

PLANNING POLICIES AND INSTRUMENTS FOR SUSTAINABILITY AND RESILIENCE IN MEDITERRANEAN CONTEXTS

The case of Egypt

Abstract

Climate Change is one of the main factors challenging the sustainability and resilience of urban and rural contexts. It is responsible for many hazards threatening the variety of landscapes and the need to face these risks is of increased interest for researchers, local authorities and policy makers. Particularly spatial planning policies and instruments are able to mitigate such risks or change the physical assets of cities so to adapt to them, consequently generating modification in urban and rural landscapes.

This paper presents the first results of a review of urban policies and planning instruments designed and issued at different administrative levels in Egypt, a country chosen within the Mediterranean region for the vulnerability and exposure of its socio-ecological systems (high density cities, particular morphological assets). Findings are then discussed with reference to the actions undertaken by national governments to increase the resilience and sustainability of urban landscapes and the level of integration of adaptation concepts in single planning frameworks.

Keywords: spatial planning, urban policy, climate change, sustainability, resilience, Egypt

Spatial planning for sustainability and climate resilient urban landscapes

Urban landscapes change as a consequence of social, economic and environmental processes. Indeed, urbanization, climate change processes, natural and man-made hazardous events have determined severe transformations of landscapes, affecting natural processes [1]. The different components of urban landscapes can be considered as complex socio-ecological systems whose functioning plays a crucial role in addressing climate change mitigation and adaptation [2]. Resilience of urban landscapes is continuously challenged by the uncertain dynamic interactions between natural processes and human activity, especially for urban areas with high population density [3]. Commitments to make cities and human settlements inclusive, safe, resilient and sustainable, thus including mitigation and adaptation to climate change, should be put into effects through local actions yet delineated in cities' strategic planning processes and climate change programs [4]. Urban land uses almost exclusively change according to decisions driven by local

authorities, causing transformations which may impact negatively for example on urban ecosystems [5] that are fundamental to provide benefits for people such as those deriving from climate and natural hazard regulation. Urban planning is the most relevant among decision-making processes for cities, as it regulates the spatial arrangement of land uses and the related quantity and typology of ecosystem services [6].

Responses to urbanization challenges require the development of specific policies at global as well as local level, together with their translation into spatial planning dimension at multiple scales. This holds true both for urban contexts in western world and rapidly developing cities of the Global South [7], where a careful management and planning of urban growth will be crucial in order to guarantee sustainable development.

In light of recent socio-economic developments and expected climate change impacts coupled with demographic processes, this paper presents the first results of a study aimed at collecting and evaluating examples of policies and planning instruments addressed to urban sustainability and climate resilience for the case of Egypt. Egypt has been chosen as a representative Mediterranean country, because it presents a high level of vulnerability and exposure of its socio-ecological systems (high density cities, particular morphological assets) to climate change risks. This paper questions how have climate change and sustainable/resilient principles in cities been incorporated into national policies and urban planning. Section 2 presents a brief overview on the Egyptian context and shows the method used to review the planning policies and instruments. Findings are described in Section 3 and discussed in Section 4 at the light of current literature on the topics. Concluding remarks are outlined in the last section.

Case study and methodology

Sustainability and climate resilience in Egypt

This paper reviews the case of Egypt, identified as one of the most critical tiles of the Mediterranean region mosaic, because of the difficult democratic transition, the challenges to economic growth and the vulnerability of the country towards climate change. In particular, the combination of population growth and climate-related risks would impact dramatically on urban areas [8].

In the context of the recent national developments as well as regional and international obligations, Egypt has issued the National Strategy for Disaster Risk Reduction (NSDRR-2030) following the international approaches including those inspiring the Sendai Framework (2015– 2030) and the UN Sustainable Development Agenda (2015 – 2030).

Although climate scenarios on climate vulnerability of the country present some uncertainties, Egypt shows a critical dependence on the narrow lifeline along the Nile and the coastal zone corridor around the delta, where major urban centers, commerce, and industrial activity are located [9]. Since Egypt is mainly a desert and relies primarily on irrigated agriculture, great concern is related to possible changes in precipitation regimes affecting the water sources of the Nile. Climate change is expected to change the hydrological cycle, prompting a greater likelihood of water-related disasters including floods and dry seasons [10]. Sea level rise challenges coastal areas as well as the fertile Nile delta with potential dramatic impacts on agriculture and infrastructure [11].

In particular, it affects the Mediterranean coast of Egypt differently according to the varying social and physical vulnerabilities that characterize each renowned Egyptian coastal features: [12] reported that the Nile Delta and Alexandria attain higher risk levels to the sea level rise compared to the northwestern coast and North Sinai areas, based on the consideration existing land subsidence, tectonic activities and shoreline morphodynamics and of physical exposure of population. Moreover, social sensitivity to climate related hazard is particularly high, due to the low-income and low standard of health and education of poor people, which represent a high percentage of the Egyptian population [13]. The combination of environmental impacts of urban development and climate change amplifies the risk profile of urban areas, which largely experience informal urbanization processes [14].

Method

The collection of policies and planning instruments was carried out following progressive stages. First, a query in the Scopus database was done, testing the following combination of search terms: (“mitigation” AND “adaptation” AND “planning” OR “policy” AND

“Egypt”); (“sustainable cities” AND “Egypt”; “resilient cities” AND “Egypt”; “sustainable planning” AND “Egypt”; “Egyptian cities”; “planning” AND “climate change” AND “Egypt”). Since no documents were found, the same combination of keywords was also used in the ResearchGate database to increase the likelihood of retrieving relevant documents. Finally, keywords were used in Google to select relevant grey literature on the topics. Review was performed in March, 2020.

We checked the alignment of documents’ contents with the research focus and topics, by screening the titles and –where available– abstracts. Only papers and documents explicitly referring to policies and planning instruments were actually reviewed. Other documents concerning theoretical studies, conference presentations and research articles with generic reference to sustainable and urban resilience were discarded.

The selected documents were then reviewed according to some relevant factors/topics, critical for the discourse on sustainability and climate-resilience goals for urban areas [15]: hazard and exposure mapping/monitoring and risk assessment; local disaster risk reduction and climate change mitigation/adaptation strategies; effective stewardship and management of ecosystems; safe and affordable housing with inclusive access to basic resources, diverse and affordable transport networks and its effective maintenance; decision-making including proactive multi-stakeholder collaboration, effective mechanisms for communities to engage with government and adequate education for all; codes, standards and enforcement combined with land use and zoning (managing land consumption rate to population growth rate, preservation, protection and conservation of all cultural and natural heritage, construction/regeneration/retrofitting strategies for built-up areas based on resource-efficient technologies and use of nature-based solutions).

Planning policies and instruments for sustainability and resilience in Egypt

Selected documents

No relevant documents/articles – from more than 100 identified by the keywords used – were selected after the SCOPUS review. From the second stage of the review to in ResearchGate, 30 papers were selected, mostly focused on climate change challenges facing Egyptian cities. Among these, however, 6 articles dealt with planning and policy framework in Egypt. Finally, 22 documents were selected as relevant to the topics in the third stage, with 13 documents about planning and policy experiences. Among the latter, 7 were in form of reports officially published by Ministry Departments and supporting agencies/organizations while the remaining 6 were scientific articles not yet retrieved. Figure 1 shows the correspondence between the retrieved documents and the analyzed policy and planning instruments, which are reported in the next sub-sections.

National Policies	Sustainable Development Strategy – Egypt’s vision 2030	Aboulnaga, M. (2016). Recommended National Sustainable Urban and Energy Savings Actions for Egypt, Cleaner Energy Saving Mediterranean Cities (CES-MED), ENPI 2012/309-311, EU Funded Project, EuropeAid/ 132630 /C/SER/Multi, Hulla & Co. Human Dynamics – KG, October 10, 2016 Alghary, S (2016). Appropriate policies and political will in making Egyptian cities resilient to natural hazards: a case study from Cairo. <i>International Journal of Engineering Research and Science & Technology</i> , 5 (4) Ayyad, K. M., Gabr, M. (2013). The role of environmentally conscious architecture and planning as components of future national development plans in Egypt. <i>Buildings</i> , 3(4), 713-727 Darwish, D., Bayad, M., & Mahdy, M. (2019). Quality of Life to Achieve New Egyptian Cities. <i>The Academic Research Community publication</i> , 3(3), 1-12 Egypt Ministry of Planning, Monitoring and Administrative Reform (2016). <i>Egypt Vision 2030</i> Youssef, A. (2017). National Strategic Plan for Urban Development - Vision 2052, and Sustainable Development Goals – SDGs Investigating Features of Alignment. Technical Report submitted to "Planning, Communications, and Reporting Unit- UNDP Egypt Country office"
	National Strategy for Disaster Risk Reduction (NSDRR 2030)	The Cabinet of Egypt Information and Decision Support Center (2017). <i>National Strategy for Disaster Risk Reduction 2030</i>
	National Adaptation Strategy to Climate Change and Disaster Risk Reduction	Froehlich, P., & Al-Saidi, M. (2017). Community-based adaptation to climate change in Egypt—status quo and future policies. In: <i>Climate Change Research at Universities</i> , 235-250. Springer, Cham The Egyptian Cabinet Information & Decision Support Center, UNDP-United Nations Development Programme (2011). <i>Egypt’s National Strategy for Adaptation to Climate Change And Disaster Risk Reduction</i>
Strategic and regional Planning	Green Pyramid Rating System (GPRS)+Green building Guidelines (GBG)	Aboulnaga, M. (2016) Antuñia-Rozado, C., Garcia-Navarro, J., Reda, F., & Tuominen, P. (2016). Methodologies developed for EcoCity related projects: New Borg El Arab, an Egyptian case study. <i>Energies</i> , 9(8), 631 Ayyad, K. M., Gabr, M. (2012). Greening Building Codes in Egypt. In: <i>Sustainable Futures: Architecture and Urbanism in the Global South</i> , Conference at Kampala, Uganda Elfiky, U. (2011). Towards a green building law in Egypt: Opportunities and challenges. <i>Energy Procedia</i> , 6, 277-283 Farouh, H. E. (2017). Fostering Sustainable Cities in Egypt. In <i>1st International Conference on Towards a Better Quality of Life</i>
	Strategic National plan for urban development (SNPUD-2052)	Arab Republic of Egypt (2016), Arab Republic of Egypt National Report. In <i>Third United Nation Conference on Housing and Sustainable Urban Development (HABITAT III)</i> , Quito 2016 The Arab Republic of Egypt Ministry of Housing, Utilities & Urban Communities General Organization for Physical Planning (2014) <i>National Urban Development Framework</i> Youssef, A. (2017)
	Strategic Plan for Greater Cairo Region 2052	Aboulnaga, M. (2016) Arab Republic of Egypt (2016) Shaalán, I. (2016). Evaluation of GOPP-UNDP Projects. Final Report The Arab Republic of Egypt Ministry of Housing, Utilities & Urban Communities General Organization for Physical Planning (2014) <i>National Urban Development Framework</i>
	Strategic Urban Plan Alexandria 2032	Aboulnaga, M. (2016) Arab Republic of Egypt (2016) Barthel, P.A., Davidson, L., Sudarskis, M. (2018), Alexandria: regenerating the city. A contribution based on AFD experiences, Paris: AFD (Agence française de développement) Shaalán, I. (2016) Sirry, A. (2018). Alexandria: development challenges of a coastal second city. In: <i>Wise Cities in the Mediterranean?</i> . Eckart Woertz (ed)

Fig. 1. Correspondence between documents’ contents and policies and planning references in Egypt.

National policies

According to the documents reviewed, Egypt has put forth many efforts both on institutional challenges and procedures for achieving urban sustainability, mitigation and adaptation to climate change.

The “Sustainable Development Strategy – Egypt’s vision 2030” aims at implementing an ambitious program of financial reform to improve the integration of adaptation into national budgeting and planning processes. The strategy identifies ten pillars of sustainability belonging to three different dimension. The “environment and urban development” pillar goes under the environmental dimension and is in the wake of the vision of Strategic National Plan for Urban Development (SNPUD-2052). In particular, a set of key performance indicators

and suggested programs to deal with different challenges were defined, including: the use of green and sustainable building methods, new infrastructure, elimination of insecure settlements, adoption of policies to reduce air pollution and adapt/mitigate climate changes, raise awareness to protection of natural resources.

The National Adaptation Strategy (to Climate Change and Disaster Risk Reduction) dates back to 2011, providing the groundwork for supporting the process to formulate and implement National Adaptation Plans. In particular, the principle of adaptation is well related to housing and transport. The document clearly refers to the idea of directing city planning, architectural design towards the requirements of a green and sustainable

architecture. Recommendations cover the efficient utilization of energy, rationalization of water use, issuing a green architecture code, adoption of an energy code for residential and commercial buildings, environmental compatibility of buildings, promoting the teaching of climate change programs in the academic programs. Large scale campaign for education are also suggested to support delocalization strategies for population living in flood-prone areas.

More recently, Egypt issued the policy NSDRR 2030 to upgrade its current national system for disaster risk reduction coherently with international approaches. The interaction between priorities for sustainable development and mitigation of risks is made clear, with specific focus also on the environment, housing and infrastructure sectors. The achievement of a good level of mitigation, prevention, and preparedness to reduce disaster risks is suggested throughout the incorporation of disaster risk reduction in all sectoral plans and strategies, the development of an early warning system, the enactment of legislations and laws. In January 2009, a major step was taken by establishing the Egyptian Green Building Council whose immediate action was to approve a national Green Building Rating System called the Green Pyramid Rating System (GPRS) [16]. This system, including awarding Green Permits, is considered the backbone of numerous proposed large scale public developments. To date, the system seems to be only limited to project proposals only (the Eco-Villages National Project and for National Affordable Non-Conventional Housing Project). Later on, the Green Building Guideline (GBG) was also published in 2013 on a voluntary-base, addressing areas of environmental sustainability, and including building site, energy, water, indoor quality and materials.

Strategic and regional planning

A number of specialized departments have been established with the purpose of building national capacity and start to implement proper spatial plans. Attempting effective leadership through inclusive governance and evidence-based decision-making supports the role of the General Organization for Physical Planning (GOPP) in executing an agenda addressed to institutional transformations, including partnerships with private sector companies. The GOPP developed the Strategic National Plan for Urban Development (SNPUD-2052), approved in 2013, which constitutes the main reference document expressing the vision for current and future development of Egyptian human settlements. It acts as a guideline for policies and practices of the Egyptian urban development with a multidimensional, multidisciplinary and multi-step strategy [17]. Although clearly grounded into the development paradigm, the Plan also include principles of sustainability and climate-resilience.

The most advanced but only regional planning instrument is the Strategic Plan for Greater Cairo Region, which has been based on sustainable pillars such as: the health and well-

being of everyone living and working in the city, enabling everyone to meet their basic needs of food, water, housing and primary resources; the enhancement of environmental quality, reducing air pollution and delocalizing heavy industries outside the main urban agglomeration, applying environmental legislations and regulations, developing potentials and capabilities of solid wastes management, boosting dependence on new and renewable energy sources; the increase of green area per capita, strengthening mass and public transportations networks; the reduction of the pressure on the central region of Greater Cairo through the development of unplanned areas; the support to urban rehabilitation and renewal projects.

The Strategic Urban Plan Alexandria 2032 (SUP) is managed and supervised by the national GOPP as well. It is the result of the partnership with UNDP (United Nations Development Programme) [18] and prepared by AS&P (a Germany-based consulting firm) that had worked from 2011-2014 on the analytic phase leading to grow up a vision implementation plan. The recent strategy has been designed to be at once a physical plan, a participatory process, and the result of consensus-building and a capacity-building tool to improve the capabilities of the local administration in urban development [19]. SUP 2032 faced several challenges since its beginning such as political instability, security and safety issues, post 2011 and the weak capacity of the local authority in the execution of the proposed development plans. An initial phase of Plan implemented databases for all the districts of Alexandria with all information on existing urban condition, based on sectoral studies (social, local economy, housing, transportation, infrastructure and environment), and elaborated detailed spatial plans for priority areas.

A new stage has now begun with the elaboration of SUP 2032 implementation plans but few information is available with this regard. Available documents, in fact, focus entirely on the role of participatory planning in developing the masterplan and on physical alternatives of development growth scenarios, strictly relying on quantitative population projections [20].

Discussion and conclusions

From principles and policies to local practices: main issues

In Egypt, development of cities over the last six decades mirrors the tension between environmental and urban agendas. Extensive environmental degradation due to human activities and mismanagement remains a major challenge facing development processes [21]. The review of collected documents allows to distill only preliminary indications about the efficacy of sustainable and climate-related policies and planning strategies existing in the country.

First, the transition of Egypt toward sustainability and climate-resilience is too recent to draw exhaustive conclusions.

The very recent policy trends stress for a new urban agenda addressed to deal with many complex demographic and urban issues such as the management of rapid urbanization process and rural-urban linkages, integration of gender in urban development, urban mobility challenges, improvement of access to adequate housing and services, and disaster risk reduction [22]. However, the majority of collected documents returned a picture of a quite strong and general policy framework but yet with limited and uncertain validation on the level of the urban practice.

Rather, some authors claim for an ineffective regional planning framework, with plans that have been not put into practice, due to a combination of reasons [23]. Among these, the flaws in the current plan-making process which relies on the government's centrality and monopoly in decision-making; fragmentation between government agencies, which leads to multiple and often conflicting spatial plans; and an absence of negotiations between various stakeholders [24]. The mere existence of international commitments, national climate policies and planning frameworks more or less aligned with acknowledged principles of sustainability and climate-resilience is not guarantee for local plans and even more for real action. For example, some authors noted that a number of the criteria in the GPRS do not comply with the national Egyptian building code [25]-[26], while data on the total number of buildings evaluated on the GBG base are not available.

Other key factors affecting the achievement of intended outcomes of sustainable urban development policies in Egyptian cities concern the administrative, fiscal, and political centralization, the local government capacity and the weak coordination and synergy between national plans and policies, as well as the lack of clarity regarding the interpretation of the law and its relevance, land owners and private developer's unwillingness to comply and the overall wider political context [27].

Limits and perspectives

The small body of documents reviewed is the result of the use of English keywords only, with few instances focusing on urban areas and local planning practices. This also depends on the fact that planning documents, if present, are in Arabic and not included in scientific databases. Moreover, some topics, such as mitigation and adaptation to climate change in urban areas, are not always specifically stressed, even if dealing with climate-related risks is clearly a priority for the high vulnerable urban communities of Egyptian cities.

However, the use English keywords can allow to extend the research –for example using the same keywords- to other Mediterranean countries, thus providing a whole depiction of the current status of planning and policy against climate related risks in this region and making comparisons possible.

Concluding remarks

Socioeconomic structure, institutional framework and environmental capital of each

Mediterranean area affect the changes in urban landscapes, following the effects of development under climate change.

Sustainability and climate resilience related commitments at the national and international levels should be put into effects through local actions depicted in cities' programs, policies and strategic planning processes. How and why urban landscapes engage these processes and the real effect of binding or non-binding policies remain largely to be explored across developing countries.

Results of this study confirm a principle of substantial commitment by Egypt to a path of urban sustainability and resilience to climate related risks. Not surprisingly, while the general policy framework and the strategic planning vision appear to be sufficiently thorough, the search of planning instruments specifically designed to equip urban landscapes against climate change impacts did not return enough information for describing the actual local urban enhancement of the analysed Mediterranean context.

The capacity to target policies and planning instruments to prioritize specific actions for adaption and mitigation, in particular, is being built progressively and increasingly but yet not practically proved.

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