

S O C I A L E C O L O G Y W O R K I N G P A P E R 1 4 2

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Exploring local opportunities and barriers for a sustainability transition on a Greek island

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Abstract

Since 2007, the Institute of Social Ecology (SEC) has been conducting socioecological research on the Greek island of Samothraki. Because research is not the only aim, the institute is simultaneously supporting the local population in a process of placing the island on a path towards a sustainable future by “transforming” it into a UNESCO Biosphere Reserve. Based on our research, administrative efforts and networking work, an application signed by the Mayor and unanimously supported by the municipal council has been submitted by the Greek National MAB committee to UNESCO. The application, currently under review, points at including Samothraki in the World Network of Biosphere Reserves.

Within this framework, in October 2012, we organized a 1-week student excursion to the island of Samothraki¹ during a crucial phase of the official application process. The objectives of the course were manifold: to (a) expose students to sustainability and development challenges in a local setting seen from the perspective of social ecology, (b) reflect and engage in the design of a management plan to include initial project ideas for the new Biosphere Reserve, such as sustainable tourism, land use, water, waste and energy systems, and (c) allow for the experience of a transdisciplinary research process by learning to interact with stakeholders and conduct interviews in a culturally challenging environment.

Methodologically, during the excursion two main approaches were pursued: (a) focus group interviews with local stakeholders (such as fishermen, farmers, local professionals, elderly people in need of care etc.) in order to explore alternative visions for the future of the island and (b) distance sampling methods in order to estimate livestock densities in different area types. This was performed in order to assess the pressing problem of erosion and biodiversity loss due to overgrazing. The aim of the working paper is to provide insight into these methodological approaches and the outcome of research conducted during the course, while reflecting on some of the challenges encountered in this transdisciplinary process and those that might still arise.

¹ As part of the course “Sustainable island – Excursion to a local research site”.

1. Introduction

1.1 Samothraki's natural and cultural assets

The island of Samothraki is among the rare remaining examples of natural island beauty within the Greek Aegean archipelago. It is situated at the Northeastern point of the Aegean Sea, very close to the border with Turkey and not far from the mouth of the Dardanelles Strait (fig. 1), on the route from the Black Sea to the Mediterranean. It has been inhabited since prehistoric times, as proven by the numerous prehistoric sites dating back to 6,000 BC. From the 5th century BC until 400 AD, Samothraki was famed as a spiritual centre devoted to the cult of Kaveiria mysteries. During Byzantine and Ottoman times the island played an important role in maritime trade, the evidence of which can still be found in the picturesque remains of towers and fortifications. In the 19th century, Samothraki was forcefully depopulated by the Ottoman army and in 1912, it became part of the modern Greek state.

A large part of the island's total surface area of about 178 km² is mountainous, owing to volcanic origin, with the highest peak rising up to 1,611 m. About three quarters of its total surface area, covering most of the mountain part together with a large marine area, is included in the Natura 2000 network². Due to the orientation of the mountain range, a wet microclimate exists on the north side, with numerous streams coming down from the mountain, forming hundreds of waterfalls and scenic freshwater ponds. Lush vegetation shaded by century-old oriental plane trees reaches down to the beaches. The southern and western sides are typically Mediterranean in terms of climate and vegetation, and agriculture dominates the landscape. The specific geographic and climatic features of Samothraki contribute to the rich diversity of habitats, which can be found on the island. The various terrestrial and marine habitats accommodate a high number of different plant and animal species including, among others, eight endemic species and the last remaining old growth oak forests among the Aegean Islands (Chanos and Scoullou 2011). The hydrographic network is extensive. There are numerous rivers, streams and springs coming down the mountain, most of which have water all year round. Due to tectonic trenches, there are also thermal water springs that, since antiquity, have been renowned for their health benefits.

The very early human presence on the island, since early history, has created cultural landscapes in the lowland accessible areas, with traditional settlements, olive tree groves and grain cultivations that diffuse within the natural landscapes. In addition, there are several cultural conservation sites, such as the capital town Chora, and the magnificent "Sanctuary of the Great Gods", a large sanctuary of pre-Greek origin that was a place of worship devoted to the Kaveiria mysteries and the origin of the famous Nike of Samothraki exhibited in the Louvre. These natural and cultural values that make Samothraki special were fortunately kept largely intact over the years and can provide the baseline for the path of the island towards a sustainable future (Petridis 2012).

² An EU-wide network of nature protection areas (for an interactive map, look at <http://natura2000.eea.europa.eu>).

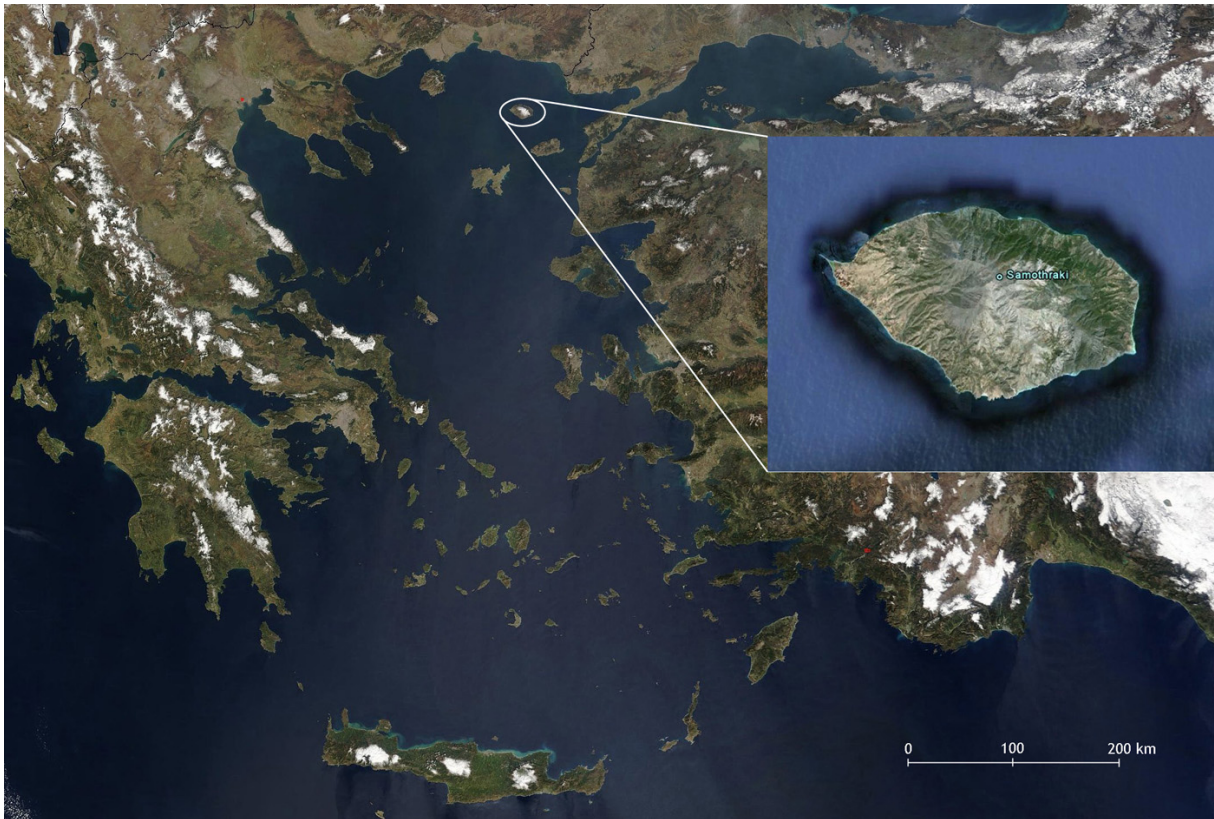


Figure 1: The location of Samothraki in the NE Aegean Sea, Greece © NASA, courtesy of nasaimages.org, 2003

1.2 Socio-economic features

The current permanent population is measured at 2,840 inhabitants (2011 census) with a low population density (15 persons/km²), a number that more than triples during the peak tourist season. In contrast to the Greek average of around 12.5% (National Statistical Service of Greece 2012) the number of people working in the primary sector on Samothraki (agriculture, fisheries and animal husbandry) is 45 % of the active population, and is very high. The income of these farmers is highly dependent on EU Agricultural Subsidies from the Common Agricultural Policy (CAP), and is mostly expended in the livestock sector. Such financial support has led to a sharp increase in livestock numbers (Fischer-Kowalski et al. 2011). Employing 12% of the working people on the island, the secondary sector consists mainly of a creamery, a wheat mill, a winery and some construction activity. The tertiary sector, with 40% of the workforce, is engaged mostly in tourism services and is the second largest sector after agriculture. The resident population appears therefore rather polarised. On one side, there is a group of less educated middle-aged males, mostly working in the primary sector, highly dependent on financial support and with little contact to outsiders. On the other side, there is a group of younger, more educated residents working in the service sector and directly or indirectly dependent on tourism (cf. *ibid.*).

An estimated amount of 27,000 tourists, whom are predominantly of Greek origin, visit the island per year. Due to its remote location, as well as the lack of sandy beaches, the island has until now escaped mass tourism. About half of the tourists stay at campsites during their holidays and most

visitors are rather young and well educated. Half of them have travelled to Samothraki repeatedly, and more than 90% declared an intention to come back in the future (Fischer-Kowalski et al. 2011). Such an attached tourist population is an important asset for the island. Results from a willingness-to-pay survey amongst visitors showed that almost 90% of respondents were willing to pay a “green” fee of 2€ or more every time they visit the island to accommodate for environmental concessions. The financial turnover from tourism is significant. Based on our visitor survey and interviews, we estimate the average daily expenditures per visitor at 37 to 46 Euro. Annually, visitors spend 16 to 20 million Euro on the island (own estimates). Although the campers spend half as much per day as those who stay in hotels, the overall contribution of both groups is nearly the same, mainly because campers, on average, stay longer. In this sense, campers are highly relevant for the local economy while exerting the least environmental pressure in terms of infrastructure demands.

Box 1: UNESCO’s Biosphere Reserve on Samothraki

UNESCO’s Man and Biosphere (MAB) Programme is an intergovernmental scientific programme striving for the improvement of the relationship between people and their environment. The Biosphere Reserve concept started by a Task Force of UNESCO's Man and the Biosphere (MAB) Program in 1974 while the World Network of Biosphere Reserves (WNBR) was launched in 1976. Biosphere Reserves (BR) are areas that encompass valuable ecosystems and social communities that wish to combine the conservation of ecosystems with their sustainable use. They are nominated by national governments and remain under sovereign jurisdiction of the states where they are located, but become internationally recognized by UNESCO. This recognition is governed by two important documents: the Statutory Framework of Biosphere Reserves and the Seville Strategy of Biosphere Reserves (UNESCO 1996). BRs form a World Network under the protection of UNESCO. Within this network, exchange of information, experience and personnel are facilitated. At present, 610 BRs exist in 117 countries, including 12 transboundary sites (UNESCO 2012). UNESCO likes to view BRs as a vast natural global laboratory, where nature conservation is combined with environmental monitoring, training, demonstration, local participation, and sustainable development. Every BR follows a zoning scheme according to local land use and protection status. Three zones are distinguished: a core area which strictly conserves minimally disturbed ecosystems, a buffer zone which surrounds the core and finally a transition zone which allows socio-economic utilization of ecosystems like tourism or agriculture, as long as they follow sustainable pathways.

The idea of transforming Samothraki into a Biosphere Reserve started as a bottom-up process, initiated by a regular visitor of the island. The idea was then gradually transmitted to local stakeholders. This was followed by several years of research, investigating the socio-economic feasibility as well as the opinions of the different stakeholders towards the potential future development of the island (Fischer-Kowalski et al. 2011). The application form required from UNESCO was prepared by the research team in collaboration with local stakeholders, and unanimously supported by the Mayor and the municipal council. The application was submitted by the Greek National MAB committee to UNESCO in 2011 and is currently under review.

1.3 Social and ecological challenges and opportunities

Within the past 20 years, there has been exponential growth in the number of sheep and semi-wild goats roaming particularly in the eastern and northern parts of the island, a fact that is strongly enhanced by the agricultural policies of the European Union. According to latest estimations, based on slaughtering statistics, the number of domestic and free-roaming goats and sheep totals around

60-80,000 (Greek Ministry of Agriculture 2008). Overgrazing, coupled with the steepness of the terrain has led to dramatic levels of soil erosion, also occurring within the Natura 2000 area and posing a major threat to its conservation goals, as well as causing destruction of the roads. Illegal logging and collection of firewood from the forests has led to further erosion and deterioration of state of the forests and their regenerative capacity. The prospect of CAP subsidies financing the keeping of goats irrespective of their effective utilization ceasing with the upcoming revision of the CAP in 2014, even if eventually not even realised, may force farmers to become more independent from financial support and change their current practices. This could be seen as a 'fresh start' towards better utilization of livestock, i.e. reaching the same income with a substantially reduced number of animals, through marketing and innovations that would improve the value-chain of (organic) agricultural products (Petridis 2012).

The tourism sector has similar problems as all seasonal vacation destinations. On the one hand, the sector is affected by a general decrease in visitation in the offseason, but on the other, it experiences the problem of a highly concentrated tourist season of less than 2 months. Under current conditions most infrastructures on the island are being overused for a couple of months and then remain underutilized for the rest of the year. The challenge of a development towards a more sustainable form of tourism should be met by efforts to reduce the environmental burden associated with tourism while seeking to increase the local income derived from it, including the generation of more highly qualified jobs that would allow young, educated people to stay on the island and sustain their lives there. The goal then should be to identify attractions, activities, information channels and target groups to populate Samothraki with visitors at other times of the year and provide incentives for longer stay (e.g. family opportunities).

The issue of waste management in Samothraki is a very pressing one. This is especially relevant to the tourist season, in which infrastructural facilities are lagging much behind the growing demand. There is effectively no waste management plan, with waste in the past being collected and either deposited on open dumps or incinerated without control, posing a risk to both human health and the environment. All waste is currently exported to the mainland, at a significant cost to the community. Therefore, there is a need for innovative ways to reduce and manage waste, using methodological tools from the field of social metabolism.

Increasing demand for environmental services not only puts a burden on the disposal systems, but also on the supply systems. Water supply in particular is organised by both communal cisterns and ancient neighbourhood rights. While there is still an abundance of freshwater in some areas, there is a lack of water in others, and the archaic distribution system is reaching its limits, particularly if – as a consequence of climate change – winters continue to remain with little or no snow as happened in the past years. Further planning and management of tourist facilities should systematically take into account their water supply issues.

While environmental opportunities for low or even zero-emission electricity generation from renewable sources on Samothraki seem excellent, they are insufficiently utilized. The four windmills once operating on site were not maintained and have been recently removed, while solar energy collection is confined to private warm water supply and limited photovoltaic fields. Despite the fact that the demand for electricity supply is rising, the main part of the island's electricity is imported the island by submarine power cables. There is a great potential for Samothraki to becoming self-reliant

in the energy sector, following the example of neighbouring island Agios Efstratios, which might be incentivised by significantly increasing electricity prices.

An additional problem is the depleted fish stock in the Aegean Sea surrounding Samothraki, making it difficult for the local small-scale fishermen to survive. Catch in the coastal waters around the island (a traditionally abundant fishing ground) is sinking, while the seasonal demand for fish and seafood continues to rise. The recent inclusion of a large marine area in the Natura 2000 network area may open a new era of marine research and protection. The designation of a marine protected area with clear zones and fishing restrictions can help the recovery of the fish stocks, while attracting alternative adventure tourism (e.g. diving, eco-sailing) which in the long run would increase local income and can provide the incentive to maintain the pristine character of the island.

1.4 Mixed-method research

To grasp the perspectives of the stakeholders and the reach of the associated problems more holistically we chose a mixed-methods approach for our students in gathering data. First, we chose a qualitative method of focus groups with various stakeholders on the island to find out about their lives on the island, the positives and negatives, and to introduce them to and find out how they could become integrated in the UNESCO Biosphere Reserve program. Secondly, we used distance sampling, an established quantitative method involving line transects in order to come up with independent estimates of a livestock burden deemed responsible for many problems such as erosion and loss of biodiversity on the island.

Generally, mixed-methods is an approach to knowledge attempting to consider multiple viewpoints, perspectives, and positions in ways that include both qualitative and quantitative methods (Johnson et al. 2007). In this initial study we used a mixed-methods approach of quantitative and qualitative methods to complement each other. Our two methods were both performed and analysed in parallel to each other. The results of the line transects, revealing an estimate of the population of small ruminants on the island, were seen as helpful in order to confirm much of what was said in the focus groups, or in the focus group specified to farmers, to possibly contradict the fairly low population estimate given.

The method of focus groups was used here to determine initial viewpoints from local inhabitants of Samothraki on their livelihoods, ways of life and the environment surrounding them. There were seven focus groups distinguished by their socioeconomic status to get an array of perspectives. The focus group method was applied here because it allows to obtain information not just from individual interviewees, but utilize the interaction between the members of the group and what evolves from their discussion, while opening an opportunity for people who share certain interests to jointly search for solutions for problems they see (Kitzinger 1994, Morgan 1997).

The method of line transects used in this research was based on a statistical model first developed by Buckland (1993). Since the 1980s, this method has been well tested and widely used, prompting now several approaches to completing a line transect (Buckland et al. 2000). For reasons due to funding and the goal of involving a group of students in this exploration, the line transects here were counted

on foot including the measurement of the perpendicular distance to the animal(s), which allowed for an end detection rate.

Sections 2 and 3 of this paper will discuss these two methods more in-depth, covering both the theories behind the methods chosen and how they were applied in the case of the island of Samothraki. The conclusion will share final reflections of managing such a process under crisis conditions.

2. Focus groups

As mentioned above, focus groups were used in this study to obtain an initial impression from a variety of locals concerning their lives and how we might both introduce them to and find a way of integration in the UNESCO MAB Programme. The following will outline the theoretical foundations of using focus groups in research and describe how we applied focus groups to this particular study.

2.1 Introduction to the method

Having increased in popularity over the past few decades, the focus group interview is used predominantly in the social sciences as a qualitative research method (Hammersley and Woods 1984, Hargreaves 1967). The specific benefits of focus group interviews are the use of group interaction as data to discover insights that might have otherwise remained hidden, as well as the possibility to avoid numerous lengthy individual interviews (Ho 2006, Reed and Payton 1997). Additionally, focus groups are appropriate in allowing for a discussion, in bringing together many actors of structurally similar interests conveniently at one time and generate an opportunity for them to detect joint solutions for problems they identify (Kitzinger 1994, Morgan 1997).

In focus groups, typically five to ten participants are chosen to gather together to voice their opinions and viewpoints concerning a study topic in a non-threatening and comfortable environment. The participants' interactions are based on a planned series of discussion topics set up by the researcher(s) who may also act as a moderator(s) during the period of group interaction (Ho 2006). The focus group participants are requested to discuss with each other, ask questions, exchange views and comment on one another's experiences and perceptions. The role of the researcher as moderator initiates the topics for discussion, perhaps projecting a certain control over the discussion; however the researcher may not offer any opinions during the discussion session (Ho 2006).

Because of the historical increase in popularity of the focus group, uses and changes to the method have become quite innovative. The following describes how the focus group method was applied to research and initial impression gathering on the Island of Samothraki.

2.2 Approach followed in Samothraki

There were seven focus group interviews performed on Samothraki from October 18th - October 21st, 2012. Each focus group lasted approximately 2 hours, had anywhere from 2-12 participants and was moderated by 1-2 moderators, including a translator. The recruitment and focus group preparation was supported by a local anthropologist who did the actual interviewing (in Greek) in collaboration with the rest of the research team, in front of four student observers and a local English translator who simultaneously transmitted the answers³. All students helped in preparing questions and interpreting the outcomes, as well as intervened towards the end of the discussion with additional questions. This setting worked well and resulted in open, lively discussions.

³ With the exception of the "elderly people" focus group, where a participant acted also as a translator.

Efforts were made to solicit members for focus groups according to the following stakeholder interests: elderly people; parents of small and school children; craftsmen; farmers and livestock herders; small-scale fishermen; tourism related professionals; and finally professionals in the tourism accommodation sector. Below, descriptions of each focus group are given including a background information and characterization of each group, the content of each discussion, and a summary and reflection given after analysis.

Issues discussed revolved around the following general themes:

- Diagnosis of the situation, of the status quo.
- Key interests: what do they need/wish, what do they fear?
- Resources and (possibly joint) action opportunities.
- Observed changes in the island's ecosystem patterns and biodiversity.
- Preferences and visions for the future: which future appears attractive, which deterrent (also in relation to the future as a Biosphere Reserve)?
- Tipping points: under which conditions would they completely change their behaviour (such as giving up their job, leaving the island, or not having children)?

2.3 Focus group reports

2.3.1 Focus group nr. 1 - Elderly people

Date and time:	18 th of October, 2012, 11 a.m.
Location:	Niki Beach Hotel, Kamariotissa, Samothraki
Participants:	Six (three male, three female): English teacher, house-wife (retired), owner of tavern and small shop (retired), teacher (retired), community employee, retiree

Background information and characterization of the group

We sat in the spacious hall of the empty hotel⁴ and arranged the seats so as to promote an easy discussion. The participants were very much on time or even early and started chatting in familiar ways. The interview lasted for 90 minutes. The English teacher did not only participate in the discussion but also acted as a translator. This dual role was rather problematic and will be discussed later on. The other two women mainly described themselves in relation to their families, a fact that implied that social and family relations are very significant for them. One mentioned children and grandchildren as being very important next to her leisure time and travelling. The other one, two daughters and widowed, used to have a tavern and a small shop on the island. Two men—compared to the women—began with lengthy introductions of themselves. The men are all currently involved in small scale farming in their retirement. One of the men was previously a teacher on Samothraki and in Johannesburg (South Africa). He had been vice-mayor of Samothraki and still often commutes to Alexandroupoli⁵. He owns some agricultural land and grows wine. The second male participant still works at the municipality, used to be president of the hunters association and is now involved in the

⁴ As tourism season is mainly in July and August, the hotel was not densely occupied.

⁵ Alexandroupoli is an important port and commercial centre of Northeastern Greece with a population of around 80,000 people. It is the closest city and the main (and currently only) connection to the island.

hiking club. He also farms some land and keeps some olive trees. The third man, not particularly verbose, shared that he is now retired and keeps some sheep.⁶ The atmosphere between the elderly people was pleasant. They seemed to be happy to be asked for their opinions, even if they could not completely comprehend the reason why they have been gathered.

Contents of the discussion

The participants of the focus group were very well aware of the privileged situation of their island, compared to others, due to the abundance of water, which is still sufficiently available. They all enjoyed living there and would not want to leave unless they are forced to. The men can do some farming and the women help with small tasks, but none of them has to work hard in the agricultural sector since they are not making an actual living out of their harvests. They are very well bound to the island as most of them have been living there for all of their lives, but this attachment also comes with its hardships: living on an island brings along some kind of isolation as movement is restricted. This is especially difficult for women, as men traditionally could spend more time socializing in cafés and could escape this isolation.

Perhaps unsurprisingly, a common theme in the discussion was how “the world used to be better”, a view also reflecting an uncertainty towards the future. Pensions in Greece have declined in the last years and are considered insufficient and insecure. Owning a piece of land and being partly self-sufficient again became a necessity. All participants own olive trees, grow their own vegetables and keep goats. The precarious situation experienced by those retired is not unique to Samothraki, but is reinforced by the island context. The biggest problems identified were the absence of a nursing home and the problematic health care system on the island. In the past, the elderly were taken care of by their families; it was considered an insult to be sent to an institution. But as times are changing and young people nowadays, males and females alike, need to go for work to make a living, they do not have the time and means to care for their parents. The perspective of being sent to the closest nursing home in Alexandroupoli was therefore considered a probable but highly unwanted future scenario for all participants and presented their greatest concern regarding the future. Therefore, one of their most burning desires is the establishment of a nursing home on Samothraki, as this would prevent them from being forced to leave the island.

The second biggest problem identified was the lack of sufficient health care on the island. There is a health centre in Chora⁷ providing basic health services, but there is no hospital and there are no specialised doctors (geriatrician, paediatrician, surgeon etc.) on the island. People in need of more specialised health care must go to Alexandroupoli, a fact that poses several difficulties and entails more effort, time and costs. As a result, for the group of elderly people, the main tipping points which would make them leave the island are either becoming incapable of taking care of themselves (as there is no nursing home on the island) or requiring specialized medical treatment (as there is no hospital).

A fact that would be important in improving their everyday life on the island would be the better organization of social activities (on top of the different clubs that currently exist, for fishing, hiking and others) and the existence of places for them to come together. A café for older people existed in

⁶ There are two main groups of retirees on the island, former shepherds and farmers and former civil servants.

⁷ Is the main village and capital of the island, with 677 permanent inhabitants (2001 census).

the past but it was not financially viable. In former times, more activities like dance or folklore events were organized but today there are no people interested in organising them.

Finally, two other points were slightly touched upon: environment and tourism. Concerning the former, the participants were all well aware of the environmental problems Samothraki is facing. As they have been living there for several decades, they have personally experienced the on-going deforestation of the island which they relate to the high number of goats and to the economic crisis forcing people to perform illegal logging for fire wood. Partially due to time constraints, and partially because of the complexity of the issue, the BR concept was not discussed in detail. However, all participants acknowledged the “specialness” of the island, reflecting on the rich flora and fauna, as well as the abundance of fresh water, and expressed a wish for the natural environment to remain so. Concerning the issue of tourism, participants considered the poor connection of the island to the mainland⁸ and the fact that young visitors do not return to the island after starting a family as central problems. They made the suggestion to attract specialised groups of visitors, rather than individual tourists, as this would be more profitable for the island. This idea resonates well with our research suggestions about extending the tourist season into spring and autumn by targeting specific groups of tourists driven by a distinct interest such as research and education, wellness and healing, adventure or culture.

Summary and reflection

The core messages conveyed in the focus group of elderly people can be summarized as follows: Older people feel very attached to Samothraki, although living on an island also entails a certain degree of isolation, which is not always seen in a positive light, and results in several practical problems. To counter these problems, social activities are of high importance and should be encouraged and organised. The participants made it clear that they would only leave the island if they are forced to because they, or their relatives, are unable to take care of themselves or require specialised medical treatment. They acknowledge some of the island’s environmental problems, like deforestation, which they attribute mainly to the number of goats and the economic crisis. Regarding tourism they would suggest to make Samothraki more attractive for larger, more specialised, groups.

The general atmosphere within the group was very friendly, open and talkative. The majority of the time was used in getting familiar with each other and talking about life on the island in general, allowing little time for discussing the BR concept. A sharper focus by the moderator could have left more time for discussing other issues of more specific socioecological interest, yet it was evident by the enthusiasm of the participants that keeping the discussion open was a more appropriate reaction and paid them due respect. A final, more technical issue was the fact that the translator also acted as a participant in the discussion, which created a bit of an imbalance, but did not significantly affect the direction of the discussion. In any case, this tactic was exceptional and not used in the other focus groups.

⁸ In the past there used to be more ferry lines connecting Samothraki to other places on the mainland, including Athens. Currently there is only one ferry line to Alexandroupoli, operating approximately once per day in the summer and less frequently during winter time. A ferry trip lasts around 2.5 hours.

2.3.2 Focus group nr. 2 - Craftsmen

Date and time:	18 th of October 2012, 7 p.m.
Location:	MDES ⁹ office, Chora, Samothraki
Participants:	Nine (all male, three of them came later): two plumbers, one electrician, three builders (unskilled), one builder with master degree, two construction entrepreneurs (one came with his child)

Background information and characterization of the group

The group consisted of nine men aged between 25-50 years who carried the discussion mostly by themselves. Most of the participants' parents were also in the construction business. They could make a decent living in the recent past, but now are doing just small fix-up jobs, as no new buildings are being constructed and most customers prefer cheap buildings to quality work. This is related to the current economic situation and especially the increased property taxes which are generally seen as a major problem. Their daily wages have dramatically decreased; a typical day's labour currently pays around 30-35€, without any insurance, and with often long delays in payment (up to two years).

Contents of the discussion

Most of the discussion revolved around employment, or lack of it, and the increasingly precarious situation most of the participants are being drawn into. They currently struggle to make enough for a living, and are forced to essentially take on any small task they can find, especially in the high season. Some also work, or could potentially work, in the agricultural sector (especially in olive gathering and livestock herding) as well as fishing, and manage to at least get insured for their work there. Despite such problems, all but one participant thought negatively about abandoning the construction business and focusing solely on the primary sector, as this was considered a "step backwards". Similarly negative views were expressed towards the idea of non-monetary exchange, such as food as payment for work, which was also considered backwards. Nevertheless, they appreciated having the opportunity of subsistence agriculture, especially if "things get worse".

One main problem they face is competition with companies from the mainland. For construction projects over 10.000€ a public call is issued in which local craftsmen are always handicapped because of higher prices of materials and logistical costs, despite the lower taxes on the island. This was attributed to monopolies on the mainland. Moreover, renewable energy projects, such as installing solar panels, or windmills, require advanced training that they cannot afford to receive. As a result, such work is also undertaken by mainland companies who usually offer a complete package of construction and repair.

An idea that came up in the discussion was the possibility of collaboration which would require an overcoming of traditional local hostilities and a fresh view of looking into the future. Since there is currently no work whatsoever, they also see little reason or opportunity for collaborating. However, they appreciate and support the idea of collaboration in terms of material purchase, which already occurs to a smaller extent, and knowledge exchange. This could also help them access funds that are

⁹ Municipal Development Enterprise of Samothraki

currently unreachable because of too much bureaucracy. However, it was clear to them that some external funding would not solve the structure of their problems.

Despite the hard times they are facing, none of the participants considered leaving the island. The working conditions are not seen as better on the mainland, and there they would possibly be worse off and not competitive enough. If anything, the island provided them with shelter and some food from subsistence farming, plus a much needed social network. According to their worst case scenario, they would leave the island to go and work abroad.

Summary and reflection

The situation of the builders and craftsmen on the island appears difficult and all participants were deeply worried about their future perspectives. However, they did not only complain about their position but also understood that they must find a way out and showed interested in proposals for solutions. They were all very positive towards a more collaborative future; even though it was far from clear what this shift might practically entail. They showed strong solidarity among each other and saw this as the only way out of the crisis. After all, they repeatedly mentioned the importance of having a social network on the island and considered themselves luckier than fellow workers on the mainland. The issue of collaboration was especially promoted by one of the participants, a middle-aged man who came later together with his child, and who seemed to have a higher authority and enjoyed the respect of the group, with his distinctive calm and slow voice. In contrast, other participants spoke rather emotionally and fast, one reason being perhaps that they either thought that what they are saying was not important or that they were afraid about someone interrupting them.

Although we did not discuss about the BR concept in detail, the impression left was that craftsmen would certainly not oppose nor would they be negatively affected by such a prospect for the island. On the contrary, there might be direct or indirect positive influences, also from increasing visitation and maintenance work on tourist houses.

2.3.3 Focus group nr. 3 - Farmers and livestock herders

Date and time:	19 th of October 2012, 11 a.m.
Location:	Local café, Chora, Samothraki
Participants:	Eleven in the end (ten male, one female): Four livestock herders, five olive oil producers, one beekeeper ¹⁰ , one agricultural officer from the regional administration

Background information and characterization of the group

We convened in a small coffee shop, the lighting was dim, there were a few round tables pushed together, and other customers beyond the people attending the focus group occasionally generated external input and background noise. At the end there were eleven participants (one woman) in the focus group, along with a moderator, observer, translator, professor, and four students. The general

¹⁰ Since most participants perform both farming and livestock breeding, mentioned here is their main occupation.

mood was a bit sceptical in the beginning, with an introduction of a few farmers but not every person in the group. A very lively and open discussion started that then reverted to a loss of attention due to people talking to their neighbours and engaged in side conversations. This was difficult for the translator.

It is important to mention that in the beginning the conversation was dominated by the older herders, then the olive oil producers and near the end the single beekeeper took over, perhaps skewing the conversation a bit. Additionally, other people, perhaps due to the location, joined the conversation that had not been invited to this focus group and had only a peripheral perspective and experience of farming.

Contents of the discussion

European agricultural subsidies have made livestock herding profitable in the past. However, feed prices continue to increase, and the amount of animals on the island requires 70-90% of their nutrition to come from imported feed, the rest is assumed to be grazed. Because of this, many farmers are asking themselves if such a livelihood is it still profitable. The farmers all spoke about how things are getting worse. All of the subsidy money goes to purchasing feed for livestock. Many farmers commented on how the food prices as well as the fuel costs are increasing, making farming no longer a profitable venture. Also stated was the fact that the political distribution of subsidies was not always fair—"The subsidies are not always given to every farmer..." which lead to a discussion on how subsidies can inhibit development, and gave way to a general distrust in governmental programs and subsidies. No one claims to grow their own feed because the costs (for fertilizers) are too high and the fields are not fertile for animal feed.¹¹ The farmers all agreed that there was no future in herding for younger people, they wouldn't be able to live from such an occupation. Climate also affects fertility and feed, if it is a very windy year, crops, fields, etc. dry out.¹²

On the production side of the coin, farmers are predominantly selling meat, no milk products, and they claim that the prices for meat are very low, and slaughter facilities are difficult to find¹³. The prices at which to sell the meat seem to be determined in a collective effort so that not one person is monopolizing the market. The few herders that were introduced stated that they have anywhere from 100-200 animals.¹⁴ Some of the herders were mixed farmers including crops such as olives as well.

There was a lot of animosity in the beginning of the evening towards new ideas and solutions. Many of the livestock owners, admittedly seeming to be reaching retirement ages—"...we are too old for new options, for example selling on the mainland"—seemed very negative about future possibilities and condemned a previous failed cooperative attempt, resulting in corruption and distrust in all

¹¹ Additional questions concerning this topic would be if fields were always not fertile for animal feed, or only now after extreme erosion.

¹² Interestingly, the focus groups avoided discussion concerning direct problems and solutions with the goat and sheep overpopulation. There are many questions still up in the air for this sensitive issue. However, concerning the focus group, there was not a lot of information acquired about this topic.

¹³ This is interesting because, the only possibility to sell and process the animal products is the creamery. There is no official slaughterhouse on the island at the moment, just the possibility to bring them on the mainland.

¹⁴ We later found out from the agronomist in our focus group that the herders, who initially stated that they have 100-200 animals each, were most likely stretching the truth, and the real numbers are probably much higher.

things communal. This topic and its history were discussed, with a fairly negative reception from the older crowd. Later, after a bit of finagling for some actual discussion on how to move forward, a few younger participants (ca. early 40s?) started discussing the potential of a cooperative—if only it functioned correctly—and also the future for additional products such as honey, olive oil and cheese. Olive oil seemed to be the product with the most positive future, with a real niche in quality and distinction. There were grumblings about farmers not being active enough to get new programs started or to promote Samothraki brands. Concerning organic, there seems to be a general view that the island is organic, however a few farmers stated that some farmers spray fertilizers or chemicals, and then it was obvious that there is no real understanding of what organic means. However, many stated that certification and changing to organic would cost too much, or that the middle-men would take their money away from them. There seems to be a deep-seated distrust in government, regulation, and middle-persons that might have an influence on their possible profits.

When asked about the local farmers' market, and possibilities selling more locally, it was also evident that the farmers were not aware of the local markets and fees and taxes to sell on the Island. There seemed to be a lot of misinformation concerning the market topic, however enough potential to warrant investigation in possibilities there. It was evident that there is no real communication among farmers on the island about their future or some sort of common goal. A main problem is they have no real market for their products. They need to do some marketing, niche finding, and customer finding research, so that they can have a larger market to sell to, a stable market. Need for an olive press, as well as a slaughterhouse was evident, and possibly another creamery. There was a consensus, with the honey, olive oil, meat and some dairy products, cheese and yogurt, that there are many possibilities on the island, just the overhead and the public relations work need to be done.

And this brings up a key point which the farmers' also acknowledged: they are not organized, and some sort of organization is needed to move forward. There seemed to be an awareness that there is a lot of mistrust and misinformation due to the lack of organization and communication with each other. Misuse and distribution of subsidies were also linked to this problem. And at this point the negative viewpoint of cooperatives seemed to turn and talk about future possibilities of working together along with the need to be organized was recognized. This brought around the point that they need money as a group to get something started. They need 30,000€ and at least 10 people to start a cooperative. This was also linked to the need of making a name for Samothraki; there was a large agreement that Samothraki could be known if they start to market their olive oil, which is considered having a distinct quality and flavour (because of a cross with wild varieties). Yet in order to certify this, they need money to send samples to the mainland. Discussion about selling abroad and getting investors for the island then came up, along with the discussion that Samothraki is organic, or perhaps not because of synthetic fertilizers being used.¹⁵ This conversation continued, waning and waxing in what could be done and what hasn't been done so far. One highlight is that the farmers sometimes have burst of motivation and attempt to do something towards marketing, and then think about the market *after* their actions. This then led to the idea that the farmers, as a group, need to do some market research and build niches.

¹⁵ Which also begs the question of why are there synthetic fertilizers being used when there are so many goats and possibilities to use their manure with composting? This is another testament for the need of communication and organization.

Education was discussed as a personal issue, but the general consensus was that education has no benefit in the current situation. Bee keeping was discussed as a good and interesting job for young people on the island—“Bee keeping is an interesting science”—providing a liveable income with a good quality of life, however the conversation was a bit dominated by one honey producer. Issues mentioned included the need of having more flowering plants on the island, and how this conflicts with livestock overgrazing and allowing for no plant regrowth? There was not much discussion on this topic in the group.¹⁶

Finally, none of the farmers discussed the possibility of leaving the island. They told of people making more and larger gardens, for self-sufficiency purposes, to get them through hard times, but there was no question of leaving. They said tourism is still good and that gives chances as well.¹⁷

Summary and reflection

Main themes pulled out of the farmer focus group included a general perspective that ‘things are getting worse’, a misinformation about local market potentials, a lack of central organization and a scepticism but interest in cooperatives. There was recognition that there are future possibilities and potential for olive oil production. There is need for a modern oil press, slaughtering possibilities as well as market research on how to better utilise their products, i.e. define market niches for olive oil, cheeses and products that can travel well like honey. It was also evident that there was a divide in the focus group between old and young, herders and non, pessimists vs. optimists—the views were differing, and there is a need to unite, especially since the herders are aware that the EU subsidies are no longer benefiting them.

Additional focus groups, or some sort of coming together, are suggested to organize and keep communication intact with farmers on Samothraki. Without communication and participation on a regular basis the organization and motivation to develop and innovate for the future is slim. Continue with the meetings, make them interesting, if they are not so in the beginning, offer food and drink, offer a potluck of the possible products to create niche markets for the Samothraki label. This allows for a very tangible conversation to talk about the possibilities of the products, brands and marketing. It will get them excited and motivated. Focus on all farmers, so that a form of an integrated farming plan can develop—i.e. instead of synthetic fertilizers for olives and crops, communicate and use a problem (goats) as a solution (fertilizer). This type of communication and working together creates stability and trust, something lacking on this island. This trust can lead to a label, a strong market niche.

Concerning the subsidies and the financial support from the EU to the farmers, it was noted that there is a certain trade-off between on-going subsidies which inhibit further development of the island’s agricultural production and the need to support the farmers—regarding the establishment of a new cooperative or olive oil press. It was evident that such subsidies must be place-based in execution, to really understand and serve local needs.

¹⁶ Later, on the side, this honey producer discussed the problem of the overpopulation of livestock, stating that the livestock and the bees compete for the same food source, and the livestock remove the perennial flowering trees and undergrowth, removing this indefinitely. In a drier region, honeybees struggle to find enough nourishment.

¹⁷ Due to the sensitive situation of the farmers and their direct connection to the land, their livelihood and its deterioration, the questions concerning ecological tipping points and the farmers’ feelings toward the Biosphere Reserve were not addressed.

2.3.4 Focus group nr. 4 - Parents of small and school children

Date and time: 20th of October 2012, 11 a.m.
Location: Cultural hall, Chora, Samothraki
Participants: Nine (all female): none originally from Samothraki, one from Belgium, with one exception all staying at home with the children

Background information and characterization of the group

We convened in the cultural hall in Chora, the capital of Samothraki, with a very quiet and concentrated atmosphere in which we all sat in a circle. There were no fathers attending (they were attending to the children meanwhile, some said). At the beginning the participants introduced themselves and their situation; the conversation was well organized, clear and open. It is important to mention that none of the women in the group was originally from Samothraki, but from different places in Greece, with the exception of one parent from Belgium who seemed to disagree with the consensus within the group. All of the women were married to Greek men, of whom most were local. This is a quite widespread phenomenon on Samothraki, yet this group cannot be considered “representative” for the population of Samothraki. All except of one father had work and caretaking is generally considered to be a mother’s job.

Contents of the discussion

There was a lot of discussion about the trade-offs of living on an island. All participants seemed to highly appreciate the possibility of raising their children in a safe, non-polluted environment, closer to “nature”, without having to deal with the stress and dangers associated with city life. On the other hand, participants seemed to agree on the fact that there are limited opportunities and after school activities for children on the island compared to bigger cities on the mainland. Moreover, the relative isolation of Samothraki and its infrequent connection to the mainland further restricts the possibilities for leisure-time activities. This is also true for adults who also have to make some sacrifices, as for example there no theatres or cinema on the island. Therefore, they have to make the most out of the opportunities that are available locally, such as language courses and music clubs, as well as a municipal creative centre, free for school children whose parents work.

Medical services, as well as giving birth locally presents a specific concern; most women have to leave the island in good time in order to give birth in a hospital on the mainland under professional treatment, leading to unnecessary high costs and overnight stays. Moreover, many anecdotal stories were presented on how inefficient medical care is on the island, a fact further influenced by the current lack of paediatricians. In this context the natural environment is seen ambivalently. On the one hand, many mothers encourage their children to go out and play with their friends and discover “nature” on their own, without having to worry about city life concerns like car traffic and crime. On the other hand there is a constant worry of accidents, exacerbated by the lack of medical infrastructure. The island with its rocky environment, its cliffs, and the surrounding sea is therefore seen both as a more “natural”, protected environment, but also as a potential danger to children.

When children reach a certain age, some of the parents accompany them to the mainland to gain better schooling opportunities. The participants seemed to agree that when the children are old enough they should leave the island to acquire more experiences, receive a better education and find jobs. For most mothers it is very important that their children also experience everyday life on the mainland when they are old enough. One mother even claimed that she sometimes fears that her child will lose touch with the rapidly changing “outside world”, because of the isolated situation on Samothraki. So some mothers asked themselves if they have enough resources and opportunities on the island to prepare their children for an independent and successful life on the mainland. When asked if they expected their children to return to Samothraki, they all agreed that this would be their (i.e. their children’s) decision. After all, all participants have also left their families and migrated to Samothraki, and considered this as “the natural way of life”.

Some participants claimed that there is insufficient communication between parents on the island, not many discussions about future plans, parent-led activities or self-organised groups to offer more opportunities to their children. Some mothers help each other in practical things, like taking care of each other’s children or shopping, but these are seen more as reciprocity acts between close friends or neighbours. In this sense, the occasion of the focus group was welcomed as an initiative triggering future collaboration between participants and parents alike. During the focus group there was a consensus that more could be done to enhance living conditions on the island. Any additional opportunities for their children, especially regarding their education, and an improved health care system would be highly welcome by all participants. But at the same time there was no real existing network which could be used to articulate such demands and even make some first steps to try and tackle some of the issues through self-organisation. A plan was briefly discussed about collectively renting and self-managing an old house as a base for extra-curriculum activities. A future composting program at the school was discussed, as a way to unite children, parents and school, perhaps offering a space for more communication, or at least a chance to engage in a common activity, as well as combat the waste problem on the island.

Participants were very curious to hear about the UNESCO MAB Programme, but at the same time sometimes sceptical if this could actually change things on the island. They all appreciated the specialness of Samothraki’s natural environment, as this was one of the main reasons that made them come there in the first place, and were very supportive of any plans or actions that would preserve it in its current shape, and even restore the degradation caused by years of recognized overgrazing.

All participants expressed a strong will to stay on Samothraki. When asked if they would remain on the island if they separated from their husbands, all apart from the Belgian replied affirmative. This further supports their deep emotional connection to the island, despite the specific concerns and limitations of raising a child there. This is closely linked to Samothraki’s natural endowment and some of the women claimed it would not make lot of sense to stay if this was “destroyed”, eroded, deforested, or “overdeveloped”. Finally, some mentioned the lack of employment for themselves or their husbands as a potential reason to “force them out of the island”, however, this was a highly unwanted scenario.

Summary and reflection

There was a general consensus that life with children on the island certainly has its difficulties and challenges, but it is also considered very special and more relaxed compared to life on the mainland. The central challenges in raising a child on Samothraki considered were the inefficient medical treatment and the limited school- and extra curriculum opportunities. These disadvantages were, in their opinion, more than counterbalanced by the assets of living in a natural environment, the security, the peacefulness and the stress-free everyday life, compared to that on the mainland. All participants seemed to have reflected a great deal upon those advantages and disadvantages considering their responsibility in raising a child on Samothraki. This attitude makes them more likely amenable to change and also potential advocates in general support of a BR future for Samothraki. Such a development could also provide a better platform for communication and “empower” them to begin realising their plans.

2.3.5 Focus group nr. 5 - Small scale fishermen

Date and time: 20th of October 2012, 7 p.m.
Location: Café-Pizzeria Skorprios, Kamariotissa, Samothraki
Participants: Five (four male, one female)

Background information and characterization of the group

The focus group with the small-scale fishermen took place in one of the cafes in Kamariotissa, the main sea-side settlement of Samothraki. We sat outside around a table, surrounded by other clients, including other fishermen, who contributed with the odd comment from outside, without however concentrating on the discussion or influencing its outcome. The atmosphere was heavy from the beginning and did not ease up during the discussion as the fishermen are in a very difficult situation.

All participants were members of the local small-scale fishermen’s association, owning small fishing boats, with a length of six to twelve meters. Sixty to seventy families used to live from fishing and often the whole family had to work together. But now they are all in a very difficult situation, because of a dramatic decline in fish catch. In former times they had to just navigate 6 to 12 miles away from the coast to fill up their nets.¹⁸ But in the last decades, as the situation has worsened, the small fishing boats need to travel at least 15 to 20 miles to find fewer and fewer fish.

Contents of the discussion

One of the biggest factors preventing a more sustainable use of the fishing grounds around the island is the on-going conflict between the small and the large scale fishing boats. Small-scale fishermen are in competition with the owners of bigger trawlers (with a length up to 40 meters), owned by a handful of powerful local stakeholders. The two groups have tried several times to negotiate, but this has always ended up in massive disputes. Big trawlers are not as dependent on weather conditions and can travel longer distances to further fishing grounds, so were accused as having fewer incentives to sustain fish populations around Samothraki. They are also allegedly often spotted

¹⁸ Fishing is forbidden in a range of 6 miles around the coast of Samothraki, but there are no controls.

fishing illegally within the six-mile zone, even as close as 200 meters away from the coast. Additionally, big trawlers, being much more effective, not only cause a rapid decline of fish stocks but also destroy the seabed. The participants went on documenting a series of examples and specific locations that were traditional breeding grounds and are now totally devoid of fish. They further accused big trawlers for fishing within protected areas and manipulating GPS-systems so that they do not show the real positions of their boats.¹⁹ The small-scale fishermen do not export their fish, but mainly supply small quantities to restaurants on the island. They currently lack the funds to invest in a big storage room and an expensive ice machine which would allow them to export their fish in further distances. One idea that came up was to establish a daily market, but they considered local demand, especially in winter months, too small to make it worth renting a building.

Another issue that came up was marine pollution. One of the participants reported that about two or three years ago there has been a severe incident of pollution in the Northern Aegean, allegedly originating from Bulgaria and coming through the river Evros into the sea. The sea was described as being brown and covered by an oily, buttery substance for days. Huge amounts of dead fish were found floating on the surface of the sea. The fisherman took some samples and sent them to the ministry for analysis but never got a response. This event caused damage in the Aegean Sea from which it has not yet fully recovered. This incident was not the first to have occurred in the area. The participants identified the beginning of a series of “major ecological problems” around 6 years ago and believe they are connected with the big fish trawler ban in Italy. The ban, according to the participants, caused many of the Italian trawler owners to move to Turkey and register their boats there. Turkey is just a few miles away from Samothraki, and Turkish trawlers are often seen passing through the waters surrounding the island.

All fishermen participants face severe financial difficulties. With no exception, they are highly in-debt, with costs such as gas prices, boat taxes and prices of fixed costs like electricity, water and the rent for parking the boats in the harbour continually rising while revenues dwindle. They feel additionally exploited by a gas monopoly on the island, and unlike big trawlers, they cannot access cheaper gas from Alexandroupoli. They cannot even afford repairing destroyed fish nets and traps. Moreover, small-scale fishermen are not subsidised and feel that they are left on their own. They have often tried to approach and get support from local politicians who “only listen to them before election periods and then forget them again”. As a result of the above, none of the participants see any future for small-scale fishing on Samothraki, neither for themselves nor for their children. Working for the big trawlers does not seem to be a solution either because of the long-term and on-going dispute and also because of competition with very cheap labour force from Egypt.

Participants were very much in support of the establishment of a marine protected area, in the context of a future BR or otherwise, that would be respected by all boats alike. The idea of the creation of an artificial reef also found support and would be welcomed. They expressed however some disagreement about the designation of the recently added marine extension to the Natura 2000 area, as it coincides with many “traditional” fishing grounds. They were very much supportive of a participatory planning of a marine protected area that would ensure the recovery of fish stocks and would benefit all. But the main challenge would be the implementation and reinforcement of such a plan. They suggested the existence of more clear signs and better protection of the current

¹⁹ Of course the validity of these claims could not be verified, as there was no representative from the big trawlers or authorities.

marine Natura 2000 area, or for that matter a future BR marine core zone. They even appeared ready to volunteer in organised patrols in the area, but would need external help to survey the protected areas, and above all the political will to implement the protection. Interestingly, they identified an increasing dolphin population in the area as a problem, as dolphins are accused of destroying their nets.

Summary and reflection

The problems the small fishermen are facing, as described from their own perspective during the focus group can be summarized as follows: There is a large conflict with the big trawlers on the island which catch too many fish and have the means to go out much further and all year round. All expenses like fuel prices, taxes on boats and harbour places, costs for electricity or water are also steadily rising. At the same time there is a massive decline in fish population further exacerbated by a large number of Turkish trawlers that appeared five to six years ago. Finally, the massive pollution originating in Bulgaria three years ago has further worsened the situation, while a perceived rising population of dolphins is causing damage to their gear.

As it was impossible to bring both small and large scale fishermen groups together on one table, only the small fishermen had been invited to take part in the focus group and the views of big trawlers were not expressed. Participants were quite visibly in a very difficult situation and the conflicts are densely charged with emotions as their families are totally dependent on the fishing business. They appeared very bound to the island as their livelihoods are totally depending on their profession and as such are potentially strong allies in the establishment of the Biosphere Reserve on Samothraki.

2.3.6 Focus group nr. 6 - Tourism related professionals

Date and time:	21 th of October 2012, 11 a.m.
Location:	Cultural Hall, Chora, Samothraki
Participants:	Twelve adults (eight male, four female, 25-50 years old, including three children): four restaurant owners, two café-bar owners, four little shop owners, one owner of rooms to rent, one member of the women's local product cooperative

Background information and characterization of the group

This was the most attended of the focus groups conducted, with some of the participants arriving later and joining the circle. The general atmosphere was very pleasant, and the participants were open-minded and interested in the discussion. They obviously did not feel disturbed by the presence of external people, one reason for this perhaps being that they are accustomed to interact and communicate with tourists. Discussions were lively and at some times unstructured, often interrupted by cell-phone activities, and latecomers. Some conversations even switched to English, which shortly excluded some of the participants, but everything was promptly translated both ways.

Contents of the discussion

After a short introduction round, the discussion was kicked-off with a reflection on recent tourist developments on the island. Everyone agreed that up until 2008 there was a stable situation, but since then things had been gradually deteriorating, in terms of fewer visitors and overnight stays. Moreover, tourists on Samothraki which are mostly Greek (80 - 90%), are now spending less money on the island; an estimated profit drop by 40-60%. Participants lamented on the short summer season on Samothraki and expressed the wish to find ways to enlarge it. They identified the inefficient transportation (including the national/international flight connection) as a key problem to be tackled. However, they were against the prospect of constructing an airport on Samothraki. Additional challenges that could act as negative publicity for the island were the lack of sufficient health services, as well as the occasional littering of beaches and other tourist areas.

The discussion quickly moved on to future visions and to the issue of agreeing on a tourist identity, in respect to what is feasible, as well as what is wanted for the future development of tourism on the island. All participants showed a clear preference against mass tourism and towards attracting more “alternative” visitors, understood as “those that respect the culture and nature of Samothraki and show interest in local people”. This came as no surprise to us, as it confirms our previous surveys, according to which the vast majority of visitors, as well as locals, opted for a “conservationist” future scenario for the island²⁰.

When it came to more concrete proposals about how they could extend the season, a range of different possibilities for alternative, more specialised forms of tourism were expressed that could focus on the natural (diving, hiking, canyoning, hot springs) or cultural (historical, religious and archaeological tourism) assets on the island. These could complement activities that already take place such as the operation of an open-air cinema, amateur theatre and sports classes (e.g. yoga and karate). Marketing strategies were outlined, such as pre-investing in some basic infrastructure and improving the internet presence of the island, as well as attracting foreign visitors from neighbouring countries. They acknowledged that they could not wait for any support from the state, even less so under the current financial situation, so any future steps can only come from their own initiatives, and this would require a certain degree of planning, organisation and cooperation between them, but also within the wider Northeastern region of Greece. Further discussed was the issue of internal communication between tourist professionals and ideas were put forward on how to improve this e.g. via spreading relevant information via cell phone and Internet, rather than relying only on information boards.

The prospect of a future BR on the island was positively welcomed and vividly discussed, and there were even some more in-depth discussions about how a BR management could be financed. In agreement with a ‘willingness to pay’ survey we performed on the island in 2011, a tourist tax of about 2€ per person and visit seemed to be acceptable. This could be paid at the ferry or at a special location at the port. Since it could be legally complicated to make this compulsory, a general consensus tended to favour keeping such a tax voluntary.

²⁰ “Samothraki as a place rich in nature and cultural traditions, a place for escape by city dwellers to find recreation in a calm environment that is well preserved” (Fischer-Kowalski et al. 2001: 187-188).

Summary and reflection

Participants of the group of tourism related professionals were very interested and motivated in actively supporting a future vision for the island in line with the BR concept, and were ready to begin actively working towards this goal. They showed special interest in being part of a management team or association, to improve internal communication and better coordinate activities. One important decision that came up from the discussions was the willingness to come up with a common strategy and stick to it. Perhaps to a greater extent than other groups, the current focus group proved a good platform for extensive self-reflection between participants and at various times the intention was expressed to continue the discussions even after the research team would be gone. Since there was a general consensus to attract alternative tourism, the next step would be to provide the organisational and infrastructural support for this, such as regularly cleaning of beaches, improving hiking paths and pushing for a wastewater treatment. Moreover, specific future joint activities were proposed, such as the development of a central webpage that would promote accommodation options on Samothraki.

This group consisted of some of the potentially strongest supporters of a BR future for Samothraki for a number of reasons. Most of the participants were young, well-educated and motivated to work together for the “common good” of the island because their visions for the future development of the island are very much in line with the BR concept that respects their local natural and cultural assets. A large percentage of the participants were “foreigners” (i.e. not originally from the island, but from other parts of Greece). Although this can sometimes prove troublesome, people who have recently entered a community bring also new, fresh ideas, and can also be more willing to get actively involved in self-organising. More generally, the tourism sector would greatly benefit from measures that would aid extending the season and attract alternative, specialised groups of visitors, without the need to invest in large scale, costly and environmentally detrimental infrastructure projects.

2.3.7 Focus group nr. 7 - Professionals in the tourism accommodation sector

Date and time: 21th of October 2012, 7 p.m.
Location: Cultural hall, Chora, Samothraki
Participants: two (one male, one female)

Background information and characterization of the group

As this focus group was scheduled for Sunday evening, only two people came to the interview. The first was a businessman owning one of the biggest hotels on the island, and the chairman of the hoteliers association of Samothraki. The second was a middle-aged woman owning five rooms for rent, while working parallel as a secretary and practicing small-scale farming. Due to the absence of other participants, she often spoke in the name of other owners of small scale tourist accommodation. Despite the small group size, the discussion was vivid and lasted for more than two hours. Since the two participants represented two distinct groups (large hotels and rental rooms and apartments) their key statements are summarized separately below.

Contents of the discussion

Despite the current Greek financial crisis, and in strong contrast to some of the participants of focus group nr. 6 (section 2.3.6), the hotel owner was surprisingly optimistic about the future of tourism on Samothraki. He confirmed the current decrease in visitation but expressed the view that recovery was already underway. He spoke very enthusiastically about some of the promotional efforts he had been involved in during the past years, as well as his current and future intentions to further support alternative forms of ecotourism, religious tourism as well as activity tourism (e.g. diving, canyoning, rock climbing and hiking), in order to attract more specialised groups of visitors. In many respects he reaffirmed many of the proposals expressed during focus group nr. 6 (section 2.3.6), while at the same time having the financial and organisational capacity to implement them.

The current key challenges to be overcome were the lack of those qualities that could turn all the ideas expressed above into a “tourist package”, such as time-based coordination of all activities and the provision of professional, certified guides, as well as minibuses for quick and easier transportation between places. He argued that this would even create jobs for a number of young people on the island as sports trainers or guides and for this purpose recently organised a seminar for young locals. He expressed some additional original ideas such as to offer discount rates for tourists groups, attract Russian tourists with pilgrimages to the diverse religious sites of the island²¹ and reunite the long-term faithful German tourists who have been visiting the island in the 60s and 70s. These were not just recommendations, but concrete proposals that he, and his colleagues, were actively pushing while visiting international tourism fairs during the winter time. A further initiative of his was the equating of prices in local accommodation and promotion of a bigger package of rooms at uniformed rates (130 rooms to date), that would be large enough to be advertised in international travel and tourism trade fairs.

His views towards a BR future for Samothraki were reluctantly positive and he seemed to be aware of the concept of sustainable development. It was clear he was not supporting mass tourism and large scale infrastructure projects, yet he appeared ready to make compromises in quality of tourism he would accept, as long as people could be accommodated using current infrastructure and during the off-season.

The second participant also supported a type of visitor that appreciates and respects Samothraki’s culture and natural environment and was clearly opposed to mass tourism plans. She was sceptical about travel agencies that would perhaps attract more tourists to Samothraki but also pocket a large share of the earnings. Her vision revolved around small scale tourism that would promote local products that would create a market for faithful and repeat visitors. This would also help raise the environmental awareness of both locals and visitors. Finally, she also agreed to the fact that more knowledgeable people concerning marketing strategies were required (e.g. producing, packaging and exporting of quality products, promoting of the island).

²¹ Orthodox Christianity is the dominant religion in both Greece and Russia.

Summary and reflection

The two participants, at times also representing other colleagues in the accommodation sector, and despite the different approaches of their businesses (room rentals vs. hotels), had rather similar views of the kind of tourism they envisioned for Samothraki. Mass tourism was clearly not an option, a view shared by most locals as well as visitors that have responded to our surveys over the years. Their vision was rather that of a small-scale, more controllable, tourism plan that would attract specialised groups of people (such as schools, university groups, religious groups, environmental clubs etc.) that acknowledge the unique natural characteristics of the island, and appreciate local products and the cultural heritage. Both agreed on the need to expand the tourist season, and identified infrequent communication, as well as lack of internal cooperation, as the main challenges to be overcome for the recovery and further promotion of tourism development. The first participant can be regarded as a “key stakeholder” on Samothraki as he has the financial means and organisational experience to realise many of the ideas that remained wishful thinking in other discussions.

Inclusion of Samothraki to the World Network of Biosphere Reserves was seen positively, as this could link the island to other regions around the world facing a similar situation, and this would enable an information exchange and collective capacity building, as well as learning from best practice, promotion of local products etc.

2.4 Discussion on the focus group method

2.4.1 Main underlying problems

It became obvious in the group discussions that people on Samothraki are well aware of existing social and environmental challenges on the island. The issues of overgrazing, lack of waste as well as water supply management and the depletion of fish stocks were all extensively discussed. Moreover, the socio-economic situation seems to have been dramatically deteriorating in the last years, mainly because of the Greek financial crisis that has affected all aspects of social life on and off the island. Thus, unemployment is high and wages and pensions are in decline. Additionally, the tourist sector has also been affected by the crisis, as there has been a decline both in number of (predominantly Greek) tourists, as well as in average expenditure per tourist.

One of the most important challenges of development on Samothraki reported was the poor and infrequent ship connection to the mainland, as well as continuous lack of coordination with bus and plane timetables. This leads to unnecessary efforts and costs for locals and might discourage potential visitors, especially those travelling from faraway places. Moreover, some of the more vulnerable groups of people on the island, like the elderly, parents with young children as well as those in need of regular care, feel very uncomfortable about the lack of specialised health care on Samothraki and perceive the distance to hospitals in cases of emergency as a negative factor for their life on the island.

Another issue that has been brought up in discussions is the lack of competitiveness of the island, often leading to monopoly situations. Prices are high on the island, especially those for construction

material and fuel, and this further reduces the already low competitiveness of local craftsmen. Moreover, education and training is lacking and mostly available only on the mainland. Jobs, especially for educated people with specialisations, are rare on the island and qualified people tend to leave.

Additionally, according to participants, there is a lack of interest and support from local and national politicians. Election promises are continuously broken and pledged payments have not reached the island. Moreover, national and European regulations (e.g. for the Natura 2000 zones) are not enforced. As a result there is a general mistrust in the state and all governmental institutions. The same holds for other official arrangements. Previous efforts to set up cooperatives failed due to a lack of cooperation, egoistic behaviour on the part of some members and lack of financial transparency. Such lack of communication and cooperation between the islanders has been the rule rather than the exception. Very few possibilities exist for information exchange and discussion of problems in a more organised way. This has resulted in rather reclusive strategies and a general lack of a mentality of collaboration.

2.4.2 Possible solutions

All participants were very open and willing to talk to us about the challenges they face, their worries and ideas. Naturally, less clear were ideas and specific proposals about providing solutions. In some cases participants even openly asked for help and suggestions on how they could improve their situation. For most of the participants leaving the island is not an option. A common strategy on Samothraki is to reduce the cost of living and external dependency by practicing some degree of subsistence agriculture, and trying to increase income by engaging in various activities, such as tourism, handicraft, and agriculture. Self-sufficiency has been of increasing importance and most people on the island either own a piece of land and few olive trees, produce their own vegetables or wine or own some goats. In this respect, despite the lack of opportunities, the island still provides the basic requirements for self-subsistence, as well as a social network that is stronger than in any larger city of mainland Greece.

Nevertheless, there is a general awareness that things are currently not sustainable, and change is needed to be able to support the livelihoods on the island in the near future. The generalised financial crisis, coupled with the general mistrust in higher institutions does not leave any room for hope of external support. Rather, and despite of negative experiences with earlier efforts with cooperatives, people seem more and more convinced that the only way to combat the current crisis is through a collaborative way out. Most participants appeared very motivated to make this change in attitudes and cooperate for a common future on the island. Practically speaking, this would mean, first and foremost, to resume more organised communication between different interest groups, develop joint strategies and at a later stage, setting up local cooperatives.

Tourism is considered as an important tool that could be used to support a more sustainable future for Samothraki. Tourist-dependent professionals seemed well aware of this and appeared especially eager to support a rather well defined vision of sustainable tourism that would extend the season without adding an extra environmental burden by attracting groups of visitors that would respect the unique cultural and natural assets of the island and potentially give something back. This would

require the development of a common strategic plan as well clear marketing strategies. This attitude is very much in line with the BR concept that has been generally positively received, or at least not contested, by most focus group participants. The benefits of increased visitation were clearer to professionals working in the accommodation sector, but would also reach people working in the primary sector, via an enlarged market for high quality organic agriculture, the improvement of the value chain of processed agricultural products and the promotion of agrotourism.

2.4.3 General discussion of the method

All in all, the choice of performing focus group interviews proved very appropriate in order to get a general impression of the main problems on the island as well as a broad outline of perspectives from the different stakeholder groups on issues regarding the future development of the island and their attitude towards the potential of establishing a BR on the island. The method chosen also gave us the opportunity to observe the interaction between the participants and thus get an impression of interpersonal relations, alliances and disagreements, as well as local power relations. We believe conducting focus groups was also beneficial to the participants, as they provided a platform of exchange of problems and perspectives and triggered a certain degree of internal communication dynamics that remains to be seen if it continues or can be reproduced in the future. The focus groups, in contrast to individual interviews, served as an arena for people to meet, discuss and reflect on their situation and coordinate future activities. Participants appreciated and were at times even positively surprised that their opinions were listened to and valued by “outsiders”.

We were also pleasantly surprised that the people were so willing and open to discuss their problems, worries and ideas with us. Our major fear—that the ‘more critical’ focus group, the farmers and herdsmen group, would be very closed and difficult to initiate within such a new situation of being part of a focus group—did not occur. By the end we felt that the participants also benefited from the possibility of coming together and being able to communicate their ideas and concerns to others, as it seems as though this is not often the case. But this positive impression that we got of the participants being open and honest comes with social caveats; the focus groups provided us with a rich source of information, yet not all of the information given to us is particularly accurate or trustworthy. Evidence from external informants, who did not take part in the focus groups, sometimes questioned the information we had obtained. For example the extent of agricultural area as well as number of goats owned by some of the herders in focus group nr. 3 (section 2.3.3) was not in line with the data later provided by a representative of the Greek Chamber of Agriculture. For future focus groups it would be helpful to collect qualitative data from individual and expert interviews as well as statistical sources to cross-check the information provided. Moreover, we suggest organising an additional focus group with students or teenagers, to also include the views of the future generations that could be particularly relevant to the development of a future BR vision for Samothraki.

3. Field survey: distance sampling

The issue of overgrazing, caused by an excessive number of sheep and semi-wild goats, has been identified as one of the imminent environmental challenges for the island of Samothraki. Coupled with the steepness of the terrain, overgrazing has led to dramatic levels of soil erosion, also within the Natura 2000 area - posing a major threat to biodiversity conservation goals, as well as leading to extensive economic losses due to the destruction of the roads. This view has been confirmed by all focus group participants, as well as through our own observations. According to latest estimates from slaughtering statistics and individual interviews, there is an estimated 60,000-80,000 sheep and goats roaming around freely on the island, a number which exceeds the estimated carrying capacity by a factor of four to five (Skapetas et al. 2004, Greek Ministry of Agriculture 2008). However, there is no official census on livestock, and due to the close link between herd sizes and the level of subsidies by the EU, there is apparent scope for misinformation when herdsmen are asked to declare accurate livestock numbers.

We could therefore not rely on statistics, or qualitative data alone – a field survey to estimate the livestock densities on the island was required. We commenced such a survey in late 2012, using walked line transects and the distance sampling method to generate a first estimate of the ruminant populations, and to test the robustness of a set of methods that could be used to follow future developments on the island. The following sections will briefly introduce the method, then present and discuss preliminary results.

3.1 Introduction to the line transect method

Estimating population numbers of mammals is a common challenge in wildlife monitoring and serves as the basis of wildlife conservation projects. Numerous methods have been developed, with distance sampling on transects established as a prominent methodology (Buckland et al. 2001). Line transects are commonly applied to livestock censuses and can be implemented in various ways, ranging from walked line transects, to vehicle-based spoor transects or aerial surveys. The latter are most commonly applied to survey large, remote areas (e.g. Jenkins et al. 2012, Pople et al. 1998). The basic idea of all the mentioned approaches is similar: a structure of sampling lines is developed in advance and then followed by one or more observers on foot, car or plane. While executing transects, direct sightings of animals, or animal tracks and scat can be documented and measured. If a statistically significant dimension is given, a calibration of these data with calculated detection rates allows for an interpolation of total species population data for the area covered.

After sampling the transects, an observer walks the transects and records all direct sightings: distances, herd size (or *cluster size*), as well as the angle to the virtual transect line are recorded. With that information, the perpendicular distance (in 90 a degree angle to the transect line) can be calculated, which in combination with cluster size and other transect parameters allows for testing models that finally give estimates on population size. Applying line transects and distance sampling requires us to make several assumptions, including (based on Buckland 2001, Eguchi and Gerrodette 2009):

- Animal population is considered “closed” from immigration, emigration, birth, and death during the survey.
- Transect lines are placed randomly in the study area such that sampled area is a random sample of the total area.
- Objects do not move in response to the observation process before they are detected.
- Measurements of perpendicular distance are exact.

In our qualitative data collection process, we complied with these pre-conditions, by walking in small and well trained teams, using state of the art equipment (distance metre, binoculars), selecting reasonable transect sites and all this within a suitable study period. The final analysis of the data generated involves other, and more complex statistical assumptions which are not discussed here, but are subject to comprehensive analysis in Buckland (2001).

3.2 Survey design used in the current survey

The choice of the methods and their configuration depends on target species, habitat specificities and remoteness, as well as the study’s budget. In our case, an overfly study would probably have been the most appropriate, as Samothraki has some very rocky, and difficult to reach areas. However, due to limited budget, hilly terrain, at least partly densely wooded study sites, and the intention to involve students as much as possible, it seemed reasonable to use line transects by foot (Buckland 2001, Jachmann 2002, Waltert 2008), as used for a goat census in Parkes et al. (1996) and David et al. (2005). As our pilot survey, it aimed at serving both as a feasibility study and as a baseline for future annual inventories. The objective was to cover as much of Samothraki’s terrain as possible and to include an adequate balance of different vegetation types and habitats to document domestic mammals and occurring feral animals. All students participating in the excursion received training on how to carry out biological field surveys of that kind. The sampling design was optimised to cover as much of Samothraki's surface as possible, in the little time available. The objective was to split into groups of four to perform at least 20 transects of 1 km each.

The direct sightings and vocalizations were recorded together with the distance and the degree to the track direction measured. After each sighting, a picture of the actual habitat was taken as well as further attributes recorded (e.g. number of individuals without earmarks) with geographical reference. A Samsung Galaxy S2 smart phone with an application for GPS-tracking enabled data collection. Moreover, a Range Master to measure the distance to the mammals and two pairs of binoculars were used during the field surveys.²²

The students walked each transect in a diamond formation to fulfil methodological requirements. One person (holding the Range Master) was leading the group in spear-like formation at constant but slow walking speed. Two students (with the binoculars) followed on either side, whereas the student in charge of recording the track (with the smart phone) was in the back. At the end of each transect the vegetation types were estimated, discussed and documented in each group. At the beginning three types were established: forest, rocky and agricultural areas. While transecting each group

²² All equipment required for this study (GPS with satellite imagery data, Range Master for distance measurement as well as binoculars) were kindly provided by chinkoproject.com.

generated new categories or included different details (e.g. beach/sand, village, bush, olive, grassland, bush and sand, mountain, alpine, rocky grassland and vineyards). Since the study design allowed students with a broad range of backgrounds to participate (relatively few had a biology background), we concluded on a fairly simple, general classification comprising the following habitat types: agriculture, forest, rocky, grassland, village and beach/sand.

For the analysis, population abundance was estimated using the Distance 4.0 program. Using the program, we truncated the perpendicular sighting distances at 5%, used half-normal/cosine functions, and applied Distance's bootstrapping option to incorporate uncertainty in model fitting and model selection.

3.3 Results

In total, 28 line transects were carried out by four groups (of four students each) from October 18th to October 21st 2012. Each of the four groups received initial training on how to document all the direct mammal sightings. Table 1 summarises the total number of sightings. The total length walked and recorded was 27.71km. Most transects were of exactly 1km in length ($\pm 15\text{m}$), whereas one exceeded 1100m and another one had to be abandoned at 610m because of a fence blocking the way.

	Direct Sightings	Median Perpendicular Distance	Median Cluster Size
Cat	4	4	1
Dog	7	12	1
Donkey	1	27	1
Goat	161	54	2
Horse	6	95	1
Pig	2	85	3
Sheep	70	86	7
Total	251	-	-

Table 1: Total number of sightings, including median perpendicular distance to the walked transects and median cluster size of the herd.

As figures 2 and 3 indicate, the line transects were distributed over the island, but constrained to habitats in the accessible areas. Within the given time constraints, transects in the very remote or rocky/mountainous areas of the Southeastern part of the island had to be reduced in order to increase coverage in the remaining, most accessible parts of the island. We included altitudes ranging from sea level to 1,000m above sea level.

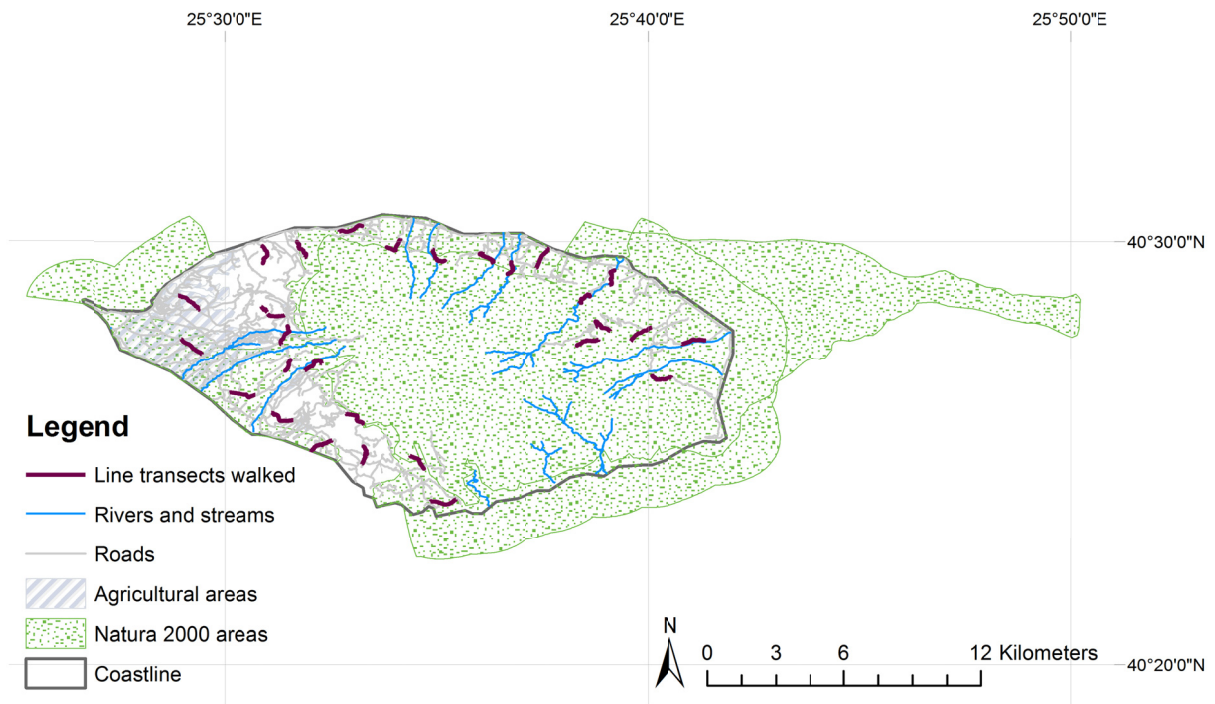


Figure 2: Map of Samothraki indicating the 28 line transects performed during the study.

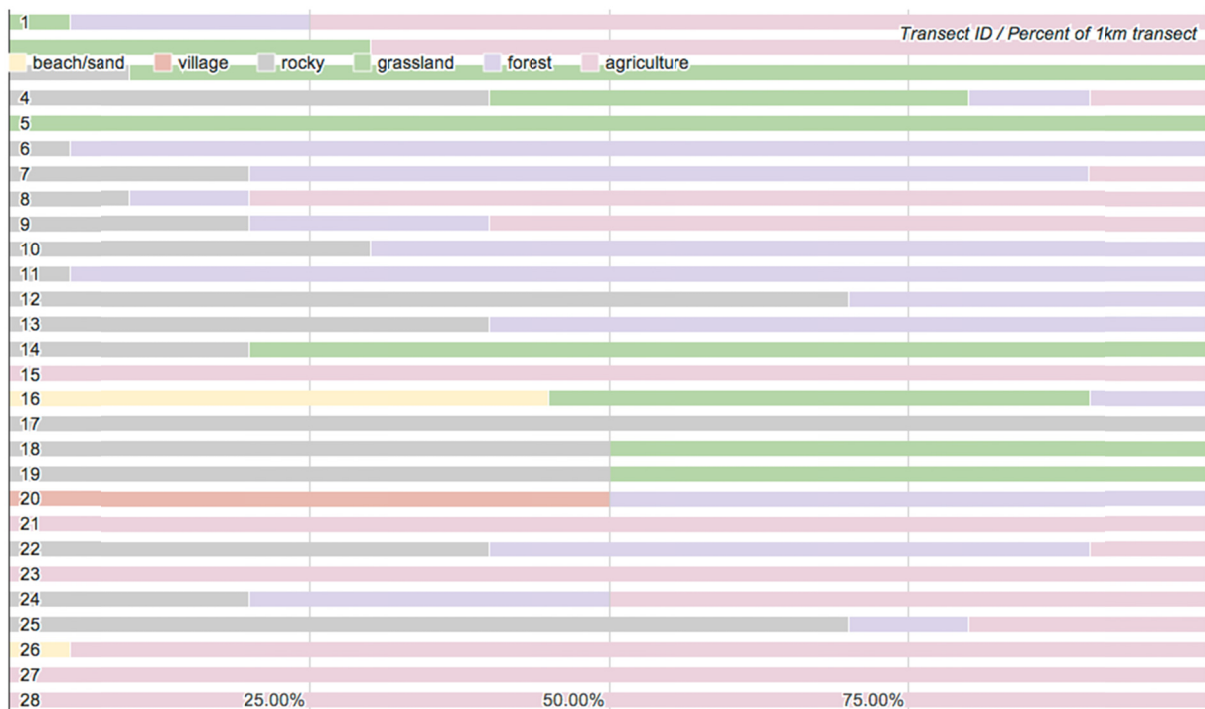


Figure 3: Covered habitat type for each transect walked (100% = 1km).

Tables 2 and 3 summarise our population estimates for goats and sheep on the island of Samothraki. For the total number of transects, on the entire island of Samothraki, we come up with the following uncorrected estimates: 60,031 goats and 67,196 sheep. However a very high Coefficient of Variation (CV) in both cases resulted in an unacceptably large 95% Confidence Interval (CI), 26,719 – 134,870 for goats and 26,951 – 167,540 for sheep. In an effort to reduce CI, we repeated the analysis, accounting only for sightings within the Natura 2000 area.

For the transects in the Natura 2000 stratum the uncorrected abundance estimate within 95% CI for those species where we had enough sightings (goats and sheep) are as follows: The uncorrected number of goats is estimated at 14,827. However with the high CV at 21% the abundance ranges from 9,726 to 22,604. The uncorrected abundance estimate for sheep is 17,508; whereas again with the CV at 37.5% abundance ranged from 8,456 to 36,250 animals. This means an uncorrected estimate of total 32,335 sheep and goats (including feral individuals) on Samothraki Natura 2000 area; given the CVs an estimate assuming a relatively high volatility.

	Population estimate	Coefficient of Variation (CV)	Confidence Interval (95%)
Goats	60,031	41%	26,719 – 134,870
Sheep	67,196	47%	26,951 – 167,540

Table 2: Goat and sheep population estimates for the entire island of Samothraki.

	Population estimate	Coefficient of Variation (CV)	Confidence Interval (95%)
Goats	14,827	21%	9,726 – 22,604
Sheep	17,508	37,5%	8,456 – 36,250

Table 3: Goat and sheep population estimates for the Natura 2000 area of Samothraki.

3.4 Discussion on the line transect method

Walking line transects has proven quite time intensive, especially as of the high translocation cost. Although we aimed at an optimal distribution of transects, we did not cover all habitat types representatively. Since most of the Samothraki's land surface is a Natura 2000 area, we did not cover sufficient non-Natura regions to achieve a reliable estimate of mammal density on those areas. The high CVs do not allow for making relevant statements of abundance of domestic or feral sheep and goats - further studies are needed to extend the database also in the more rocky regions of the island. Most likely, an overfly study is required to generate an initial index that allows for the correction of the data generated in the walked line transects. Nevertheless, the present pilot study succeeded in identifying the main advantages and drawbacks of the chosen method. The distance sampling method can be considered, to a large extent, appropriate for the aim of the study, given our time and financial budget. Performing additional transects in future surveys and covering all habitat types sufficiently would reduce the CVs and produce more reliable data. These could include a longer time frame. A standardised regular yearly monitoring could be easy to implement and would identify long term changes in population patterns.

4. Discussion

4.1 *General insights and future challenges*

The Greek island of Samothraki is a place endowed with high cultural and unique natural assets and is in a crucial phase of development towards a more sustainable future path, soon to become the first 'new generation' UNESCO Biosphere Reserve in Greece. The course correlating with this project and paper aimed at providing participating students training in socio-ecological thinking and interdisciplinary methods within a local setting. The on-going process of bottom-up transformation gave the students the opportunity to engage in a real-life project and utilise their scientific training within the field of sustainability studies, in order to analyse and accompany this process further. The focus was to stimulate students to search for solutions for sustainability and development challenges within problem-oriented teams. In addition, the focus group method chosen supported the transdisciplinary character of the project. It helped to start a transition process which is expected to continue without external help in the future. We can only hope that this feeling of sharing a common vision and motivation of acting together will continue.

Within the local population, two main tendencies can be identified (confirming previous data). On the one hand, there is a large group of rather young and educated people, working directly or indirectly in the tourism sector, that wish to protect the natural and cultural heritage of the island and are motivated to look into innovative collaborative ways of doing so. They are very supportive of the idea of establishing a BR on Samothraki, and consider that they could individually and collectively benefit from such a scenario. On the other hand, there is a more conservative group of middle-aged males with low levels of education who are mainly occupied with farming and livestock herding. They were slightly sceptical and even indifferent to the idea of a BR, seen as an external enforcement that would limit their ability to keep large subsidised herds of free roaming goats. Nevertheless, the current financial crisis seems to be forcing them as well to look into more collaborative ways out, and a new generation of farmers with a fresher attitude towards utilisation of agricultural produce seems to be in disagreement with the more traditional views. In any case, in order to gain further support from all stakeholders and create a BR vision that is universal and equally supported by the majority of the local population, it is important to develop a future management scenario which also incorporates the needs of those people not directly engaged in the service sector.

Another aspect is the importance and the special position of the so-called "outsiders" or "newcomers", which are often the group of residents that are initiating and implementing new ideas. Perhaps this happens because of their ability to have a different, more distant view on the situation, or perhaps because of the fact that they have—compared to the average resident—a different background, coming from cities, mainland, different country etc. This may allow us, as the research group, to act as outsiders, initiating new development. Similarly, the women with whom we talked to in focus group nr. 4 (section 2.3.4) are mainly from the mainland, none of them was born on the island, and this group seemed very open and interested in the BR project and some of them are even already involved in a locally active NGO, gleaming evidence of newcomer influence. In spite of this impression of the importance of outsider initiators, it is also necessary to involve the locals so that the whole process of becoming a BR is a process of real participation. We gained the impression in the focus group with the farmers (section 2.3.4) of a general mistrust in all things official, governmental, subsidized, and other top-down arrangements such as middle men, previous dealings

with cooperatives, etc. This makes it even more important to frame the process of establishing the BR as a transparent and bottom-up process.

In conclusion, we think the best and most appropriate possibility of development for the island of Samothraki is towards a pathway of environmental friendly, “eco”- tourism and not toward adoption of mainstream tourism with necessarily excessive high-class infrastructure and comfort. Due to the quite remote location of the island and the environmental setting as a rather unique place with rich areas of habitat, it is even more important—especially with the overpopulation of livestock—even prescient, to preserve its natural areas. Thus, for us, creating a BR on the island and promoting it would make the utmost sense.

4.2 Sustainability or collapse: possible and impossible future pathways

In the view of Tainter (1988) when the level of social complexity cannot be sustained anymore, and the costs of complexity exceed the benefits, societies collapse, in the sense of breakdown of complexity and rapid population decline. Following the sociometabolic approach (that takes society as the unit of analysis, interpreted as a socioeconomic system that interacts with systems in the natural environment), we conceptualise collapse as a situation when social metabolism ceases to function properly (Fischer-Kowalski and Haberl 2007). Referring to a socioecological system, collapse occurs when one or more of the subsystems cannot reproduce themselves any more. Complex systems may have several *tipping points*. Sometimes referred to as critical transitions or catastrophic thresholds, these are points at which a system shifts abruptly from one state to another (Scheffer et al. 2009). This may happen when the ecological resilience of a system is exceeded (Briske et al. 2010), or could be triggered by social stressors, such as demographic, economic governance or environmental-perception factors (Dearing et al. 2010).

So on the one hand we could identify some ecological tipping points such as the overuse of resources that if crossed can lead to ecological collapse. Overfishing, deforestation and massive erosion following overgrazing may serve as examples. On the other hand there are some social tipping points that if crossed can lead to societal disintegration and collapse and finally to the die out of the local population. An example of the latter is the maintenance of a school. If a rural secondary school cannot be maintained, this would cause all young parents to withdraw from the island, which in turn would threaten caretaking of the old who would therefore also have to leave the island. These issues exist in all rural communities, but they are even more pronounced in island communities that face more stringent limitations. Bussing children to school to a neighbour community may be an option, but shipping them regularly across the sea is not. Thus tipping points become more critical, and if crossed can lead to a mass abandonment of the island. While in agrarian societies of the past the fertility of the land and protection from raids may have been critical for sustaining a local population, in modern society the critical level of sociometabolic standard and complexity is much higher.

Future research on Samothraki needs to explore the factors that would cause the local society to prosper and sustain itself on the island and those that lead to its collapse. At present there is a fragile situation of slow decline of population and ecological conditions that might possibly be brought to a tipping point by impacts of the Greek economic and governance crisis and climate change. The island community has decided to make an effort at turning the whole island into a BR by UNESCO

standards, and this excursion is part of a long-term effort to provide scientific support to this process. In order to avoid collapse in the present, we need to generate improved insights from past collapses, as well as identify current threats and possible ailments. Moreover, we need to explore the option space for sustainability and use qualitative methods to find out if in a situation of crisis cultural change towards collaboration and self-empowerment may occur and widen the range of possible solutions.

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