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RESEARCH

Mitigating seasonality patterns in an archipelago: the role of ecotourism

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Abstract

Due to their insularity and small economies, several islands have become reliant on tourism activity for the livelihood of their communities. Islands of the same archipelago have faced various challenges in terms of tourism growth and related impact. Primarily, tourism has been characterised by seasonality (the strong spatio-temporal concentration of tourists in a destination) especially in the most peripheral islands. In other cases, tourism has grown considerably resulting in overemphasis on mass tourism throughout part of the year. This is largely experienced due to Sand, Sun and Sea (3S) tourism. Fieldwork, including interviews with key stakeholders and ecotours off-season, was conducted in the Aegadian Archipelago, off the west coast of Sicily. Findings revealed that ecotourism not only is the preferred alternative form of tourism among stakeholders but is also possible and ideal as confirmed through the ecotours. This is because different ecotourism activities can be practised all year round, thus mitigating seasonality. In return, this can help ease the financial, social and environmental challenges associated with current tourism models improving the well-being of local communities. Marine ecotourism is considered as a means to give more value to marine protected areas and to make existing tourism activity in the peak season more sustainable.

Keywords Seasonality · Ecotourism · Archipelago · Central Mediterranean · Blue economy · Aegadian Islands

Introduction

Owing to the small size of island economies and the constraints set by insularity, growth and development on islands is increasingly dependent on the tourism sector (Mazzola et al. 2019). Whilst tourism on islands in the Mediterranean region naturally has a positive impact, it has also led to various negative environmental, economic and sociocultural consequences (Baldacchino 2015), not to mention that most islands face considerable disparities in tourism influx (Ruggieri 2011). This is known as seasonality and has been defined by Butler (2001) as a temporal imbalance in the phenomenon of tourism. Baum and Hagen (1999) linked the significant variation on the demand-side in peripheral areas such as islands to climatic and demographic lifestyle, as well as structural or institutional factors. Because of seasonality, host communities have experienced various challenges including seasonal environmental congestion and low return on investment for tourist enterprises (Andriotis 2005). In addition, seasonality in tourism influx has an impact on the local community as it influences the employment period which tends to be seasonal in nature (Silva and McDill 2004; Ruggieri 2011). In fact, islands also face the challenge of displacement of permanent residents, at least throughout a period of the year, due to necessity to work elsewhere (Marjavaara 2008; Peronaci and Luciani 2015). The reduced income off-season leaves an impact on the quality of life (Cannas 2012). Various strategies have been adopted to tackle seasonality. These fall into one of three main categories: aggressive pricing, diversification of the product mix and change of the customer mix (Andriotis 2005).

Sand, Sun and Sea (3S) tourism is a leading attribute for island destinations in the Mediterranean (Alipour et al. 2020). Due to the strong reliance on mass tourism around coastal areas (Cannas and Giudici 2015), tourism activity in the Mediterranean region predominantly takes place during the summer period (Ruggieri 2015). On a global level, the

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Mediterranean region shows the highest levels of seasonality which is on the rise (Duro and Turrión-Prats 2019). There is thus the necessity to investigate how to attract other forms of tourism and tourists with different interests to such destinations to overcome seasonality and the negative impacts mass tourism has brought with it (Baldacchino 2015). Ecotourism, a form of tourism which takes place in natural settings, is educational/interpretative in disposition and embraces sustainability (Weaver and Lawton 2007), has been touted as an alternative tourism product to mass tourism in Mediterranean islands (Said 2017). Ecotourism involves several subcategories, such as marine ecotourism (Cater 2003) which is practised in marine and coastal settings (Sakellariadou 2014). It has been argued that if managed in a sustainable manner, ecotourism can not only overcome seasonality (Garrod and Wilson 2004) but also reduce pressure on the destination during peak seasons (Buckley 2009) alleviating the negative impacts of mass tourism (Santarem et al. 2015).

Ecotourism is able to tackle the various causes of seasonality since it tends to attract older tourists, whose holidays are not tied by work or school holidays and as the peak of ecotourism activity goes beyond the traditional tourism season (Garrod and Wilson 2004; Agius et al. 2018). Supporting this argument, Santarem et al. (2015) argue that the good weather and limited rainy days coupled with the opportunities provided during the entire year through seasonal differences of features is an opportunity for Mediterranean islands to extend the tourism season, disperse tourists over the year and reduce seasonality through ecotourism activities. The potential of tackling seasonality through ecotourism is more pronounced in smaller and more peripheral islands within archipelagos since their economies depend heavily on a short tourism season (Bardolet and Sheldon 2008; Fennell 2014) at times lasting just 1 month (Ruggieri 2015). While spatial–temporal studies are limited, there seems to be a relationship between relative remoteness or peripherally and degrees of seasonal concentration (Goulding 2006) with seasonal peaking increasing with distance from the core (Butler and Mao 1997).

In addition, peripheral islands are less easily accessible when compared to bigger islands and this served as an indirect strategy to limit the number of visitors (Weaver 2004). As a result, masses have been kept away throughout most of the year and their environmental resources, on which ecotourism depends, have remained mostly intact (Garrod and Wilson 2004). This has increased the ecotourism potential of small peripheral islands in archipelagos (Agius et al. 2019). In fact, ecotourism-related strategies presented by Weaver (1993) to enhance tourism in 3S dominated islands include regional ecotourism, catering to ecotourists in nature-based settings such as peripheral islands. Other strategies include a comprehensive ecotourism approach for destinations in which 3S tourism is undesired or unsuited, diversionary ecotourism opportunities to diversify the tourism product, thus providing a nature-oriented alternative to resort-based tourists as well as applying the principles of alternative tourism to 3S tourism in order to minimize negative environmental impacts.

Ecotourism has been touted not only as a possible antidote for seasonality but also as a means to address resulting problems faced in peripheral areas by offering the opportunity to redeploy unemployed or under-employed resources (Garrod and Wilson 2004). However, it has also been said that a major weakness for the sustainability of ecotourism development is its seasonality (Sayyed et al. 2013). Thus, it might not necessarily be the answer to address the seasonality faced by islands. Furthermore, while seasonality is viewed as a challenge and often a problem affecting many tourism areas (Jolliffe and Farnsworth 2003), seasonality has also been considered a positive aspect to preserve the way of life of islands, to conserve the local natural environment (Jolliffe and Farnsworth 2006) and to ease stress from local operators (Cannas 2012; Corluka 2019). Therefore, these aspects and the views of host communities must also be taken into consideration.

Notwithstanding its impacts, seasonality has been neglected in tourism research and few studies have looked into the role ecotourism can play to mitigate seasonality (Weaver 1993; Garrod and Wilson 2004; Santarem et al. 2015 especially in the case of archipelagos. By understanding seasonality in tourism at a destination, one can propose methods to spread demand and reduce its impacts. However successful strategies must take into account the specific characteristics of the destination (Cannas 2012). Using in-depth interviews, the research aims to study the views of interested stakeholders on the causes and impacts of seasonality and on the potential for ecotourism to mitigate existing trends. The potential of ecotourism to mitigate seasonality in the archipelago is further probed in a practical approach through a pilot study based on two ecotours organised off-season. Findings will be used to propose ideal strategies for islands taking into account the various levels of seasonality and characteristic of islands in an archipelago.

Area of study

The Aegadian Islands comprise three main inhabited islands: Favignana, Levanzo and Marettimo. See Fig. 1. Favignana is the biggest island and is home to the Municipality which is the main government body of the archipelago. The archipelago is located directly west of the city of Trapani on the westernmost point of Sicily (Himes 2007). Marettimo is the furthest from Sicily (see Table 1).

The islands are connected to each other and to mainland (Trapani, Sicily) through a hydrofoil and ro-ro ferry service.

Fig. 1 The Aegadian Islands. Drawn for the authors by Andrea Pace

Table 1 Characteristics of the islands under study

Factor	Aegadian Islands		
	Favignana	**Levanzo**	**Marettimo**
Density habitants/km^2	227	38	66
Permanent population	4500	220	820
Area (km^2)	19.8	5.8	12.4
Distance from mainland (km)	16	13	24

Source: Bonanno (2013), Peronaci and Luciani (2015), ISTAT (2017).

Whereas multiple runs of hydrofoil are available all year round, the service is more frequent in the summer period. Storm conditions and rough sea, especially in mid-winter, occasionally cause the temporary suspension of services. The closest airport is found at Trapani (Agius et al. 2019). The archipelago has a Mediterranean climate, with less than 4 months having an average temperature < 10 °C. The summer season is dry and warm with temperatures > 22 °C. Most severe storms usually occur in autumn and winter seasons, and spring presents milder conditions while summer has a generally calm weather (Lo Re et al. 2019). Because of its natural importance, the archipelago has earned a number of designations (EUR-Lex 2015) including an extensive marine protected area (MPA) that is one of the largest in European seas (D'Anna et al. 2016). The MPA is divided into zones falling in four protection levels. The sea surrounding the island of Marettimo has the highest level of protection (Donati 2016). This brings with it a number of restrictions for mass tourism activity.

Whereas in the past, the major economic sectors were fishing and quarrying, today tourism is a major economic activity in the archipelago (Groppi et al. 2018). Tourist arrivals have increased constantly in the past decade and exceeded 800,000 arrivals. The island of Favignana receives the most tourists with some 60,000 visiting the island of Favignana in August. This has led to extensive pressure on the environment due to a number of reasons including traffic as well as waste and sewage water generation (Peronaci and Luciani 2015). Furthermore, growing tourist pressure in summer is worsening the hydrological problem on Favignana, which is not self-sufficient and thus supplements its water supply via an underwater pipeline and ship

transportation (Groppi et al. 2018). Yet, as shown in Fig. 2, tourism remains seasonal in nature with most tourists visiting the archipelago (particularly Favignana) in the summer period (Guerra 2015; Peronaci and Luciani 2015). Therefore, several residents live on the islands during the peak season only (Groppi et al. 2018).

Research methodology

In order to respond to the research questions, four study-visits were held between 2013 and 2017 throughout different months (February, April, August, October), including in the off-season, permitting the researcher to experience different tourism influxes and make relevant observations. A first study visit was conducted in October to become familiar with the area of study, identify ecotourism attractions through discussions with locals and operators and to test ecotourism excursions/services.

With this information in hand, two ecotours defined as a "purposeful travel to a natural environment to interact, learn and experience other cultures, and to help local communities economically that work towards conservation and preservation of the ecosystem" (Khan and Su 2003, p. 118) were organised during the months of February and April for a total of 49 ecotourists with an age range between 23 and 50 and who voluntarily accepted to participate in the trips, at their own expense. The trips lasted 4 nights and the programme involved various ecotourism activities on all three islands and in the MPA, as well as excursions during which tourists could experience nature and local traditions. Activities included trekking, cycling, boat tours, botanical trips, bird/wildlife watching, eating/buying local products, interacting with locals, nature photography, visiting caves and visiting interpretation centres. Participant observation and informal conversations were used as per Lepp (2007) to obtain the views of ecotourists on their experience.

Twenty-three in-depth interviews were held with stakeholders across the entire area of study. These were held during the month of August when most stakeholders are on the islands. As per Okech (2011) and Orams (1999), ecotourism stakeholders interviewed included locals, resource users (including operators, guides), tourists, government and official agencies, non-governmental organisations (NGOs) (working in the environmental and cultural sectors) and academics. Interviewees were recruited through two sub-types of strategic informant sampling technique. The first is expert sampling which involves the selection of "typical" and "representative" individuals. The second technique used, also known as snowball sampling, involves asking an initial set of informants to propose other potential sample members (Finn et al. 2000). Experts were chosen deliberately due to their background and since they could contribute in the field of study (Bogner et al. 2009; Muskat et al. 2012). Table 2 shows the distribution of stakeholders with whom interviews were conducted in the area of study, whereas Table 3 shows the distribution of males and females interviewed.

Interviews were held face to face. The nature of societies within small islands is likely to be quite divided and individuals tend to be very much interested in matters concerning others (Baldacchino and Ferreira 2013). Furthermore, local communities can feel uncomfortable or even suspicious in the presence of tape recorders (Parker-Jenkins 2018). Taking these aspects into account, and considering that the researcher was unknown to the local community, notes were taken during and right after each interview to ensure that an adequate pool of stakeholders acceded to participate in the interviews and also provided tangible information.

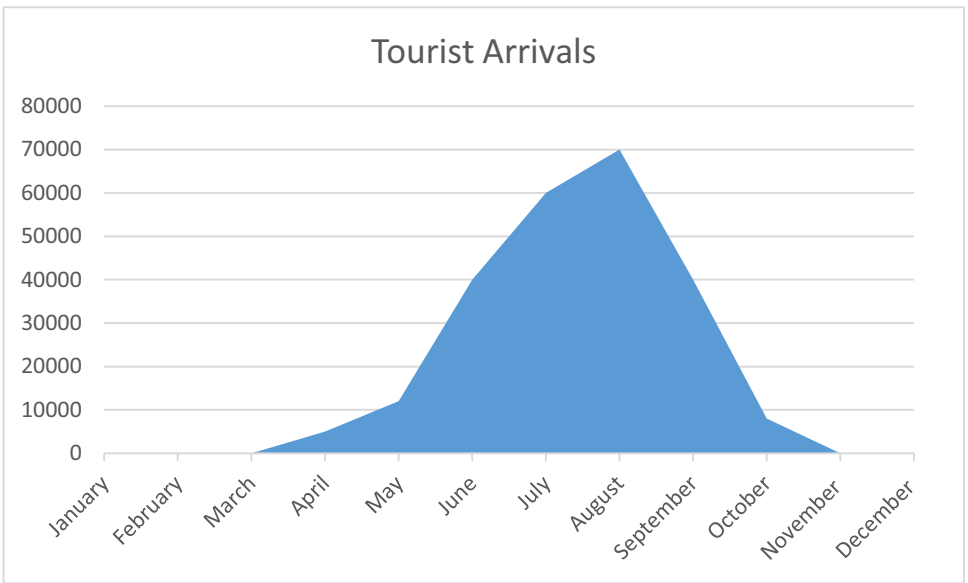

Fig. 2 Tourist arrivals on the Aegadian Islands in 2014 (adapted from Guerra 2015)

Table 2 Distribution of stakeholders with whom interviews were held in the area of study

Eco-destination	Count/percentage	Stakeholders					
		Locals	**Tourists**	**Tourism industry**	**Academics**	**Government, agencies, politicians**	**NGOs**
Aegadian Islands	Count	3	8	7	1	2	2
	Percentage	13%	35%	30%	4%	9%	9%

Table 3 Proportion of males and females and number of interviews held in the area of study

Eco-destination	Count/percentage	Gender		Total interviews
		Male	**Female**	
Aegadian Islands	Count	19	4	23
	Percentage	83%	17%	100%

Interviews lasted approximately 45 min and were kept semi-structured and informal. No formal questions were prepared but a checklist of topics derived from literature review and the research plan were kept ready in hand to guide the researcher throughout the interview. This ensured that a consistent range of topics was covered in each interview (Wearing et al. 2002). Furthermore, this permitted the researcher to ask supplementary questions or to ask the interviewee to explain the answer provided (Veal 2006). Questions asked were related to (1) existing tourism trends, (2) factors leading to seasonality, (3) impacts of mass tourism and seasonality, (4) the potential to practise ecotourism all year round to mitigate seasonality, (5) willingness of local communities and operators to have tourism spread throughout the year, (6) the market of tourists that needs to be tapped and (7) different strategies needed for the islands within the archipelago. As per Dooley (2002), data collection through interviews was considered to be completed when the researcher experienced exhaustion of sources, saturation of categories and emergence of regularities.

Once fieldwork was completed, all transcripts were prepared. Data collected were integrated and analysed manually following the approach adopted by Stoffelen (2019) to analyse tourism data collected from various stakeholders. The research plan and relevant documentation were reviewed by the University Research Ethics Committee (UREC) at the University of Malta. Necessary ethical considerations such as confidentiality were given due importance.

Results and discussion

This section presents the main findings from the site visits, interviews and ecotours. In addition, it discusses these findings in the context of studies in other archipelagos and strategies required to shift to ecotourism.

Factors causing seasonality

Stakeholders outlined that tourism activity in the Aegadian archipelago revolves around the summer months with the islands facing seasonality to various degrees. The highest degree of seasonality was expressed by the most peripheral island of the archipelago. An operator from Marettimo said that tourism mainly revolves around the months of July and August. Whereas to a slightly lower degree, the smallest island of the archipelago (Levanzo) expressed similar trends. Favignana, which is the biggest and main island in terms of tourism infrastructure and power, records the most tourist arrivals and the lowest level of seasonality in the archipelago with an operator from Favignana claiming that "As of October, tourism on the island decreases significantly." Tourists visiting the islands in February and April as part of the ecotour pointed out the absence of tourists off-season. They considered the lack of crowds as an added value for their experience especially on Marettimo due to the pristine environment and sense of tranquillity.

According to interviewees, the short tourism season and seasonality in the area of study are linked to a number of issues one of which being distance of islands from mainland and connectivity. Several flights to Trapani, the closest airport to the Aegadian Islands, especially those operated by low-cost airlines to international destinations, are discontinued from time to time limiting tourism to domestic markets. Levanzo and Marettimo being smaller, less populated islands and less visited face additional travel burden due to lower frequency of crossings whilst Marettimo, being the most remote island, faces higher expenses of fares. Furthermore, in case of bad weather, Marettimo being the most remote, is most likely to experience suspension of services as experienced during one of the ecotours forcing a change in the programme; however, tourists still managed to sojourn on the island once weather improved. Ecotourists considered travel in bad weather as the least interesting aspect of the experience. These characteristics are said to also contribute to lower tourist arrivals and increased seasonality in smaller islands of archipelagos as they dishearten visitors. In fact, Levanzo receives more daily visitors than Marettimo, whilst Favignana receives most tourists due to proximity to mainland and highest frequency of crossings.

According to operators, seasonality in the Aegadian Islands has also been linked to the limited efforts and funding to target international markets in terms of promotion. In fact, ecotourists interviewed remarked that they had never heard of the islands before being invited to join the trip. In addition, one of the factors that motivated tourists to travel to the islands was to visit a new unknown destination. Therefore, domestic tourism remains the major target for tourism on these islands. Dependence of tourism on domestic markets has in fact been identified as a reason why peripheral areas suffer from seasonality (Garrod and Wilson 2004). Furthermore, across the area of study, the environmental assets of the islands are not well promoted with the MPA being seen by tourism operators as a burden due to numerous restrictions associated with its management. Therefore, few tourists are attracted beyond the summer season for ecotourism purposes. This results in a tourism market mostly associated with the summer period and the traditional "Ferragosto" break taking place in mid-August whereby several Italian nationals flock to the south of the peninsula, especially to islands, to swim and seek the sun as well as beaches. This favours tourism on Favignana which is the only island in the archipelago having sandy beaches. Stakeholders added that, in general, the smaller islands get even less attention in terms of promotion leading to not only fewer visitors in the summer period but also greater impact on seasonality.

One should note that in the case of archipelagos, most power is located on the bigger island of the archipelago. Even higher power is situated further away on a bigger island (Sicily) resulting in what Weaver (1998) described as nested core-periphery relationships. Baldacchino and Ferreira (2013) have attributed this dominance/subordination relationship whereby one island tends to have, even if subtle, more power than the other islands, to archipelagos. Such repercussions are more pronounced on peripheral islands of archipelagos and this explains why islands such as Levanzo and Marettimo receive less attention in terms of promotion and thus exhibit a higher degree of seasonality.

Seasonality has also been linked to the lack of services and packages throughout the year. Since operators do not have a substantial demand in the off-season, several decide to suspend their services right after the summer season. Operators claimed that since services are not available all year round, few visit the islands off-season with an operator from Favignana describing the situation as "a viscous circle". In the case of Levanzo, the situation is even worse as the school has been closed, and therefore families have no possibility of schooling their children on the island. This has a drastic impact on ecotourism-related services (including accommodation and organised excursions) as services usually provided by members of such families are not available all year round. Considering the absence of big hotels and reliance on small properties owned the local community for accommodation, the beds available across the archipelago vary throughout the year due to the shift of people to mainland. Similarly, museums and heritage sites, which due to their relevance/overlap with the environment are of interest to ecotourists, are closed during the off-season due to both lack of demand and of human and financial resources. Some companies such as those offering travel services engage staff fluent in various languages to assist tourists. However, such a service is only available throughout the summer period due to lack of demand beyond the peak season. Notwithstanding this challenge, participants of ecotours confirmed that they found all necessary services during the ecotours including accommodation, food and beverages, and ecotourism excursions as well as relevant museums and centres but this was prompted by small family-run operators who took the opportunity to work off-season and make necessary arrangements with local authorities. This implies that provided that there will be demand, operators would be willing to work off-season and offer their services all year round. Furthermore, while connectivity remains a challenge, the major challenge remains the lack of marketing of the islands, as ecotourism destinations and emphasis on 3S and seaside tourism.

Impacts of seasonality

Due to the seasonal nature of tourism and economic dependence on tourism, operators and the host community have few job opportunities with a secure income all year round especially between October and May. Moreover, several locals are employed under precarious working conditions with contracts lasting for the duration of the peak tourism season only. Thus, several seek jobs on the mainland at least throughout a period of the year. As a result, entire families are forced to move to mainland Sicily; and thus, the islands become mostly deserted during the winter period increasing the sense of isolation. This period is even longer on smaller islands leaving a heftier economic impact. An operator from Marettimo said "In winter including September, October and November the island is almost completely abandoned and almost all locals go to Trapani. This is mostly due to the fact that there is lack of work and no tourists".

For those who decide to stay on the islands the solution is to make the most out of the tourism season. A local from Levanzo said "After August there is not much work on the island and most of the locals are worried that they will not make ends meet by the end of the year." As a result, locals have to work round the clock in the peak season to obtain enough income that can sustain them all year round. Whereas in response to the seasonality of tourism, some might prefer intensive work for a couple of months (see also Vogiatzakis et al. 2008), locals would still prefer to have the opportunity to work throughout the year. In fact, a local from Levanzo said "Working hard in summer and taking it easy in

winter is now also a way of living and part of the mentality of the island. Meanwhile, locals still prefer tourist arrivals to be well distributed all year round rather than a lot of pressure in summer." Confirming this, another operator said "In summer one must work 12 h straight without eating and without a break to make up for those months when there is no work to do." Likewise, an operator from Marettimo said "Currently operators must earn in 40 days (July/August) what one would normally earn over a year." Seasonality is thus said to have a social and economic impact on the islands and its inhabitants as the latter experience a lot of work pressure over a short period of time, affecting their social life in this period. Another response has been occupational multiplicity especially in the case of those residing on smaller islands of archipelagos all year round. Due to the seasonality experienced on most of the islands, operators cannot specialise solely in the field of ecotourism. Instead, they exhibit a high element of diversification in services provided to secure other sources of income and make ends meet.

One other aspect that is impacted by seasonality includes the level of investment. Due to seasonality and the lack of constant demand, operators have narrow interest and capacity to invest in the sector. In particular, the low annual occupancy rates leave an impact on investment made in accommodation structures and in the quantity of equipment needed for excursions such as diving/snorkelling gear.

In addition, the prices of food products and services tend to fluctuate throughout the year with prices going up during the peak season when tourists are on the islands. This fluctuation has been linked to the additional demand and the resulting additional operating costs to meet the demand such as engagement of more employees in markets (Eurisles 2002). Furthermore, it has been attributed to a mechanism used by local operators to make up for the low domestic demand off-season. Such issues of price fluctuations require attention as it has also been reported to be a top concern for visitors in archipelagos (Bardolet and Sheldon 2008). This has also impacted the local communities.

Seasonality also contributed its fair share of negative social issues. In the Aegadian Islands, excessive competition for tourists due to the seasonal nature of tourism and the need to make the most out of the short tourism season have led to tension between operators. An NGO representative from Marettimo said "The tourism industry can divide the community." whilst a local from Levanzo said that the community is quite divided in summer. On Levanzo, an initiative to found a cooperative among boat operators failed to materialise. This tourism induced tension escalated to rivalry between communities of different islands similarly to inter-island rivalry reported in other archipelagos (Baldacchino and Ferreira 2013). In fact, stakeholders from Levanzo and Marettimo spoke several times how Favignana dominates the tourism industry in the archipelago while locals from Levanzo even chant hymns denigrating the community of Favignana. The lack of cooperation between islands of the same archipelago and the stiff competition have in return hindered the development of ecotourism packages (Agius et al. 2016).

Ecotourism can extend the tourism season and mitigate existing challenges

Stakeholders across the area of study including operators remarked that seasonality could be reduced through ecotourism activities that can be practised throughout the entire year including off-season. Stakeholders said that this is supported by the favourable climate of the archipelago which permits tourism to take place all year round. Therefore, "natural seasonality" can be overcome in the area of study as the climate of the islands makes such seasonality less pronounced. Referring to activities that can be practised in winter operators identified nature photography and even boat tours along the coast. Such activities have also been experienced during the ecotours organised. Furthermore, the mild weather conditions in the off-season are more ideal to practice ecotourism activities such as trekking and cycling as confirmed by ecotourists visiting the Aegadian islands in February and April and trekking events organised on Marettimo off-season. Introduced wild mammals such as red deer (*Cervus elaphus*), mouflons (*Ovis orientalis musimon*) and wild boars (*Sus scrofa scrofa*) can be spotted on Marettimo all year round as confirmed by stakeholders including ecotourists during their trip.

Moreover, the peak of certain ecotourism activities does not fall in the traditional tourism season. For example, bird watching is ideal between February and May (spring passage) as well as between September and November (autumn passage), whilst the period between March and May is ideal to observe the rich biodiversity of flowering plants. In the case of the Aegadian Islands, Marettimo hosts no less than 500 plant species (Gianguzzi et al. 2006) and some nine endemic plant species can also be found in the archipelago (Pasta and La Mantia 2013). Supporting the argument an operator from Levanzo said "In the off peak season one can better appreciate nature."

Furthermore, whereas the summer period is synonymous with 3S tourism, practising ecotourism activities in this period is still possible especially due the presence of an MPA with its objectives including the promotion of marine ecotourism. Policy makers on the Aegadian Islands also started to promote ecotourism-related activities within the MPA such us canoeing (see Guerra 2015). Activities identified by stakeholders include snorkelling, diving and the observation of marine fauna, which also extend well beyond the tourism season. This is facilitated by the presence of various marine charismatic species including the

monk seal, bluefin tuna (*Thunnus thynnusthynnus*), loggerhead sea turtles, dolphins (*Stenella coeruleoalba* and *Tursiops truncates*), mantas, sharks (*Lamna nasus* and *Prionace glauca*) and sperm whales (*Physeter macrocephalus*) (Donati 2016), several of which are rare on protected (Donati 2015). According to eNGOs, other activities that can be practised in these months are volunteering such as assisting in the turtle rehabilitation centre found on Favignana. This is because this period coincides with the period in which fishers operate most out at sea, thus increasing the likelihood of encountering injured turtles.

Operators outlined that apart from these excursions, the archipelago offers the opportunity to visit ecotourism-related interpretation centres. For example, in the case of Maretttimo where the endangered monk seal (*Monachus monachus*) has been spotted after a long period of time, one finds the monk seal observation centre. On Favignana, one finds the former tuna factory (Ex Stabilimento Florio delle Tonnare di Favignana e Formica) that provides various insights into the traditional tuna fishing system as well as the interpretation centre of the MPA. This further supports ecotourism since the latter includes education as one of its main pillars.

The potential of ecotourism to mitigate seasonality as outlined by stakeholders was further confirmed through the successful organisation of two ecotours off-season and the ability to complete all excursions in the programme. Ecotourists who joined the ecotours and who were interviewed as part of this study expressed fulfilment after the ecotour since the islands gave them the opportunity to immerse in nature and practise various ecotourism activities as outlined above. Their favourite activities included trekking on Marettimo, cycling on Favignana and visiting the cave "Grotta del Genovese" on Levanzo. The potential of the islands to serve as ecotourism destinations all year round was also confirmed by two groups of ecotourists who returned to the archipelago following the two ecotours organised to further immerse in their natural environment. Participants confirmed that they would recommend the destination to friends and relatives especially off-season.

While it may be difficult for policy makers to change existing tourism trends (the influx of domestic tourists in August for tourism activity that revolves around the coast and the sea), ecotourism can not only tackle seasonality but also make tourism in the summer period more sustainable. This is because some ecotourism excursions practised in marine settings are considered to be important components of mass tourism. For instance, marine activities such as SCUBA diving and snorkelling are related to 3S tourism but provided that they are carried out in a sustainable manner, one cannot find any reason not to consider them as ecotourism activities (Johnson 2006).

Considering the aforementioned challenge of suspension of transport services in case of storms, stakeholders said that the ideal tourists should have some degree of flexibility. One should keep in mind that ecotourists tend to be more flexible and are less likely to be influenced by weather conditions to travel (Fennell 2014). The fact that ecotourists are less influenced by "institutionalised seasonality" further supports the argument why ecotourism can be instrumental to tackle seasonality on archipelagos. While the age of participants of the ecotours ranged between 23 and 50, they were predominately young people. Yet they still participated in the ecotours off-season making use of long weekends and Easter holidays. Therefore, while demography, calendar and holidays have an impact on tourism trends as outlined in literature and confirmed by operators, these factors can also be mitigated through well planned packages.

Ecotourism as a means to ensure sustainability

Mitigating seasonality by encouraging ecotourism all year round implies that the islands will face a change in existing tourism influxes. Stakeholders, in particular operators, remarked that by having tourism spread throughout the entire year, various aforementioned socio-economic challenges associated with seasonality will be addressed. Operators believe that ecotourism throughout the entire year will offer higher income leading to a better standard of living for the local community. This is supported by studies which have found that ecotourists are wealthy (Fennell 2014) and high-spending tourists (Wilson and Garrod 2003). Furthermore, it will offer jobs to locals, including young people, in ecotourism and related sectors such as interpretation and enforcement within protected areas (Black et al. 2001). A local operator from Levanzo said "Locals appreciate tourism as it creates more work. One should keep in mind that all locals somehow make money from tourism." Supporting the argument that the arrival of tourists all year round is welcomed by locals, ecotourists visiting the islands, specifically the peripheral island of Marettimo, claimed that locals enjoyed their presence in February as few tourists visit the islands in this period. They observed an "overwhelming positive reaction" from locals, service providers (including those offering ecotourism services) and owners of local stores. This is due to the money spent by tourists on the islands off-season, something that is not quite common on the island. Tourists claimed that money was spent on accommodation, ecotourism excursions, artisanal products, food stores and restaurants. Since these are all locally owned and family run, leakage of funds was minimal, something which is also associated with ecotourism confirming its added value (Garrod and Wilson 2004; Sakellariadou 2014).

Beyond financial aspects, the spread of tourism all year round, possibly through ecotourism, is seen by locals as

beneficial because the presence of tourists may raise awareness on the challenges faced on the islands, such as those related to connectivity, especially in winter. They believe that authorities might tackle such challenges for the sake of tourism but the local community will benefit too.

Stakeholders from Levanzo and Marettimo also favoured ecotourism development as a means to avoid the repercussions of mass tourism on Favignana. While stakeholders from the island of Levanzo and Marettimo want to have more tourism all year round, they are not simply after bigger numbers in summer. Owing to the fact that Levanzo is the closest island to mainland, throughout the summer period it serves as one of the stops for all-inclusive day excursions that leave from the port of Trapani. Concerns have been raised by stakeholders including tourism operators on the huge quantity of visitors that visit the port of Levanzo just for few hours branding the tours as "hit and run". This is because such tourists cause havoc, spend little and therefore do not support the local economy. Such activities are considered among the most that negatively impact the environment as well as on small tourism operators (D'Anna et al. 2016).

Locals and tourism operators from Marettimo and Levanzo said that they did not want the islands to become "another Favignana" referring to the crowdedness and noise that one experiences on the sister island in summer. Stakeholders from Levanzo and Marettimo emphasised that rather than mass tourism and day-trippers, the right quality of tourists such as ecotourists needs to be targeted all year round. This is supported by the fact that ecotourists not only have sensibility towards the environment (Weaver 2008 but also prefer to travel in small groups (Garrod and Wilson 2004). On the other hand, an operator from Levanzo specified that "Levanzo has a natural carrying capacity through the limited beds available and thus can never become another Favignana".

Concerns raised on the possibility that Levanzo and Marettimo copy Favignana's tourism model are just. This is because whereas the islands in the area of study all face seasonality, the biggest island— Favigana—experiences big masses of tourists during the peak season. This has also been reflected in a study on Favignana's electric consumption which was found to be characterised by a strong seasonality due to the summer touristic fluxes (Groppi et al. 2019). The energy needed on the island multiplies threefold during the summer months reaching a peak throughout the month of August and a minimum in November (Groppi et al. 2018). The high influx of tourists also led the Municipality to prohibit crossings to the island by car via ferryboats for non-locals throughout the month of August (Trifirò 2014).

Islands in an archipelago require different strategies

Islands in the Aegadian archipelago have different tourism characteristics and thus require distinct responses that complement one another. Seaside tourism will not disappear from the area of study but it can be made more sustainable through the application of various ecotourism principles. This is especially the case for soft ecotourism activities such as coastal boat tours and snorkelling which are included in the itinerary of mass tourists. Policy makers interviewed confirmed that important steps have been made in this regard as the management body of the MPA created a label for the environmental certification of tourist services including accommodation, catering, rental of boats and bikes, sightseeing tours, passenger sea and land transport, fish tourism and diving among others (Donati 2016). This is especially important for the island of Favignana where mass tourism in the peak season is most prominent.

Whilst mass tourism and anthropic activity on Favignana have led to habitat fragmentation and degradation of extensive coastal environments, nevertheless, the small island still enjoys pockets that can cater for ecotourism all year round (Agius et al. 2019). Therefore, one approach to tackle seasonality can be to adopt a diversionary ecotourism activity and shift attention from the beaches to other venues such as protected areas including in marine environments. This requires sites to be well managed, zones set to be respected and visitors to be given the right guidance. Furthermore, the rules of the MPA need to be fully respected by both tourists and operators. In such cases, ecotourism can serve as a means to rehabilitate impacted areas for the benefit of the environment and local communities (Weaver 2008. This is in line with initiatives taken by local NGOs to rehabilitate coastal areas on Favignana (Agius et al. 2016). In addition, ecotourism can generate funding for the management of the same parks and for conservation purposes.

Taking into consideration the entire archipelago, a regional ecotourism strategy can be applied (Weaver 1993. In such scenario whilst tourism related to the coast continues to play a substantial role in summer on Favignana (and to a much lower extent on Levanzo and Marettimo), ecotourism is promoted in the peripheral islands where 3S is unsuitable and undesirable. This is supported by the fact that outer peripheral islands of archipelagos are naturally richer (Halpenny 2001). In fact, both Levanzo and Marettimo have extensive rocky coastal areas which are unsuitable for 3S and hence attract much fewer domestic tourists than Favignana in summer. However, they have greater potential for ecotourism. Hence, island hopping that has been considered as one of the most activities enjoyed by participants of the ecotours organised as well as in studies on ecotourism taking place on islands (Jaafar and Maideen 2012) is promoted. In fact consolidated promotion strategies of archipelagos have

been based on the "nature of differentiation" of islands and the need to visit all for a complete experience (Baldacchino 2015).

In the long term, the island of Marettimo may push for a comprehensive ecotourism approach. This implies that the entire island is oriented towards this form of tourism all year round. Various factors may favour such an approach including its remoteness, pristine environment, extensive marine and terrestrial protected areas, higher levels of protection and limited human impact due to a small population and absence of mass tourism and hotels. To further strengthen its potential in recent years, the critically endangered Mediterranean monk seal (*Monachus monachus*) has been spotted in the coastal caves of the island and an observatory has been set up inside the castle located at Punta Troia (Donati 2016).

Conclusion

This paper sought to identify the causes and impacts of seasonality experienced by islands in the Aegadian archipelago and if ecotourism can reduce seasonality in tourism influx. Seasonality was found to be strongest in the most peripheral island (Marettimo) and lowest in the main island of the archipelago (Favignana), following core-periphery relationships. According to stakeholders, the main causes of seasonality are considered to be connectivity, lack of services all year round and inadequate marketing. However, ecotours organised confirmed that while connectivity can present a challenge from time to time due to possibility of bad weather, this did not halt ecotourism activity. Furthermore, all services needed were available and service providers showed willingness to work off-season. Hence, the main challenge leading to seasonality seems to be lack of adequate marketing and the association of islands with seaside tourism and reliance on domestic tourism.

While 3S/seaside tourism dominating tourism on central Mediterranean islands is restricted to a short period of time, stakeholders believe that considering the climate of the archipelago and its natural attractions, various ecotourism activities can be practised all year round including wildlife watching and boat tours along the coast. Several ecotourism activities including bird watching and flower gazing can be practised well beyond the summer period. The off-season period is also ideal to practise activities such as trekking and cycling. Thus, ecotourism has the potential to overcome seasonality in the archipelago especially in small peripheral islands such as Levanzo and Marettimo that have been less impacted by conventional tourism. This has been confirmed through the successful organisation of two ecotours organised off season (February and May) after consultation with locals and ecotourism operators which resulted in fulfilment of ecotourists.

Mitigating seasonality by encouraging ecotourism has also gained support from local stakeholders on grounds of sustainability. They consider it as an opportunity to address the challenges associated with seasonality and existing tourism trends, such as unemployment off-season, precarious working conditions, higher cost of living, the social negative impact on local communities including the need to work under pressure in summer, inter-island rivalry and tensions that exist between competing operators on the same island and demographic change. Ecotourism is also favoured as a means to halt or even revert the negative environmental impact emanating from mass tourism on Favignana or to avoid becoming "another Favignana" in the case of Levanzo. However, this requires the implementation of a number of policy measures including branding islands as nature islands and placing emphasis on the entire archipelago (rather than on Favignana). In addition to adequate marketing strategies and events held in the off-season (Pereira and Eichenberg 2016; Saatsakis et al. 2018) such as trekking and mountain biking, operators need to collaborate and develop tailor-made packages with the right components in terms of ecotourism activities for specific seasons to exploit the favourable weather conditions and the different natural attractions and possibilities available on the islands throughout the year. By addressing seasonality, operators will be able to specialise in ecotourism services and invest in equipment and operations further improving the services for ecotourists.

Considering the opportunities that the archipelago presents, including an extensive MPA which aims at making tourism more sustainable, marine ecotourism can serve to differentiate the tourism product reducing pressure on coastal areas during peak seasons shifting from a consumptive 3S approach to a more sustainable form of tourism all year round. Marine ecotourism can also make current tourism activity more sustainable by embracing ecotourism principles. This is especially relevant to the island of Favignana which is frequented by masses of tourists in at least part of the year and which has faced intense anthropic pressure in various areas of the island. The regional approach proposed by Weaver (1993) can be used to promote ecotourism in peripheral islands such as Levanzo and Marettimo and island hopping. In such cases, peripheral islands with extensive seasonality become the core of the ecotourism experience (Weaver 2017). Marettimo, which is the least impacted and with the highest level of protection, is best placed to adopt a comprehensive ecotourism strategy targeting exclusively ecotourists. Whilst this requires adequate planning and management through use of guides and interpretation to limit environmental impact, it has the potential to generate funding for the management of parks and to generate more sustainable income for the local communities.

The COVID-19 outbreak has left a drastic impact on tourism in the area of study (Agius et al. 2021). However,

ecotourism can serve as an opportunity to relaunch tourism. Market research suggests that post-COVID-19, people will seek out natural spaces and quality experiences (Global Environment Facility (GEF) 2020). This is supported by the fact that during the pandemic, TripAdvisor introduced a ranking for the best parks across Europe (TripAdvisor 2021). Therefore, it is imperative that the Aegadian islands respond to this demand not only to address seasonality but also for the archipelago to remain a competitive tourism destination and safeguard its major economic activity.

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Declarations

Conflict of interest The authors declare no competing interests.

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