emergency cases. The supreme committee members represent 9 ministries, instead of 7 in the first committee.

1. Minister of Foreign Affairs
2. Minister of Investment and International Cooperation
3. Minister of Water Resources and Irrigation
4. Minister of Planning, Monitoring and Administrative Reform
5. Minister of Finance
6. Minister of State for Environmental Affairs.
7. Minister of Agriculture and Land Reclamation
8. Representative of the Ministry of Defense, and
9. Representative of the Ministerial Group for Services

The Executive Office includes most of the supreme members, together with the Ministry of Interior and Central Agency for Public Mobilization and Statistics (CAPMAS).

The main objectives of the council are:

1. Setting the state's policy regarding climate change given the international agreements and treaties
2. Incorporating climate change concepts along with Egypt's sustainability vision 2030.
3. Following on agreements of the UNFCCC with its related protocols and agreements.
4. Integrating climate change concept with the national strategy of sustainable development and intersectoral services and providing adequate local and international funds.
5. Increasing scientific research, publications on climate change, with follow -up international reports
6. Increasing awareness levels among different stakeholders regarding climate change
7. Incorporating climate change concepts in different education levels
8. Institutional and individual capacity building for concerned stakeholders
9. Incorporating the responsibilities and specialties of the Egyptian Council for Clean Development to the responsibilities of the National Council for Climate Change.

Critiques of Existing Adaptation Strategies:

While the GoE has been involved in a set of initiatives associated with climate change adaptation and mitigation, a set of institutional challenges do still exist.

The availability and accuracy of data, alongside the lack of financial resources and cross sectoral coordination, represent a major dilemma in the course of the

country's strategy to combat climate change and improve its climate governance frameworks (UNEP, 2018).

A number of critiques that persist in the existing adaptation policies can be listed. Those were based on the analysis of the latest national strategies for adaptation, and as per the interview with the key informants from civil society actors and representatives from the Ministry of the Environment. Existing gaps include:

- Vision 2030 does not have the environmental pillar as a cross cutting edge in all the developmental strategies. It is not taken seriously as one of the main pillars of sustainability with clear monitoring and implementation tools(Elewa, 2019).
- Gap in integrating the National Adaptation Plan (NAP) to the National development plan (Elewa, 2019).
- Paris agreement was not compatible with local enforced laws on polluters to be aligned with Egypt's INDCs; hence, both international and local regulations are not aligned together with concrete enforcement strategy by the local law or international community.
- There is no plan for adaptation by integrating a holistic solution for the jobs that would be lost by farmers for the degradation of the agriculture sector as a result of SLR or low Nile flow, beside all other lost jobs related to the agriculture sector.
- The council's meeting is not heldon a regular basis. Annual meetings or in the case of emergency is not adequate for cooperation between different ministries to implement real adaptation strategies.
- Incapability of achieving objectives 5th, 6th and 7th objectives listed in the "National Council for Climate Change" with the absence of key ministries like Ministry of Education, Ministry of Higher Education and Scientific Research and the National Media Authority.
- Capacity building; 8th objective stays as a gap with no clear plan on implementation; which framework will be used, what is the scope of the overall program and which of the stakeholders will be the beneficiaries.
- There is no bounding time frame for the objectives to be met. How will those objectives be put in action? Who will be accountable? How will monitoring and evaluation take place, with transparency integrated? How will we assure good governance to guide the overall adaptation to climate change?

The last three gaps will be evaluated with their existing related steps and regulations locally and internationally. A concrete set of recommendations will be listed later to fill those existing gaps. After this, general recommendations will be added to enhance the overall adaptation process.

III. Policy Options: Climate Adaptation Governance in Egypt

1- Advocacy and Awareness

Since climate change is a cutting-edge subject and multidisciplinary by nature, it requires an interconnected methodology for adaptation by including all stakeholders and concerned players. This kind of inclusion is best done through awareness and communication programs. According to both Article 10 of the 1997 Kyoto Protocol, and Article 12 of the 2015 Paris Agreement, spreading public awareness and promoting the public understanding of the problem is crucial for the success of any intervention; on the local, regional and international levels. As a policy option, investing in creating communication programs that are tailored to address the public awareness needs should typically be a priority for any decision maker. This is not only for the public to realize the significance of the problem, but also for governmental counterparts and employees in state institutions to be entitled and involved consciously in the climate adaptation process. It also guarantees that all stakeholders are on the same base of knowledge. Most of the literature and reports lay emphasis on the importance of awareness and education in changing public behavior and creating consensus on how important and pressing repercussions of climate change are, especially for developing nations known to be the most vulnerable. This highlights the importance of bringing public attention to the problem, including all stakeholders.

Building upon previous efforts, a national communication strategy with tailored programs and projects with the participation of all stakeholders became crucial at that stage. The UNEP in a 2006 booklet on climate awareness for government focal points, had noted that a national communication strategy would typically include launching a nationwide program (UNEP, 2006). This is to happen with the identification of relevant stakeholders and assessment of public needs through measuring the degree of awareness. Next comes strategizing short-term and long-term targets, validating data collected on stakeholders' awareness and perception of the issue, and finally the implementation and impact evaluation.

With a more local context, stakeholders may include all concerned ministries, municipalities- especially of the coastal cities- civil society, media, NGOs, academia, government employees, schools, universities and the private sector. The more inclusive the process, the more comprehensive and wider the scale of its impacts are. In this part, the focus is on schools, academia and the media.

Public Attention to the Problem: Schools and Academia

Choosing schools is one of the most influential tactics as they are key stakeholders on the future. A good example of effective awareness efforts is tailoring a set of programs and informative activities on the topic of climate change. The United Nations Educational, Scientific, and Cultural Organization (UNESCO)'s 2016 "Getting Climate Ready- Guide for Schools" provides interesting insights in how to use education as a driving force in the global effort to address climate change. The guidebook includes empowering students to take action while

teaching climate change in all subjects. Updating curricula to include more climate-based and environmental content is also amongst the recommendations stated in terms of the successful examples of using education as a means of climate awareness to younger generations. Developing a concept of school sustainability alongside making community partnerships are also key elements to highlight in this regard. It is worth noting that the UN Education for Sustainable Development (ESD) is one of the initiatives that serve this purpose too (UNESCO, 2016).

Egypt is part of "Associated Schools Project Network" global initiative, with its local project in Egypt of "Raising awareness" and "UNESCO club students on ethical principles in relation to climate change and risks". The project's aim is to provide training material to school students that advocate for preserving the environment through encouraging them to plant trees and spreading awareness on the importance of recycling. This is in a bid to create a public opinion that is more into environmentalism and awareness of the dangers of pollution and climate change at large. Another report by the Climate Change Central Department at the Ministry of Environment highlights some efforts conducted to publish books on climate change, allocate spaces in national newspapers for information and advocacy material on the topic. Efforts also include conducting scholastic and cultural activities and seminars amongst school children and youth.

The 2010 National Awareness Plan of Egypt focuses on holding information sessions to students at schools and enhancing school libraries through introducing special sections for environmental sciences, named "Green Corner". Field visits are also on the table when it comes to awareness efforts.

Those are all great initiatives by the ministry to introduce climate concepts to different age groups, in steps to achieve objectives 5 and 7 in the National's council of climate change adaptation. However, without concrete foundation of climate concepts in the school curriculum, the integration of climate concepts will not be obligatory in every day school activities, and thus will not prepare a generation ready to apply scientific research and come out with possible adaptation solutions on the same topic.

2- Capacity Building for Relevant Government Entities

In terms of climate change adaptation, the context of capacity building does make a difference. Not all countries have the same capacity of climate change adaptation. Developing countries like Egypt are the most affected by climate change and the least able to afford the consequences. Since those with the least capacity are hit first and hardest by respective impacts, it is crucial that these countries have a long-term strategic vision that will enablethem to have a set of rigorous activities on specific related topics and contexts. This should produce good capacity-building outcomes and, finally, result in a successful environmental impact.

Capacity Building might be defined as“a process that builds upon and strengthens the existing capacities and potential of individuals, groups, organizations and collaborations to create an impact”(Mary Ann et al., 2015). But how can we define capacity building for sustainable climate change adaptation? This can include a set of behaviors and activities that could impact individual and institutional capacities on the long-term, such as being exposed to new ideas, skills and models, planning good public communication messages,promoting networking,efficiently engaging in political dialogues, and expanding resource (Marry Ann et al., 2015).

Since measuring capacitybuilding is difficult,three main elements are needed in order to be able to evaluate capacity-building efforts: (1) a good understanding of the community collaboration strengths, (2) knowing to which extent policy -makers, community leaders, businesses and other stakeholders are ready for changes, and (3) the social, economic, political and natural contexts in which climate change adaptation is supposed to take place (Marry Ann et al., 2015).

Although many projects have focused on Egypt’s adaptation policy, there are still gaps to fill in. These limitationsare caused due to many reasons, among them is the existence of different strategies, timeframe and who isaccountablefor funding and implementation. Some of these limitations are listed as follows: (a) Although health-relatedrisks are identified in the National Strategy for Adaptation to Climate Change and Disaster Risk Reduction (2011), the implementation of the adaptation plan is still unidentified ; (b) Effective implementation methodologies of the plan are still lacking; (c) An integrated multi-sector plan did not take place; and (d) The lack of the performance-management component.

Where is Egypt in the Picture?

According to the UNDP, Egypt has developed in 2013 the “Low Emission Capacity Building” program, a UNDP-funded project that aims at strengthening national capacities to (1) design a low-carbon emission strategy; (2) identify opportunities for adequate mitigation actions; (3) enable the design and implementation of mitigation actions by selected industries and (4) design measurement, reporting and verification systems for mitigation actions.

Furthermore, although Egypt has always met its obligations set by the UNFCCC regulations seen in its full participation at the COP meetings since COP in 1995, submission of its National Communications and its National Environmental Action Plan, etc.is still facing capacity challenges that if addressed properly, will lead to a better awareness of environmental practices.

In response to the above, Low Emissions Capacity Building Program (LECB) was devoted to training on climate change for EEAA and its regional branches on 2017. The training was a joint program in cooperation between the UNDP and EEAA. In a series of 5 trainings, the 4th episode was dedicated to journalists and media workers. The agenda included different areas of effects of climate change on biodiversity and Egypt’s natural resources, international cooperation

towards adaptation ...etc. The role of media on spreading awareness on climate change was only tackled in one session. This is to be counted as great efforts towards bringing media and journalism stakeholders on the adaptation's discussion.However, there should have been more practical and tailored content to these sectors specifically. Also, the capacity-building programs did not include a methodology for follow up or practical implementation of learning outcomes, each in their specific sectors.

3- Transparency, Accountability and Participation (TAP)

Since the international community has not agreed upon one definition of governance, the UNDP has defined it as "the exercise of economic, political and administrative authority to manage a country's affairs at all levels". They added: which "comprises mechanisms, processes and institutions through which citizens and groups articulate their interests, exercise their legal rights, meet their obligations and mediate their differences"(UNDP, 1997).On the other hand,the OECD has defined it as"the use of political authority and exercise of control in a society in relation to the management of its resources for social and economic development. This encompasses the role of public authorities in establishing the environment in which economic operators function and in determining the distribution of benefits as well as the nature of the relationship between the ruler and the ruled" (OECD, 1995).

Moreover, worldwide, governance is known to include a set of principles, amongst which are Transparency, Equity and Inclusiveness, Responsiveness, Accountability, and Participation. In the context of these principles, the paper focuses on Climate Governance, known as "mechanisms and response measures aimed at steering social systems towards preventing, mitigating or adapting to the risks posed by climate change"(Jagersand Stripple, 2003). Thus, we decided to focus on promoting just 3 of its pillars, namely Transparency, Accountability and Participation (TAP) as a policy option to follow.

The adaptation process must be intersectoral between the administrative and governmental entities, civil society, the private sector, academia, and the public.

This vertical and horizontal policy implementation will assure participation of all stakeholders, ensuring that no one is left behind. This would widen the scope of governance both horizontally and vertically(Peltonen, Juhola and Schuster, 2013). Collaboration between different stakeholders will develop more coherent policies, aligned with the national strategy and would trigger more joint synergies.

One of the key points to tackle is holding key players accountable by allocating clear roles while drafting strategies, i.e. holding responsible stakeholders accountable. For example, who has the power to implement a certain adaptation strategy; national authority or municipalities? Who will be accountable for the results? Which sector should be accountable for the responsibility of adaptation? This remains as a gap in the Egypt's NDC or any of the other national strategies.

Mainstreaming information on foreseen climate change impacts, ongoing projects to adapt and mitigate its implications fulfill the first pillar of the TAP principle: Transparency. Forecasted impacts of climate change put a lot of uncertainties on different scenarios of climate change. The Ministry of Environment website has a list of all reports and national adaptation strategies published up to date on climate change. This assists a lot of researchers in developing better adaptation to climate change. This also helps in achieving objective 7 of the National Council of Climate Change Adaptation, encouraging scientific research to develop solutions for climate change vulnerabilities. However, an important questionremains: to what extent can adaptation measures be mainstreamed across all sectors in all forms, in newspapers and different media channels?

Participation as a major component of the TAP model plays a vital role in ensuring the efficiency of adaptation and resilience at times of crises. When strong political interests intersect with the readiness to pay and provide support from the national level, flood protection measures are accomplished quickly and vice versa (Naess et al., 2005).

Society depends strongly on scientific processes to understand the nature of the problem as well as to identify alternatives to it in coping with climate change as well asother environment issues. Here comes the role of transparency in communicating the correct info to the public. This highlights the importance of the interface between science and policy at the core of decision-making when it comes to adaptation. Knowledge and information on climate change are crucial for sub-national actors, and they often have to create choices with great uncertainty even with local information(Lange and Garrelts, 2007).

While this paper focuses on adaptation, itshould be noted that adaptation is normally not handed in isolation from the involvement of decision-makers at the national level. Traditionally,local climate initiatives have put greater emphasis on mitigation in their climate policies, and adaptation has often been considered later on in the policy phase. Successful adaptation and mitigation strategies should be translated into local settings with the involvement and participation of local authorities(Peltonen, Juhola and Schuster, 2013).

After evaluating the three policy options, we can conclude that the third policy option TAP model happens to be crucial in order to be integrated with the National Strategy for Climate Change.

IV. Recommendations: Improving Climate Governance

It is well-known that more stakeholders apart from the government are becoming involved in decision-making, feasibility of strategies implementation and its results. In facing an environmental catastrophe like climate change, collaboration through partnerships and stakeholder networks come to be crucial while designing and implementing policies to mitigate and adapt to climate change as cross-cutting elements.

Egypt's National Environmental, Economic and Development Study (NEEDS) for Climate Change identified three geographical spots for adaptation interventions: Nile Delta and its quality, Sea level rise and urbanization. Given the Egyptian context, the development of an adaptation plan for coastal zones and agricultural sector should concentrate on easy and low-cost adaptation measures that can be influenced by traditional knowledge, meeting local conditions and fittingto sustainable development needs. In order to improve the planning of adaptation strategies for these sectors under Egyptian conditions, it is essential to improve the scientific capacity, use a bottom-up approach, and create community-based actions by involving stakeholders in adaptation planning, as well as raising government awareness and community adaptive capacity. Adaptation priorities were given to coastal zones management, the agricultural sector in terms of the improvement of present crop patterns, the development of new crops adapted to a greater temperature, theimprovement of the on-farm irrigation system, and the development of a special fund program for coastal and agricultural adaptation and risk reduction operations (Arab Republic of Egypt, 2010).

Although many technical projects, as stated above, focused on Egypt's adaptation plan, gaps still exist on the framework of implementation. Who will be responsible? Who will implement? Who will be accountable? How will the whole process be monitored? What are the readiness levels of all stakeholders in terms of contributing to the adaptation strategies? What are the timeframes and methodologies for implementation? Many cross-questions remain to be gaps in the technical adaptation plan. All those projects lacked the following:

Awareness and Advocacy: Incapability of achieving the aforementioned 5th, 6th and 7th objectives (pp. 11-12)listed in "National Council for Climate Change" on incorporating climate change concepts in different education levels, and increasing scientific research in the same field on the local context. With the absence of key ministries like the Ministry of Education, the Ministry of Higher Education and Scientific Research and the National Media Authority, those objectives will not realistically be achieved.

Capacity Building: The Eighth objective stays as a gap with no clear framework on implementation with a bound timeline.What is the scope of the overall program and which of the stakeholders will be the beneficiaries?

Governance: There is no bounding timeframe for the objectives to be met. How will those objectives be put in action? Who will be accountable? How will monitoring and evaluation take place with transparency and public participation integrated in the decision/policy making process? How will good governance be assured to guide the overall adaptation to climate change?

Based on the aforementioned remarks, a set of three recommendations are provided, each is tailored to a certain policy option.

Recommendations

1: Incorporating Climate Concepts in School Curricula:

Education seeks to bring aboutdeep, long-term changes in comprehension, especially among youth. It includes developing curricula for education, training of trainers (ToT) and teachers, and adequate pedagogy (UNESCO, 2016).

Ultimately, the outcome of a successful program would be a population whose deep appreciation of the climate challenge leads to better national action and engagement. The Ministry of Education and Ministry of Higher Education are considered to be prominent actors to incorporate climate change concepts in schools and to have more publications with local context on the same topic. If we are to focus on educating future generations about the implications of climate change through incorporating new environmental concepts, the best way to learn is through experiential learning.

Objectives 5 and 7 of the "National Council for Climate Change Adaptation" under the "Climate Action Schools" program are to be planned and implemented in order to engage climate concepts in different educational levels and to foster academic research on this topic. Climate action should be integrated with practices inside educational institutions and giving incentives for scientific research on this issue. This should take place with active involvement of students, teachers, staff and families, and last but not least, schools/ universities principals/ deans.

- ***Knowledge:*** Curricula should follow the "Education for Sustainable development (ESD)" methodology. It should also integrate updated data on climate change with a bold focus on the local context: how will climate change affect Egypt? What vulnerabilities are we facing? How can we adapt to its consequences? And how can we contribute to the solution? The UNESCO's 2016 "Getting Climate Ready: Guide for Schools" can be used as a reference.
  For universities: Obligatory courses/internships should be designed for first year students on the same topic, with implying more practical projects to adapt or mitigate climate change. Priority should be given to graduation projects and postgraduate scientific research on climate adaptation, while giving practical solutions to climate vulnerabilities in different sectors.
- ***Research Papers and Hands-on Initiatives:*** The best way to concrete the climate concepts among youth and rising youngsters is by integrating them with "Project based learning" teaching methodology. Practical and graduation projects that offer solutions and different local context research should be encouraged by staff and teachers. Positive incentives can include a bonus academic score with every positive action done on a voluntary basis regarding climate change.
- ***Green Environment:*** Constant reminders of green practices labels; with focus on energy efficiency and saving water on templates designed by the Ministry of Education and monitored by the Ministry of Environment, hanged as template labels. Those are to be attached to light keys, ACs and Elevators (if available) to set reminders to take climate action by turning off the lights,

adjust the AC temperature, close windows and curtains while the AC is on and use papers wisely. The purpose of those labels is not solely to use energy efficiently, but to practically engage and trigger the participation of future generations in contributing to actions of using resources consciously, in a sustainable manner that would keep the right of future generations in the same, with the least carbon emissions.

• ***Green Buildings:***Being guided by the "Leadership in Energy and Environmental Design (LEED)" green building certification as a guideline for constructing all new schools considering all the specified guidelines to have an energy-efficient building design.

• ***Energy Saving Apparatus:*** Schools/ universities are to select Grade Aefficient-energy saving apparatuses and replace the yellow light with white light to reduce electricity consumption and waste.

2. Capacity Building Programs for Different Stakeholders:

• Programs should be tailored as per the trainees' sectors, and most importantly, follow up projects should be required for attaining the training certification. Without the application of the training learning outcomes, this may turn into routine check least adding no impact to the overall adaptation strategies.

• Practical implementation should be one of the key elements of those programs, as one indicator for certifying the programs' graduates or as a key indicator that the program was delivered successfully. This can possibly happen by the second phase or follow up on outcome projects.

• Documenting those programs in manuals as a reference and for the internal use within the same organization. Attending parties can repeat the same program for their colleagues. This can also be another indicator of the program success; how many times the program was redelivered to attendees.

• Adopting more capacity-building initiatives for government employees, schools and universities, with more focus on teachers, school principals, university deans and media stakeholders.

• Beside the technical knowledge, capacity-building programs should include a managerial dimension to turn this climate concept knowledge into adaptation actions, each in their own contexts. For example:

a. With Academia, programs should include climate-related problems that need proposal for solutions. This is to take it back to their pool of students and trigger academic papers and innovative projects in their graduation and semester projects.

b. With Media and Journalists, programs should include building capacities in advocacy and design awareness campaigns to the public on the climate change topic, with more success stories and best practices of countries with a similar context. Some obligations should be put on sending institutions as a follow up tool, to organize public campaigns on the topic post the program.

c. For Teachers and Principals, programs should be integrated with best

practices of adopting "Climate action schools" project (detailed in the first policy option) and innovative methods of engaging students in the climate action process.

Also, there should be:

- A clear allocation of responsibilities among environment-related governmental institutions to follow up on the training efforts, avoid overlapping of mandates and waste of effort.
- Allocating funds for national capacity-building initiatives in different climate change contexts.
- Establishing a specialized national agency to help the government and different stakeholders to improve theircapacity to better plan, prepare, and respond to extreme environmental events, whether through funding provision, training, or workshops, etc. This could also happen by joining the African Risk Capacity Initiative, using human resources of academia and specialized NGOs and civil society capacities working in the same field.
- Exchanging expertise and information on capacity-building activities by networking and fostering partnerships.

3. Achieving Good Governance Guided by TAP Model

- Focusing on making the necessary legislative modifications and fulfilling the constitutional commitments related to promoting TAP.
- Utilizing social networking services to achieve climate awareness as well as enhance the transparency and participation components of the TAP model.
- Collaborating with the private sector, civil society and international organizations and launching a national campaign to raise awareness among citizens of the best practices to combat climate change on the local and individual level.
- Agreeing on a unified strategy/action plan that is obligatory to implement for all state institutions with clear jurisdictions, tasks, timeframes and mechanisms for accountability.
- Launching a societal dialogue with investors and business men on how to best avoid the repercussions of climate change without the economy being badly affected. Different stakeholders may be included such as farmers, fishermen, as well as those working in the tourism industry.
- Benefiting from academic institutions and international expertise in improving the public sector's institutional resilience and enhancing its adaptation capacity.
- Holding the municipal/local council elections, as soon as possible, to allow for more public participation in the process of policymaking at the municipality level. This makes the government interventions more humane and citizen centric.
- Deepening and utilizing the Information and Communication Technology for Development (ICT4D) component for better climate governance, transparency, exchange and storage of data, data processing and more efficient decision making and assessment of risks and threats.

V. Conclusion

This paper aimed at focusing on Egypt's governance in the field of Climate Change. The policy highlighted how the GoE could reach sustainable Climate Governance through promoting public awareness and advocacy, building effective capacity-building programs for different stakeholders. It also focuses on governance as the main umbrella under which all players and actors tend to operate and interact, guided by the TAP model (Transparency, Adaptation and Participation).

Egypt is one of the most vulnerable countries to climate change. The Nile river, the sole source of water for Egypt and Northern agriculture lands that produce at least 30%of Egypt's food security demands, are both highly sensitive to climate change. The country had made great attempts in passing adaptation strategies.

However, all of them lack coherent policies that adopt good governance strategies. The sectoral divisions of public administration pose one of the main challenges in implementing adaptation measures. Successful adaptation therefore needs cross-sectoral dialogue and intervention. This paper focuses on proposing three policy options that would improve climate change adaptation governance.

The paper reviewed the history of strategies adopted to adapt to climate change, ending by the last agreement of the "National Council for Climate Change Adaptation," headed by the Prime Minister of Egypt. This part was concluded by critiques of the current adaptation strategies and gaps in the council's overall objectives for adaptation. The three main gaps that we focused on for recommendations where the 5th, 6th and 7th objectives; increasing scientific research, publications on climate change, with follow-up international reports, increasing awareness levels among different stakeholders regarding climate change and incorporating climate change concepts in different education levels.

The paper proposes three policy options in steps to improve climate change adaptation governance. The first one focuses on awareness and advocacy, with a focus on academia and schools. The policy proposes the following number of strategies to integrate climate concepts through practice, integration in schools/ universities curricula and giving priorities to graduation products and post graduate scientific research on topics that propose solutions to climate change vulnerability. These would fill the gap in the National Council objectives 5 and 7.

The second option puts capacity building as a main methodology to enhance the capacities of different stakeholders, with focus on tailoring the training content as per the sector, and adding follow up projects post the training to turn the learning outcomes into applicable knowledge. These would fill the gap in the National Council objectives; 5 and 6.

Participation of the civil society and academia is important in building capacities for academia, school principals, Media and government employees. Those capacity-building efforts contribute to awareness of school and university students and the public through the trained and tackling awareness through media, university and school students.

Little coordination between governance scales and the allocation of positions and duties still appears to be taking place. Both regional and national projects seem to suffer from a lack of accurate implementation measures, and sometimes from the absence of appropriate financing. Since the field of adaptation policy is quicklyadvancing, these issuesare likely to increase as more strategies are developed and more in-depth adaptation execution studies are needed.

Local research institutions working on climate change problems provide assistance in data collection, analysis and monitoring in many sectors and fields, including agriculture, water resources, coastal zone management, and meteorology. These should remain well-trained. The current SDS 2030 update is an opportunity to incorporate climate changeinto national strategies, leading to a better allocation of national budgets across vital development sectors.

The implementation of a well-planned capacity development plan and sector action plans are key future steps towards promoting adaptation planning and execution in Egypt.It is necessary to integrate climate monitoring into the national budget.

Under the different IPCC scenarios, climate projections should be implemented. Assessments of sector vulnerability should be performed and updated on a regular basis. It is also necessary to integrate a continuous and iterative surveillance and assessment processes into adaptation projects.

Therefore, paying strict attention to the TAP model alongside capacity building amongst civil workers, NGOs members and Media should be put at the forefront of any governmental effort that seeks to ameliorate climate governance frameworks in Egypt and improve the country's resilience and adaptation capacity.

VI. References

- Abutaleb, K., Mohammed, A. and Ahmed, M. (2018). Climate Change Impacts, Vulnerabilities and Adaption Measures for Egypt's Nile Delta. Earth Systems and Environment, 2(2), pp.183-192.

- Ann Castle, M., Tan, N. and LaGro, J.A. (2015). Evaluating Capacity Building to Foster Climate Change. Adaptation.. Open Journal of Social Sciences, Vol.3 No.3, 2015. Available at: https://file.scirp.org/pdf/JSS_20150311145802 25.pdf

- Arab Republic of Egypt (2010). Egypt National Environmental, Economic and Development Study (NEEDS) for Climate Change. [online] UNFCCC, p.5. Available at: http://unfccc.int/files/cooperation_and_support/financial_mechanism/application/pdf/egypt_final_report_needs.pdf

- Climate Change Profile Egypt. (2018). [online] Government of the Netherlands. Available at:https://reliefweb.int/sites/reliefweb.int/files/resources/Egypt.pdf

- Climate Change Vulnerability & Adaptation in Egypt and the role of Research & Science in informing Adaptation to CC in food production and Water Resources (2015).

- Egyptian Environmental Affairs Agency (EEAA). (2016). Egypt National 3rd communication Under UNFCCC (p. XVII). Cairo: Egyptian Environmental Affairs Agency (EEAA).

- Elewa, L. (2019). Steps taken my Ministry of Environment in Climate change adaptation.

- Gisselquist, R. M. (2012). Good Governance as a Concept, and Why This Matters for Development Policy.

- Gibb, N. (2016). Getting Climate-ready: A Guide for Schools on Climate Action. Paris: UNESCO, pp.https://unesdoc.unesco.org/ark:/48223/pf0000246740

- Green Climate Fund. (2017). Enhancing Climate Change Adaptation in the North Coast and Nile Delta Regions in Egypt (p. 10). UNDP. Retrieved from-https://www.undp.org/content/dam/egypt/docs/Operations/The%20Social%20and%20Environmental%20Standards/ESMF%20English.pdf

- IPCC (2007). Climate Change: Impacts, Adaptation and Vulnerability. Cambridge University.

- UNDP (2018). National Adaptation Plans in focus: Lessons from Egypt. Available at: https://www.adaptation-undp.org/sites/default/files/resources/naps_in_focus_lessons_from_egypt.pdf

- United Nations (1992). United Nations Framework Convention on Climate change. United Nation, p.17.

- UNEP (2006). Raising awareness of climate change A handbook for government focal points. UNEP.

- UNFCCC (2015). Egyptian Intended nationally determined contribution. [online] UNFCCC. Available at:https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Egypt%20First/Egyptian%20INDC.pdf

- Egypt's Cabinet Information and Decision Support Centre (IDSC), (2011). Egypt's National strategy for adaptation to climate change and disaster risk reduction.

- El Raey, M., (2004). Adaptation to Climate Change for Sustainable Development in the Coastal Zone of Egypt. ENV/EPOC/GF/SD/RD(2004)1/FINAL, OECD,Paris.

- Lange, H. &Garrelts, H. (2007). "Risk management at the science-policy interface: Two contrasting cases in the field of flood protection in Germany", Journal of Environmental Policy & Planning, vol. 9, no. 3-4, pp. 263-279.

- Nawaz, N. R., Bellerby, T, Sayed, M. and Elshamy, M. (2010). Blue Nile Runoff Sensitivity to Climate Change, The Open Hydrology Journal, Bentham Open, 4, 1-15.

- Næss, L.O., Bang, G., Eriksen, S. &Vevatne, J. (2005). "Institutional adaptation to climate change: Flood responses at the municipal level in Norway", Global Environmental Change Part A, vol. 15, no. 2, pp. 125-138.

- Peltonen, L., Juhola, S. and Schuster, P. (2013). Governance of Climate Change Adaptation: Policy Review. European Regional Development Fund.

- UNDP (2013). Low Emission Capacity Building Project. What is the Project About? http://www.eg.undp.org/content/egypt/en/home/operations/projects/climate-and-disaster-resilience/low-emission-capacity-building-project-.html

- UNEP. (2013). Adaptation to Climate change induced water stress in the Nile Basin. Nairobi. Retrieved fromhttps://na.unep.net/siouxfalls/publications/Nile_Basin.pdfUNESCO (2016). Action for Climate Empowerment Guidelines for Accelerating Solutions through Education, Training and Public Awareness: Retrieved from:https://books.google.com.eg/books?id=LHX2DQAAQBAJ&lpg=PR1&dq=Climate%20Action%20for%20Empowerment%20Guidelines%20for%20Accelerating%20Solutions%20through%20Education%2C%20Training%20and%20Public%20Awareness&pg=PR1#v=onepage&q=Climate%20Action%20for%20Empowerment%20Guidelines%20for%20Accelerating%20Solutions%20through%20Education,%20Training%20and%20Public%20Awareness&f=false

The Public Policy HUB

Where Rigour Meets Creativity

The Public Policy HUB is an initiative that was developed at the School of Global Affairs and Public Policy (GAPP) in October 2017. It was designed to fill in the policy research gap. It provides the mechanism by which the good ideas, plausible answers, and meaningful solutions to Egypt's chronic and acute policy dilemmas can be nurtured, discussed, debated, refined, tested and presented to policymakers in a format that is systematic, highly-visible and most likely to have a lasting impact.

The Public Policy HUB provides a processing unit where policy teams are formed on a regular basis, combining experienced policy scholars/mentors with young creative policy analysts, provide them with the needed resources, training, exposure, space, tools, networks, knowledge and contacts, to enable them to come up with sound, rigorous and yet creative policy solutions that have a greater potential to be effectively advocated and communicated to the relevant policy makers and to the general public.

The School of Global Affairs and Public Policy

Jameel Building

policyhub@aucegypt.edu

Tel +20 2615 3323

AUC Venue . P.O. Box 74 . New Cairo 11835 . Egypt