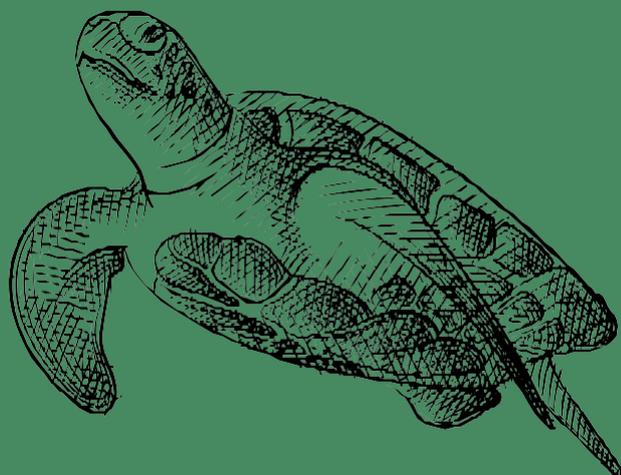
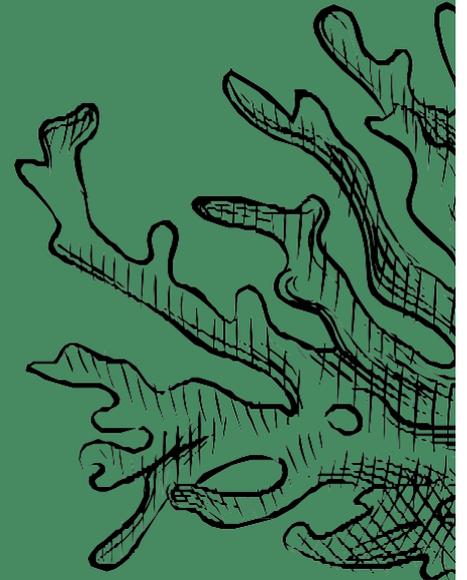


Mitigating and Adapting to Climate Change: Solutions for the Tourism Sector in Egypt

A Policy Paper



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I. Executive Summary

Climate change is an indisputable reality whose current repercussions are much deeper than ever before. If no immediate actions and precautions are taken seriously against it, the world will face outrageous consequences from water and food shortages; where climate change can disrupt food availability, reduce access to food, and affect food quality (EPA Chicago, 2022); field crops spoilage, disappearance of cities and islands, heavy torrents, warmer and cooler weathers, and marine life disappearance. Even if global warming is limited to 1.5 or 2°C, the rise in people exposed to extreme heat remains significant. Therefore, societies will need to increase their resilience to cope with more frequent and intense heatwaves (European Commission, 2020).

However, all these catastrophes are still avertable with the adoption of some corrective measures to reduce greenhouse gas emissions from current random activities, such as the use of massive non-eco-friendly means of transportation, air and water pollution from industrial activities, heavy consumption of non-renewable resources, and energy waste.

Tourism is one of the most vulnerable sectors to climate change, particularly coral reefs and beach tourism. However, it simultaneously contributes to greenhouse gas emissions through the consumption of energy, the use of fossil fuels, and the transportation of tourists (Peeters et al., 2017). Climate change impacts will not affect coastal and marine tourism only, for the massive changes in temperature will affect tourists' preferred destinations and durations, which will definitely affect the sector and its economies. Besides, vanishing beaches, the higher frequency of storms and floods, and the lack of snowfall, inter alia, are some other consequences of global

warming that are bound to have an impact on the tourist industry. Similarly, droughts and heat waves will put tourists off visiting the affected regions, as experts have warned for years (DW, 2022).

Meanwhile, tourism in Egypt is one of the most important sources of national income with the annual dollar revenues it provides and the foreign currency returns that enabled it to participate significantly in the gross domestic product and combat unemployment by employing a wide segment of the workforce in Egypt (Elnagar & Derbali, 2022). Consequently, this paper spotlights the weaknesses of the vulnerable Egyptian tourism sector with a view to help it mitigate and adapt to climate change and avoid losses via opening up opportunities to overcome the obstacles and challenges that might face this primary source of foreign income for the country.

The paper starts by identifying the problems that face the tourism sector and the actions, policies, and laws currently undertaken to reduce the impact of climate change. These policies are examined in the light of recent developments, including the hosting of COP27 in Egypt. The paper also provides a brief overview of where the tourism sector currently stands, and how policies have served to enhance its situation and sustainability, allowing it to reshape itself, adapt to climate change, and use them to present an infusion that would keep it running despite all the challenges. Meanwhile, the paper attempts to build on the current policies that have been initiated by the Ministry of Tourism, including the partnerships with the UNDP and other civil society organizations, and the launching of the Green Star Certificate.

The paper proposes a number of policy alternatives that could help the tourism sector in Egypt operate more efficiently through offering some recommendations to reduce carbon and methane emissions, known as greenhouse gases, which can be more sharable among and visible to tourists via publishing numbers and statistics of tourist flows. It also puts forward several overarching recommendations that apply not only to the tourism sector but also to other sectors contributing to or affected by

tourism. Finally, this paper is an addition to the literature on sustainable development policy options in Egypt, and, as such, it promotes cooperation among all concerned stakeholders from the government and the public and private sectors on areas that require development and further examination, such as the sustainable solutions for mass transit restructuring, the introduction of electric vehicles, and the possibilities of carbon capture and storage.

II. Methodology:

This research is based on a qualitative analysis, in which the researchers interviewed a number of representatives from the Egyptian government as well as private environmental and tourism consultants. Interviews were conducted in-person and via Zoom with interviewees who mainly represented the Ministry of Environment and the Ministry of Tourism and Antiquities. The total duration of interviews exceeded five hours, and among the interviewees were Dr. Hussein Abaza, Senior Advisor to the Minister of Environment, Engineer Sherif Abdelrahman and Dr. Mohamed Moatemed from Egyptian Environmental Affairs Agency (EEAA), Dr. Sherif Dawood from the Sustainable Development Unit at the Ministry of Planning and Economic Development, and Dr. Nashwa Talaat, Advisor to the Minister of Tourism for Sustainable Tourism.

In addition, since the researchers believe the private sector to play a major role in the tourism sector in Egypt, they reached out to hotel managers and owners, especially in Sharm El-Sheikh, to discover the greatest

challenges they faced while switching to eco-friendly hotels; however, there was no response to help them build accurate statistics. This research module would be very productive for future researchers to approach the private sector and provide data on the challenges that face them in switching to eco-friendly facilities and the ways in which the government can support them in the light of that paradigm to reach a new phase of green tourism. The main research questions are: What are the major climate change challenges that face the tourism sector in Egypt? What are the best approaches to overcome these challenges and what could be the suitable alternatives to adopt to and mitigate climate change? These are the questions the paper answers in the following parts.

III. Problem Statement

Background of the problem:

The Global Background of the problem:

The current global warming trend is different because it is clearly the result of human activities since the mid-1800s, and is proceeding at a rate not seen over many recent millennia (Technical Summary, IPCC, 2021). It is undeniable that human activities have produced the atmospheric gases that have trapped more of the Sun's energy in the Earth system. This extra energy has warmed the atmosphere, ocean, and land. Besides, widespread and rapid changes in the atmosphere, ocean, cryosphere, and biosphere have occurred (Nasa Website, 2022).

Climate change is an unstoppable phenomenon, yet it can be managed in a better way to avoid its negative effects and mitigate its newly emerged products as much as possible. According to NASA Evidence, the planet's average surface temperature has risen about 2 degrees Fahrenheit (1 degree Celsius) since the late 19th century, a change driven largely by increased carbon dioxide emissions into the atmosphere and other human activities (NASA Website, 2022). Most of the warming occurred in the past 40 years, with the seven most recent years being the warmest. The years 2016 and 2020 are tied for the warmest year on record (NASA Website, 2022).

The Effect of Climate Change on Tourism:

Greenhouse gas emissions from different human activities worldwide raise global temperature. Climate change will cause rising temperatures, ice melting, and rising sea levels; reduce the productivity of agricultural lands; and demolish vulnerable seashores and islands, which threatens beach tourism and coral reefs . By Time, these changes in global temperature will also shift summer and winter months and their lengths. All these changes will have negative implications on tourism, particularly in vulnerable areas and countries, which will threaten the sustainability of the sector's industry, employment, economic resources, and income.

Changes in temperature and sea level will directly affect the tourism industry, the destinations selected by tourists, and the periods they spend there. This is in addition to

some indirect effects that can be summarized in the quality of the tourist experience and the competitiveness of touristic sites, especially coral and beach tourism.

These resulting changes should be addressed immediately and seriously via adopting and mitigating short-term and long-term strategies while promoting sustainable green tourism, maintaining tourism activities, and saving fragile touristic sites.

The signatories of the **Glasgow Declaration on Climate Action in Tourism** are committing to act now to cut global tourism emissions by at least a half before 2050. Their actions are aligned with 5 pathways defined in the Declaration: **measure, decarbonize, regenerate, collaborate, and finance** (UNWTO Website, 2020).

Even though climate change is a global phenomenon, its effects will vary greatly not only from one country to another but also from one city to another. According to the latest UNWTO reports, this will be highly visible in the tourism industry. There are expected shifts in tourists flows as a direct result of climate change, which will be asymmetrical within the same country. Some countries will witness increases in tourist numbers while others will experience reductions, creating winners and

losers, especially when certain destinations start to be more attractive to tourists while others drop in the pecking order of tourists' preferred destinations.

Reef tourism is an industry worth \$36 billion a year and can face over 90 percent losses by 2100 (Ahram Online Website). Egypt ranks first in Africa, fifth in MENA, and 51st globally in the travel and tourism development index (TTDI).

The Effect of Climate Change on Tourism:

Egypt is one of the Middle Eastern and North African (MENA) countries expected to face climate change effects on different levels. According to the Egyptian Central Bank, tourism revenues contribute to up to 15% of Egypt's GDP with an estimate of 13 USD billion in 2021, compared to 3.8 USD billion in 2020 (Trading Economics Website, 2021). Besides, it is a major source of foreign currency earnings for the country (Reuters, 2021). Reports and recent data indicate that Egypt has already started experiencing severe weather conditions and rising sea levels. Egypt's coral reefs as well are already at risk of bleaching, which will affect the country's status as an ecotourism destination (Egyptian Environmental Affairs Agency, 2021).

Although Egypt is expected to be facing climate change effects that would negatively impact the tourism industry, there has been a lack of studies that cover the comprehensive effect of those changes on Egypt, especially in the tourism sector. Nonetheless, a study published in 2019 on the potential effects of climate change on tourism in one of Egypt's top resort towns "Hurghada" has found that tourist behavior will change ultimately in the coming years (Mahmoud, D., Gamal, G., & Abou El Seoud, T. - 2019). The study was based on both Representative Concentration Pathway 4.5 and Representative Concentration Pathway 8.5 scenarios, which, simply put, is a conservative and extreme scenario for climate change effects. The study found that under

both scenarios, Hurghada, and subsequently Egypt, will face challenges due to shifting tourist preferences as a direct result of climate change. It concluded with a call to policymakers to address the issue (Mahmoud, D., Gamal, G., & Abou El Seoud, T. - 2019).

Egypt's geographical location is unique. It is bordered by Libya in the west, the Mediterranean Sea in the north, Sudan in the south, and the Red Sea in the east. Due to this vital economic and touristic location Egypt occupies between the continents of the world, it has over decades served and secured the world trade routes and connected the globe. Its coastline of over 3,500 km along the Mediterranean Sea and the Red Sea is known for its sunny hot summer and moderate warm winter, allowing beach and sea activities. Besides, the massive coast of the Nile delta, about 300 km, permits agricultural productivity and activities, contributing to some three-fourths of the total value of Egypt's agricultural production while the rest comes from fruits and vegetables and other specialty crops. Egypt is also known to have two seasons of cultivation, one for winter and another for summer crops (Britannica Website, 2022). As a result, Egypt is one of the luckiest countries on earth for having multiple unique resources that vary between agricultural land, fresh water, long sandy coasts, and different terrains from one city to another.

Egypt is one of the world's most vulnerable countries to the repercussions of climate change despite its limited contribution to GHG emissions; it contributed only 0.6 percent to global emissions, a relatively small percentage (World Bank, 2022).

The Mediterranean and the Nile delta shores are vulnerable to the impacts of climate change in Egypt. In addition, the expected high sea level, shoreline erosion, stresses on fisheries, and saltwater intrusion in groundwater create significant challenges to Egypt as a tourist destination, which, in turn, will affect the hard currency and the national economy.

The direct and indirect impacts of climate change may also lead to changes in the interests of the tourism sector, which may take advantage of the opportunities offered by the new scenarios, such as the expansion of tourism in conservation areas. Similarly, the advertising of eco-tourism in rural and inland areas can progressively decongest areas that are more vulnerable, saturated, fragile, and whose sustainability is conditioned by climate change.

Furthermore, the entire tourism system can and should take steps, since climate mitigation action has become crucial at this point to limit the global temperature rise to 1.5°C and reduce greenhouse gas emissions associated with its activities. For the tourism sector, it is highly recommended to go for green tourism for multiple reasons, particularly that green tourism has low ecological impacts where using local food products from local businesses instead of importing food at huge costs helps reduce the carbon print, opens job opportunities for locals, and gives unique experiences to tourists. Tourists, on the other hand, should be aware of the impact of their choices on the environment; they should be encouraged to choose less polluting means of transportation and use products and activities with low or zero carbon footprint. Travel agents as well should promote lengthier stays, destinations closer to source markets, and the development of eco-efficient products and activities. This is in addition to green

tourism policies and adaption actions for the tourism sector. Finally, the government and the community should seek to develop a normative outline that helps energy efficiency, education, and awareness programs on the subject.

Adopting the 1.5°C objective, Egypt is highly advised to shift to sustainable eco-friendly tourism, which means that both public and private sectors should start finding alternatives to imported services, like food, in local sources. Moreover, they should subsidize the use of resources like electricity and replace it with renewable solar panels, for this, on the long term, will highly reduce facilities' consumption of resources and, therefore, their expenditures, which will allow them to use their income in other areas that need development. Such eco-friendly programs should be encouraged and supported by the government via reaching an agreement that enables the private sector to obtain tax facilitations, for example, or other advantages, such as investment in green fields facilitations. The government may also strengthen public-private partnerships in this framework, which will raise awareness in the private sector about climate finance and its difference from investment finance, and direct the private sector so that its Corporate Social Responsibility (CSR) activities include adaptation projects in partnership with the civil society organizations responsible for environmental activities.

These efforts to increase the sustainability of the tourism industry will provide a critical case study of Egypt's determination and commitment to the global fight against climate change and for biodiversity conservation. Sustainable tourism development requires the informed participation of all relevant stakeholders, as well as strong political leadership to ensure wide participation and consensus building. Achieving sustainable tourism is a continuous process, which requires constant monitoring of impacts and the introduction of the necessary preventive and/or corrective measures whenever necessary.

Sustainable tourism should also maintain a high level of tourist satisfaction and ensure a meaningful experience to the tourists, raising

their awareness about sustainability issues and promoting sustainable tourism practices amongst them (UNDP, 2022).

Recent efforts in acting against climate change in the Tourism Sector in Egypt:

Egypt has recently shown commitment to acting against climate change, with the establishment of the National Council for Climate Change, and the announcement of its National Climate Change Strategy 2050 to support a stronger greener Egyptian economy. The strategy includes adaptation

and mitigation programs in all sectors until 2050.

Tourism is one of the main sectors that have witnessed several initiatives in the past couple of years, as climate change has been at the forefront of the public discourse

Ministry of Tourism's Reform Program

In 2018, the Egyptian Ministry of Tourism announced an overall reform program whose structural reform pillars are: Institutional and Legislative Branding and Promotion, Infrastructure and Tourism Development, and International Tourism Trends. All this is directed to put Egypt on a sustainable path, consistent with the United Nations Sustainable Development Goals (SDGs).

The international tourism trends pillar involves making use of modern technology and adopting sustainable tourism strategies.

Partnering with International Organizations - UNDP as a Primary Partner

Egypt has been partnering with the United Nations Development Program (UNDP) in several sustainable tourism projects through the Mainstreaming Biodiversity in Egypt's Tourism (MBDT) in coordination with the Ministry of Environment. These projects include an online portal dedicated for sustainable tourism, the Egyptian Sustainable Tourism Portal (ESTP), which is a resource created by the Ministry of Tourism for tourism operators to find guidance on practical sustainable solutions in the industry.

Another initiative in 2022 was the hotels Green List (GL), which includes establishments that have been verified by the Ministry of Tourism as environment friendly. Egypt has also established a guideline for ecolodges to provide a licensing framework and promote green tourism (UNDP, 2022).

Green Star Hotel Program

The Egyptian strategy of Sustainable Development 2030 exemplifies a step towards inclusive development that achieves prosperity in Egypt through economic and social justice and environmental protection. (SDS) represents a roadmap for achieving the dreams of Egyptians and their aspirations to a decent life (Egypt's vision 2030). In the light of Egypt's 2030 vision, "Green Star Hotel" certificate (GSH), which is a national green certification and program managed by the Egyptian Hotel Association (EHA) under the

patronage of the Egyptian Ministry of Tourism (GSH Website), was recognized in January 2015. This certificate motivates hotels in Egypt to become recognized and approved world-wide as green eco-friendly facilities. Hotels interested in obtaining this certificate received a number of trainings and awareness sessions as well as one-on-one consultation to know the benefits of joining this program and the ways in which this initiative can help them cut on operational costs and achieve higher net profits.

Preparations for COP27 (United Nations Climate Change Conference) in Egypt and Policy Readiness

Egypt is hosting the COP27, the 27th Session of the United Nations Climate Change Conference, which will be the first time for the conference to take place in an African country. Currently, Sharm El Sheikh, the hosting city of COP 27, is experiencing an ongoing green transformation to become a model for sustainable coastal tourism centers globally. There are several sandbox projects that are being tried out in Sharm El Sheikh as prototypes of sustainable tourism and transportation solutions to be implemented in other Egyptian cities after COP27. These projects include initiatives for sustainable solutions for mass transit, increased use of renewable energy, among other several 30 environment related projects, as per recent official announcements.

More specifically, the tourism sector in Egypt has been one of the most affected sectors due to the Ukraine war. Some estimates claim occupancy rates for Egypt's top resorts in Sharm El-Sheikh fell by 70% (Reuters, 2022). Russian and Ukrainian tourists are estimated to constitute around 30% of incoming tourists to Egypt's resorts. While this is clearly a challenging time for the tourism industry, it also

means that there will be increased willingness from different stakeholders to implement different new strategies and programs, since the status quo has been forcibly changed.

The below figure from a recent study provides an example of how climate change could affect major tourist destinations in Egypt. Estimates for Hurghada's temperature till 2050 have been calculated using climate change scenarios RCP4.5 and RCP8.5. RCPs refer to Representative Concentration Pathway, which are scenarios of global emissions rising with varying degrees. The RCP4.5 is considered a moderate scenario by the Intergovernmental Panel on Climate Change (IPCC), whereby countries would be able to curb emissions while RCP8.5 represents the scenario where emissions continue to rise. For Hurghada, one of Egypt's top tourist attractions, in both scenarios, the number of months that have attractive weather conditions will continue to decline throughout the years 2021–2050. Essentially, this means that Egypt should be ready with proper adaptation and mitigation tools for the implications of this for the tourism sector.

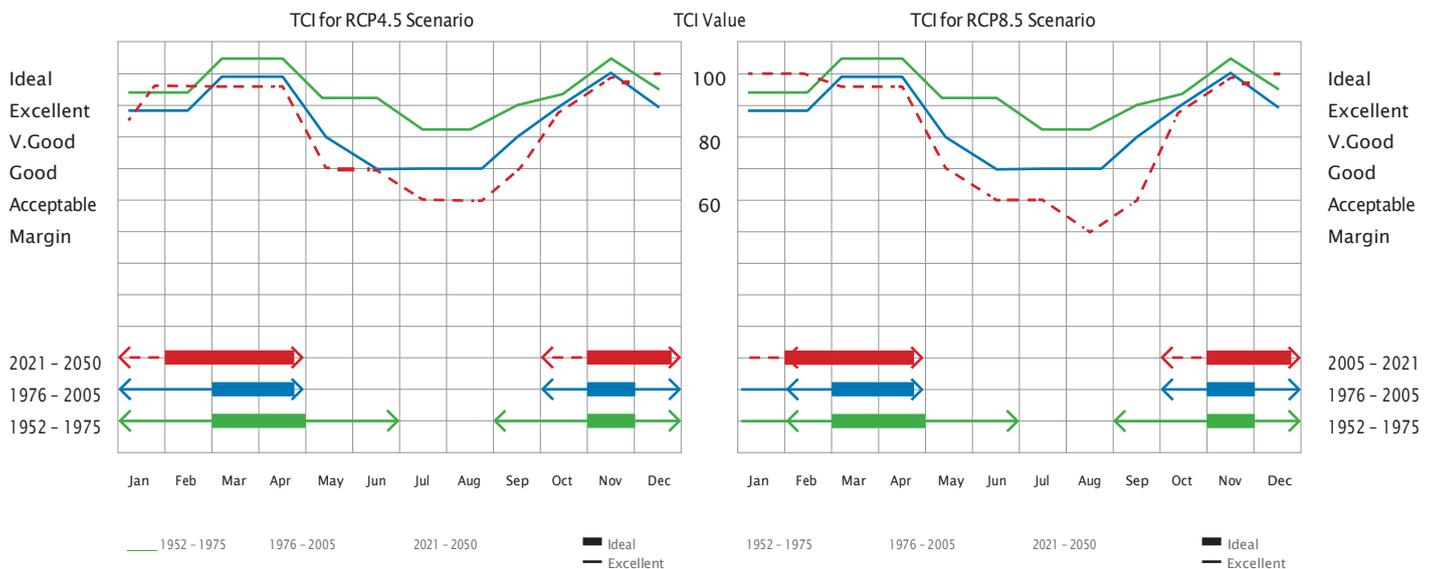


Figure (1). Example of Expected Climate Change Effects on Hurghada's Weather for Tourism

Review of Current Policy Environment: Egypt Welcomes Sustainable Development Policies in Tourism

In summary, while there are multiple initiatives and programs that have been initiated either by the Ministry of Tourism or the Ministry of Environment in regards to sustainable solutions for the tourism industry, there is still a long way to go. Fortunately, this could be considered a time of opportunity for policymakers interested in sustainable development for the tourism sector, as there are multiple factors that pave the way for policy implementation.

First and foremost, there has been a tremendous increase in the political will of Egypt's government to address climate change effects in all aspects, not just tourism. This can be easily deduced from the previously mentioned programs initiated for the restructuring of the Ministry of Tourism and the new partnerships with the UNDP. There is also the fact that Egypt is hosting COP27 in November 2022, which has propelled climate change discussions to the forefront of the public discourse.

Secondly, since the tourism sector is a major contributor to the GDP and also to the country's already challenged sources of foreign

currency, there is an increased focus on ways in which the sector can be restructured and improved.

Thirdly, the tourism sector in Egypt has been expectedly one of the most affected sectors by the Ukraine war. While clear data is not yet available on the magnitude of the effect, some estimates claim occupancy rates for Egypt's top resorts in Sharm El-Sheikh fell by 70% (Reuters, 2022). Russian and Ukrainian tourists are estimated to constitute around 30% of incoming tourists to Egypt's resorts. While this is clearly a challenging time for the tourism industry, it also means that there will be increased willingness from different stakeholders to implement different new strategies and programs, since the status quo has been forcibly changed.

Lastly, the following sections on policy alternatives and conclusions in this paper reflect the belief that Egypt is now in a favorable environment for sustainable tourism policies, which means that there will be higher chances of considering policy options that support this direction.

Policy Options/ Alternative Analysis:

This policy brief presents multiple policy recommendations for mitigating and adapting to climate change that can affect the tourism industry in Egypt. The policy recommendations follow an incremental approach, whereby current systems in place can be better utilized

instead of building from scratch or proposing programs that lack the minimum framework required. Building on the current policy initiatives undertaken by the Ministry of Tourism, we believe that this approach will make it easier to move forward with our recommendations.

Alternative 01

Mobile Application: Horus the Travel Planner

Launching a mobile application, “Horus the Travel Planner,” under the supervision of the “Green Tourism Unit” of the Ministry of Tourism in collaboration with Google Maps in which

visitors planning to visit Egypt can find online consultation and recommendations to enhance their travel experience in Egypt.

How the application works

First, the application users submit the planned duration of their stay, their interests, preferred sightseeing, and budget. Then requests are reviewed by travel agents. This phase looks into desired destinations on the map to recommend the ideal route with less GHG emissions, taking into consideration moving vertically or horizontally sequentially from one site to another to reduce CO₂ and save tourists’ time and money. This phase also recommends the realistic duration of stay compared to the desired sightseeing. Plans generated by the travel agents are personalized to match the requester’s submitted data during 24 hours.

Afterward, the generated plan is shared with the requested, along with modifications and recommendations to enhance the traveler’s experience. Finally, the application provides information and advice for a more eco-friendly stay, daily calculations of CO₂ emissions and carbon footprint for their activities, eco-friendly transportation options, and hotels and their prices, covering all travelers’ perspectives through one platform.

This application could be a mandatory download to all Egypt airports arrivals.

Pros:

Employment Opportunities: This application will offer employment opportunities for tourism and archaeology graduates, giving them the opportunity to practice their studies after receiving the required training to offer online services.

Statistics: This application can be used as a great statistical tool for the Ministry of Tourism to know the most desired tourist destinations, helping the ministry to offer better services and plans to accommodate the number of visitors.

Online Free Consultation: This application is also an innovative and trendy tool that allows tourists to get a remote consultation experience from a professional travel agent.

Advertising Platform: This application can be used as an advertising tool for eco-friendly activities, hotels, and transportation means.

Cons:

Delays: Responding to travelers within 24 hours with their personalized plans might give an unpleasant experience to the requester, especially for those who are not staying for long periods.

The Unwillingness to Download: Travelers might not be interested in downloading and using the application; therefore, it can be connected with the COVID-19 certificate and discounts and vouchers for using eco-friendly transportation and hotels recommended by the application.

Alternative 02

Mandatory Online Reporting of Environmental KPIs for Hotels & Tourism Operators

Establishing mandatory environmental reporting guidelines for hotels and tourism operators in Egypt. The reporting will be through a portal that will have all the environmental key performance indicators (KPIs) on the Ministry of Tourism's website that is accessible to the public. Suffice to note that the Ministry of Tourism has already launched the Egyptian Sustainable Tourism Portal (ESTP), which has some guidelines for hotels. This study recommends further utilizing this portal by introducing mandatory reporting guidelines through the portal and also merging it with the recently established Eco Egypt Green List for hotels.

Environmental KPIs can include questions on whether firms have policies around environmental protection, waste recycling, water and energy consumption, and GHG emissions. It can also include questions on how these organizations monitor and report their data. The Ministry of Tourism can also determine certain criteria that would make the reporting mandatory and in specific figures

depending on the organization's size, such as the revenues, the number of locations, and the employee headcount.

It is important to note that in our stakeholder meetings, the idea of the portal for environmental KPIs was seemingly considered by the Ministry of Tourism at some point. It is also worth mentioning that ESG (environmental, social, and governance) reporting is now an official requirement for all Egyptian companies listed on the EGX (Egyptian Stock Exchange) as of 2022. This means that this alternative is timely and can be a starting point for the Ministry of Tourism, since there is a number of hospitality and tourism companies (<https://enterprise.press/greeneconomys/esg-reporting-is-coming-to-egypt-in-2022/>).

Eventually, the Ministry of Tourism can have a clear ranking of tourism companies when it comes to environmental KPIs, which can be used not just for branding, but also for better access to green-financing options.

Pros:

The portal already exists - our recommendation is to utilize it even more.

Good for business: Environmental KPIs can ultimately be good for business. As several studies have shown, monitoring and evaluating these KPIs closely often leads to cost-efficient alternatives for the organizations.

Brand enhancement: Both the Ministry of Tourism and the key players in the tourism industry would benefit from better public perception. The Ministry of Tourism can use such reporting to award top scorers with better branding opportunities.

Practical and easier to implement: Environmental KPIs for tourism industry will be in line with the recent Egyptian Financial Regulatory Authority (FRA) for ESG reporting and also in line with Egypt's climate action plan and will not require huge investments or revenue sources.

Cons:

Enforcement can be challenging: Reporting environmental KPIs can require certain setups and capacities that might not be present in many tourism sector operators. Besides, the Ministry of Tourism would be challenged to find ways to enforce the policy with no reward/punishment system in place, which would be extremely difficult to implement as per our discussions with the stakeholders.

Quality of data: Since this is a new approach for most companies in Egypt, there could be challenges in the quality of data and how it can be used later on.

Alternative 03

Establishing Food Loss, Waste Reduction, and Recycling Program

Even though food waste has been usually framed as an ethical issue, it has been increasingly scrutinized as one of the often-overlooked sources of global carbon emissions. The official numbers of the Food and Agriculture Organization of the United Nations (FAO) indicate that one third of all food production is lost or wasted, and that 1 in 9 people overall suffers from hunger. The (FAO) estimates that over 1 billion tons of food waste are wasted, and that this amount of food waste contributes to about 8% of global carbon emissions. Food waste is expected to increase even more, and it has been incorporated into the sustainable development goals (SDG 12: Sustainable Consumption and Production), with the aim of cutting food waste into half by 2030.

While the lack of reliable data makes it difficult to gauge the size of food waste in the tourism sector, there are some evident indicators of how enormous it is. A recent study of 450 hospitality businesses across 25 countries found that between 8 to 20 percent of the total food produced in the tourism sector is wasted. Several high-profile brands like Hilton & Hyatt have set goals to cut food waste by 30 percent by 2030 (Tourism Review, 2020).

The learnings from the literature and similar developing countries point to the ability of governments to play a vital role in reducing food waste through policy programs. This policy paper recommends a multi-layered approach to encourage tourism operators and other stakeholders in the industry through tax laws and incentives, and through food waste laws that mandate regulatory requirements to minimize food waste. In addition to that, turning food waste into agriculture fertilizer requires certain systems in place as far as legislation and technical support. Establishing an efficient quality management system enables the

production of high-quality compost, ensures reliability and trust, and facilitates the creation of a compost market (European Environment Agency, 2020). Lastly, the Ministry of Tourism could lead the initiation of multidisciplinary working groups across the private sector and the civil society to formulate proposals and legislations that would drive the initiative of reducing and reusing food waste.

The silver lining for business would be that research has shown that these kinds of programs produce significant savings once the systems are established, and they also provide good branding opportunities. These programs could incorporate other sustainable solutions of turning food waste into fertilizers, generating electricity, etc. through technical assistance frameworks. Besides, the tourism sector would be an excellent trend-setter, since the usual stereotype about the industry is that enormous amounts of food waste are the norm. Therefore, if the industry could demonstrate progress on how food waste reduction can be good for business while also helping in meeting emission targets for climate change, it would present an excellent success story for the rest of the food chain stakeholders.

Lastly, the Ministry of Tourism can also use the build-up that will come from the COP27 conference in November, as the Egyptian officials responsible for the organization of the meetings have announced that all unused food will be repackaged and redistributed among Egypt's poor. This initiative is meant to provide a role model for all stakeholders in the food chain industry and hence should be used by the Ministry of Tourism to establish similar programs, including possible sandbox projects in the city of Sharm Elsheikh (MENA Website, 2022).

Pros:

- Support Egypt's National Climate Strategy in reducing emissions
- Cost savings for hotels and tourism operators
- Could potentially create jobs in the compost fertilizer industry

Cons:

- Challenges in initiation of food waste reduction programs due to high operating and setup costs
- The time and skills required for the technical setup for turning food waste to energy

Alternative 04

Establishing a Strategy for Medical Tourism

As highlighted in the previous sections, climate change can have a direct negative impact on tourism in Egypt due to weather changes in certain seasons that might reduce the number of tourists. This is where medical tourism comes in, in which individuals travel to other countries for certain health care services. Several developing countries, including Turkey, the United Arab Emirates, Thailand, and Malaysia are already supporting similar programs and are some of the biggest recipients of medical tourists (ITC, 2014).

Encouraging medical tourism in Egypt can be fulfilled through a development strategy that incorporates all aspects that Egypt is lacking in this field: First, establishing a platform for governance with the concerned authorities. Second, supporting the development of medical tourism products through the Ministry of Tourism initiatives. Third, ensuring that the required framework of healthcare and insurance products are in place and are meeting the expectations and needs of tourists.

Medical tourism is a promising field, as it incorporates different private sector stakeholders and has the potential for interdisciplinary cooperation between private

hospitals, hotel chains, tour operators, and also different governmental agencies, including the Ministry of Health, the Ministry of Tourism, and other regulatory bodies. It is important to note that establishing a wholesome strategy for medical tourism would also mean further opportunities for public-private partnerships, and, as such, would fall under Egypt's 2030 vision. Another important aspect to consider regarding medical tourism is that it offers an opportunity to tackle the current "brain-drain" that is affecting the Egyptian medical community. A recent research by Egyptian scholars published by the World Health Organization (WHO) in 2021 has revealed that almost 90% of the approximately 800-doctor sample from both public and private hospitals were either interested in or considering migration opportunities. The main reasons cited were the lack of financial incentives and the tough working conditions (Kabbash, 2019). This is where medical tourism could come in as an opportunity for enhancing the environment of medical professionals in Egypt. The overall improvement in the standards of private hospitals and the increased scrutiny that would be required to attract medical tourism would eventually have "trickle-down" effects to the rest of the medical sector in Egypt.

Pros:

- Egypt is becoming more affordable lately due to currency devaluation and also the energy crisis in several countries.
- Relatively lower costs of labor in Egypt can encourage investments in the medical tourism field.

Cons:

- Building up the framework for medical tourism can be expensive and might not have immediate returns for investors
- Egypt is already suffering from a shortage of doctors due to migration, and if medical tourism is also a competition for doctors in the public sector, it can add to the problem

IV. Conclusion

Climate change has become a much more tangible catastrophe worldwide. Bearing in mind the current natural disasters in different countries around the world, the COP27 to be held in November 2022 in Egypt, has a heavier duty on its shoulders. However, it still has a greater opportunity, for many developing countries are already experiencing the consequences of climate change. On top of these consequences comes the rise in temperature, which took place this summer in Spain and led to forest fires. Other countries, on the other hand, experience huge drops in water levels, as it was the case in Germany. On August 12, 2022, the Rhine River in Kaub, Germany dropped below a key waterline level of 40 cm (15.7 inches), which is used as a benchmark for determining its navigability (The Watchers, 2022). This is in addition to floods in other EU countries, similar to the heavy

rains that caused minor flooding in parts of Carinthia, Austria on 15 July, 2022, particularly Treffen, which witnessed severe floods in June 2022 (EFAS, 2022). Experiencing such crises would mean an increased level of participation and commitment to reach an immediate and fair agreement to be enforced, especially on manufacturing developed countries. This agreement would target the reduction of their carbon print via controlling their greenhouse gas emissions and reaching the agreed upon percentage of emissions, with a view to help save life on earth while giving the coming generations better living conditions, reducing temperature change impacts, and reserving the limited non-renewable resources.

The tourism sector in Egypt is one of the most vulnerable sectors that will witness great losses as a result of climate change if no immediate action is taken. Egypt will lose its beach tourism due to the disappearance of some of its shores. Besides, the bleaching of coral reefs will affect the number of tourists visiting the country every year, which will highly impact the country's economy, since tourism is one of the main foreign currency income sources. Old policies and laws did not serve the purpose of enforcing sanctions and limiting greenhouse gas emissions, carbon print, and food waste. Revised and future policies and laws, by contrast, are providing great opportunities for the tourism sector in Egypt to reduce its greenhouse gas emissions, saving its investments and employment.

Partnerships between the private sector and the government are highly recommended to overcome obstacles in the tourism sector. The private sector is not fully aware of its operational budget savings on the long term if it starts replacing non-renewable energy resources with renewable ones. Nonetheless, it should also be taken into consideration that switching to renewable resources is an expensive process that requires funds or at least a percents from the government.

Other recommended partnerships are those between the Ministry of Tourism and Ministry of Transportation to provide clean means of transportation in to-be-green cities and vulnerable touristic sites to help reduce the carbon print and emissions produced from regular transportation.

The current policy programs provide a solid base for the actions against climate change,

especially with the Ministry of Tourism's reform program, Green Star Certification, and UNDP partnerships. However, more actionable policies that engage multiple stakeholders in the private sector are still required for a more wholesome approach. As established in previous sections of this paper, Egypt is one of the countries at risk of being susceptible to the negative implications of climate change that will result in declining tourism, and, therefore, should start mitigation and adaptation actions. This paper provides four different policy alternatives that all contribute to the efforts already in place to support the Egyptian tourism industry. These policy recommendations can also be regarded as a groundwork for further research into programs that can tackle climate change effects in Egypt.

The research conducted for this policy brief has also yielded other findings of possible policy options that address Egypt's climate change challenges beyond the tourism sector. Some of these recommendations are being tested in sandbox projects in Sharm El-Sheikh, like electrical buses for mass transit systems and the use of electrical cars as taxis. Moreover, further research is required to explore the opportunities of the use of carbon capture, the utilization and storage capacities, and the potential and possible initiation of a market for carbon credits in Egypt. Other topics for further research include exploring the potential use of other fuels, like natural gas for cars and ships in touristic areas on a trial basis, and promoting non-motorized transportation for residents and tourists through the use of bicycles and electric bicycles.

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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 in Egypt. It provides the mechanism by which the good ideas, plausible answers, and meaningful solutions to Egypt's chronic and acute policy dilemmas that are proposed by the country's best minds, the experienced and the creative from different age brackets, 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.

It is designed to develop a cadre of well-informed and seasoned policy developers and advocates, while simultaneously fostering and promoting creative solutions to the challenges facing Egypt today. The project provides a processing unit or hub 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 policymakers and to the general public.

Since its establishment, the Public Policy HUB has been supported by Carnegie Corporation of New York, UNICEF Egypt, and Oxfam. The Hub had partnerships with different ministries and governmental institutions like the Ministry of Social Solidarity, Ministry of Planning, Ministry of Health, Ministry of Trade and Industry, Ministry of Local Development, Ministry of Education, Ministry of Environment, National Council for Childhood and Motherhood, National Population Council, and General Authority For Transportation Projects Planning.

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