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Island Sustainability-Predicted Impacts of Climate Change on the Tourism Sector in Malta: Recent Experiences and Anecdotes from a Small Island

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This paper aims to review threats to, and consequences of current climate change predictions on tourism in Malta. The paper reviews recent published research on the impacts of climate change and consequences of such on the physical social and economic character of tourism operations in the Maltese islands. The validity and practicality of management options to tackle the complex nature and juxtaposition between tourism growth, environment and climate change, and tourism destination management are considered, including an evaluation of management responses, the efficacy of local governance and current and future policy options and choices. The research methodology is primarily focused upon a qualitative content analysis and evaluation of contextual issues from a range of published sources and case studies drawn from current and contemporary published research and more contemporary media and anecdotal sources.

Conclusions from the research demonstrate and discuss the efficacy of current predictions and how tourism infrastructure and destination management issues for island tourism should be tailored to more strategic policy responses from all key tourism stakeholders in both the private and public sectors. In this respect the paper highlights the current impasse between public perception and policy implementation which, to date, largely continues to overlook and disregard immediate threats from climate impacts set against continued tourism growth. This clearly fails to provide adequate strategic management or responsible governance responses. In conclusion, strategic and combined management strategies are considered and advocated for managing tourism island destinations, and for addressing the increasing demands from the often complex tiers of stakeholder groups that are represented. In this context implications are further drawn for the future prospects for island tourism in the Maltese Islands.

Key Words: island-tourism, climate-change, sustainability, Malta

Introduction: Climate Change and Consequences for Island Tourism

The growth of island tourism destinations has been unprecedented over the last thirty years (Jones, 2014). Today, some of the most pervasive issues for island destinations are the impacts associated with climate change (Jones, 2021) and in-turn the continued reliance on air transport (Gallego & Font, 2019). Other challenges relate to travel patterns, overtourism, tourism impact, and economic diversification (Jones & Phillips, 2017). It is such issues and challenges that may ultimately determine the successful growth or decline of many island destinations. With current predictions of climate change and sea level rise they are, however, becoming increasingly threatened by climate induced damage and economic uncertainty. In this context, early concerns have been raised by, for example, the UK based Churchill Insurance group which highlighted the vulnerability of some of the world's most famous tourist destinations including many island resorts which may have to close due to threats from environmental damage and climate change. Their initial assessments and forecasts express clear warnings that within twenty to forty years, destinations such as the Great Barrier Reef, Islands of the Caribbean, Pacific and Indian Ocean and swathes of America's Gulf Coast and Europe's Mediterranean Basin could experience severe physical damage, in turn

forcing the closure or economic demise of many coastal and island tourism destinations (Smithers, 2006; Jones & Phillips, 2011).

Climate change predictions, especially with regard to sea level rise, storm surges and rising temperatures, will have significant consequences for the future management of tourism destinations. Together with such warnings, further academic assessments over the last fifteen to twenty years have helped frame a better understanding of climate change and its impacts on tourism (Environmental Scientist, 1999, 2000; Agnew & Viner, 2001; Giles, 2002; Lohmann, 2002; Phillips & Jones, 2006; Giddens, 2011; Jones & Phillips, 2011, 2017).

The UK-based, *Stern Review* (HM Treasury-Cabinet Office, 2005) also concluded in 2005 that scientific evidence shows that emissions from economic activity, have caused changes to the Earth's climate. In-turn the United Nations Intergovernmental Panel on Climate Change (IPCC, 2007) also provided warnings. Their 2007 study concluded that climate change would be far more destructive and have a more immediate impact than was first estimated. Predictions suggested an increase in storm frequency, rise in sea level, water scarcity and desertification, acidification of seas and oceans and more prevalent and prolonged heatwaves.

The more recent IPCC *Fifth Assessment Report* (2014) also confirms that the process of climate change will have significant impacts, in particular rising temperatures and extreme weather (IPCC, 2014) The report raised stark warnings and highlighted the fact that tourism economies across the world will not escape, with many tourist destinations increasingly at risk. Authors focussing specifically on tourism and climate impacts have supported the IPPC findings, e.g. Becken and Hay (2007), Gössling (2011), Ranade (2012), Scott, (2012), Jones and Philips (2011, 2017), and Hall *et al*. (2011, 2015). That said, future predictions of climate change, still remain uncertain and increasingly controversial as Booker (2009) and Romm (2015) suggest, with greatest uncertainties in the short to medium term. Inevitably, however, evidence suggests that the growing longer-term impacts and implications for tourism destinations will increasingly threaten viability. In this context, the development of tourism across the Mediterranean and the Maltese islands, as an example, continues to provide the quintessential traditional tourism destination. As such, destinations like these present increasing and formidable concerns for future sustained growth especially when the consequences of predicted impacts from climate change are considered.

Despite much rhetoric and debate, the recognition of such challenges has been variable and policy responses somewhat patchy. The UN's 1997 *Kyoto Protocol* which tackled carbon emissions was one of the first efforts to set binding targets for carbon emissions (Henson, 2011). The second *International Conference on Climate Change* held in Davos, Switzerland (2007) established new agreements that the tourism sector needed to rapidly respond to climate change, and progressively reduce emissions. The Davos Summit stated that the scientific evidence was clear and climate change had to be considered the greatest challenge to sustainable tourism in the 21st century - *Davos Declaration on Climate Change and Tourism* (UNWTO & UNEP, 2007). The report suggested that action would be required to combat emissions and enact emissions mitigation measures, especially those related to transportation and accommodation activities. It also advocated using new technology to aid energy efficiency and to provide financial assistance for developing tourism regions (UNWTO & UNEP, 2007).

Following this, United Nations actions, such as the *Copenhagen Climate Change Conference* in December 2009, although highlighting new threats, was somewhat disappointing in that it failed to reach agreement on further targets (Vidal *et al*., 2009, 2012). More recent initiatives, such as the *United Nations Framework Convention on Climate Change* – UNFCCC – held in Paris during December 2015, has, however, been seen as a watershed in establishing binding agreements for tackling climate change in the short to medium term (Harvey, 2015). The United States pulling out of the current agreements has, however, marred progress in this respect (Holden, 2019). Nevertheless, despite such setbacks, global risks will not disappear and will become increasingly threatening. The *2019 United Nations Annual Global Report on Climate Change* has also increased warnings and states that carbon emissions have already far exceeded agreed

limits with dire consequences predicted (Whipple, 2019). According to the United Nations World Meteorological Organisation's *State of the Global Climate Report -2020* (WMO, 2020), 2020 will likely be one of three warmest years on record. It confirms that ocean heat is at record levels and that extreme heat, wildfires and floods, as well as a record-breaking Atlantic hurricane season, have affected millions of people. It suggests climate impacts are compounding threats to human health, security and economic stability and even with current COVID-19 and pandemic lockdowns slowing economic activity, atmospheric concentrations of greenhouse gases continued to rise (WMO, 2020).

The recent *Extinction Rebellion Movement* (XR) and resulting global demonstrations, also provide other sombre messages. XR activities have certainly become more forceful in direct action and are increasingly becoming hard line, which by default may create further uncertainties for tourism operations globally (John, 2019; Extinction Rebellion, 2019).

Malta, Tourism Growth and Climate Change

Between 2010 and 2019, inbound tourism to Malta attained record yearly increases, mainly attributed to improved air links and marketing and branding efforts. Statistics show that Maltese tourism has grown consistently from 6% to 13% annually between 2013 and 2019, and despite a slight divergence to specialised markets, traditional types of tourism still remain the predominant market share. The Malta Tourism Authority (MTA) statistics show that arrivals exceeded 2.7 million visitors in 2019 (MTA, 2019; Galea, 2019) and that the wider Mediterranean remains a key growth area for tourism for Europe and globally with an annual growth rate in excess of 10% per annum (UNWTO, 2019).

Tourism now accounts for between 25% and 29% of Maltese GDP and is the largest contributor to the services sector. It is estimated that tourism now accounts for 22% of government income (Euro 2.2 billion P/A), 11% of imports and outflows and 17% of full-time equivalent employment. Despite such success, this continued growth, particularly in the peak summer season, is contributing to enviro-socio-economic challenges. Inbound tourism is now creating environmental strains which are leading to carrying capacity issues, resource impacts, waste and pollution challenges and increasing local friction with regard to 'overtourism' (Debono, 2019b). Such issues have been explored previously by a number of authors such as Austin (2012) and Dodds (2007) who have also highlighted the Maltese Islands' tourism carrying capacity pressures and growing challenges. Responses from authorities such as the *Tourism Policy for the Maltese Islands 2012-2016* (MTA, 2012), and the Ministry for Tourism's *2015- 2020 Tourism Strategy* (2015) aim to combat such issues by providing a framework to ensure that the industry works towards the sustainable development of Malta's tourism.

However, increasing climate change predictions are now compounding these existing issues and further complicate policy challenges for the future.

The Maltese Government's own *National Climate Change Adaptation Strategy* (Ministry for Resources and Rural Affairs, 2012) highlights significant threats posed to Malta and its tourism industry from climate change. These include worsening water quality and availability, more frequent extreme weather events, soil loss, physical erosion and an accelerated desertification process, threats to public health, bio-hazards, sea level and temperature rise, coastal erosion and flooding as well as ecological damage. Initial responses from the tourism authorities emphasise the need to promote better sustainable approaches for future tourism development across the Maltese islands but with little reference for actions to tackle climate threats (MTA (2012).

The more recent strategy published by the Ministry for Sustainable Development - *Environment and Climate Change* (2017) aims to create the appropriate governance framework through which Malta is able to react to anticipated climate change scenarios that are likely to test its resilience up to 2050. However, there has been a growing frustration and criticism of the current *status quo* or 'steady as you go' approach to tourism growth and development. Recently, there have been increasing calls to ensure that new directions for tourism begin to tackle development excess and growing concerns regarding notions of 'overtourism', climate change and green agendas (Times of Malta, 2018). Increasingly too,

international perceptions have turned more critical on the Islands' ability to adapt to climate change in the short to medium term (Mallia, 2018; Leone-Ganado, 2018).

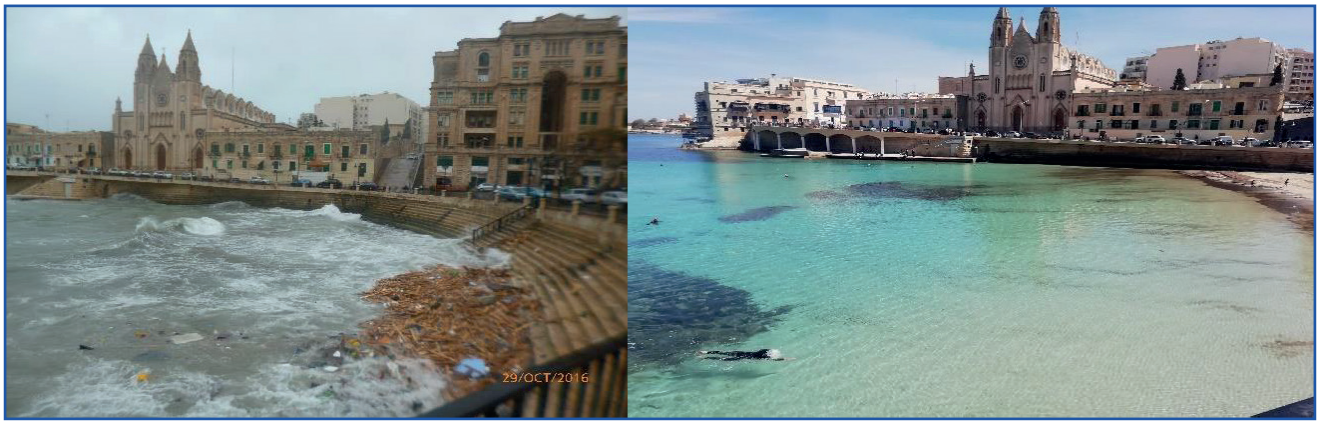
The Maltese Government's preliminary draft new tourism strategy *Recover Rethink Revitalise - Malta Tourism Strategy 2021 – 2030* (MTA, 2021) provides some initial insights for the directions of future tourism growth. In a departure from the *status quo*, the new strategy seeks to safeguard environmental protection, while emphasising the need for carbon-neutrality targets to be met, and importantly, from an environmental standpoint, seeks targets related to the EU Green Deal and United Nations Sustainable Development Goals (Azzopardi, 2021)

Despite these positives moves and clearer directives for policy, impact forecasts for climate change, particularly for Malta and its tourism industry, remain less clear. Mallia's (2018) and Leone-Ganado's (2018) more negative assessments on the ability of Malta to adapt quickly, are also pertinent in this respect. Scenarios from the IPPC (2014) *Fifth Assessment Report* clearly set the framework for understanding the nature of climate change across the Mediterranean with predictions of increased fires, heat waves, droughts and floods, health and bio-hazards, long-term sea-level change, increased sea temperatures and large-scale disease-related mortality events. These still provide an on-going understanding of threats specifically for Malta.

Research by the European Union also provides a number of additional indicators and more tangible forecasts. A joint report by the IUCN, MedPlan and WWF (2012) clarified predicted changes to the Mediterranean marine

Figure 1a: Climate Change & Tourism – Malta: Storm Surges: Sliema Promenade and Waterfront

Figure 1b: Climate Change & Tourism – Malta: Storm Surges: Balluta Bay St Julians



Source: Author

environment, illustrating considerable increases over the last forty years to sea temperature and salinity. The more recent European Environmental Agency's (EEA, 2017) *Report on Climate Change Vulnerability in Europe,* provides empirical evidence for climate change across the Mediterranean region. Forecasts predict higher and prolonged increases in temperature, proliferation of more simultaneous hot days and nights, intensification of drought, acute water shortages, the rise of solar/UV radiation, insect infestation, adverse ecological change and bio-hazards, together with significant threats to health and wellbeing. The report particularly highlights the vulnerability of the Southern Mediterranean regions, identifying coastal environments, areas of high population and high dependency on summer tourism. The report highlights some serious pointers since these characteristics reflect the nature of tourism operations on the Maltese Islands and provide some challenging warnings in this respect. The report concludes that the suitability of Southern Europe for tourism would decline significantly during key summer months (EEA, 2017). See Figure 1.

The Research Paradigm

This paper is based upon a review of current literature that has addressed the discourse between island tourism, climate change and tourism policy and governance. The focus of research material has been varied, consisting of academic papers, reports, media, social-media and real-time experiences - primarily utilising content analysis methodological approaches. This research technique is used to make replicable and valid inferences by interpreting and systematically evaluating such texts and media sources. Therefore, the methods applied are primarily based upon the existing understanding of secondary data, media and content analysis, as described, for example, by Collis and Hussey (2003), Camprubí and Coromina, (2016) and Metag (2016). The focus is thus, to develop a sense of 'contemporary synthesis' of evidence associated and attributed to the research topic; this is also very much in line with Veal (1994) and earlier definitions of such research techniques. In this respect Ryan's (1995) reference to Moutinho's research which implies that such techniques are

> *designed to find the 'emotional hot buttons' in relation to a particular topic, by bringing hidden stimuli up to the level of conscious awareness'* (Ryan, 1995:97).

In this respect, undertaking a review of existing published literature to evaluate issues and contemporary debates or 'emotional hot buttons' as Moutinho suggests, and how this might relate to the tourism and climate change dynamics of Malta, was very much the key objective and focus for this paper.

Using Malta as a specific case, the methods adopted aim to 'probe and explore' the current and contemporary policy and management issues and challenges which pertain to island tourism, climate change and tourism destination management. From such analysis the research aims to assimilate and identify management issues that have most relevance for the future management of island tourism destinations. For example, on the one hand, management that recognises climatic threats, and on the other, management that protects tourism infrastructure and island tourism resources.

Climate Change and Impacts: Experiences and Anecdotes from Malta

Apart from such data which provides some substantiated research on current changes to Mediterranean environments, empirical data supporting evidence of climate change and impacts on tourism still remains variable. This is particularly true when data are considered for Malta. There is however a growing volume of contemporary experience and anecdotes which suggests that climate change and the resulting impacts on the current Maltese tourist economy is real and tangible (Jones, 2015, 2017a/b; Palmieri, 2014). The evidence from local media and academic sources suggests that Malta has and continues to be impacted more frequently and consistently by a number of threats. These are now causing, at times, severe disruptions to tourism operations leading, in-turn to economic implications. Evidence thus far, from the current assessment of impacts of climate change on Maltese tourism operations can therefore, largely be attributed to the following six prevailing factors.

Figure 2: Climate Change & Tourism – Malta: Impacts

Source: Author

i) severe climatic events,
ii) temperature stress,
iii) flooding and increases in sea-level,
iv) resource depletion
v) bio- hazards and eco-disruption,
vi) threats from changing consumer green agendas.

See Figure 2.

Severe climatic events:

Reports (by for example, Fritz, 2014; Times of Malta, 2014b; Malta Today, 2014) have highlighted the growing severity of storms which have been likened to tropical hurricanes with winds in excess of 95mph (150kmp). Over the last decade they have become the expected 'norm' for yearly weather incidents. In 2019 reports documented severe storms which highlighted increased abnormal weather events (Cilia, 2019). These storms have resulted in damage to buildings, local flooding, damaged infrastructure, extreme local and international travel disruption including the suspension of ferry services and flights. Power surges and outages, damage to the electricity grid and damage to telecommunication and road networks have also been reported (Micallef Decesare, 2017; Urpani, 2020). All have resulted in severe disruption to tourism operations and travel and created major difficulties for operators and visitors and have adversely impacted tourism operations across the islands (Leone- Ganado, 2018). Again, such incidents have been reported by online travel sites such as Lonely Planet (2014), thus, emphasising the potency of online platforms in distributing negative social media connected messages (Bay News, 2019a). As a consequence, Camilleri (2016) intimates that in the long term, the summer peak holiday season will have to move to shoulder periods in order to avoid the worst heat excesses of summer. This of course would have significant impact on the traditional holiday season for Malta with a need to shift operations to shoulder and winter periods.

Temperature Stress:

The recognition of heat stress and prolonged durations of high temperatures has been another phenomenon more frequently reported (Sansone, 2012; Muscat, 2014a; Calleja, 2019). Such phenomena have not only increased the incidences of heat related illness but have also had consequences for public utilities and the

disruption to water and power supplies across the islands (Galdies, 2015). Dangerous levels of temperatures in excess of 40°C and high UV exposure are now regular events and create regular compelling risks to locals and visitors alike. Bay News (2019b) highlighted that Malta's summer of 2019 was one of the hottest on record with temperatures reaching over 39c. Such occurrences particularly demonstrate the risk for tourism operators and visitors over the traditional summer season between June and September.

Flooding and increase in sea-level.

The growing awareness of sea level rise and the potential flood risk to existing tourism centres, beaches, marinas and low-lying hinterlands through small rises in water levels and results of storm surges have created significant vulnerability (Sansone, 2012; Muscat, 2014a; 2014b; Micallef & Peregin, 2012; Mercieca, 2017). The loss of already limited beaches and associated tourism facilities would be a dramatic impact for the islands. In the main, tourist infrastructure is located close to the water and therefore extremely vulnerable to small rises in sea level and storm surges. Muscat's (2014a/b) illustration and visual projection of how Manoel Island and The Strand, Sliema, (one of Malta's prime tourism real estate areas) would look with a 0.5m sea level rise is a dramatic case in point where substantial tourism infrastructure and tourism operations would be severely damaged. Mercieca's (2017) projected simulations of flooding and water inundation of low-lying coastal strips is also significant and somewhat disturbing in this respect.

There is evidence of recent flooding associated with severe storms and tidal sea surges which has caused significant road damage and transport disruption across the islands (Micallef Decesare, 2017). In February 2019 Hudson (2019) reported that Malta had experienced its worst storm in decades which accounted for considerable damage. Along St Julians and Sliema promenade, businesses were damaged by the waves that battered the shore and buildings. The sea inside St Julians Bay was littered with wooden and plastic debris, remnants of destroyed boats and yatchts. This contributed to considerable economic loss. Heritage Malta also reported considerable damage to many of its heritage sites. (Hudson, 2019).

Resource depletion:

Threats to environmental and natural resources, as Mercieca (2012) has indicated, shows that Malta is among the ten poorest countries globally in terms of water resources per inhabitant (172 out of 180), stating that nowhere else in Europe is water more scarce. He suggests that there are only some 60 cubic metres of potable water per inhabitant and that nowhere in Europe is water such an acutely scarce resource - the European minimum norm is 1000 cubic metres per person. Planelles (2019) also confirms such a concern, suggesting that water shortages are one of the most significant dangers to the economic wellbeing of the Mediterranean region. Debono (2019a) has also suggested that water scarcity will have severe detrimental impact on agriculture, not only limiting the supply of food and socio-economic change, but also changing the rural landscapes and community culture of the Maltese islands. This has also been confirmed by recent research from Hartfiel *et al*. (2020). Clearly this also has profound resource, social and environmental implications for continued and sustainable tourism growth in Malta. The underlying impacts for the ambience and character of island landscapes and natural environments and the associated wellbeing for its rural communities is a growing concern. Such images and connections to island landscapes attract many visitors to Malta which might in the future be at greater risk.

Bio-hazards and eco-disruption.

Deidun (2010) expressed concerns regarding changing ecology and has reported increased incidents of, for example, jellyfish 'blooms'. Tremlett (2013) has also tracked the changing ecology of the islands, reporting surges in jellyfish blooms in 2013, suggesting this was not only transforming local Maltese ecosystems but also threatening the health of tens of thousands of tourists. Reports by Piraino (2014) show that the island of Lampedusa (some 160km from Malta), has only one swimming week a year free from jellyfish. He goes on to estimate that over 150,000 tourists are now treated annually for severe jellyfish stings and that the impact on tourism has been severe. In the same year the global news media organisation CNN reported on the significant increase in jellyfish populations in the Mediterranean and the Black Sea, and warned of the potential impacts for tourists (CNN, 2013). In 2018 record numbers of

jellyfish 'blooms' were again reported in many coastal parts of the islands causing increased risks to tourists and by default potential impacts to tourist experiences and operations (Costa, 2018a). Other bio-hazards were reported by Abela Mercieca (2010) and Chetcuti (2012) who highlighted the abnormal rise in numbers of victims bitten by the 'Asian Tiger Mosquito' and the rise in incidence of severe attacks during recent summer seasons. The rise in sand fly populations due to warmer climate have also been highlighted as an increased health risk to visitors. The arrival of the silver-cheeked toadfish (Lagocephalus sceleratus), first reported in 2015, have add to these significant risks. The powerful neurotoxin of the fish, if ingested, can block nerve function in mammals including humans, ultimately causing death by paralysis (Ameen, 2015). Although risks to date have been small, these manifestations are now regularly reported on social media sites, such as Trip Advisor, which can raise warnings and concerns relating to a number of adverse messages by tourists such as 'mosquito problems' and 'jelly fish stings' across the islands. In this respect the power of social media to deliver negative messages globally, and their consequent impacts to local tourism operations, cannot be under-estimated (Jones, 2017b).

Threats from changing consumer green agendas.

With growing concerns about environmental issues and climate change and its impact there is a growing body of thought concerning the choice and impact that individuals can make when deciding options on travel and holiday destinations. Costa (2018b) raises issues and challenges in this context by proposing that tourism across the islands must change direction from the current over-reliance on mass tourism and seek a new direction that is more in tune with the environment.

According to a Sustainable Travel Report by Booking.com, a large majority of global travellers – 87% say that they want to travel sustainably. In addition, 54% of generation 'Z' now say that the environmental impact which traveling has on destinations is an important factor when deciding where to book travel, and 56% would want to stay in a green or eco-friendly accommodation (Travel Agency Central, 2018). Consumer environmental conscience has grown significantly in the last decade. Increasingly, concerns regarding environmental impacts such as 'carbon footprint' and 'environmental wellbeing' are increasingly determining visitor choice decisions for travel. The Extinction Rebellion movement of 2019 has certainly focussed minds in this respect. As a consequence, there is growing evidence that travellers are increasingly making conscious decisions about their travel choices – where and particularly by what means they travel. As Baum (2019) intimates, the concept of 'fly-shame' promoted by environmentalists is a new emerging concept. This very much creates a dilemma between climate change, air travel and countries dependent on tourism – such as Malta, where 98.1 percent of visitors arrive by air (MTA, 2019). Such a high figure places existing tourism operations in a considerably vulnerable light. The MTA's (2021) recent launch of its new tourism strategy demonstrates signs in the right direction for following a more 'green' tourism agenda. Farrugia (2020) suggests that when considering new developments for Malta, 'on the environment', nothing should be left to chance. He suggests that planning policies should start factoring an eco-system approach. These are 'of course' worthy objectives and despite increasing policy recognition on these matters, Brincat's (2015) assessment of environmental and eco 'readiness', or not, as the case may be, for Maltese tourism still remains pertinent.

The points raised here present some pertinent evidence of the current challenges from climate threats and where pressures are emerging. Current experiences present some warnings for tourism in Malta and would suggest that disruption will potentially adversely impact tourism operations and activities at a number of levels:

i) In extreme scenarios the summer season will become more disrupted and unbearable due to prolonged periods of high temperatures;

ii) in-turn this will lead to increased dangers to health and general wellbeing;

iii) immense pressures will be further placed on water supplies leading to more frequent water shortages and disruption to supplies;

iv) increased health risks may occur due to high solar exposure heat stress;

v) increased incidences of disruption to infrastructure particularly to power supplies and telecommunication networks will occur more frequently with habitual power-outages;

vi) increased travel disruption, cancellations and delays will become common events, adding to and increasing operational costs;

vii) increased storm surges and weather events causing localised flooding disrupting local transportation networks and damaging infrastructure;

viii) increased health related risks will be caused by exposure to changing ecological habitats leading to bio and ecological hazards.

The additional economic costs, health risks and security questions for mitigating and adaptation against such events also provide a compelling argument for much needed actions. The need to manage negative social media posts and respond to changing consumer demands for green tourism agendas will also be an increasing 'must'.

Climate Change and Island Tourism: Actions for Malta

Evidence from the literature shows that threats derived from climate change will ultimately impact upon the future viability of tourism across the Maltese islands and in-turn their sustainability. The recent MTA (2021) launch of a new tourism strategy for the islands is a positive in this respect. The report clearly recognises that climate change and its impacts have potential to adversely affect tourism operations across the islands. From the existing and current evidence, it looks as if several complex tensions and pressures now present some real tangible challenges for the Maltese tourism industry. These are largely concerned with the synergies between the forces of climate change and effective management strategies to combat them.

The multitude and diverse array of tourism stakeholder interests and abilities to coordinate coherent responses to current and future threats will largely determine success of failure if this respect. As Jones (2017b) suggests, it is probably still too early to speculate on future outcomes, but interplay between these issues will ultimately determine the future sustainability and viability of tourism in Malta. Again, as Jones (2017b) and the current MTA (2021) initiative intimate, management and policy still requires a more robust approach based upon better coordination and strategy which identifies problem recognition and

Figure 3: Climate Change & Tourism – Malta: Actions

Source: Author

promotes effective management solutions. In this context there is still need to provide effective responses to such notions as 'climatic impact', 'fly shame', 'adverse social media', 'over-tourism', 'stresses to infrastructure capacity', 'over-dependency on air travel' and solutions for promoting policies designed to 'mitigate and adapt' for climate change.

These, in summary, would appear to include a collection of what would seem to often be quite disparate interests that require a more strategic and coordinated approach in order to address both the impacts of climate and environmental change and the need to sustain tourism economic wellbeing. The experiences from climate change and its impact on tourism operations across the Maltese Islands to date, point to indicators and challenges that need actions. In this respect current or future policy and management options should perhaps further explore opportunities to tackle and combat climate impacts with short- and medium-term policy solutions. These might for example include opportunities that address the current problems and consequences now being experienced from climatic related events. They could include and point to further measures that for example,

i) further promote niche tourism developments,

ii) encourage shoulder and off-season tourism,

iii) give priorities for resource conservation,

iv) improve 'green' transport,

v) provide for strong planning regulations and environmental design,

vi) enact carbon offsetting measures,

vii) boost carbon taxes,

viii) ensure protection of infrastructure through robust mitigation and adaptation,

ix) guarantee and safeguard greening and protecting the environment,

x) promote and support targeted environmental marketing and branding initiatives (see Figure 3).

Creating synergies to promote such actions would appear to be critical if the tourism industry across Malta is to be sustained for the future. In this respect many of these ideas to solve climate related issues are not new but require renewed effort. For example in the longer term, future policy directions might suggest a gradual seasonality shift toward shoulder and off season periods. This will inevitably provide challenges to the existing tourist economy and environment and the way in which tourism is thus structured and planned in the future.

A move to more specialised niche or micro markets away from traditional sun and beach markets would perhaps aid such a diversion and one which, to some extent, is already happening. Critical to this would be notions that advocate less tourist numbers during the summer and better quality, higher spending tourists that do not wholly rely on the sun and sea factors during the spring, autumn and winter. The option to increasingly promote opportunities for both innovative and sustainable niche market development could be supportive of such direction. The MTA has already explored measures to promote cultural tourism and cultural events as well as marine tourism and tourism that is focussed on the blue-economy. Other initiatives have been related to community tourism, educational tourism linked primarily to English as a foreign language, religious tourism, and food and gastronomy. All provide interesting pointers for the future direction of tourism on the Islands.

Innovative environmental management strategies that: protect natural resources (particularly water) and ensure green agenda initiatives and protection of the natural environment and island landscapes should perhaps be strengthened and policed appropriately. The promotion of sustainable modes of transport, particularly innovating public transport will assist with combating the over reliance on car usage and tourist car hire. Strengthening building and planning measures that promote concepts of 'smart' planning design and suitable regulation should assist with building control and help combat further inappropriate tourism developments.

With regard to fiscal stimuli the introduction of effective fiscal measures to ensure 'carbon capture', aid green initiatives, fund mitigation and adaptation measures, and support other environmental enhancement measures, will assist with climate protection and improving environmental quality and value. These in turn should assist with the promotion of Malta as a 'green' destination' and provide a clear message for future tourism policy choices for Malta and visitors alike. These are concepts and options which have already been explored by, for

example, Jones (2017b) and broader climate analogies by Hall (2015) Scott (2012) and Becken and Hay (2007) who express parallel policy options and frameworks.

Summary and Conclusion

Impacts of predicted climate change on tourism across the Maltese islands will certainly present significant threats in the future. In conclusion it seems reasonable to assert that there still remains continuing unpredictability regarding the science of climate change and the validity of current predictions, particularly for Malta. However, findings from the IPCC (2014) and more contemporary anecdotal sources based upon local climate experiences go some way to confirm worrying trends. General evidence and experiences from Malta show that there is recognition of adverse climatic impact such as resource depletion, a general increase in major climatic events and storm surges, prolonged heat stress, ecological threats and hazards, and potential sea level rise. Evidence and experience also illustrate that major disruption to tourism operations can occur, often with physical and economic loss and structural damage.

There are however mixed responses when mitigation, adaptation resolutions and responses are called for or actions taken. Here, co-ordination, knowledge gaps and divergence in policy responses can prevent synchronised decisions to ensure ameliorative actions are taken.

In this context there is a set of complex synergies and hierarchies that exist between tourism stakeholders. These synergies often require complex decision making that meets the needs of often quite diverse stakeholder interests. Without this, a multitude of policy gaps and shortfalls in preventative actions can remain. Crucial, perhaps, is the ongoing issue to promote further tourism growth against a backdrop of climate change threats. These are increasingly and potentially at odds with one another. Covid aside, the consistent drive for more growth from both the private and government sectors to boost international visitors to over three million per annum is a case in point (Times of Malta, 2014a). Since COVID-19, the economic imperative and pressures are even greater. However, in the light of recent climate threats one could argue that this does not bode well for the future prospects of Maltese tourism in the longer term. As things stand, recent assessments by, for example, the European Commission, also do not bode well either. As Mallia (2018) suggests, there are major shortfalls to strategic policy actions and there still remains some way to go before the tourism industry of Malta and its Government will be fully prepared for the impact of climate change. Clearly, in this respect, there remain major gaps between policy, strategy, problem recognition, forward planning and the effective implementation of mitigation and adaptive measures.

Pertinent to this, is engagement with appropriate long-term policy implementation measures and a strategic 'push' which connects more closely with 'green' agendas for environmental and tourism management that promotes sustainability at its core. These themes have already been explored in the literature (for example by UNEP & OECD, 2011; Jones & Phillips, 2017; Hall *et al*., 2012; Sing, 2012). Quintessentially, such an approach entails ensuring decision making structures that are fit for purpose. The evidence is thus quite clear; Maltese tourism will inevitably have to adapt. This might have to include a number of key actions and policy responses as already explored in this paper. The challenge is one which requires action in the form of better coordinated policy initiatives and responses. Recent sentiments expressed by Extinction Rebellion Malta, suggest that Malta's economic future will face the consequences of a failure to act (Azzopardi, 2019). These are notions and challenges that all tourism stakeholders and operations in Malta will need to fully recognise and be watchful of, if Maltese tourism is to be placed on a more sustainable and climate responsive platform for its' future sustainability.

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