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visionARM 2050

A Vision for Fisheries and Aquaculture Research

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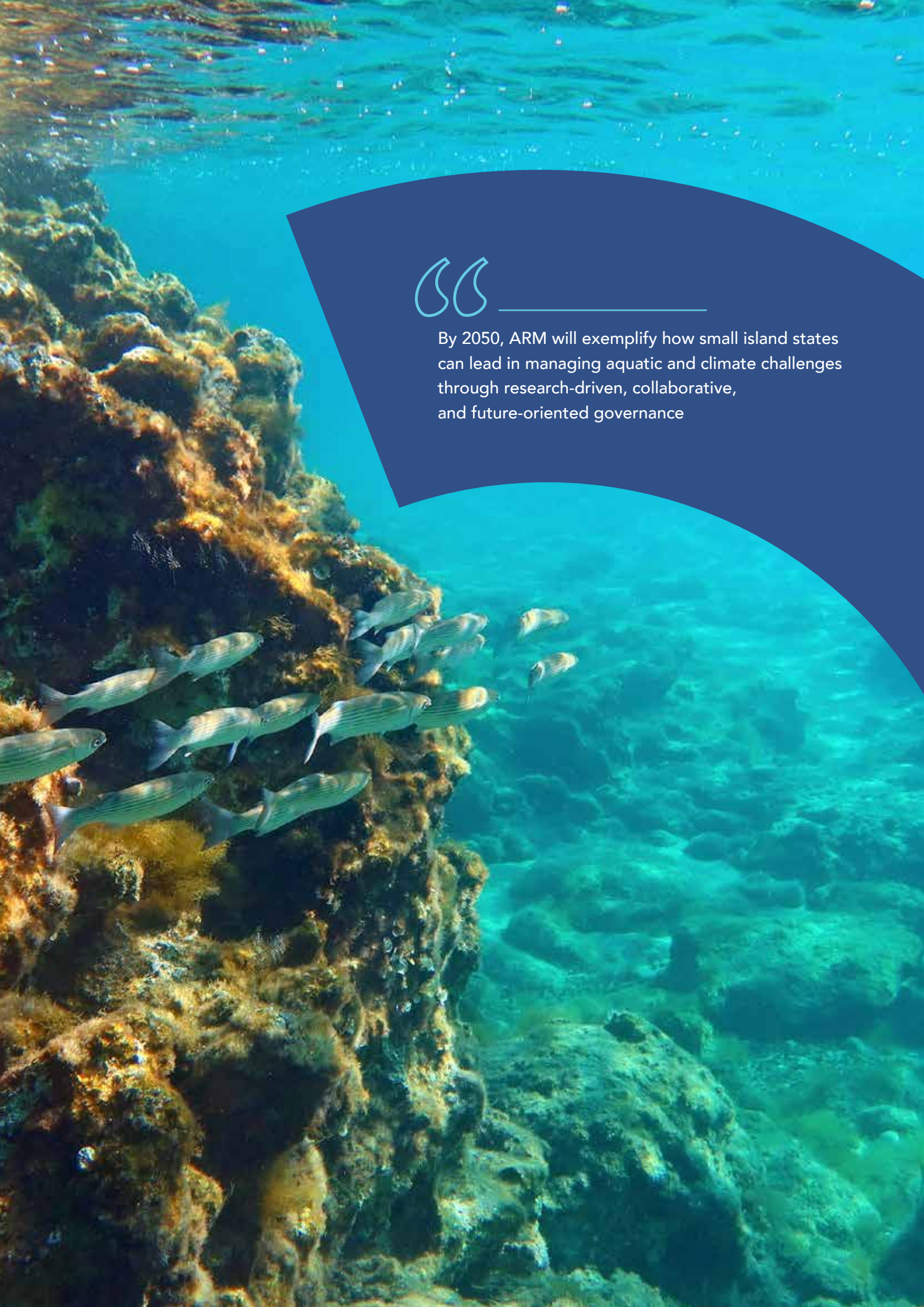

By 2050, ARM will exemplify how small island states can lead in managing aquatic and climate challenges through research-driven, collaborative, and future-oriented governance

01

Executive Summary

Aquatic Resources Malta (ARM) is Malta's dedicated National Agency responsible for research, innovation and technical development in aquaculture and fisheries.

VisionARM 2050 identifies the framework and agenda for the agency's evolution into a modern centre of excellence - a research driven, *science-first* institution supporting a sustainable, competitive and environmentally responsible blue future for the Maltese Islands. The document is structured into 4 key sections:

1. **Strategic Transformation** – outlines the context, overarching strategies, and long-term ambitions of VisionARM 2050.
2. **Four Strategic Pillars** – presents the foundational framework of the vision, detailing the objectives, priorities, and targets guiding its implementation.
3. **Review and Adaptive Checks** – defines the mechanisms for monitoring, evaluating, and reporting progress to ensure accountability and continuous improvement.
4. **Phased Roadmap** – sets out the sequence, milestones, and deliverables required to realise the ambitions of the Four Strategic Pillars and achieve the VisionARM 2050 goals.

VisionARM 2050 positions ARM as a catalyst for scientific excellence, policy innovation, and sustainable development in Malta's blue economy. By 2050, ARM will exemplify how small island states can lead in managing aquatic and climate challenges through research-driven, collaborative, and future-oriented governance.

> VisionARM 2050 ensures that the leadership of Malta's aquatic resources directly contributes to the country's broader ambition for a resilient, inclusive, and sustainable future

02

Strategic Transformation

Alignment of Aquatic Research with Malta's Vision 2050

VisionARM 2050 builds on Malta Vison 2050 by translating its broad social, economic, and environmental goals into the domain of fisheries and aquaculture research. As Malta's dedicated aquatic research agency, Aquatic Resources Malta (ARM) aligns its strategy with national priorities by promoting scientific excellence, sustainable resource management, skills for the blue economy, and innovative governance. In doing so, VisionARM 2050 ensures that the leadership of Malta's aquatic resources directly contributes to the country's broader ambition for a resilient, inclusive, and sustainable future.

The Vision in Numbers

Aquatic Resources Malta's long-term plan, *VisionARM 2050*, is built on:

- 1 vision
- 4 strategic pillars
- 40 vision objectives
- 3 phases of implementation

The *VisionARM 2050* roadmap spans the period 2025–2050.

Institutional Origins and Initial Challenges

Aquatic Resources Malta (ARM) stands at a pivotal juncture in its institutional development. Established in 2024, ARM is the government's dedicated research agency for fisheries and aquaculture.[1] The agency is tasked with administering, managing and fulfilling Malta's obligations for collecting and submitting data at EU level; re-establishing research and conservation activities in fisheries and aquaculture; addressing long-standing issues in fisheries research; introducing new research projects and expeditions; enhancing the quality of research in the sector; fostering professional collaborations with national, European, and international institutions; and positioning itself as a recognised reference point in specialised niches at both the European and global levels.

The organisation's initial challenges during its foundational stages include:

- Building a research community in both fisheries and aquaculture;
- Operating within facilities in need of refurbishment;
- Establishing a culture of timely and accurate data delivery;

1 It was founded through the amalgamation of a fisheries research unit within a wider department and a department for aquaculture that recently was not very active in reseach.

- Developing professional relationships with EU institutions;
- Engaging in research projects that support the sustainable use of aquatic resources;
- Forming partnerships with fishers, industry stakeholders, and research institutions;
- Attracting scholars and scientists.

As an integral part of its statutory role, ARM is also committed to:

- Conducting research to generate new knowledge relevant to the industry, the fishing community, and the general public.
- Proposing to government that aquatic and conservation research projects, currently distributed across different entities and departments, be consolidated under an inter-ministerial research council for greater efficiency, integration, and impact.
- Investigating recurrent issues that harm the marine environment and providing science-based recommendations to mitigate negative impacts.

Vision and Strategic Shift

ARM is now embarking on a bold and strategic transformation. Its vision for 2050 is to become a fully-fledged research institution dedicated to research and innovation in fisheries and aquaculture. This represents a decisive shift: from a primarily administrative entity centred on data collection and submission in fisheries, with minimal aquaculture activity, to a proactive leader in scientific excellence.

Capacity Building, Expertise Development and Growth

Central to this transformation is a strong emphasis on staff training and continuous professional development to build internal capacity and expertise, retain institutional knowledge, and attract a mix of technical, experienced, and highly qualified professionals.

Whilst retaining and sustaining its obligatory duties, ARM will actively foster professional research partnerships – bridging its work with fishers and their representatives, the aquaculture and fisheries industries, and national and international research institutions. These collaborative relationships will ensure that ARM's research is relevant, impactful, and directly aligned with the practical realities and sustainability goals of the sector.

This strategic shift in vision requires a third important factor: the development of the first state-of-the-art research facilities in Malta that meet the ambitious research targets in fisheries and aquaculture.

Governance and Collaborative Framework

Crucial to the successful implementation of this vision is a robust governance framework. The strategy requires coordinated input and collaboration across multiple government ministries, authorities, agencies, institutions, NGOs and stakeholders.

This entails cross-sectoral coordination through the inter-ministerial council and ensuring alignment of efforts across these entities. This integrated governance model will support transparent decision-making, promote shared responsibility, and enable adaptive management in response to evolving scientific, economic, and social challenges.

Vision Statement

By 2050, ARM will be Malta's national centre of excellence in fisheries and aquaculture research – a leading contributor to policy innovation and resource management, recognised across the EU, the Mediterranean, and globally. ARM will lead with research, scholarship, and partnerships to secure a resilient, sustainable, and productive future for Malta's aquatic resources.

03

Four Strategic Pillars

An Integrated Framework for Transformation

VisionARM 2050 is structured around four strategic pillars that represent the foundation of Aquatic Resources Malta's transformation into a leading national and regional institution for aquatic research, policy, and innovation. These pillars reflect core areas of investment, reform, and capability-building that will shape ARM's future direction and long-term impact. The pillars are:

a. Scientific Excellence and Innovation
b. Sustainable Resource Management and Ecosystem Resilience
c. People and Skills for the Blue Economy
d. Governance, Partnerships and Digital Transformation

Each pillar addresses specific environmental, economic, and social dimensions – but it is their interdependence that gives the strategy its coherence. Rather than functioning in silos, the pillars form an integrated ecosystem of transformation, where knowledge flows across domains, partnerships amplify impact, and long-term sustainability is pursued through systems thinking.

Together, they aim to position ARM not only as a research institution, but as a catalyst for resilient, knowledge-based, and inclusive development of Malta's aquatic resources. Each pillar includes a set of Vision Objectives outlining the specific initiatives and outcomes ARM will pursue through to 2050.

This investment not only supports environmental sustainability but also aims to boost economic competitiveness in Malta's blue economy and encourage job creation through research-driven organisation and innovation

Pillar 01

Scientific Excellence and Innovation

Context:

ARM's statutory mission is rooted in the generation and application of scientific knowledge to guide the sustainable use of Malta's aquatic resources. It must establish itself as a scientific hub by investing in infrastructure, research systems, and innovation ecosystems across both fisheries and aquaculture.

This investment not only supports environmental sustainability but also aims to boost economic competitiveness in Malta's blue economy and encourage job creation through research-driven organisation and innovation. Internationalisation of research – through participation in global networks, joint projects, and knowledge exchange – will be a key driver of scientific excellence and relevance.

Vision Objectives:

- Refurbish current research facilities at Fort San Luċjan to host research and conservation projects and activities in both fisheries and aquaculture. This is among the first immediate actions to be taken so that current fisheries obligations are properly met, and new projects are introduced, whilst aquaculture research and conservation projects are promoted.
- Establish the first state-of-the-art research centre in fisheries and aquaculture in Malta, including laboratories with capabilities in fish genetics, disease diagnostics, nutrition, food safety and biosecurity, breeding programmes, and environmental impact assessments.
- Lead research in fisheries and aquaculture at national, European, and international levels, including the publishing of research papers in scientific journals.
- Expand international research partnerships and representation in global scientific networks.
- Support research projects and innovation through collaborations with industry and stakeholders.
- Explore the possibility of public-private collaborations.
- Serve as a 'testing site' for novel and primary research.
- Support the implementation of the fisheries and aquaculture national strategies.
- Develop a national R&I agenda for aquaculture, including alternative feeds, genetic improvement, and low-impact systems.
- Expand research in aquaculture to support sustainable local fish production.
- Identify alternative fish species suitable for aquaculture in Malta.
- Aim to diversify and strengthen Malta's aquaculture sector through science-based, sustainable practices.
- Promote fisheries with the upcoming generation, including through fishing itself or aquatic sciences.
- Research recurrent issues and effects of aquaculture, including its positive impacts (e.g. food security, economic opportunities) and negative impacts (e.g. environmental degradation, effects on wild fish populations), and put forward actionable recommendations to address them.

> ARM will also strengthen its role in conservation, particularly with regard to endangered species, through research, habitat protection, and population recovery strategies

Pillar 02

Sustainable Resource Management and Ecosystem Resilience

Context:

With growing pressures on aquatic resources and biodiversity, ARM must integrate fisheries management with ecosystem conservation and climate adaptation. It will promote ecosystem-based practices, marine spatial planning, and habitat restoration.

These efforts must balance ecological priorities with the economic needs of coastal communities and the social importance of traditional fisheries.

ARM will also strengthen its role in conservation, particularly with regard to endangered species, through research, habitat protection, and population recovery strategies. Enhanced stock monitoring and data integration will not only improve our ability to protect endangered and protected species, but also directly improve the management and productivity of the fisheries sector.

ARM will work to promote fisheries both as a vital artisanal skill and as a sector that embraces innovation and technology, preserving traditional knowledge while encouraging its transmission to younger generations. It will also actively engage with recreational fishers to better understand the real-world impact and potential of fisheries – both in terms of sustainability and economic value.

By recognising fishers as key knowledge holders and potential co-researchers, ARM will encourage their participation in data collection and monitoring efforts, promoting a more inclusive and informed approach to aquatic resource management. This will help reduce the stigma and fear associated with reporting, thus fostering trust and cooperation while revitalising the fisheries sector.

Vision Objectives:

- Apply ecosystem-based and adaptive fisheries management principles.
- Strengthen stock monitoring and data integration – including for endangered and protected species – to support sustainable fisheries development.
- Promote the fisheries sector as a valued artisanal livelihood and encourage generational transfer of skills.
- Engage recreational and artisanal fishers as co-researchers to support data collection, foster leadership, bridge local knowledge with scientific research, and build trust by reducing stigma around reporting and enforcement.
- Support marine habitat restoration and blue carbon initiatives.
- Contribute to the effective planning and implementation of Marine Protected Areas (MPA).
- Promote marine biodiversity conservation through regional cooperation.
- Strengthen the fisheries sector through sustainable practices, improved management, and community engagement.
- Enhance management and conservation efforts through the use of restorative and regenerative aquaculture.

To achieve its vision, ARM must provide traineeships and create internships and research mobility schemes, including PhD and postdoctoral opportunities

Pillar 03

People and Skills for the Blue Economy

Context:

To achieve its vision, ARM must develop and retain a talented, multidisciplinary workforce. It will also play a national role in building research careers in fisheries and aquatic sciences. This includes contributing to social development through the creation of quality employment opportunities and career pathways.

Public educational campaigns will also form part of ARM's broader engagement strategy, raising awareness about the importance of aquatic ecosystems, conservation, and sustainable practices among the general public.

ARM will also collaborate with schools and universities to ensure that marine science and aquaculture are integrated into curricula, offering educators and students a more engaging and hands-on experience. Summer school programmes and interactive outreach initiatives will give young people direct exposure to the sector, fostering early interest and long-term career pathways.

Vision Objectives:

- Provide informational tours of the Agency's research facilities.
- Promote research projects and expeditions to highlight the variety of roles, tasks, and research skills in fisheries and aquaculture.
- Offer competitive conditions, training, and growth opportunities to retain employees.
- Attract specialists through targeted recruitment campaigns and attractive career frameworks.
- Provide traineeships and create internships and research mobility schemes, including PhD and postdoctoral opportunities.
- Contribute towards existing Bachelor's and Master's programmes – such as marine biology, oceanography and Earth systems – including the possibility of establishing an applied Master's programme in partnership with the University of Malta, MCAST, and other European universities.
- Deliver national public outreach campaigns on marine sustainability and conservation.
- Integrate marine and aquaculture studies into the school curriculum through more engaging, experiential approaches.
- Establish summer school programmes that connect students directly with research, conservation, and fisheries activities.

ARM will adopt a data-driven, collaborative model that promotes accountability, stakeholder trust, and digital innovation

Pillar 04

Governance, Partnerships, and Digital Transformation

Context:

Good governance requires openness, participation, and smart systems. ARM will adopt a data-driven, collaborative model that promotes accountability, stakeholder trust, and digital innovation. Social inclusion in research is a core principle of this approach. ARM will create platforms for dialogue with diverse stakeholder groups within the fisheries and aquaculture sectors, as well as with the general public, to grasp an authentic understanding of the reality, value, and effective use of research.

Digital tools will also support economic efficiency and service delivery, helping to reduce the administrative burden on small-scale operators and ensuring access to data and services.

Vision Objectives:

- Establish an Implementation and Oversight Unit within the Office of the CEO (ARM) to monitor and manage the implementation of the vision objectives of VisionARM 2050.
- Introduce an integrated digital data management system.
- Establish regular stakeholder fora and expert advisory groups.
- Represent Malta in EU and global aquatic governance initiatives.
- Popularise science, transparency, and citizen engagement.
- Leverage digital platforms for public education and knowledge sharing.
- Secure funding for human resources, research, facilities/infrastructure, and service development.
- Organise thematic seminars and conferences to disseminate research findings, and publish scientific papers in peer-reviewed academic journals.

ARM will establish a system of periodic reviews and adaptive checks under the Implementation and Oversight Unit (Office of the CEO)

04

Review and Adaptive Checks

VisionARM 2050 recognises that long-term strategies must remain flexible and responsive to emerging challenges and opportunities. To ensure relevance and effectiveness, ARM will establish a system of periodic reviews and adaptive checks under the Implementation and Oversight Unit (Office of the CEO).

- Phase-end reviews will assess progress against vision objectives, adjusting priorities where needed.
- Mid-phase evaluations of major projects will ensure objectives are on track and resources are used efficiently, guiding adjustments for subsequent phases.
- External peer reviews will be sought to benchmark ARM's scientific and policy outputs against international best practices.
- Stakeholder consultations will accompany reviews, ensuring that feedback from fishers, industry, civil society, and academia informs adaptation.
- Annual reporting will highlight achievements, challenges, and forward-looking priorities.

This adaptive review process will ensure that VisionARM 2050 evolves as a living strategy – grounded in evidence, co-created with stakeholders, and able to anticipate and respond to Malta's aquatic and climate realities.

05

Phased Roadmap

The transformation of Aquatic Resources Malta (ARM) into a regional and international leader requires a carefully sequenced, adaptive approach. The phased roadmap provides structure and direction to ensure that investments, reforms, and partnerships build progressively over time and generate momentum towards VisionARM 2050. Each phase is aligned with the four strategic pillars to ensure coherence across all areas of development.

Phase I

Foundational Investments and Institutional Strengthening (2025–2030)

The immediate priority is to consolidate ARM's institutional base, ensuring it has the facilities, expertise, and systems required to deliver on its statutory duties while laying the foundations for growth.

- **Infrastructure:** Refurbish Fort San Luċjan facilities, ensuring laboratories, tanks, and data systems meet essential standards for research and monitoring.
- **Human Capital:** Expand staff capacity through recruitment, training, and professional development, with an emphasis on building expertise in fisheries biology, aquaculture science, marine ecology, geostatistical/econometric analysis of fisheries, and digital data management.
- **Research Centre Design:** Finalise architectural and technical designs for a new state-of-the-art research centre, including future laboratories in fish genetics, aquaculture nutrition, and climate adaptation research. Submit applications for the necessary building permits, issue tenders, and commence construction of the long-awaited research centre.
- **Governance and Systems:** Establish an inter-ministerial research council and implement an integrated digital data management system.
- **Early Outputs:** Deliver first consolidated scientific publications, initiate pilot aquaculture and conservation projects, and establish initial partnerships with national, Mediterranean, European and international research institutions.

Phase II

Regional Leadership and Internationalisation (2031–2040)

Building on its foundational investments, ARM will position itself as a recognised leader in the Mediterranean and Europe, both through advanced infrastructure and international collaborations.

- **Research Centre Establishment:** Finalise, commission and operationalise Malta's first dedicated fisheries and aquaculture research centre, designed to host advanced laboratories, field stations, and training facilities.
- **Scientific Excellence:** Increase production of peer-reviewed research, lead major EU and international projects, and serve as a testing site for novel technologies in aquaculture and fisheries management.
- **New Expeditions & Programmes:** Lead and co-lead international research expeditions in fisheries, aquaculture, and marine conservation, expanding ARM's global scientific footprint.
- **Ecosystem Resilience:** Integrate ecosystem-based management, climate adaptation strategies, and marine habitat restoration projects into policy frameworks, ensuring measurable impacts on biodiversity and fisheries sustainability.
- **Skills & Careers:** Establish joint postgraduate programmes with accredited research institutions, sponsor PhDs and postdoctoral researchers, and run international training exchanges to cultivate Malta as a centre for aquatic science education.
- **Digital Integration:** Fully operationalise advanced data platforms connecting researchers, fishers, regulators, and the public, positioning ARM as a leader in open science and digital innovation in marine governance.

Phase III

Consolidation and Global Recognition (2041–2050)

By 2050, ARM will be a fully-fledged research institution and an international reference point for science-based aquatic governance, particularly in the context of small island states and climate resilience.

- **Global Reference Role:** Serve as a benchmark research agency in specialised niches such as aquaculture genetics, climate-smart fisheries management, and Mediterranean biodiversity conservation.
- **Policy Leadership:** Act as a trusted advisor to the Maltese government and EU institutions, shaping policies on fisheries, aquaculture, marine conservation, and blue economy strategies.
- **Inclusive Governance:** Operate as a model of participatory, transparent, and science-driven governance, where fishers, communities, and industry stakeholders co-create research and management priorities.
- **Capacity-building:** Support knowledge transfer and provide technical assistance to other small island states and Mediterranean partners, sharing Malta's model of integrated aquatic research and governance.
- **Economic and Social Impact:** Demonstrate tangible contributions to Malta's blue economy – securing food supply chains, supporting sustainable aquaculture industries, and creating high-value research-driven jobs.
- **Long-Term Sustainability:** Ensure ARM's research centre and programmes are financially and institutionally sustainable, with diversified funding streams from government, EU programmes, and public-private partnerships.

06

Conclusion

VisionARM 2050 sets a bold and transformative course for the future of Malta's aquatic resource governance, research, and innovation. This vision is not simply a roadmap for institutional development; it is a national commitment to aquatic sustainability, scientific excellence, and inclusive growth.

Through its four strategic pillars, VisionARM 2050 defines an integrated approach to addressing the environmental, economic, and social challenges that lie ahead – ensuring that Malta's aquatic ecosystems and blue economy are resilient, productive, and future-ready.

The successful implementation of this vision requires more than policy alignment and technical capacity – it calls for a shared sense of purpose across government, academia, industry, and civil society. VisionARM 2050 invites all stakeholders to contribute to this transformation: to co-create knowledge, to act responsibly, and to guide Malta's aquatic future with foresight and determination.

By 2050, ARM will not only reflect the highest standards of scientific and institutional excellence, but will also stand as a model for small island states navigating complex aquatic and climate futures. The journey begins now – with deliberate investment, cross-sectoral collaboration, and a unified ambition to secure the long-term well-being of Malta's marine environment and the communities that depend on it.

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