

M3.1 BUSINESS BRIEFS

GREEK PILOT



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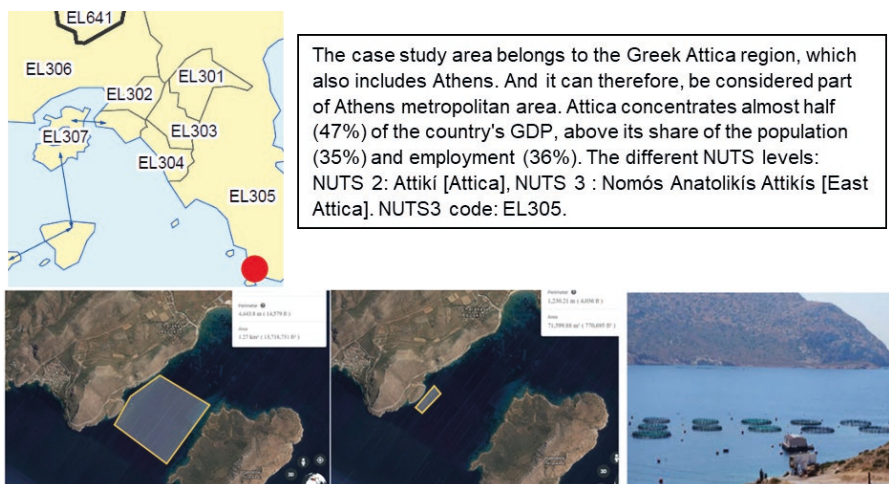


OBJECTIVE OF THE PILOT

The mission of the Greek pilot was to explore how to combine aquaculture and tourism activities. Specifically, the pilot investigated the potential of including an aquaculture farm in scuba diving tours, thereby turning the aquaculture farm into a touristic asset, providing economic opportunities, and alleviating local opposition to aquaculture.

CONTEXT OF THE PILOT

The Greek Pilot, denoted as the PATROKLOS Pilot site, is situated in the 59th km of the Athens-Sounio road, Palaia Fokaia, Attiki, Greece, in the wider area of Cape Sounio.



Technological readiness level (TRL)

The project partner **KASTELORIZO AQUACULTURE**¹ operates an aquaculture farm on floating facilities in the marine area near the Natura 2000 islet Patroklos, which is located 850 meters from the shore of the mainland. In addition, they operate an aquaculture farm on Crete. They produce fish and shellfish and sell them in Greece and abroad, including in its seven own restaurants. Their fish and shellfish farming unit is already established and in operation (i.e. TRL = 9).

The project partner **Planet Blue**² is a local diving center based in Lavrio, Greece, 60km south of Athens and not far from Patroklos. They offer diving tours for groups and individuals. Planet Blue also has a business providing Remote Operating Vehicles (ROVs) to aquacultures, including mapping the underwater landscape of aquaculture sites or conducting inspections or repairs of aquaculture infrastructure placed in great depths. In addition, Planet Blue offers diving expeditions for cleaning up waste in the aquaculture area. Both the diving activities and the ROV services are already established and in operation (i.e. TRL 9).

The pilot reached its aspired TRL of 7/8 (demonstration in an operational environment, also referred to as pre-or first of a kind commercial demonstration) by the end of the project. Both Kastelorizo and Planet Blue have mature, existing businesses. The innovative element is the combination of their two businesses into a multi-use case .

Legal characterisation

The aquaculture site has an exploitation permit for 10 years, which included an environmental impact assessment. This permit delimits the borders of the aquaculture site. It is however unclear whether legislation allows or prohibits additional use of the same site. In addition, the commercial exploitation and the production of sea bass and sea bream must adhere to a set of regulations on health and safety rules, environmental guidelines, sampling, physio-chemical treatment (e.g. HACCP certification).

The diving company also have all the necessary certificates by Bureau Veritas and have a strong security track-record, with its own camera-based monitoring. It also has all the necessary insurances.

There are no legally binding national marine spatial plans for Greece. There is therefore no over-arching framework enabling or promoting MU.

There are regulatory challenges to get aquaculture licenses. However, there is a relaxed regulatory framework for scuba diving operations, which increases the potential for the sector to engage in multiuse activities.

1 The company has the full-time equivalent of 98 employees and an annual turnover of 5.4 million Euros (2020).

2 Planet Blue has the full time equivalent of two employees and an annual gross turnover of 110 thousand Euro.



Environmental characterisation

Several environmental factors come into play when ensuring the successful operation of the aquaculture and scuba diving operations:

- Aquaculture impacts could affect local water quality and diving, therefore mutual interest in managing environmental impacts.
- There is a documented increased in ecosystem services. Aquaculture can attract fauna (which is often scarce in other sites due to overfishing in the Mediterranean), supporting diving increased recreational value and increasing biodiversity in the area.
- Climate change brings about increasingly frequent extreme weather events (warming, storms, etc.) – potentially poses a risk for both aquaculture and tourism activities.

Socio-economic characterisation

Greek marine aquaculture started in the early 1980s, around 400 t of seabass and seabream were produced in 1984. Total seafood harvested from aquaculture amounted to 125.772 tonnes in 2017, with an estimated first-sale value of 534.95 million euros. In 2018, Greece ranked 2nd in volume and in value among the EU-28 in fish farming. As with the rest of the Mediterranean basin, there has been a slow growth in the Greek aquaculture sector in recent years. The reasons for the continuous stagnation are economic, regulatory, and bureaucratic. Social acceptability was also found to be a significant barrier for coastal aquaculture.

With its 13,676-kilometer coastline, sank archaeological treasures and an archipelago of around 6,000 islands (227 inhabited), Greece has a great offer for scuba divers. Since 2005, the Greek government gradually has modified the rules and lifted many of the restrictions, facilitating dive tourism across the country. Recreational divers in Greece are mostly men (81.6%), well-educated (63%), 31-50 years old (68.3%) with a personal monthly income between 1,201-1,500 euros (32.7%). Before coronavirus, global trends in revenues and number of marine divers were falling globally. The sector has been hit very hard by pandemic related traveling restrictions. As of 2023 there are no recent available statistics for Greece.

BUSINESS ANALYSIS

Business Model Canvas Results

The business analysis of the Greek pilot has described the two partners' business models and evaluated their combined, multi-use business model. The external setting for the pilot poses some challenges and opportunities. Most pressing and uncertain is the regulatory/political situation related to maritime spatial planning and multi-use. The pilot is also exposed to the external economic setting, in particular, COVID-19's negative impact on tourism.

Several synergies between the two businesses support multi-use. Most important is the aquaculture farm and location itself, which is attractive to both partners. Both partners share some similar customer segments (domestic and international tourists), offering potential advertising synergies. There is also potential for cost savings due to some overlaps in terms of costs (advertising and boats).

The financial benefits of the multi-use predominantly accrue to Planet Blue. They arise from revenue from scuba diving and some potential cost savings. The financial benefits for Kastelorizo are generally indirect. Overall, the financial benefit of multi-use compared to the baseline case of single-use (aquaculture) is relatively small. Both partners can benefit from funding related to research projects.





SWOT Analysis for multiuse setup in the Greek pilot

<p>Strengths</p> <ul style="list-style-type: none"> • Two well-established partners (profitable etc.) • Two successful, attractive services/goods • Location of multi-use appropriate for both activities • Local offering (attractive to tourists and domestic customers) • Technical know-how (e.g. offshore monitoring, internal systems) • Safe operations operating with zero accidents 	<p>Weaknesses</p> <ul style="list-style-type: none"> • Unclear legal setting (i.e.. unclear if aquaculture license will be affected by diving) • Both partners are affected by local and global economic situations (especially through domestic and international tourism) • Government delays in putting plans into place (e.g. diving parks) • Public perception of aquaculture is quite poor
<p>Opportunities</p> <ul style="list-style-type: none"> • Licensing, regulation – potential to work together to access new sites/reduce admin burden. • Potential cost savings related to operations (e.g. boat trips, monitoring) • Potential to develop new activities and revenue streams (e.g. new diving activities, packages) • Potential to improve the social perception of aquaculture (with related benefits) also through educational trips • Potential of continued funding for multi-use (through research projects or from EU /local authorities e.g. EU European Maritime, Fisheries and Aquaculture Fund) 	<p>Threats</p> <ul style="list-style-type: none"> • Aquaculture license only 10 years (renewability) • Unclear how Greek Maritime Spatial Planning regulation will develop, and how this will be implemented by local regulators (e.g. threat of future re-zoning of the site) • Coronavirus - continued potential impact on both partners (reduced tourism) • Climate change – extreme weather events, shifting average temperatures, weather, etc. • Slow economic recovery, especially slow recovery in expenditure on costly activities such as diving • Potential for accident or other events negatively affecting both partners

POTENTIAL FINANCIAL AND ECONOMIC IMPACTS AND ADDED-VALUE

On the Kastelorizo side, no significant direct impacts on costs or revenues were identified. Planet Blue did carry out some monitoring activity at the site but this was unrelated to the touristic diving activity, so is not considered related to multi-use.

Further cost savings due to improved Fish-Farm Performance and Assessment can be expected for Kastelorizo. This financial impact refers to improved aquaculture operations through upgrading fishfarm monitoring systems and are not necessarily associated with the multiuse setup under investigation. These services that are provided by an ICT solutions company called WINGS would help the fishfarm to comply with existing environmental standards and reduce their environmental negative impact. A series of actions that help to improve aquaculture operations:

- Optimal feeding time depending on fish behavior
- Reduced fish stress because of the use of camera. Calculation of average weight instead of manual sampling that can cause physical damage.
- Early detection of disease / quick prevention of outbreak

In terms of upscaling operations, Planet Blue revenue would be boosted by offering new diving trips to the aquaculture site. It is unclear whether Kastelorizo will boost its revenue, though it could potentially develop packages with Blue Planet targeting tourists (e.g. combining diving and restaurant meals).

In addition, several economic impacts have been identified in the pilot; these are highlighted in the table below. Other impacts that are not considered significant multiuse impacts are: food provisioning and food security from aquaculture. These are likely significant impacts for the aquaculture sector, but not dependant on the combination of activities with scuba diving. Same could be said about wider economic impacts such as rural services provision or employment stemming from aquaculture and scuba diving tourism. The scale of these impacts is not expected to be significant under a multiuse or a single use activity setting.





Economic impact	Definition	Scale
Increased scuba diving experience in a fauna rich area	The presence of caged fish in addition to certain minimum levels of water quality attracts other fish species. Such as dolphins, which is an emblematic fish species and therefore, of high economic cultural value . These are impacts related with maintaining and increasing local marine biodiversity leading to the provision of other ecosystem services and other economic impacts to humans, which will in return turn into an increased scuba diving experience and more visitors/costumers for the multiuse activities.	HIGH POSITIVE
Increased education for divers	Increased awareness (tourists) of the environmental protection of the area	LOW POSITIVE
Marine citizen science (MCS)	Possibility to design marine citizen science (MCS) projects involving recreational scuba divers that support biodiversity monitoring and marine conservation. Under the current multiuse setting this could be a potential add-on coming from the previous two impacts. Recreational aquaculture divers could perform some data collection activities resulting in a greater enjoyment of their scuba diving experienced while helping to monitor the site.	LOW POSITIVE
Increased local acceptance	The multiuse setup will definitely increase local acceptance of the aquaculture farm near Patroklos by residents, as well as increased wider societal acceptance of aquaculture. Evidence suggests that local residents express a more negative attitude towards aquaculture and its further development than national or international tourists. This leads to social opposition processes and blockages and irreversibility of opposition to development aquaculture projects in most cases. Kastelorizo may use the diving site to offer tours to concerned residents. In addition to the services offered by their restaurants, this may support easing concerns about the quality of the caged fish. All these actions could be included as a battery of options to increase the transparency in fishfarm operations.	HIGH POSITIVE

OUTLOOK AND RECOMMENDATIONS

According to our analysis in the Greek pilot, the combination of marine activities sharing existing infrastructure with touristic activities is likely to result in win-win situations. Our assessment has identified a series of positive financial, environmental, social and economic impacts.

Touristic activities (such as scuba diving tours) are good candidate activities to be combined in a multiuse setting with aquaculture. However and in terms of magnitude of multiuse impacts, the likely winner in this context is the aquaculture operations. The combination with scuba diving activities can help reducing local residents' negative opposition to aquaculture (and farmed fish in general) by increasing transparency about its operations and potential negative environmental and quality impacts. Swimming through the cages and its surroundings will enhance the diving experience. As such, it can be sold as part of existing diving packages. Nevertheless, there are hardly any financial gains for both activities from multiuse. The benefits are purely economic and difficult to quantify.

Promoting the combination of multi-use could serve as a strategic tool to support the ongoing economic growth in blue economy in Europe. This holds significant relevance; especially as novel policy measures are being developed to encourage investment in the blue economy sectors. A multi-use framework, coupled with tourism activities may present a viable approach to address local acceptability, a key obstacle to the sector's expansion in numerous coastal areas. Nevertheless, it is essential to conduct further research to quantify the extent of this potential positive impact. Exploring methods that capture public preferences could be valuable in future research on this project.





**Discover United
follow-up project:
ULFARMS**



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