

Malta's Multiannual National Plan for the Development of Sustainable Aquaculture

2022-2030



GOVERNMENT OF MALTA
MINISTRY FOR AGRICULTURE,
FISHERIES AND ANIMAL RIGHTS

MALTA'S MULTIANNUAL NATIONAL PLAN FOR THE DEVELOPMENT OF SUSTAINABLE AQUACULTURE (MNPSA) 2022-2030

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1. Introduction

Worldwide appreciation for aquaculture is increasing. Both the European Union (EU) Commission and the Food and Agriculture Organization (FAO) acknowledge aquaculture as a sustainable source of high protein food with a low carbon footprint. The aquaculture industry creates jobs and economic opportunities in coastal and rural communities. This sector can help: decarbonise the economy, fight climate change and minimise its impact, reduce pollution, contribute to improved ecosystem protection and maximise resource utilisation.

This Multiannual National Plan for the development of Sustainable Aquaculture (MNPSA) acknowledges and incorporates the core objectives of the: European Green Deal (EGD)¹, the Farm to Fork Strategy², the Biodiversity Strategy³, the Ecosystem Approach to Aquaculture (EAA)⁴ and of the Zero-pollution ambition for a toxic-free environment⁵. This MNPSA also takes into account the EU Organic Aquaculture⁶ concepts and the new EU Strategic Guidelines for a more Sustainable and Competitive Aquaculture⁷, which identify four key priority areas being: building resilience and competitiveness, participating in the green transition, ensuring social acceptance and consumer information and increasing knowledge and innovation.

This MNPSA lays out a framework of operations, to ensure that the aquaculture industry and all relevant stakeholders in Malta continue to progress and strengthen despite the existing global challenges that are affecting this sector. The vision and goals presented in Malta's plan have been devised with the international context in mind, particularly the Integrated Maritime Policy for the European Union⁸ and the Atlantic Strategy and associated Action Plan⁹ which recognise the contribution that the 'Blue Economy' can provide to European and global economic growth, mainly the need for appropriate policies, strategies and funding mechanisms to enable this.

A strategic and long-term approach targeting sustainable growth, food security and sectoral resilience is very much relevant in today's context. This MNPSA will seek to use past experiences and present technological know-how, to be supported by a holistically focused public sector managerial approach. The end scope shall be to develop a diverse portfolio of feasible and sustainable options, economically relevant for new entrants joining the industry. In addition, producers will be encouraged to scale-up operations to provide fresh, organic and sustainable quality products to the now more informed consumer. There are still some regulatory, technical, and organizational challenges yet to be tackled for the Maltese aquaculture sector to proactively thrive which are explained throughout the plan. Keeping in mind the limited resources available, such needs will be addressed throughout the plan's life cycle.

¹ https://eur-lex.europa.eu/resource.html?uri=cellar:b828d165-1c22-11ea-8c1f-01aa75ed71a1.0002.02/DOC_1&format=PDF.

² https://eur-lex.europa.eu/resource.html?uri=cellar:ea0f9f73-9ab2-11ea-9d2d-01aa75ed71a1.0001.02/DOC_1&format=PDF.

³ https://eur-lex.europa.eu/resource.html?uri=cellar:ea0f9f73-9ab2-11ea-9d2d-01aa75ed71a1.0001.02/DOC_2&format=PDF.

⁴ https://eur-lex.europa.eu/resource.html?uri=cellar:a3c806a6-9ab3-11ea-9d2d-01aa75ed71a1.0001.02/DOC_1&format=PDF.

⁵ https://eur-lex.europa.eu/resource.html?uri=cellar:a3c806a6-9ab3-11ea-9d2d-01aa75ed71a1.0001.02/DOC_2&format=PDF.

⁶ <https://www.fao.org/3/i1750e/i1750e.pdf>.

⁷ https://eur-lex.europa.eu/resource.html?uri=cellar:a1c34a56-b314-11eb-8aca-01aa75ed71a1.0001.02/DOC_1&format=PDF.

⁸ https://eur-lex.europa.eu/resource.html?uri=cellar:a1c34a56-b314-11eb-8aca-01aa75ed71a1.0001.02/DOC_2&format=PDF.

⁹ https://eur-lex.europa.eu/resource.html?uri=cellar:ebb94528-8d5b-11eb-b85c-01aa75ed71a1.0001.02/DOC_1&format=PDF.

¹⁰ https://eur-lex.europa.eu/resource.html?uri=cellar:ebb94528-8d5b-11eb-b85c-01aa75ed71a1.0001.02/DOC_2&format=PDF.

¹¹ https://eur-lex.europa.eu/resource.html?uri=cellar:bab1f9a7-b30b-11eb-8aca-01aa75ed71a1.0022.02/DOC_1&format=PDF.

¹² https://eur-lex.europa.eu/resource.html?uri=cellar:bab1f9a7-b30b-11eb-8aca-01aa75ed71a1.0022.02/DOC_2&format=PDF.

¹³ <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52007DC0575&from=BG>.

¹⁴ <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52020DC0329&from=EN>.

2. Main objectives

The Maltese Government, via the presentation of this document, is highlighting the core objectives of its national strategy the years 2022-2030. This plan intends to consolidate the progress made in this field through the implementation of the previous Multiannual Plan (2013-2025), taking into account all the lessons learnt over the past years, new contextual realities and the development of new aquaculture technologies and solutions.

The continued development of the aquaculture industry needs to be carried out sustainably. Therefore, Malta's vision for the sector is:

- A more competitive and resilient aquaculture sector that develops in balance with good environmental practices and societal expectations. This holistic synergy between the multitude of variables aims to increase stakeholder involvement and investment, whilst promoting market expansion to meet the growing demands of consumers for seafood products.
- The provision of streamlined and less bureaucratic governance processes, promoting transparent and accountable practices for the public and the commercial enterprises in the industry.

For the achievement of this vision, Malta has focused its MNPSA on 70 strategic activities which are explained in more detail in Section 7 - Objectives and actions for the period 2022-2030.

To keep abreast with progress and to address ongoing challenges that impact the industry, Malta is committed to review its core strategy periodically, in line with the EU's aquaculture vision. This shall ensure that the MNPSA remains a relevant document and truly represents ongoing global challenges, the industry's growth and development, and considers evolving societal interests.

It is essential to be in a position to strategically review and assess progress being made, hence tackle any short comings not foreseen during planning stage. In this regard, Malta has also submitted a Technical Support Instrument (TSI) project application to the EU Commission, requesting support to finance the drafting of a new National Aquaculture Strategy, which will act as the main implementing mechanism of this MNPSA. In case EU funds are not secured, Malta still intends to resort to local funding to tackle the core requirements identified throughout this MNPSA, strategically limiting actions depending on resource availability.

3. Description of the National aquaculture sector

3.1 General overview

The Maltese aquaculture sector falls under the responsibility of the Ministry for Agriculture, Fisheries, Food and Animal Rights (MAFA). The Director General responsible for the Department of Fisheries and Aquaculture (DFA) within this Ministry, manages two directorates, Fisheries and Aquaculture. The Aquaculture Directorate regulates the aquaculture sector and oversees to the Government's research and development efforts in this area, hence was responsible for the implementation of the Aquaculture Strategy 2014-2025 for the Maltese Islands, which text was subsequently updated and shall be superseded via this new Multiannual Plan.

The aquaculture industry in Malta has considerable socio-economic value and potential as it enhances the overall economic diversification, contributes to employment generation, provides valuable export earnings, and contributes towards the EU trade deficit for fisheries products.

3.2 Systems and cultured species

The Maltese aquaculture industry is entirely dependent on marine resources and is divided into two distinct sectors being:

- the Capture-Based Aquaculture (CBA) of Atlantic Bluefin tuna (*Thunnus thynnus*).
- the Closed-Cycle Species (CCS), mainly Gilthead Sea bream (*Sparus aurata*) and European Sea bass (*Dicentrarchus labrax*).

Commercial production of these CBA and CCS systems is exclusively conducted in floating cage culture systems.

Alternative fish species have been cultured by the Aquaculture Directorate, such as the Meagre (*Argyrosomus regius*), Sea Bream (*Diplodus sargus*), Bluefin Tuna (*Thunnus thynnus*) and the Amberjack (*Seriola dumerili*). In addition, pilot culture studies have been carried out for Sea urchins (*Paracentrotus lividus*), Sea cucumbers (*Holothuria poli*, *Parastichopus regalis*), Cuttlefish (*Sepia officinalis*) and Red scorpionfish (*Scorpaena scrofa*).

In terms of alternative aquaculture systems, the Aquaculture Directorate is investing in sustainable strategies for production. Specifically, these include Integrated Multi-Trophic Aquaculture (IMTA) primarily for fish-invertebrate systems, and aquaponics using gilthead Sea bream and lower trophic organisms including polychaetes, halophytes and macroalgae integrated in a recirculated aquaculture system.

Presently, the Maltese aquaculture sector is principally composed of seven companies operating from seven sites. Five operators produce exclusively tuna, one operator produces both tuna and CCS, and one operator produces only CCS. All farming operators have significant experience in operating successfully in offshore aquaculture and have an adaptable and competent workforce available.

3.3 Sector performance and contribution to the economy

According to Malta's National Statistics Office (NSO)¹⁰, during 2020, the total output value generated by the Maltese aquaculture industry rose by €2.4 million, i.e. 1.4% over that registered in 2019. Concurrently, the intermediate consumption of the industry, which takes into account the main operating expenses incurred by the operators, fell by €50.6 million, i.e. 27.3% when compared to the preceding year. As a result, the industry's Gross Value Added settled at a net positive balance of €44.1 million. Meanwhile, the gross fixed capital consumption of the industry's fixed assets fell marginally by €0.3 million to a total of €4.4 million while the expenditure on the compensation of employees increased by €0.6 million to €10.1 million. The industry attained a Net Operating Surplus of €29.6 million (table 1).

¹⁰ https://nso.gov.mt/en/News_Releases/Documents/2021/11/News2021_210.pdf.

Table 1. Value added of the aquaculture industry.

| Table 1. Value added of the aquaculture industry (€ million) | | | | | | |
|---------------------------------------------------------------------|-------|-------|-------|-------|-------|-------------------|
| | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 ^p |
| Number of fish farms | 5 | 6 | 7 | 7 | 7 | 7 |
| Output | 130.8 | 178.4 | 201.2 | 239.2 | 176.3 | 178.7 |
| - Tuna farming | 111.1 | 152.5 | 168.4 | 228.6 | 152.1 | 198.3 |
| - Closed cycle species | 16.8 | 11.5 | 12.0 | 14.1 | 9.8 | 17.1 |
| - Change in stocks | 2.5 | 10 | 18.3 | -7.1 | 11.3 | -38.8 |
| - Other output | 0.4 | 4.5 | 2.5 | 3.6 | 3.0 | 2.0 |
| Value added, gross | 20.9 | 32.8 | -3.3 | 7.6 | -9.0 | 44.1 |
| Value added, net | 19.3 | 31.4 | -5.3 | 3.4 | -13.7 | 39.7 |
| Operating surplus, net | 15.3 | 27.6 | -10.2 | -5.2 | -23.2 | 29.6 |

The value added of the Maltese aquaculture industry in 2020 was € 217.5 million of which, 91% coming from tuna farming, 8% from CCS and 1% is coming from other output/revenue (Fig. 1).

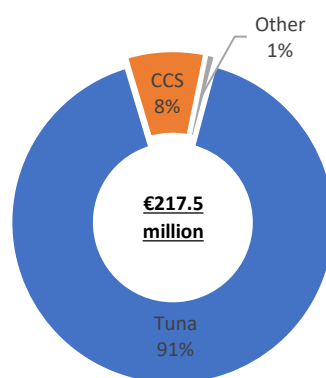


Figure 1. Value added and percentage distribution of selected aquaculture output in 2020.

In terms of volume, the total sales of farmed fish rose by 6,000 tonnes, i.e. 43.4% when compared to 2019. This was mainly due to a rise in the volume of sales of farmed tuna of 4,600 tonnes (38.8%). In terms of value, the total sales of farmed fish increased by €53.5 million, i.e. 33.1% to a total of €215.4 million.

In terms of production, as shown in Fig. 2, tuna farming productions had followed National quota allocation for each respective year and the tuna industry became one of the island's major exporters of fish products, namely to Japan as a frozen product for the sushi and sashimi trade.

CCS production, instead, has seen a considerable decrease in the past years, from the highest recorded levels in 2014 (2,900 tonnes) to the lowest recorded levels in 2019 (1,900 tonnes). Despite this trend, in 2020, CCS production registered an increase of 37% over the 2019 production, reaching 3,200 tonnes. These changes are due to market fluctuations and different production strategies from the operators. Almost all the CCS production is exported as whole, gutted/ungutted fresh fish to Europe and North Africa.

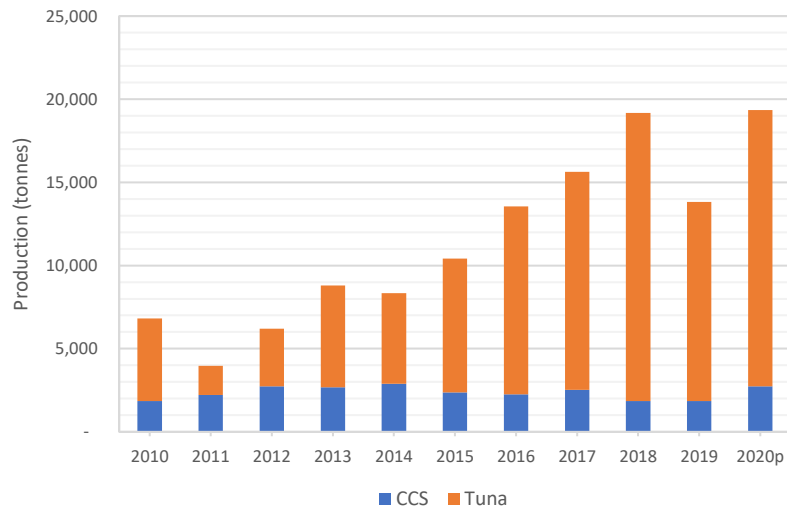


Figure 2. Distribution of the Maltese aquaculture production 2010-2020.

Maltese aquaculture is a valid economic sector with a positive growth potential and its expected expansion is based on the potential identification of new aquaculture zones to be used for CCS and other novel species and on reaching the CCS production target of 5,000 tonnes, in addition to the tuna farming production, until 2030. It is forecasted that the industry will increase direct and indirect jobs by up to 25% by 2030 with a Gross Value Added of around €70 million to the Maltese economy.

The Malta's advantageous geographical position affects the aquaculture industry in two different ways: from one end, being located in the middle of the Mediterranean Sea, which is demonstrated to be a migratory route for wild stocks of Atlantic Bluefin tuna, plays a beneficial role for the tuna industry, shortening the towing time of live tuna from the fishing ground to the farming sites. On the other end, despite its proximity to European (80 km south of Sicily-Italy) and North African (284 km east of Tunisia and 333 km north of Libya) markets, CCS sector still struggles to overcome limitations related to space, resources and market related factors.

3.4 SWOT analysis

The following Strengths-Weaknesses-Opportunities-Threats (SWOT) analysis of the Maltese aquaculture industry has been developed in consultation with the concerned stakeholders.

| Strengths | Weaknesses |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> • Experienced offshore sector; • Sheltered bays suitable for aquaculture production; • Geographical position; • Good water quality; • Know-how on high value species for CCS diversification • Established tuna production capabilities; • Global recognition as a leading producer of farmed Bluefin tuna; • Experienced operators with proven track record. | <ul style="list-style-type: none"> • Complex licensing process; • Insufficient investment in R&D; • Lack of private investment; • Limited transport logistics; • Small domestic market; • Reliance on other countries markets; • Limited influence on international markets; • Limited availability of coastal space; • Space competition; • Poor public perception; • Limited economies of scale. • Only two small farms form a vulnerable CCS industry |
| Opportunities | Threats |
| <ul style="list-style-type: none"> • Continuing to play a major role in the world’s Bluefin tuna industry; • Global demand for high-quality seafood; • Reinforcing the leadership in offshore aquaculture; • Promoting aquaculture diversification; • Introducing new aquaculture concepts; • Introducing quality control schemes; • Set up a new Aquaculture Research Centre; • Develop lower trophic level species culture; • Use of financial instruments. • Vast Maltese waters open the door for further development of offshore aquaculture | <ul style="list-style-type: none"> • Fish diseases and parasites; • Co-existence with other marine activities; • Public opposition to industry; • Spatial restrictions on aquaculture activities; • Increased competition from companies inside and outside the EU; • Competition in the tuna sector; • Impacts of climate change on aquaculture; • Impact on biodiversity from alien species. |

Arising from this SWOT analysis, the following over-arching sectoral needs have been identified. Relevant actions were included into this MNPSA to proactively tackle these operational opportunities, being:

- i. A streamlined and efficient licensing system that provides greater business certainty to applicants and more transparency to the general public;
- ii. Need to increase sustainable production, value and employment in the Maltese aquaculture sector;

- iii. Strengthen the hatchery function to steer the development of CCS into a stronger CCS industry;
- iv. Encourage new aquaculture enterprises to enter the sector;
- v. Support evolution of SME enterprises through scaling;
- vi. Develop or introduce and commercialise new species for CCS, good husbandry practices, diverse products, new disease management practices, new technology and equipment and new ways to reduce the environmental impact of aquaculture;
- vii. Promote through professional training, skills development and networking of the uptake of best husbandry, environmental and disease management products and practices, adoption of innovative technology, and scaling;
- viii. Provision of advisory services in terms of health and safety, environmental management, animal welfare and professional business and marketing strategies;
- ix. Promote Organic Aquaculture practices and certification;
- x. Promote the development of Integrated Multi-Trophic Aquaculture practices;
- xi. Protect biodiversity in marine habitats, including species and habitats protected under Natura 2000, with acquisition and analysis of data, assessment of environmental impacts, preparation of plans, networking and capacity building, monitoring and reporting and alien species management;
- xii. Support good governance of aquaculture and reduction of the administrative burden on operators through investment in support systems that facilitate online licence application and tracking and that facilitate spatial mapping of aquaculture sites and exclusion areas, in particular areas protected under Natura 2000 and requiring spatial protection;
- xiii. Aquaculture to be better integrated into marine spatial planning policies.

4. The legislative and institutional framework regulating the Aquaculture industry

4.1 *The institutional framework*

The legislative power in relation to aquaculture activities is conferred to the **Ministry for Agriculture, Fisheries, and Animal Rights (MAFA)** which is composed of various Departments amongst which is the **Department of Fisheries and Aquaculture (DFA)**¹¹ which is administrative responsible to regulate aquaculture operations via existing operational permits. Furthermore, it is also responsible to oversee ongoing aquaculture operations to ensure that all activities are in line with concession parameters and conditions, permit renewals, extensions and other authorization requirements. MAFA-DFA is responsible for the national policy in capture fisheries and aquaculture and the coordination of administrative regional policies. MAFA-DFA also maintains institutional relations with the EU and coordinates actions and activities with other ministries, administrative regions and other stakeholders. The jurisdiction of MAFA-DFA includes seafood production chain, research activities in capture fisheries and aquaculture, use of vessels and crew, implementation of the aquaculture regulatory framework together with the interested parties with the aim of encouraging cross-disciplinary actions and integration at regional and local level.

¹¹ <https://agrikoltura.gov.mt/en/fisheries/Pages/home.aspx>.

The **Environment and Resource Authority (ERA)**¹² has jurisdiction on aquaculture and environment interactions, environmental impact assessment, marine protected areas, Natura 2000 sites, conservation on natural resources and biodiversity, application of EU environmental legislative framework, such as the Water Framework Directive (WFD) and the Marine Strategy Framework Directive (MSFD) and environmental education.

The **Planning Authority (PA)**¹³ regulates and processes the applications for the development of an aquaculture zone in the national territorial waters of Malta.

The **Animal Health and Welfare Department (AHWD)**¹⁴ within MAFA deals with safety of the food chain, animal health and welfare, hygiene, trade, policy and enforcement, including products from both capture fisheries and aquaculture.

The **Malta Competition and Consumer Affairs Authority (MCCAA)**¹⁵ is responsible for the promotion and protection of consumer rights and welfare. The MCCAA has jurisdiction for competitiveness and innovation policies, energy policies and integrated development with other industrial activities.

The **Ministry for Education, Sport, Youth, Research and Innovation (MEYR)**¹⁶ is responsible for some policy items in relation to research planning, education and training in capture fisheries and aquaculture.

Transport Malta (TM)¹⁷ is responsible for regulating maritime leisure activities in the territorial and internal waters of Malta, focusing on the preservation of good order, promoting and overseeing safety of navigation. Transport Malta regularly issues Notices to Mariners to assist in the safety of navigation and related matters.

Lands Authority (LA)¹⁸ acts as the administrator of public property on behalf of and in the ultimate interest of taxpayers and is responsible for licenses and concessions for land and water use for aquaculture activities.

The **Federation of Maltese Aquaculture Producers (FMAP)** is the only established producer organisation in Malta representing 5 out of 6 tuna aquaculture operators. FMAP goals and remit are to promote sustainable aquaculture and to represent the members of the FMAP and Maltese aquaculture at National, European and international level.

4.2 The governing regulations

The regulatory framework for aquaculture in Malta falls under the provisions of CAP 425 – Fisheries Conservation and Management Act¹⁹ and its Subsidiary Legislations related to aquaculture, which mainly are:

¹² <https://era.org.mt/>.

¹³ <https://www.pa.org.mt/>.

¹⁴ <https://agrikultura.gov.mt/en/ahwd/Pages/home.aspx>

¹⁵ <https://www.mccaa.org.mt/>.

¹⁶ <https://education.gov.mt/en/Pages/educ.aspx>.

¹⁷ <https://www.transport.gov.mt/>.

¹⁸ <https://landsauthority.org.mt/>.

¹⁹ <https://legislation.mt/eli/cap/425/20191001/eng>

- S.L. 425.02 – Fish Market Regulations²⁰: this legislation addresses the obligations of buyers to label all the fishery products offered for sale by specific information in line with the respective Regulations as derived from the common European legal framework.
- S.L. 425.03 – Tunny Fish (Importation) Restriction Order²¹: this legislation focuses on Restriction Order for Tunny fish importation.
- S.L. 425.05 – Fisheries and Aquaculture Services Payments Regulation²²: this legislation regulates the payments for services conducted outside the DFA’s precincts and outside normal office hours by Government Fisheries Officers when their attendance is required on and during aquaculture operations.
- S.L. 425.12 – Aquaculture Operations Regulations²³ and L.N. 157/2017 - Aquaculture Operations Regulations 2017²⁴: this legislation deals with aquaculture operations regulations and outlines the provisions needed to set up a new fish farming business, including the application process, the payment of one-time fee for new applications and yearly fees, the establishment of an Aquaculture Operations Register, and the designation of power to the Director on related matters. It provides also the Code of Good Practice for Sustainable Aquaculture as an Annexed Schedule to the policy.
- S.L. 425.13 – Blue Fin Tuna Harvesting Regulations²⁵: this legislation focuses on the fact that caged Bluefin tuna shall be weighed at the moment of harvest. During the harvesting period, the DFA shall monitor and forecast harvesting weights.

In 2018 the permit procedure was standardised through an Aquaculture Operations Permit document, signed by the DFA as the Contracting Authority and the aquaculture operators as permit holders. The Aquaculture Operations Permit is a comprehensive document that establishes the delimitations of a fish farming concessionary area and the relative conditions, while it subjects the operators to duties and obligations to which they must adhere to in the management of their production operations. It also outlines the conditions for their engagement in the Environmental Monitoring Programme with the ERA, and their Site Markings compliance obligations which falls under the remit of TM. The permit is valid for 25 years with the option to renew for further periods of 5 years or for such longer terms in line with the L.N. 157/2017.

In the year 2020, to enhance the administrative and regulatory capacity of the DFA and to reflect the added impetus for the aquaculture sector, the following legislative amendments have been published:

- L.N. 431/2020 - Fisheries and Aquaculture Services Payments (Amendment) Regulations. This legislation was required for the abolition of the €230 per Bluefin tuna tonne fee in order to eliminate the additional burden imposed on aquaculture operators by means of the introduction of Article 4 in Subsidiary Legislation 425.05.
- L.N. 188/2020 and L.N. 189/2020 - Blue Fin Tuna Harvesting and Aquaculture (Amendment) Regulations. This legislation was required to give power to the Director General Fisheries &

²⁰ <http://extwprlegs1.fao.org/docs/pdf/mlt1890.pdf>.

²¹ <https://legislation.mt/eli/si/425.3/20100722/eng>.

²² <https://legislation.mt/eli/si/425.5/20100722/eng>.

²³ <https://legislation.mt/eli/si/425.12/eng/pdf>.

²⁴ <https://legislation.mt/eli/ln/2017/157/eng>.

²⁵ <https://legislation.mt/eli/si/425.13/eng/pdf>.

Aquaculture to order the release of fish that are kept in an illegal/irregular status in the Maltese territorial waters.

Other Governing Regulations that are important to mention within the regulatory framework of Maltese aquaculture, are:

- the Environment Protection Act (CAP. 549)²⁶,
- the Marine Policy Framework Regulations (S.L. 549.62)²⁷;
- the Water Policy Framework Regulations (S.L. 549.100)²⁸;
- the Veterinary Services Act (CAP 437)²⁹;
- the Development Planning Act (CAP. 552)³⁰.

However, there are many national and European regulations governing strategic aspects of aquaculture production to be considered in the ongoing study to review the Maltese Regulatory framework. These include rules on the use of land and maritime areas, the sustainable use of natural resources, the protection of environmental quality and sensitive areas, preservation of biodiversity, animal health and welfare during farming, transport, killing/slaughtering, hygiene and products safety, processing, traceability, labelling and marketing.

5. Progress at present, pursuant to the 2013 Strategic Guidelines

The following table below summarizes the progress achieved to date in the Maltese aquaculture sector based on the targets listed in the Multiannual Plan 2013-2025.

| Area | Measures | Progress to date |
|------------|----------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Regulatory | Updating of National Aquaculture policy & improving governance | <p>The Aquaculture Strategy was issued in 2013 and published in 2014. In 2017 two new policies related to aquaculture were published, while amendments to relevant policies were carried out in 2020.</p> <ul style="list-style-type: none"> • L.N. 83/1991 (S.L. 425.05) - Fisheries and Aquaculture Service Payments - published 1991; amended by L.N 426/2007, L.N 344/2015 and L.N. 431/2020. • L.N. 157/2017 (S.L. 425.12) - Aquaculture Operations Regulation - published 2017; amended by L.N. 188/2020. • L.N. 272/2017 (S.L. 425.13) - Bluefin Tuna Harvesting Regulation - published 2017; amended by L.N. 189/2020. <p>The administrative and regulatory capacity of the DFA has been enhanced by a substantial increase in Human Resources (HR) capacity and by introducing several actions such as:</p> <ul style="list-style-type: none"> • 100% checks over all Bluefin tuna farm operations; • Increase in control and inspections, and launching of investigations; • Routine random control transfers; |

²⁶ <https://legislation.mt/eli/cap/549/eng/pdf>.

²⁷ <https://legislation.mt/eli/sl/549.62/eng/pdf>.

²⁸ <https://legislation.mt/eli/sl/549.100/eng/pdf>.

²⁹ <https://legislation.mt/eli/cap/437/eng/pdf>.

³⁰ <https://legislation.mt/eli/cap/552/eng/pdf>.

| | | |
|-------------|----------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | | <ul style="list-style-type: none"> • Numbered seals and sealing of all Bluefin tuna farm cages; • New Standard Operating Procedures (SOPs); • Risk Management System. |
| | Identifying and applying for new Aquaculture sites/zones | <p>The offshore (6 km away from coast) South-East Aquaculture Zone (SEAZ) has been identified in 2018 and now represents the biggest tuna farming concessionary area of Malta which includes 4 tuna operators.</p> <p>The application process of the North-East Aquaculture Zone (NEAZ) is still in progress.</p> <p>Plans are in place to identify other site/s deemed adequate for CCS aquaculture usage, hence supporting sectoral expansion.</p> |
| | Preparation of Environmental Permit | Operations within aquaculture zones are regulated by the ERA through an Environmental Permit that lays out all the conditions and obligations that aquaculture operators need to adhere to in the management of their production operation concerning the impact it has on the environment. This permit runs parallel with the Aquaculture Operational Permit and is valid for 1 year and is subject to a yearly renewal. |
| | Preparation of disease contingency plan | A Mass Mortality Contingency Plan (MMCP) for the tuna farming and CCS has been developed in compliance with the requirements defined by the Environmental Permit conditions as issued by ERA. |
| Operational | Hatchery development | Within the Aquaculture Directorate, hatchery functions were conducted over several years through a private public partnership, focusing on the hatching and growth of various aquaculture species such as Sea bream, Sea bass, Meagre and Amberjack. This function ceased in 2016 as this economic model did not yield the originally projected results. Hatchery functions shall still be carried out directly by the Aquaculture Directorate though, since such is an integral function of Aquaculture. |
| | Baitfish feeding practices | <p>A number of measures were imposed on aquaculture operators to mitigate the effects of baitfish feeding on the environment and on other economic sectors, mostly related to potential generation of smells and oily slicks. These measures included:</p> <ul style="list-style-type: none"> • The relocation of tuna farms to offshore sites; • The installation of booms along pens to collect oily residues from baitfish; • The collection of waste material from around penning zones with the use of skimmers; • The appropriate conditions related to thawing of frozen baitfish; • The conditions ascertaining containment of thaw waters and oily residues on the supply vessels during transportation of baitfish. |
| | Review of tuna offal disposal | Despite an initial policy and regulatory direction to transport this waste back to land for incineration, the Maltese incinerator at the abattoir does not have the capacity to process the amount of waste generated during this period (approximately 8-10 tonnes of offal per day) and thus no longer accepted this waste. |

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| | | <p>In view of this, the accepted practice had returned to offshore offal disposal, at a site 10 km offshore as directed by the Director General Fisheries. A VMS-equipped vessel takes the waste from the processing vessel and transports it further offshore to a dumping site. The vessels are closely monitored by the DFA to ensure that the offal is dumped at the designated sites.</p> <p>The possibility of identifying alternative options for the disposal of the offal is a condition of ERA's Environment Permit and will be discussed in detail with the relevant authorities. In parallel to this, various initiatives were taken on a local level both by the DFA and by the Industry where different options to re-use this offal were currently being explored.</p> |
| | Production of Codes of Good Practice | L.N. 157/2017 on Aquaculture Operations Regulation adopted the Federation of European Aquaculture Producer's Code of Conduct for European Aquaculture as the Code of Good Practice for sustainable aquaculture to be adhered to by the local aquaculture operators |
| | Enforcement of operating conditions including site marking | Site Marking and Enforcement provisions were outlined in the Aquaculture Operational Permit. |
| | Market development | <p>New markets were explored through research, such as the BYTHOS project³¹, a collaboration between several partners exploring the production of new products from fish by-products.</p> <p>This project promoted investment and worked to stimulate demand in the development of commercially exploitable biotechnology products. Specifically, BYTHOS developed:</p> <ul style="list-style-type: none"> • Biotechnologies for the extraction of bioactive molecules (BAMs) to be applied in human health and the pharmaceutical/cosmetics industry; • Methodologies for fish feed development from fish waste to achieve zero waste: marine collagen was extracted, and fishmeal prepared and tested through the BYTHOS project. <p>Through the participation in the project 'Self-sufficient Integrated Multi-Trophic AquaPonic' (SIMTAP)³², a Recirculating Aquaculture System (RAS) for the co-culture of fish, filter-feeding polychaetes, algae and halophyte plants has been developed to contribute innovative brackish aquaponic systems and methodologies, as part of the green transition of the EU aquaculture sector and in line with principles of circular economy.</p> |
| | Improving the image of Aquaculture | <p>Some actions were taken for the improvement of the image of aquaculture:</p> <ul style="list-style-type: none"> • Adoption of an Environmental Permit; • Relocation of the tuna farm offshore (6 km away from coast) to deeper waters; • Changes in baitfish feeding practices; • Adoption of the Code of Conduct. |
| | Improved disease diagnostic facility | No action was taken on this initiative and will be carried forward to the new strategic plan. |

³¹ <http://www.bythos.eu/>.

³² <https://www.simtap.eu/>.

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| | Vocational training forum | <p>Since 2019, the DFA engaged foreign entities for the provision of specific training courses to Fisheries Officers, National Observers and Captains of towing vessels. Trainings include also Basic Safety Training courses (STCW'95) for Fisheries Officers and National Observers carrying out duties at sea. The training courses were/are implemented on yearly basis through National Funds and involved at least 30 candidate observers, including undergraduate and graduate students, 30 captains and 20 Fisheries Inspectors.</p> <p>A public reference library specialized on aquaculture has been set up to enable personnel and students access to scientific international journals and books for consultation of aquaculture-related publications.</p> |
| Environmental | Independent review of the Environmental Monitoring Programme (EMP) | <p>The conditions and provisions for implementing an Environmental Monitoring Programme (EMP) are outlined in ERA's Environmental Permit. The operators are obliged to conduct EMP by engaging an independent party (which shall be approved by ERA and DFA) twice a year (at Low-season and Peak-season) and submit reports to ERA and DFA.</p> <p>The EMP includes the following criteria:</p> <ul style="list-style-type: none"> • Water quality <ul style="list-style-type: none"> - chlorophyll <i>a</i>; - Dissolved Oxygen; - Total Nitrogen; - Total Phosphorous; - Total Organic Carbon; - Total Suspended Solids. • Seabed physical and biological attributes <ul style="list-style-type: none"> - Video surveys by using a Remotely Operated Vehicle (ROV) to assess: <ul style="list-style-type: none"> o Level of uneaten feed accumulating on the seabed; o Species diversity and abundance of megafauna; o Marine litter; o Overall impacts from the farm activities on the physical and biological characteristics of the seabed <p>Salinity, temperature, turbidity, sea current speed and direction also form part of the EMP.</p> |
| | Develop Environment Quality Standard (EQS)s | <p>The Water Policy Framework Regulations (S.L. 549.100) deals with the implementation of Environmental Quality Standards (EQS) for priority substances and certain other pollutants, with the aim of achieving good surface water chemical status, by transposing Directive 2013/39/EU and amending Directives 2000/60/EC and 2008/105/EC as regards priority substances in the field of water policy.</p> |
| Innovation | Tuna research | <p>The Aquaculture Directorate was a partner in TRANSDOTT, an FP7 project for the translation of domestication of Atlantic Bluefin Tuna into innovative commercial applications. The Aquaculture Directorate, along with another local partner, was the sole broodstock manager and contributor of viable tuna eggs and was heavily involved in the hatching and weaning trials. Comparative analysis on different culture methods conducted by and</p> |

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| | | <p>between the Aquaculture Directorate and the foreign partners (both EU and non-EU) was carried out and findings published in the project's final report³³. The project ended in 2015.</p> <p>In 2020, the Aquaculture Directorate was awarded the ICCAT GBYP CALL (11/2020) - Biological studies – Sampling for Adults - ICCAT Atlantic-Wide Research Programme on Bluefin Tuna (ICCAT GBYP Phase 10) aimed at the collection of biological samples from farmed tunas to the ICCAT Bluefin Tuna genetic and ageing studies. Data are published in the final report³⁴.</p> |
| | Amberjack research | A joint research initiative between the Government (then VAFD-MRAE) and the industry (Malta Fish farming Ltd.) through an agreement signed on 27/07/2006, gave life to the Amberjack Project. The project involved the development of commercially viable technologies to efficiently produce amberjack juveniles. |
| | Alternative tuna feeds | Focus has shifted on research projects to improve feed efficiency and growth rates in order to maximise profit and lower the environmental impact. However, over the last two years, the industry explored alternative feed solutions for the bluefin tuna. |
| | Public Private Partnership (PPP) and business plan | Communication and site visits with foreign investors were made but nothing conclusive was ever reached. Focus has shifted on collaborative initiatives rather than pursuing the model of a Public Private Partnership (PPP). |
| | Review of research priorities and funding | Beyond the INTERREG Italia-Malta BYTHOS project, the Aquaculture Directorate will continue to prioritise alternative protein-based sources for feed development and blue biotechnology as means for waste valorisation. The DFA expects to benefit from early-stage national funding programmes to drive research into innovative solutions that reduce reliance on wild fish populations for fishmeal in feed production. |
| | | To contribute towards the sustainable development of the aquaculture industry, the Aquaculture Directorate will continue to prioritise emerging strategies like integrated multi-trophic aquaculture, aquaponics systems, and biofloc aquaculture. The DFA expects to be aided through the European Maritime, Fisheries and Aquaculture Fund (EMFAF) and the ERA-NET Cofund on the Blue Bioeconomy. The DFA is already funded through PRIMA programme (Horizon 2020 European Union's Framework Programme for Research and Innovation) for sustainable and innovative aquaculture strategies. |
| | | Core institutional funding, Malta Council for Science and Technology (MCST), and funding for aquaculture research through European measures were central to any R&D&I (e.g. Horizon 2020 EU Research and Innovation programme). EMFAF will be central to support research innovation in species diversification, blue economy and sustainable aquaculture strategies, among other research areas, according to the Operational Programme. |

³³ <http://www.transdott.eu/transdott/wp-content/uploads/2016/02/TRANSDOTT-FINAL-REPORT-SUMMARY.pdf>.

³⁴ https://www.iccat.int/GBYP/Docs/Biological_Studies_Phase_10_Sampling_MAFa.pdf.

6. Lessons learnt from past projects / Covid-19 pandemic

Through the implementation of the current Multiannual Plan (2013-2025), based on a collaborative/communicative approach with the relevant stakeholders and federation, several activities related to regulatory, operational, environmental and innovation areas have been implemented with great success, such as updating of National aquaculture policy and preparation of Environmental Permits that include EMPs, Hatchery activities with research on a number of aquaculture species namely the Amberjack and Bluefin Tuna, improving the image of aquaculture by relocating to offshore tuna farm sites, improving baitfish feeding practices, and vocational training.

Some activities were not pursued for strategic reasons and contextual changes, such as studies on Alternative Tuna Feeds and Tuna Offal Disposal, while other activities have not been executed and will be carried forward to the upcoming Multiannual Plan 2022-2030, such as the setup of a Disease Diagnostic section.

Lessons learnt from past projects help to identify the gaps that need to be linked through actions, as well as strengths for further climate change adaptation initiatives. The following are the lessons learned from the projects:

- In the case of the development of a commercial land-based marine hatchery through a collaboration model of PPP, the Maltese Government had explored and actively implemented this initiative creating the Malta Aquaculture Research Centre. However, experience showed that for the local context, this was not the best economic model to follow; in fact, such collaboration was terminated in 2016. Nowadays initiatives are collaborative in nature, but do not take the form of a PPP.
- Biologically active molecules (BAMs), collagen and fish oils, have been extracted from discarded Bluefin tuna components in the labs set up by the BYTHOS project. Any additional wastes can be further minimised through the production of fishmeal for fish feed to go to zero waste. This project presented an opportunity to move away from discarding waste and providing value to waste for the extraction of value-added products with commercial application. Through BYTHOS, concepts of blue economy and growth are substantiated by research in blue biotechnology to attract potential investment from the industry.
- The ongoing 'Self-sufficient Integrated Multi-Trophic AquaPonic' (SIMTAP) project shows the potential of small-scale recirculating aquaculture systems for the co-culture of fish and lower trophic organisms for reuse and recycling of brackish water, organic matter and nutrients from fish wastes in land-based aquaculture. While still subject of research, this emerging technology, as well as other integrated multi-trophic aquaculture systems, may have important application in the sustainable development of aquaculture and has scope for further research investment. In Malta, where space and resources are a limiting factor for the continued expansion of aquaculture, these innovative systems can be explored as means for maximising production, and with consideration for footprint, land requirement, water access and usage.

The Covid-19 pandemic has taught us that preparedness is key. The identification of undergoing factors aids in the prevention of undesirable scenarios potentially may lead to health-related issues, both to the fishing and aquaculture industry and to consumers themselves. An Effective disease-monitoring plan with adequate contingency mechanisms is needed to maintain a high level of disease awareness and preparedness, safeguarding the environment in case of a biological outbreak.

7. Objectives and actions for the period 2022-2030

In line with the “Strategic guidelines for a more sustainable and competitive EU aquaculture for the period 2021 to 2030” (COM (2021) 236 final), the actions and plans for the period 2022 – 2030 will be laid out following the four major inter-related objectives or priority areas.

1. Building resilience and competitiveness;
2. Participating in the green transition;
3. Ensuring social acceptance and consumer information; and
4. Increasing knowledge and innovation.

The following proposed actions shall be the core activities that Malta will be targeting to achieve further sustainability from the industry; through competitiveness and resilience as well as the supply of nutritious and healthy food while helping to reduce the EU’s dependency on seafood imports and creating more opportunities and jobs. These actions which address the 70 targets listed under 25 objectives shall be undertaken by Government, the private sector or a combination of as deemed appropriate. These actions can be financially supported via Maltese National Funds, co-funded by EMFAF or other EU Funds, as well as the local industry.

The Table below indicates four main priority areas that include 25 objectives and 70 targets or actions that will be undertaken by the Government of Malta, who will take responsibility to coordinate with other entities or private industry as deemed appropriate.

| Priority area | Objective | Target | Action |
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| Resilience and competitiveness | Governance and planning | T1 | Propose new draft regulations aimed at promoting increased environmentally friendly aquaculture and the sustainable development of the industry. |
| | | T2 | Review relevant legislation and explore ways to simplify and facilitate application procedures, including the revision of the permit application fees. |
| | | T3 | Set up an Aquaculture Board that brings together public authorities with responsibilities for aquaculture to facilitate the planning, funding, licensing and monitoring of aquaculture activities in a timely manner. This public entity will also encourage the involvement of relevant stakeholders at various stages as deemed necessary. The setting up of such mechanism emanates from the EU aquaculture guidelines. National legislation shall also be amended to accommodate such mechanism. |
| | | T4 | Enhance the administrative and regulatory capacity of the Aquaculture Directorate in relation to concession fees, control, offences, penalties and enforcement measures, compliance and reporting obligations by making the necessary amendments in the current legislations and transposing the existing SOPs into law. |
| | Spatial planning and access to water | T5 | To identify other potential land-based, inshore and offshore aquaculture sites for the expansion of existing aquaculture, and the introduction of new aquaculture species and strategies. |
| | Climate-change adaptation and mitigation | T6 | Increase investments in R&D and conduct research both on the effect of Climate Change on the local aquaculture industry and on sustainable genetic |

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| | | | technologies to create farmed types that are resistant to, can adapt to, or can minimize the impacts of climate change, for example able to withstand acidification, salinization and temperature and precipitation changes. Aquatic Advisory Council recommendations ³⁵ , research will focus also on alternative production species such as microalgae and macroalgae, to contribute towards increased sustainable production by minimising the carbon footprint of fishmeal-based feeds. |
| | | T7 | Integrate climate-proofing, technological and financing innovations that increase adaptation and resilience of the sector, including innovations in institutions, emissions reductions and renewable energy systems such as co-location of new aquaculture sites with offshore infrastructures such as offshore oil rigs, wind and wave energy facility installations or photovoltaic power generation or using renewable energy heating and cooling systems and water pumps or hydropower and other aquatic-based energy systems that exploit the energy potential of tides, currents, waves and wind. |
| | Producer and market organisations | T8 | Diversify the markets export that lead to higher growth of the sector through the Malta Food Agency (MFA). |
| | | T9 | Attend/participate in international import expos and fairs which showcase the Maltese aquatic product for potential export. |
| | | T10 | Develop and coordinate trade delegations by the Malta Food Agency/Trade Malta/Malta Enterprise to visit Third Countries for potential tapping of export markets and / or sharing of knowledge and resources. |
| | Professional associations and farmers' collaboration | T11 | Encourage small-scale aquaculture producers to form a cooperative or federation by emphasizing on factors that contribute to the strengthening, empowerment, and sustainability of such aquaculture-related associations for small-scale farmers and operators. |
| | | T12 | Support and collaborate with the industry or associations in matters involving the development of the aquaculture sector and encourage operators to collaborate in order to benefit from economies of scale through synergies, access to EU funding programmes, best practices and sharing of ideas and resources. |
| | | T13 | Invest in R&D&I for a sustainable food system to improve sustainability of production. |
| | | T14 | Promote safe aquatic foods in national food-based dietary guidelines, school feeding programmes, and other food and nutrition strategies. |
| | | T15 | Participate in collaborative programmes for sustainable aquaculture development and stronger advocacy in aquaculture. |

³⁵ [https://aac-europe.org/images/downloads/AAC Recommendation - Seaweed I 2021 02.pdf](https://aac-europe.org/images/downloads/AAC_Recommendation_-_Seaweed_I_2021_02.pdf).

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| | Control & traceability | T16 | Reinforce the importance of labelling in relationship to the sale of aquaculture products to enhance consumer green choices. |
| | | T17 | Strengthen inspection activities at retail outlets selling aquaculture products, by collaborating with other entities like MCCA and VRD, to monitor and enforce labelling information in relationship to aquaculture products and also to possibly identify misleading information or fraud. |
| | Diversification and adding value | T18 | Invest in research and innovation to: <ul style="list-style-type: none"> i. introduce CCS innovative species with potential for aquaculture and ii. explore alternative production systems aimed at reducing the vulnerability risks associated with monoculture practices. These include integrated systems and emerging strategies for low-cost water recycling and reduced feed input, for the production of a variety of alternative aquatic organisms. |
| | Job opportunities in aquaculture | T19 | Promote job opportunities for young women and men also through the development of a new Aquaculture Research Centre which shall house hatchery functions. |
| | | T20 | Develop education programmes and sustainable aquaculture training and where applicable include them in existing curricula. |
| | | T21 | The forecasted expansion of the aquaculture sector will increase direct and indirect jobs through investments in the green transition and blue economy up to 25% by 2030. Baseline employment status of 2020 amounting to 410. |
| | Capacity development | T22 | The new Aquaculture Research Centre which shall also incorporate a hatchery function within the planned Sustainable Development Hub, will have great occupational potential to support the planned expansion of Maltese aquaculture sector by promoting the development of skills for evaluating the nature and impact of bio- ecological interactions between species that are directly or indirectly affected by aquaculture and the importance of these for sustainable and responsible aquaculture management. |
| | | T23 | A commercial Aquaculture Development Scheme, directed to research and business development, will be created to support capital investment by aquaculture enterprises, mostly SMEs, to sustainably grow production and value, to reduce the impact of aquaculture on the environment and to improve safety and working conditions in aquaculture sites. |
| | | T24 | Launch support measures mostly in the form of grants and tax credits to potential start-ups and business entities. Such initiative shall potentially be coordinated with Malta Enterprise, which is the country's economic development agency, tasked with attracting new foreign direct investment as well as facilitating the growth of existing operations. An |

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| | | | Environmental Promotion and Protection Fund shall also be set up and launched for this purpose, which shall focus on financing environmentally sustainable aquaculture projects. |
| | | T25 | Undergo consultations with other entities, especially INDIS Malta Ltd, in order to identify and offer suitable industrial space for land-based aquaculture activities. |
| | | Transnational cooperation | T26 |
| | Code of Conduct | T27 | Implement and continuously monitor the adoption of "A Code of Conduct for European Aquaculture" ³⁶ , to be integrated in the Aquaculture Operations Regulations, ensuring the highest standard of quality food production while maintaining environmental integrity and consumers' demands. |
| Green transition | Sustainability | T28 | Support a more productive, responsible and sustainable aquaculture sector by improving governance and management of aquatic ecosystems, by conserving biodiversity and habitats and by empowering communities. |
| | | T29 | Improve sustainability of the aquaculture sector by encouraging circular initiatives and feed efficiency. |
| | | T30 | Adopt an Ecosystem-based Approach to ensure that cumulative pressures are compatible with Good Environmental Status (GES) ³⁷ and sustainable use of resources. |
| | | T31 | Information dissemination to encourage consumers to make informed choices regarding consumption of sustainably sourced seafood, such as through specifically labelling sustainable seafood in retail establishments as well as in restaurants. |
| | | T32 | Some of the pressure on wild fish stocks can be relieved by diverting the existing demand to farmed products. Within this context, it will also be ensured that aquaculture facilities operate in an environmentally sustainable manner. The possibility of carrying out specific environmentally friendly aquaculture practices or operations will be evaluated to promote the maximisation and utilisation of available national marine resources. |
| | | T33 | Embrace the principles of the Blue Economy, Blue Production, Blue Communities and Blue Fora. The involvement and participation of all stakeholders, both public and private, will be ensured to realising the full potential of a sustainable blue economy. |

³⁶ <https://feap.info/wp-content/uploads/2018/10/feap-code-of-conduct-2008.pdf>;
https://www.foedevarestyrelsen.dk/english/SiteCollectionDocuments/25_PDF_word_filer%20til%20download/Akvakultur/Annex%201%20engelsk.pdf.

³⁷ <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32017D0848&from=EN>.

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| | Biodiversity, habitat, ecosystems functions | T34 | Apply the concepts of physical, ecological, and social carrying capacity in aquaculture planning, use of environmental impact assessments, and monitoring aquaculture operations for impacts to ecosystems and biodiversity (including non-native or genetically altered species, transboundary aquatic animal diseases, and the use of antimicrobials and other chemicals). |
| | | T35 | Effectively manage, Aquaculture Zones through an ecosystem-based approach, to conserve biodiversity, sustain ecosystem services, and provide nature-based solutions to climate change, while also creating opportunities for diversification of employment and increase in green jobs. Aquaculture activities that are permissible within MPA's also need to be in line with relevant MPA regulations. |
| | | T36 | Conduct necessary research and project to assess and monitor the state and trends of farmed aquatic genetic resources and their wild relatives in Malta and to conserve and responsibly restock endangered species, and as appropriate, encourage CCS production of endangered species and native species with potential for aquaculture. |
| | Environmental performance | T37 | Strengthen the commitment of the sector to the marine environment integrity updating the established Environmental Monitoring Programme (EMP) for the aquaculture activities to conform to the Marine Strategy Framework Directive ³⁸ and kept it up to date in relation to emerging contaminants such as pharmaceuticals. |
| | | T38 | Strengthen the current criteria and methodological standards (Environmental Quality Standards) to set quantifiable targets and indicators that are specific for the local context (waste management, pollution response, periodic monitoring of water quality, sediment and benthic habitat quality). |
| | Organic aquaculture | T39 | Promote and encourage producers to move to organic production and organic certification by putting in place aid schemes for those operators interested in investing in organic aquaculture. |
| | | T40 | Hold discussions with aquaculture operators and facilitate the permit/application process |
| | Sustainable feed | T41 | Explore and test alternative feed solutions for CCS and conduct research to assess the potential of alternative protein sources for feed development, e.g. the possibility of using isopod-based meal for the feed production industry. |
| | | T42 | Plan new research projects, through EMFAF, focusing on improving the feed efficiency, Feed Conversion Ratios (FCR) and growth rates of farmed species, such as tuna, in order to maximise profit and lower the environmental impact. |
| | Biosecurity, animal health | T43 | Enter into discussion with the public entities (VRD) responsible for the regulation and administration of |

³⁸ <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32008L0056&from=EN>.

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| | and welfare, and public health | | the local animal welfare sector to address lacunas in the legislation to ensure that fish welfare concepts are integrated especially with regards to the facilitation of enforcement in this respect. |
| | | T44 | Prepare contingency mechanisms, together with the VRD, that can be implemented in the case of an outbreak of either an emerging disease problem or a notifiable disease. |
| | | T45 | Outline an effective disease-monitoring plan to maintain a high level of disease awareness and preparedness and to ensure environmental protection. |
| | | T46 | Support the industry by carrying out analytical testing within the Aquaculture Directorate. |
| Social acceptance and consumer information | Communication | T47 | Target marketing strategies and education initiatives to aid consumers understand and appreciate the health and environmental benefits of aquaculture products intended for human consumption. |
| | | T48 | Embark on a series of campaign projects, through EMFAF, aimed at improving public perception, build trust and address issues on food security through education. |
| | | T49 | Launch of a promotion campaign, through EMFAF, aimed at primary and secondary school students to raise awareness about aquaculture and its contribution to society. |
| | | T50 | Promote sustainable aquaculture and disseminate information on this sector by making the Aquaculture Directorate available for educational visits both for students and for the general public. |
| | | T51 | Ensure transparency and the early involvement of local stakeholders in the planning of specific aquaculture activities. |
| | | T52 | Develop synergies with existing activities (recreational fisheries, tourism, the processing industry) to generate additional income opportunities such as aqua-tourism, for farmers and improve livelihoods. |
| | Nutritional value, quality and safety of aquaculture products | T53 | Undertake promotional campaigns, through EMFAF, about the supply of quality aquaculture products while taking into consideration environmental protection, animal health and welfare. |
| | | T54 | Undertake promotional campaigns, through EMFAF, about the high nutritional value of aquaculture produce. |
| | | T55 | Undertake promotional campaigns, through EMFAF, to make the consumer more aware of the advantages of consuming short supply chain produce and the beneficial effects on health and environment when consuming low trophic and organically cultured food. |
| | Stakeholder involvement | T56 | Identify stakeholders to discuss together the sustainable development of aquaculture, including direct social dialogue for a revised aquaculture strategy. |

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| | Monitoring, statistics and information | T57 | Continue fulfilling reporting obligations requirements imposed by the International Commission for the Conservation of Atlantic Tuna (ICCAT) and the General Fisheries Commission for the Mediterranean (GFCM). |
| | | T58 | Keep involved in the EU's Data Collection Multi-Annual Programme (DC-MAP). |
| | | T59 | NSO will continue conducting its own aquaculture data collection exercise in the form of a series of surveys and questionnaires with the fishing and aquaculture industry. |
| | | T60 | ERA will continue collecting data from aquaculture activities for environmental monitoring purposes. |
| | | T61 | Facilitate and create a system that integrates all the different features used to manage the Aquaculture Directorate's data recording in a single interface and the obligation to send data will be enforced in the relevant S.L. |
| | | T62 | A new web-based facility/portal is being finalized and will provide each operator with access to his/her personalised online portfolio, which will encompass all operational details. It shall also include a payment facility. |
| Knowledge and Innovation | Foster aquaculture innovation and technology | T63 | Stimulate relevant research and innovations by strengthening partnerships. |
| | | T64 | Set up the new Aquaculture Research Centre which shall also include a hatchery function, within the planned Sustainable Development Hub which intends to regenerate an old oil storage plant of circa 18,000 m ² into an open space, with recreational facilities for all the family and also attracting investment in new niche areas. This Facility will serve as a unique hub where stakeholder organisations, businesses, the Directorate etc. can mutually embark on R&D projects, innovation, blue economy and the circular economy. In this regard, the new Aquaculture Research Centre will be financed through national funds and shall be equipped with the latest technological and analytical testing facilities, in order to ensure a strong emphasis on projects related to sustainable aquaculture development. |
| | Integrated aquaculture systems | T65 | Encourage, through EMFAF, research on land-based and cage-based Integrated Multi-Trophic Aquaculture (IMTA) and Aquaponics to increase production and environmental sustainability, while contributing to lower vulnerability risks and increased resilience to climate change. |
| | Farming of other aquatic products | T66 | Thorough assessment of the potential of innovative fish species for increased diversification and production, and the integration of emerging aquaculture systems. |
| | | T67 | Encourage R&D and investment to develop the appropriate techniques and technologies from pilot |

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| | | | <p>to commercial scale production of alternative species such as:</p> <ul style="list-style-type: none"> • marine fish species, for example the common dentex, bogue and mackerels to reduce pressure on the wild populations of small pelagic species used as baitfish, through EMFAF; • lower trophic organisms that include invertebrates (e.g. sea cucumbers and sea urchins) and macroalgae as part of emerging sustainable strategies of production, funded through EMFAF; • microalgae and macroalgae to produce algae-based products for cosmetic, nutritional and application purposes, and as protein source in feed development. <p>Within this context and with the support of EMFAF, it is planned the purchasing of a rhib, fish farming cages, scientific equipment and other operational equipment to carry out innovative research and studies directly at sea.</p> |
| | Vocational Training Programme | T68 | Conduct dissemination and information sessions in relation to sustainable aquaculture and innovative aquaculture practices, research and topics of interest. |
| | | T69 | Introduce scheme for sponsoring Degrees in aquaculture or related fields and subsequently promote employment within the aquaculture Directorate. |
| | | T70 | Plan specific training for Officers to improve and acquire new skills related to sector, for example for disease surveillance and notification. These training activities should be supported by EMFAF funds. |

8. Concluding remarks

During the decade between 2010 and 2020, when the most recent officially reported production statistics were issued (NSO, 2021), aquaculture production dramatically increased from a total production of 6,881 tons in 2010 (NSO, 2011) to 19,829 tons in 2020. Of these, the CCS production complying mainly of Gilthead sea bream and European sea bass went from 1,946 tons in 2010 to 3,213 tons in 2020, still below the highest production recorded from local CCS farms; 3,536 tons in 2012 – which indicates Malta’s current maximum CCS production capacity. The major increase in production came from the CBA production of wild-caught fattened bluefin tuna, which increased from 6,881 tons in 2010 to 19,829 tons in 2020.

In the case of the CCS production, which does not include tuna farming, the capacity has remained stable during the past decade and beyond, and the figures fluctuate within the range of the maximum production capacity of the farms. To reach a forecasted increase to 5,000 tons by 2025, as indicated in the 2014 Aquaculture Strategy for the Maltese Islands, new aquaculture zones may need to be established. Selection of zones shall be based on the pillars of sustainable development and marine spatial planning taking into account the environmental, economic and social aspects, to ensure societal wellbeing. These must be established in line with the core objectives of this MNPSA that provides strategic guidelines for Malta’s aquaculture sector. The primary scope of this MNPSA is to provide a roadmap of where Malta’s aquaculture Sector shall be heading in the upcoming years.

A forecasted increase of the CCS production to 5,000 tons will see an increase of over 40% for the CCS production, and this would increase revenue by around €7 million, assuming prices remain stable, as in recent years. The increases or decreases of the CBA industry are dependent on bluefin tuna catch quotas and are also dependent on the Japanese market prices.

With reference to the CCS industry, the sector can continue to develop and contribute to environmental sustainability by further minimising its impact. The new Aquaculture Research Centre can lead the way with innovative species that will contribute to socio-economic sustainability and introduce other aquatic organisms such as sea urchins and sea cucumbers that can be utilised in IMTA or other integrated RAS systems that will be developed.

The four priority areas that will guide Malta’s aquaculture development until 2030, each have several objectives and actions that are shown in Annex 1, where the implementation timeline is indicated. The areas to be targeted are diverse, but collectively shall ensure the adoption of an integrated policy system, subsequently leading to a unified, well-managed and multi-faceted sectoral approach by ensuring the effective and efficient use of EU funding, coupled with public and private funding.

This MNPSA will be complemented with a revised Aquaculture Strategy for the Maltese Islands before 2023, as the current Aquaculture Strategy expires in 2025. Despite the limited size of the CCS industry, there is a scope for growth and further stability of the industry, and the Government of Malta supports growth due to a number of reasons, namely that it:

- contributes to the overall diversification of the economy, especially in primary food production,
- has the potential to provide employment,

- has the potential to provide GVA to the Maltese economy,
- is a valuable provider of fish for the local retail and foodservice sectors,
- provides valuable export earnings,
- contributes positively towards the EU trade deficit for fisheries products,
- has an opportunity to lead the way as an innovator in the culture of alternative species and other technologies that lead to integrated, circular aquaculture systems

The Government of Malta is determined to follow this MNPSA and create an aquaculture industry that abides by the principles in the EU strategy guidelines and other EU initiatives as mentioned above. The Government of Malta also understands that there can be conflicts between aquaculture and the environment, but these can be resolved through critical stakeholder meetings, good management practices and effective environmental monitoring.

Malta forecasts to increase its aquaculture industry's capacity by 20% over and above the current production of €44.1 million, up to €53 million by 2030. The sector also has an opportunity to lead the way as an innovator in the culture of alternative species, culture technologies and sustainable feed development. Due consideration also will be given to the potential contribution by aquaculture to food security and to environmental and socioeconomic sustainability.

This will require a holistic approach that includes the expert advice from professionals, appropriate financial instruments and research and innovation in order to assess and explore methods of creating a legislative and executive framework for sustainable food systems. Such action will support the implementation of a sustainable food policy for the local context.

Furthermore, the Aquaculture sector already plays a significant role in food and nutrition security. Recent events in relation to the Russian invasion on Ukraine have shown how vulnerable the food supply systems really are, resulting in a worldwide appreciation and policy shift towards food security. Therefore, to reach its full potential and deliver sustainable and equitable aquatic food in the future, the planned growth of the Maltese aquaculture sector will increase Malta's food security in the next 10 years that conforms with the European Green Deal ideals and the Farm to Fork Strategy.

Annex I - Implementation timeline

The table 2 below shows the indicative roadmap of actions for the implementation of the MNPSA.

| Area | Objective | Action | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | |
|--------------------------------|------------------------------------------------------|--------|------|------|------|------|------|------|------|------|------|--|
| Resilience and competitiveness | Governance and planning | T1 | | | | | | | | | | |
| | | T2 | | | | | | | | | | |
| | | T3 | | | | | | | | | | |
| | | T4 | | | | | | | | | | |
| | Spatial planning and access to water | T5 | | | | | | | | | | |
| | Climate-change adaptation and mitigation | T6 | | | | | | | | | | |
| | | T7 | | | | | | | | | | |
| | Producer and market organisations | T8 | | | | | | | | | | |
| | | T9 | | | | | | | | | | |
| | | T10 | | | | | | | | | | |
| | Professional associations and Farmers' collaboration | T11 | | | | | | | | | | |
| | | T12 | | | | | | | | | | |
| | | T13 | | | | | | | | | | |
| | | T14 | | | | | | | | | | |
| | | T15 | | | | | | | | | | |
| | Control & Traceability | T16 | | | | | | | | | | |
| | | T17 | | | | | | | | | | |
| | Diversification and adding value | T18 | | | | | | | | | | |
| | Job opportunities in aquaculture | T19 | | | | | | | | | | |
| | | T20 | | | | | | | | | | |
| | | T21 | | | | | | | | | | |
| | Capacity development | T22 | | | | | | | | | | |
| | | T23 | | | | | | | | | | |
| | | T24 | | | | | | | | | | |

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|--------------------------------------------|----------------------------------------------|-----|--|--|--|--|--|--|--|--|--|
| | | T25 | | | | | | | | | |
| | Transnational cooperation | T26 | | | | | | | | | |
| | Code of Conduct | T27 | | | | | | | | | |
| Green transition | Sustainability | T28 | | | | | | | | | |
| | | T29 | | | | | | | | | |
| | | T30 | | | | | | | | | |
| | | T31 | | | | | | | | | |
| | | T32 | | | | | | | | | |
| | Biodiversity, habitat, ecosystems functions | T33 | | | | | | | | | |
| | | T34 | | | | | | | | | |
| | | T35 | | | | | | | | | |
| | Environmental performance | T36 | | | | | | | | | |
| | | T37 | | | | | | | | | |
| | Organic aquaculture | T38 | | | | | | | | | |
| | | T39 | | | | | | | | | |
| | Sustainable feed | T40 | | | | | | | | | |
| | | T41 | | | | | | | | | |
| | Biosecurity, animal health and public health | T42 | | | | | | | | | |
| | | T43 | | | | | | | | | |
| T44 | | | | | | | | | | | |
| T45 | | | | | | | | | | | |
| Social acceptance and consumer information | Communication | T46 | | | | | | | | | |
| | | T47 | | | | | | | | | |
| | | T48 | | | | | | | | | |
| | | T49 | | | | | | | | | |
| | | T50 | | | | | | | | | |
| | | T51 | | | | | | | | | |
| | Nutritional value, quality | T52 | | | | | | | | | |
| | | T53 | | | | | | | | | |
| | | T54 | | | | | | | | | |

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|--------------------------|----------------------------------------------|-----|--|--|--|--|--|--|--|--|--|--|
| | and safety of aquaculture products | T55 | | | | | | | | | | |
| | Stakeholder involvement | T56 | | | | | | | | | | |
| | Monitoring, statistics and information | T57 | | | | | | | | | | |
| | | T58 | | | | | | | | | | |
| | | T59 | | | | | | | | | | |
| | | T60 | | | | | | | | | | |
| | | T61 | | | | | | | | | | |
| T62 | | | | | | | | | | | | |
| Knowledge and Innovation | Foster aquaculture innovation and technology | T63 | | | | | | | | | | |
| | | T64 | | | | | | | | | | |
| | Integrated aquaculture systems | T65 | | | | | | | | | | |
| | Farming of other aquatic products | T66 | | | | | | | | | | |
| | | T67 | | | | | | | | | | |
| | Vocational Training Programme | T68 | | | | | | | | | | |
| | | T69 | | | | | | | | | | |
| T70 | | | | | | | | | | | | |