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Accessibility of Peripheral Regions: Evidence from Aegean Islands (Greece)

Ioannis Spilanis
Department of Environmental Studies
University of the Aegean
Mytilini, Greece
ispil@aegean.gr

Thanasis Kizos
Department of Geography
University of the Aegean
Mytilini, Greece
akizos@aegean.gr

and

Paraskevi Petsioti
Department of Geography
University of the Aegean
Mytilini, Greece
p.petsioti@gmail.com

Abstract: Islands, especially smaller ones, are characterized by discontinuity of space and are considered as some of the least accessible areas. In this paper, we seek to shed light on the accessibility problems that islands face from the point of view of island residents. This shift in emphasis considers additional aspects to accessibility that include the availability of connections to access services required to cover the needs of island residents and the different destinations where these may be available, and the time that one may have to spend to get to these destinations in order to use these services. An alternative measure of accessibility is proposed, based on the time required to travel; this is then applied to three different Greek islands in the Aegean Sea. The accessibility of the residents of these islands to selected services is compared with that of settlements in continental Greece of similar population and distance to the capital Athens. The findings clearly demonstrate the adversities that island residents have to face, especially for smaller islands, where accessing selected services may require as many as four destinations, with virtual distances 4 to 6 times longer than 'real distances'.

Keywords: accessibility; Aegean; Greece; islands; peripherality; virtual distance

Introduction

Accessibility reflects the ease of access between two points in time. Conceptions of accessibility can be traced according to Farrington (2007) in land use - transportation modelling and measurements of accessibility of cities (e.g. Bruinsma & Rietveld, 1998) or in rural areas (e.g. Nutley, 1980; Cross & Nutley, 1999) and were gaining ground in the 1990s, aided by GIS developments. Most of these approaches aim at linking the accessibility of certain services by certain social groups and/or certain areas. Nutley (1980) recognized that many of these approaches assume a dichotomous nature of accessibility and services, e.g. if access is possible or impossible, if a service is present or absent, etc., an assumption retained by many recent studies as well (e.g. Preston & Rajé, 2007; ESPON, 2006; Farrington & Farrington, 2005).

Farrington (2007: 320) formulates a "new narrative of accessibility" echoing Moseley's conceptualization of accessibility as "the degree to which something is "get-at-able" (1979: 56), and as an idea much more far-reaching than that of mobility or transport per se". This "get-at-ableness" is defined as "the ability of people to reach and take part in activities normal for that society", offering "a potentially powerful lever in the achievement of greater social inclusion, social justice and sustainability". In this context, accessibility "is at least as much about people as places. A place is not just 'more' or 'less' accessible, but accessible relative to people in all their different circumstances" (Farrington, 2007: 320). This does not mean "that people live and operate aspatially; place is also an important theme in their experience, and their location at any given time is an important factor in their experienced accessibility" (*ibid*.)

The analysis of Preston & Rajé (2007: 156) on transport related social exclusion, builds on this conception of accessibility by identifying three different 'types': "the level of travel in the area as a whole (area mobility), the level of travel made by particular individuals or groups (individual mobility), and the overall accessibility of the area". It is a relative term (Gutierrez & Urban, 1996) and it depends with what it is compared to (Handy & Niemeier, 1997) and the level to which it refers. For example, at the local level, accessibility may refer to the ease of access to a number of local services; while at European level, it may refer to the ease of access to a major urban centre (Gutierrez & Urban, 1996). Another aspect of its relative value is the means of transportation between the areas; thus, assessing levels of accessibility depends on many different factors (Geurs & van Wee, 2004). However, it is an inherently spatial concept which brings location into the "structural construction of social issues" (Farrington, 2007).

Islands are considered as special cases of accessibility (Baldacchino, 2007). Depending on national definitions, there are many islands in the world. The most complete database widely available of the most important islands is that of the UNEP[1]. According to its records, more than half (52%) are located in the Pacific, characterized also by the lowest median size (137 km^2) and of the lowest altitude (along with Arctic islands), but the diversity is significant. Mediterranean islands are in comparison bigger and with higher altitudes on average. They are quite important in terms of land area and population. For example, both Malta and Cyprus are exclusively island states. In Greece, islands make up 19% of the land area and 15% of the

[1] With 2,000 islands in total, many of the smaller islands are not covered; e.g. in Greece, 36 islands are included out of the 105 that are inhabited, available at: http://islands.unep.ch

population, and in Italy 17% and 12% respectively while less so for Spain (2.5% and 6% respectively). Differences are important, as in Italy a few big islands dominate, while in Greece many more middle and small size islands are encountered. Despite these differences, there are some features that make the islands "insular", described as "insularity" or "islandness" (Royle, 2001; Gillis, 2004; Baldacchino, 2004; Armstrong & Read, 2006), composed of "objective" characteristics such as small size (land area and population) and isolation – remoteness and a non-measurable but distinctive "experiential identity" (Baldacchino, 2004; Gillis, 2004). Small size and isolation are key factors in considering island accessibility. If in continental areas, private transport, at least in theory, can cover for the absence of public transportation, the geographical discontinuity of space on islands (Baldacchino, 2007) makes this alternative unavailable. The fact that most European islands are located in the geographical periphery of Europe results in low levels of accessibility, especially for smaller ones that do not or cannot have an air service, and so can only be accessed by sea.

The question that we want to address with this paper is to determine whether "conventional" measurements of accessibility that are routinely used in mainland areas are adequate for islands, especially from an islander (and not visitor) point of view.

The islanders' point of view (Baldacchino, 2004; Péron, 2004) adds more layers to the discussion on accessibility. Most "conventional" approaches to accessibility issues (e.g. ESPON, 2006; Bruinsma & Rietveld, 1998; Farrington & Farrington, 2005; Geurs & van Wee, 2004; Gutierrez & Urban, 1996) use variables such as the means of transportation and the time required to access a destination. Including and appreciating the islanders' point of view adds factors such as the excessive or total dependence on public transportation compared to mainland areas; the cost of travel to and away from an island; the availability of connections to access services required to cover the needs of residents that may not be available locally; the different destinations where these services may be available; and the availability of overnight return from these destinations (Royle, 2001). Conventional measures of accessibility do not typically consider such issues, nor do they address them adequately (CRPM, 2002). The largely a-spatial approach that most such measures employ is one of the reasons for considering islands as different from larger scale, urban, transportation infrastructure. Another reason is that in most of these measures the frequency of the actual public transportation is not considered at all and accessibility is calculated as if all transportation is available any time of any day of the week (Farrington, 2007), a fact that simply is not true for islands (CRPM, 2002). For islands, if a service is not provided *on* the island, the cost and the time required to access it is disproportionably high compared to that on the mainland. The issue of higher costs of ferry trips compared to public or private transport costs in the mainland has to be considered as well.

A typical and characteristic example is the multimodal accessibility index (MAI) that is used to calculate the accessibility of towns of the EU from a perceived European centre with the use of terrestrial (train, road) and air travel -but not sea travel- on the basis of the presence or not of terminals or the geographical distance from the terminal, if that is not available (ESPON,

2006). The point of spatial reference is NUTS 3 regions[2] and the approach relies much on accessibility by air (which determines as much as 90% of the overall multimodal accessibility) and does not consider discontinuities of space. For example, an airport or a rail station off an island is considered as accessible for the inhabitants of the island exactly as that in an area in the mainland with the same geographical distance. Therefore, island related realities such as the additional time needed to get to an island by ship, or the fact that islands do not have railway networks are not taken into account. Moreover, the daily accessibility *from* the island (for work, health, shopping, business, administrative affairs, education, training or entertainment) is not taken into account, neither are the higher costs of ferry trips. Finally, analysis at the NUTS 3 level in archipelagos concerns only the main island where the airport and the main port are located and does not address the reality of multiple peripherality of any smaller islands. Such cases for smaller islands are not easily comparable to any situation on the mainland.

These issues were recognized by approaches made specifically for islands (e.g. CRPM, 2002; Lekakou & Vitsounis, 2011) that employ a "straightforward description of accessibility" (*ibid*.: 77), that is, that consider accessibility as a feature of human perception of space, and take into account the frequency of trips and the weighted travel time of ship crossings.

In this paper, we seek to shed some light on the accessibility problems that islands face from the point of view of island residents. This point of view includes the different destinations that island residents may have to travel in order to have access to a number of vital services, including factors such as the type of available transportation, the frequency of connections and the cost in time and money that this access may involve. This approach does not differentiate between the residents of the islands, effectively considering them all as members of the same, relatively uniform, social group. This does not imply that all island residents have the same needs towards services, but the case of islands is indeed a special case in comparison to the case of the mainland, since accessibility defines and determines to a large degree how island residents can take part "in activities normal for that society" (Farrington, 2007: 320). An alternative measure of accessibility is proposed, based on already existing approaches (CRPM, 2002) that will be applied to three different islands: the small islands of Lipsi and Serifos (the first in the Dodecanese archipelago and the second in the Cyclades archipelago) and the medium size island of Kalymnos (also in the Dodecanese), all located in the Aegean Sea, and part of Greece. The accessibility of the residents of these islands to selected services is compared with that of settlements in mainland Greece of similar population and distance to the capital Athens.

Methods and Data

The case study areas

The Aegean Islands occupy a space defined by the Island of Crete in the south, mainland Greece in the north and west and mainland Turkey in the east, a total of 210,240 km^2. A

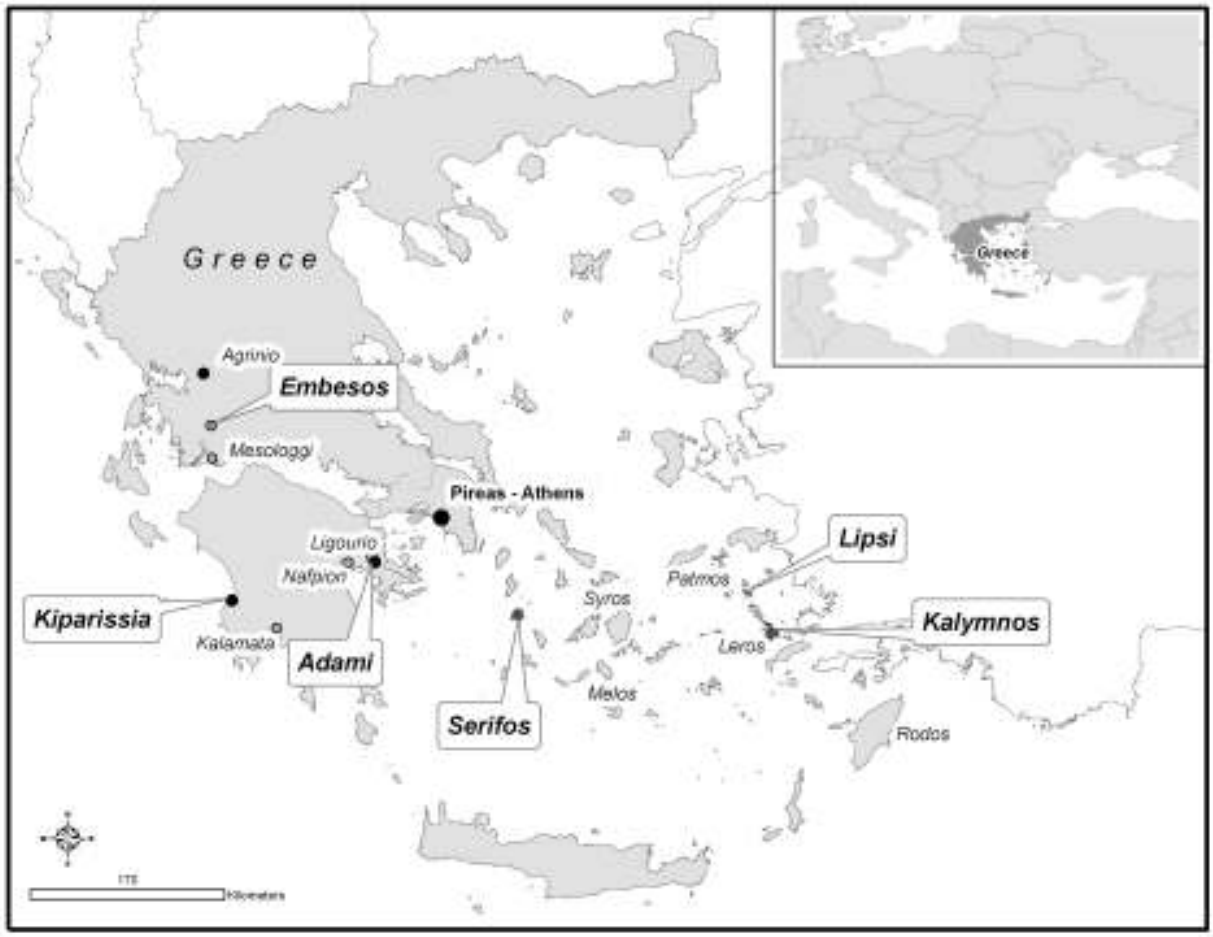
[2] The NUTS nomenclature corresponds to administrative units in the EU: NUTS 0 is the EU, NUTS 1 the Member States; NUTS 2 the Regions and NUTS 3 smaller administrative units that correspond to different national levels for each Member State.

complex of 2,800 islands (including rocky islets), out of a total of 3,053, are in the Greek state (the remaining 253 are in Turkey), out of which more than 70 are inhabited by some 500,000 people excluding Crete. They are very diverse in terms of land area and population, with some 340,000 people living on the five bigger islands (Lesvos, Rodos, Samos, Hios and Lemnos).

The selection of the case study areas for islands is based on two factors related to each other. The first refers to the connectivity of islands to the capital of Greece, Athens and its port Pireas, since the transport system of the Aegean islands is very centralized and many locals consider the link with Pireas as an important "quality" indicator of the connection of the island. The different options that are observed include three options for ferry links: (a) daily ferry connection with Pireas; (b) 2-5 links per week with Pireas; and (c) no direct link with Pireas. The options also include three for air connection: (a) daily connection with Athens and/or Thessaloniki; (b) 2-3 times per week and (c) no connection for those islands with no airports (15 islands have airports excluding Crete). The second refers to the size of the population of the island, correlated with its area size as well. The PLANISTAT study (2002) finding was used that a population of 4 to 5 thousand people consists a key threshold for the provision of an important part of services locally, but there are "superior services" (e.g. hospitals, tertiary education, cinemas, etc.) that are located only in a big regional city or in the capital of the country. Since the goal of the paper is to discuss accessibility to services, bigger islands that can sustain by definition a number of key services locally due to their population and area size were excluded. Size and connectivity are related, especially for smaller islands, as all islands with no direct link with Pireas or few weekly links are small or very small ones. Another reason for not considering big islands such as Lesvos (90,000 people) and Hios (40,000 people) is that their size creates very important internal differences in accessibility to services, while all these case studies can be considered if not a single point in space, very homogenous internally.

The final selection of case study islands combined size and accessibility: Lipsi is a small island (15.9 km^2) with 696 inhabitants in one settlement, at a distance of 283 km from Pireas and not directly linked with it. Serifos is a small to medium sized island (73.23 km^2) with 1,414 inhabitants, most living in the settlements of Chora and nearby Livadi and four other settlements, located 119 km from Pireas and linked directly with it 5 times a week. Kalymnos is a medium sized island by Aegean island standards (110.8 km^2) with 16,000 inhabitants, most living in the main settlement, at a distance of 315 km from Pireas and linked 2-5 times a week with Pireas. Kalymnos also and has an airport with 2-4 links with Athens. Lipsi and Serifos cover the lowest categories of connectivity and size and Kalymnos serves as a basis for comparisons with smaller islands. These three cases are not representative of the wide variety of cases within the Aegean islands archipelago, as each island presents its own peculiarities related with size, location, nearby islands, etc., but they can be considered as indicative cases.

Figure 1: Location of the Case Study Areas and Other Places Mentioned in the Text.



The selection of the mainland areas was more complicated and there were three different issues that were taken into account: (a) the geographical distance from Pireas/Athens, although here distance is different from that of sea travel, since land travel uses existing road networks; (b) the distance from local population and services centres (typically NUTS III capitals), as very proximate settlements to these areas tend to have only the most basic services available locally while remote ones tend to have more and this can distort findings; and (c) the population size of the settlement. Embesos (compared with Lipsi) is a small village in Etoloakarnania with 615 inhabitants, 55 km from the local urban centre of Agrinion and 334 km from Athens. Adami is a small village near Nafplio (North East Peloponnese) of 410 inhabitants, 138 km from Athens and is compared to Serifos, although of smaller size, since it forms a comparable network with nearby small settlements. Finally, Kiparissia is a town in Messinia (South West Peloponnese) of 8,648 inhabitants, 263 km from Athens and is compared to Kalymnos. The selected areas are not considered identical to the island ones and not representative of the wide variety of cases that could be selected, just indicative cases that can provide a basis for comparisons.

Quality of life services

The analysis of services and the needs of people towards them can be divided broadly into two: business administration, which relates services to the 'consumer' and his/her needs; and how businesses and states can respond. According to Schneider & White (2004), some of the commonly used classifications compatible with the approach used here include that of Lovelock (1983) who places services along two dimensions: who or what is the direct recipient of the service (people or things) and what is the nature of the service act (tangible and intangible), ending in four different categories. He enriched his analysis by adding two more questions on the nature of services: whether the "customer" needs to be physically present throughout the delivery, only to initiate or terminate the act or not at all; and if the "customer" needs to be mentally present (Schneider & White, 2004: 72-3). The other line of analysis is that of economic geography, from more 'classical' texts to the new economic geography. Daniels (2006), Bryson & Daniels (2007) and especially Wood & Roberts (2011) provide a review of the literature and offer some of the standard classifications into 'basic' and other services, although what these 'basic' services are differs widely, depending on the type of context they refer to (national, regional, urban/rural). Moreover, a substantial corpus of literature by such international organizations as UNESCO and the World Bank deals with such 'basic' services as targeted to children, the poor, immigrants, and other groups.

The selection of the services that are assessed was quite complex, for three main reasons: (a) public services or services of public interest (that may or may not be provided by the state) have to be included along with private ones, although national and regional cases are very diverse to what is considered as public and private; (b) the basic goal of the paper is to estimate how often a resident of an island has to travel off the island to access a service or the degree to which the service is "get-at-able" (Farrington, 2007) and this requires a classification of the frequency of use of these services; (c) some of the services are provided individually by shops or public bodies and others are or can be provided in groups in the same shop. An example would be the service "electric appliances" which includes all kind of appliances and "basic administration" which includes all types of services and documents provided by local administration to residents. At the same time, official classifications of services may be like the one that EUROSTAT uses and considers only broad categories of services or like the one in Greece for tax reasons that goes into detail to cover all possible cases, but at the same time it is not detailed enough. To illustrate, in the Greek tax system, plumbers, carpenters and electricians fall in the same occupation category. Therefore, the final selection was in a large degree *ad hoc* for the Greek administrative context and it is not exhaustive. The approach followed is that of the last type according to Preston & Rajé (2007): the overall accessibility of the area and not individual mobility, although obviously some of the residents of the islands have to travel more frequently for specific services, e.g. high school students on an island with no such service, or elderly residents to higher level health services. The reason for this choice is to compare the overall or "average" accessibility of islands and not that of social groups within them. We took into account the questions set by Schneider & White (2004) on the tangible or intangible services and assumed that, for most of the services, the presence of the "customer", in our case the islander, is required where the service is provided.

Overall, 44 different services were included and classified into three types according to the frequency of their local use. The first is *Basic services*, covering everyday needs of the

residents and including 17 different services, some of public interest such as banks, basic administration (including all basic services provided by local administration), doctors, post offices, pharmacies and primary schools, some provided by public and other by private vendors (pharmacies and banks) and other private services such as bakeries, food (mini markets and meat providers), car services, carpenters, electricians, gas stations, hairdressers, nurses, plumbers and tobacco sellers. Some of these private services can be obtained in the same shop (e.g. food, meat and tobacco), but not always. The second is *Intermediate services*, covering needs that are important but not on an everyday basis, in total 21 different services, 10 of public interest: regional administration, agriculture bureau (that also manages Common Agricultural Policy subsidies), Court 1st degree, fire service, health centre, high school, notary, police, tax service and town planning bureau (that issues building permits). The 11 private services include: book stores, clothing, dentists, electrical appliances, furniture, home products, physiotherapists, shoes, sports and supermarkets. The third is *Higher level services*, covering five less frequent needs, such as veterinary services hospitals, universities, second degree courts, medical exam laboratories and cinemas. Table 1 provides an overview of all the services included. Local informants were consulted on the frequency and some changes were made according to their remarks, placing services such as meat providers from the intermediate to the basic services category.

The accessibility of services approach

Accessibility to a number of key services for the residents of the case study islands and the areas used for comparison is estimated here with the use of the real time needed to access the port (or the town for mainland areas) where this service is available, via public transportation only (ferry boat or bus). The calculation is performed on a weekly basis, as public timetables are typically formulated on that basis. The variables used for the calculation are the frequency of connections between these points, travel time, standard waiting time at a port (or a bus terminal) and possible intermediate ports between the two points and is adapted from CRPM (2002). The formula for calculating total travel time is given in equation (1):

$$TT = RT + BT + WT + (P * 168/N) \quad (1)$$

Where:

- TT stands for the Total Time in hours;
- RT stands for the Real Travel Time between the port (or the town for mainland areas) and the destination in hr and includes the total travel time for all possible stops of the ferry/ferries (or the bus/buses), as many as may be required to complete the journey;
- BT stands for Boarding Time in hr (i.e. time required to be in the port or bus station in order to get on ferry or bus. It is set at 2hr for major ports, 1hr for smaller ones and 0.1hr for buses);
- WT stands for possible Waiting Time if the total trip includes a change of ferries in a port (or buses) in hr;
- P stands for the Probability to catch the ferry or the bus: If there is one daily connection then there is a possibility of having to spend 12 hours ashore (or in the bus terminal) on average and p= 12/24= 0.5, for 2 daily connections p= 6/24=0.25, for 3 daily connections p=4/24=0.17, and for 4, p=2/24=0.08;
- N stands for the frequency of weekly connections between the departure and the destination points; and 168 are the hours in a week (7 x 24 hr).

This index presents some important advantages and some drawbacks. The most important advantage is that it takes into account the frequency of connections and can be used to reveal seasonal differences of accessibility for the same island or group of islands. Another important advantage is that it is flexible and can be calculated for separate islands or for groups of islands with some assumptions. It can also be calculated for the same island via different ports. The weekly basis that is used for the calculation of connections and frequencies reflects the reality of sea travel that is scheduled on this basis. Daily averages of the week schedule are meaningless.

Its disadvantages include the fact that the quality and capacity of ferry boats is not included in the index and this can be of great importance. Additionally, other means of transportation such as aircrafts or speed boats are not included, but since generally the islands with higher frequencies and more connections are anyway bigger islands which typically also have airports and are serviced by high-speed boats, comparisons for all islands can be performed only for "conventional" ferries. Finally, the issue of travel costs is not considered in the index, because of the different prices between seasons and ferry companies for the islands.

The data for the calculation of the index for the list of the services of Table 1 were collected during face to face interviews with local administrators. These were typically the mayors, but also other workers in the local Municipality, six in total, three for the islands and three for continental areas. The frequency of ferry boats with each of the destinations mentioned was taken from www.gtp.gr.

Findings

The residents of all case study islands have all the services considered as basic available locally. On the contrary, in two of the three mainland areas, many of the basic services are available at a small or great distance (Table 1). Almost all intermediate services are available locally in the biggest settlements (Kalymnos and Kiparissia) and the same is true for almost all higher level services. The difference in smaller settlements is related to where intermediate and higher level services are available. Serifos, because of its relative proximity to Athens, but mostly because of the frequent connection with Pireas, appears to be almost entirely dependent on Athens for many private services and from other islands for many public services. The same seems to be true for Embesos and Adami: Embesos is dependent from Agrinio and Adami from Ligourio, but with an important difference compared to the islands. The accessibility of these services is easier for both of these towns compared to Serifos to a greater and Lipsi to a smaller degree.

Table 1: Services available to Residents of the Case Study Areas.

Services group	Services (in alphabetical order)	Lipsi (distances in km): Leros 20, Patmos 18, Kalymnos 39, Rodos 160, Athens 283.	Embesos (distances in km): Agrinio 55, Mesologgi 75, Athens 334.	Kalimnos (distances in km): Rodos 125, Athens 315.	Kiparissia (distances in km): Kalamata 51, Athens 263.	Serifos (distances in km): Melos 49, Syros 50, Athens 119.	Adami (distances in km): Ligourio 7, Nafpio 34, Athens 138.
	Bakery	0	0	0	0	0	0
	Bank	0	Agrinio	0	0	0	Ligourio
	Basic administration	0	Agrinio	0	0	0	Ligourio
	Butcher	0	0	0	0	0	0
	Car service	0	0	0	0	0	0
	Carpenter	0	0	0	0	0	0
	Doctor	0	0	0	0	0	Ligourio
	Electrician	0	0	0	0	0	0
	Food (mini-market)	0	0	0	0	0	0
	Food (restaurant)	0	0	0	0	0	0
	Gas/Petrol station	0	0	0	0	0	0
	Hairdresser	0	0	0	0	0	0
	Nurse	0	0	0	0	0	0
	Pharmacy	0	0	0	0	0	Ligourio
	Plumper	0	0	0	0	0	0
	Post office	0	Agrinio	0	0	0	Ligourio
	Primary school	0	0	0	0	0	Ligourio
Intermediate services	Tobacco	0	0	0	0	0	0
	Administration	Kalymnos	Mesologgi	0		Syros	Nafplio
	Agriculture bureau	Rodos	Agrinio	0		Melos	Nafplio
	Book store	0	Agrinio	0	0	Athens	Ligourio
	Clothing	0	Agrinio	0	0	Athens	Ligourio
	Court 1st degree	Patmos	Agrinio	0	Kalamata	Serifos, Syros	Nafplio
	Dentist	0	Agrinio	0	0	Athens	Ligourio
	Electrical appliances	0	Agrinio	0	0	Athens	Ligourio
	Fire service	0	Agrinio	0	0	Syros	Nafplio
	Furniture	Athens	Agrinio	0	0	Athens	0
	Health centre	0	0	0	0	Melos	Ligourio
	High school	0	0	0	0	0	Ligourio
	Home products	0	Agrinio	0	0	Athens	Ligourio
	Notary	Leros	Agrinio	0	0	0	Ligourio
	Physiotherapist	Leros	Agrinio	0	0	Athens	Ligourio
	Police	0	0	0	0	0	Ligourio
	Shoes	0	Agrinio	0	0	Athens	Ligourio
	Sports	0	Agrinio	0	0	Athens	Ligourio
	Supermarket	0	0	0	0	Athens	Ligourio
	Tax service	Leros	Agrinio	0	0	Melos	Nafplio
	Town planning unit	Kalymnos	Agrinio	0	0	Melos	Nafplio
Higher services	Veterinary	Leros	0	0	0	Athens	Ligourio
	Cinema - theatre	Patmos	Agrinio	0	0	Syros	Ligourio
	Court 2nd degree	Rodos	Agrinio	Rodos	Kalamata	Syros	Nafplio
	Hospital	Leros	Agrinio	0	0	Syros, Athens	Nafplio
	Medical exams	0	0	0	0	Syros, Athens	Ligourio
	University	Rodos, Athens	Athens	Rodos,Athens	Kalamata,Athens	Syros,Athens	Athens

Table 2: Type of Services Available per Destination and Accessibility of Destinations for the Case Study Areas, 2009.

Departure point	Destination	Services available at destination	Distance (km)	Total Time (hr)	Km per hr	Overnight return (weekly connections)
Lipsi	**Leros**	Veterinary, Notary, Tax service, Physiotherapist, Hospital	20	13.3	1.5	Yes (7)
	Patmos	Court 1st degree, Cinema	18.1	12.6	1.4	Yes (7)
	Kalymnos	Administration, Town planning bureau	39	14.5	2.7	No (7)
	Rhodes	Court 2nd degree, University	160	20.4	7.9	No (1)
	Pireas (Athens)	Furniture University	283	38.3	7.4	No (1)
Embesos	**Agrinio**	Basic administration, Post office, Bank, Sports, Police, Book store, Agriculture bureau, Court 1st & 2nd degree, Home stores, Clothing, Furniture, Tax service, Electric appliances, Dentist, Town planning unit, Fire service, Notary, Shoes, Physiotherapist, Hospital, Medical exams, Cinema, University	60	1.6	36.7	Yes (49)
	Mesologgi	Administration	95	2.6	36.3	Yes (49)
	Athens	University	334	10.1	33.1	No
Kalimnos	**Rhodes**	Court 2nd degree University	121	32.6	3.7	No (2)
	Pireas (Athens)	University	315	31.5	10.0	No (2)
Kiparissia	**Kalamata**	Court 2nd degree University	68	3.9	17.3	Yes (49)
	Athens	University	263	10.1	26.0	No
Serifos	**Melos**	Town planning bureau, Agriculture bureau, Tax service, Health center	52	19.2	2.7	Yes, some days (14)
	Syros	Administration, Court 1st degree, Fire service, Court 2nd degree, Medical exams, Hospital, University	50	30.8	1.6	No (3)
	Pireas (Athens)	Sports, Book store, Home stores, Clothing, Electric appliances, Furniture, Dentist, Super market, Shoes, Physiotherapist, Veterinary	119	21.2	5.6	No (14)
Adami	**Ligourio**	Basic administration, Doctor, Primary school, Post office, Bank, Pharmacy, Police, High school, Book store, Home stores, Clothing, Electric appliances, Health center, Veterinary, Dentist, Notary, Shoes, Physiotherapist, Medical exams, Cinema	7	1.5	4.6	Yes (35)
	Nafplio	Administration, Agriculture bureau, Court 1st & 2nd degree, Tax service, Town planning bureau, Fire service, Hospital, Medical exams, University	34	1.8	19.2	Yes (35)
	Athens	University	138	8.1	17.0	No

The case of Lispi requires some explanation. Even though it is a small island (half the population of Serifos), there are two reasons why it appears to be more self-sufficient than Serifos. The first has to do with the location of the two islands: Lipsi is more remote from mainland Greece or other big islands and not immediately linked to a bigger centre. Serifos, in contrast, is close to Pireas – Athens; and therefore more services have to be available locally, even if many of them are not of the same magnitude, range or quality as those provided in Athens, Rhodes or even Kalymnos. The second refers to the efforts by local government to stem the out-migration of the island's population by providing more services locally as well as daily transportation to Leros and Patmos for those services (public and private) not available on the island.

The total travel time to the destinations where many of the services are available is striking for all islands, especially when they are compared with the ones for mainland settlements. Even though a typical speed for a ferry in the Aegean is 20 knots or 29.7 km/hr, the speed calculated with the actual distance and the total travel time required to reach the destinations is never higher that 10 km/hr (Table 2). This rate for going to Leros and Patmos from Lipsi is 24 times higher than the corresponding rates for going to Agrinio from Embesos, and similar differences are found between Kiparissia and Kalymnos, and Serifos and Adami, (Table 2). The example of Lipsi is revealing: from the islander's point of view, the island is more isolated than the geographical distance indicates. The total travel time of 38.3 hr brings Athens in the bay of Naples in Italy with the average ferry speed of 29.7 km/hr, and the 20.4 hr trip to Rhodes as if it was located between Crete and Cyprus. Another important issue refers to the possibility of overnight trips to obtain many of these services (Table 2). The possibility to return overnight makes a service much more attractive and "get-at-able" than the alternative, to have to spend the night where the service is provided. This is another very important difference between islands and mainland areas, as the type of transport available and the low frequencies and travel speed for islands make overnight trips rare. Only from Lispi to Leros or Patmos is such an opportunity available, and this is mostly due to the efforts of local administration that finances these trips. Linked with this issue is the type of service available with non overnight trips. One may travel to get to a hospital if he/she may have to spend the night there, but never for cinema, another service unavailable to smaller islands. This practically means that these services are not available at all to island residents. Although cost is not considered here as direct comparisons are not easy, costs are higher with ferries than with buses or private transportation, especially when a vehicle is transported as well.

Discussion

In this paper, we have attempted to highlight some of the accessibility issues of small islands by comparing them to similar mainland settlements in the Aegean archipelago. The findings are indicative as each island has its own particularities concerning its distance from mainland Greece, integration into ferry lines (some islands may benefit from the fact that they are on the line of bigger islands), links with nearby islands, etc. At the same time, comparing islands with mainland settlements has also its own limitations, as the fundamental insularity principle, fragmented and discontinuous space, is not directly comparable in land. But, within these limitations, the findings indicate and quantify some very important differences.

For the first of these, in the literature on accessibility services are usually linked with certain social groups (e.g. Preston & Rajé, 2007; Farrington & Farrington, 2005). In this paper, we wanted to focus on the degree to which a number of services that constitute an important part of the quality of life are "get-at-able" (Farrington, 2007: 320) for residents of small and medium size islands. Since insular space is by definition discontinuous, our approach assumes a necessarily dichotomous nature of accessibility to these services as its departure point, since on an island a service is either present or absent. But, although many of the services discussed are not available locally in the small mainland settlements, while they are available on the corresponding islands, accessibility to these services differs always in favour of mainland areas when comparing available public transport choices. The situation is even more skewed when - as our local informants assert- private transport and taxis are taken into account, very common options for locals in the mainland, but unavailable for islands. In this sense, residents of islands have to face more complex choices and are restricted to public transport only. This is a qualitative difference as well, since on islands most of these trips to other destinations in order to cover different needs are independent of each other and cannot be combined. For example, if someone travels to Rodos from Lipsi, he/she will have to take another ferry to Athens, which may not be on the same day.

As expected, size is important for the provision of both public and private services for islands and mainland areas (Nutley, 1980). However, the population size for the local provision of services is smaller for islands than for mainland areas as a direct consequence of insularity (Armstrong & Read, 2006). Since everyday transportation is not available, many services are provided locally even if their quality or variety may not always satisfy local needs. Therefore, the increase of the availability of intermediate services locally in bigger mainland settlements is unsurprising, since the size of the population justifies the provision of private services (selling furniture, electric appliances, home products, physiotherapy services) and the existence of public services (tax office, town planning). Establishing and maintaining such services in areas where the level of population is lower than the threshold for its "spontaneous" emergence raises the cost for both private and public services. For public services, a revealing example is provided by ESPON (2011) for Notio Aigaio Region (40 inhabited islands). If all its population was living on one island, a maximum of three ports would be sufficient, while now there are 50, along with 14 airports instead of one, 21 power production plants instead of one, five hospitals instead of one, 90 primary schools instead of 211, 35 waste water treatment units instead of eight, and so on.

The differences between Serifos and Lipsi for basic and intermediate level services demonstrate the possibility of local and small scale governance initiatives to improve the provision of, or the accessibility to, services. This may be the result of necessity, since the island is small and remote, but many small islands in the area have not been able to follow the example of Lipsi.

One of the most important issues is that the availability of many services at a particular location does not mean that island (or mainland) residents will use them, as the quality of service also matters (Preston & Rajé, 2007 raise the issue for non-island populations). During the interviews in the islands, it was mentioned to us that "well, you can find [the service] there,

but we usually go [to a bigger island or more often Athens]". The quality of services is perhaps as important an issue as the availability of choice. Although for most of the services discussed the physical presence in the area remains necessary, another issue refers to the growing resort to electronic/ on-line service provision on islands, most of which are public services, such as the management of tax records and in general dealings with the tax service or private services, such as ferry and plain tickets and travel management in general.

Finally, within the approach employed here, island residents are considered as relatively homogenous and having similar service needs. Obviously, the elderly in Lipsi (for instance) have a different 'feel' for the existence of a pharmacy, a doctor and access to a hospital than that of the teenagers living there; but the dichotomous (either – or) nature of the availability of many of these services on islands causes similar accessibility 'experiences' for both groups (Farrington, 2007). And so, when residents in island settlements are compared to those in mainland settlements that are similar in terms of population and distance from basic service providers, the islanders' internal differences become much less significant; they can be plausibly considered as one group, mostly due to the permanent influence of insularity and its consequences.

Conclusion

What is the 'real' distance between two points in time? Geographical distance measures how "far" or "close" two places are located; but this is not sufficient to estimate the complexities of accessing a place. As the above findings demonstrate, geographical distance only partially determines accessibility for small islands. The choice of transport is anyway limited to public transport at determined frequencies with much higher transport time (and cost). Moreover, different services are located at different destinations. Combined with the inability to return overnight from many of these destinations, many days may be required to go and return from a trip. The geography for these residents of smaller islands seems therefore very different from that of a 'conventional' map; space contracts or subtracts according to these factors.

In this paper, we have attempted to explore some issues that reflect the everyday life of people living on islands. The approach has revealed some of the differences between islands and comparable mainland areas, but more research is required beyond our exploratory findings. This is the result of the largely *ad hoc* selection of the services investigated and the fact that costs and the quality of the services are not considered. Moreover, some other aspects that influence this geography (such as personal choices and family ties with different places) are not covered by the approach followed here. All these open up new possibilities for further research that could enrich the findings discussed in this paper.

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