

SUSTAINABLE AQUACULTURE POLICY

Abu Dhabi Emirate

March 2019



هيئة البيئة - أبوظبي
Environment Agency - ABU DHABI

EXECUTIVE SUMMARY

Aquaculture's contribution to world food consumption reached 49 % of the world's total food consumption in 2013, and according to reports by the Food and Agriculture Organization of the United Nations (FAO) it is expected to increase to more than 62 % in the year 2030.

Fish resources in the United Arab Emirates are under severe pressure due to an increasing demand in seafood, an increase in population, advancements in fishing methods, overfishing, pollution and climate change. The Ministry of Climate Change and Environment has estimated that the gap between demand and consumption of fish in the country is around 136,450 tonnes (2015), and according to the Ministry's statistics, the production of licensed aquaculture farms in 2015 has contributed to less than 1% in covering the demand for fisheries products.

In order to preserve the sustainability of fisheries resources, the Government of Abu Dhabi developed a program to address fisheries in its strategic plan, 2016-2020, to enhance fish stocks to sustainable levels and contribute to food security.

This policy for sustainable aquaculture in Abu Dhabi Emirate seeks to develop a sustainable and competitive aquaculture industry for Abu Dhabi which contributes towards economic growth, food security, the provision of meaningful employment and the generation of wealth for its citizens whilst contributing in preserving the cultural and social heritage of the emirate, and the protection of healthy, productive and resilient ecosystems.

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1. POLICY OVERVIEW

1.1 Policy Vision

The Environment Agency Abu Dhabi (EAD) in collaboration with the Ministry of Climate Change and Environment (MOCCA), Ministry of Food Security, the Abu Dhabi Department of Economic Development (DED), the Abu Dhabi Agriculture and Food Safety Authority (ADAFSA) and stakeholders, is pursuing a policy aim for the aquaculture sector of:

Policy Aim: "A sustainable and competitive aquaculture industry for Abu Dhabi which contributes towards economic growth, food security, the provision of meaningful employment and the generation of wealth for its citizens by producing safe, wholesome and high-quality seafood products to satisfy market demand through the use of sustainable technologies that preserve biodiversity and to ensure the protection of healthy, productive and resilient ecosystems."

1.2 Policy Challenge

Best available scientific and socioeconomic information indicates that the United Arab Emirates' (UAE) wild catch fisheries are severely overexploited. In recognition of this challenge, EAD in collaboration with MOCCA, has identified aquaculture as a sustainable sector that can support reducing pressure on the emirate and wider UAE's fisheries resources, and contribute to the social and economic wellbeing of its citizens.

1.3 Policy Objectives

The objectives of this policy are :

- 1. To clearly convey to all aquaculture stakeholders, including industry and general public, a common vision for aquaculture in Abu Dhabi emirate; and
- 2. Encourage the sustainable growth of the sector within the context of a series of common principles that shall guide sustainable aquaculture development.

1.4 Legal Authority

Under Articles 3 (12) and 3 (13) of Law 16 of 2005, EAD has a mandate to prepare and develop policy and plans in respect of fisheries and aquaculture management. This policy is an Abu Dhabi emirate 'whole of government' policy taking into account the entities with a mandate within the Aquaculture sector, as defined by legislation. This legal framework includes, but is not limited to:

- Federal Law No. (23) of the year 1999, as amended by Federal Law No.7 (2016), regarding the Exploitation, Protection and Development of the Living Aquatic Resources in the Waters of the State of the UAE;
- Federal Law No.(24) of 1999 for the Protection and Development of the Environment;
- Ministerial Decision (302) of the year 2001 concerning the executive bylaw of Federal Law 23 of the year 1999;
- Ministerial Decree No. (277) of the year 2001 Pertaining to Aquatic Farms located in Fresh Water, Brackish Water and Sea Water Subject to the Sovereignty of the State; and
- ADAFSA Agriculture & Food Safety Policy and Regulation No. 8 concerning the Technical and Hygiene Requirements for Animal Production Establishments.
- Law No.(2) of the year 2008 on food in the emirate of Abu Dhabi.

In summary, MOCCA, EAD, DED and ADAFSA all have a mandate for an element of the Aquaculture sector, as defined within this legislation.

This policy, authored by EAD, has been completed with the review and approval of these stakeholders, and at the request of the Abu Dhabi General Secretariat for the Executive Council (Decision No: 2016/043/29).

1.5 Policy Effective Date

This policy, to pursue sustainable aquaculture in Abu Dhabi emirate, is effective as of March 2019.

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Stakeholders	Stakeholder Role
Additional Delivery Partners	
Khalifa Fund	• Support small and medium-sized aquaculture projects financially in the form of loans, at their discretion.
UAE University	• Aquaculture research collaboration.
Khalifa University	• Aquaculture research collaboration.
Additional Policy Stakeholders	
Aquaculture producers	• Produce aquaculture product for market or research.
Commercial and Recreational fishers	• An opportunity to invest in aquaculture.
Fisherman's Cooperative	• Sell and market both wild-catch and aquaculture products.
Hospitality Industry	• Sell and market aquaculture products.
General public and consumers	• Consume aquaculture products.

1.6 Policy Application

This policy gives direction to all aquaculture stakeholders, including the industry and general public, on Abu Dhabi government's common vision for sustainable aquaculture.

Key policy stakeholders include:

Table 1: Aquaculture Policy Stakeholders

Stakeholders	Stakeholder Role
Decision Makers	
Ministry of Climate Change and Environment (MOCCA)	<ul style="list-style-type: none"> • Provide aquaculture permit to allow the proponent to start a commercial aquaculture venture. • Regulate the import, export and marketing of aquatic organisms and fish products in the UAE. • Permitting of CITES-listed or non-native aquatic species. • Develop regulation and strategic targets at the federal level and provide technical advice.
Environment Agency - Abu Dhabi (EAD)	<ul style="list-style-type: none"> • Provide the environmental permit for the aquaculture project after ensuring the project will not have detrimental impacts on the environment or the natural resources, and conducting routine inspections for compliance.
Abu Dhabi Agriculture and Food Safety Authority (ADAFSA)	<ul style="list-style-type: none"> • The protection of consumer health, and food quality and safety through regular testing of aquaculture feeds and feed additives, and aquaculture end products (live or processed).
Abu Dhabi Department of Urban Planning and Municipalities (DPM)	<ul style="list-style-type: none"> • Advise suitable locations for aquaculture based on the Emirate's development plans. • Leasing and allocation of land and sea sites for aquaculture. • Issue site plans.
Abu Dhabi Department of Economic Development (DED)	<ul style="list-style-type: none"> • The first point of contact for applicants wishing to start an aquaculture business. They are the entity responsible for issuing of Trade licenses for commercial activities in the Emirate of Abu Dhabi.
Technical Advice and Policy Delivery	
Environment Agency - Abu Dhabi	<ul style="list-style-type: none"> • Support the policy manager with technical advice on policy implementation.
Abu Dhabi Agriculture and Food Safety Authority	<ul style="list-style-type: none"> • Support the policy manager with technical advice on policy implementation. • Development of food security strategies, and support local productions and coordinate investments in the food sector to achieve food security. • Providing many free services to farmers including extension services, training and marketing.
Additional Delivery Partners	
Abu Dhabi Aquaculture Coordinating Committee (ACC)	<ul style="list-style-type: none"> • An inter-agency committee intended to enhance communication and collaboration amongst the federal and emirate departments and agencies engaged in the aquaculture sector.
Sheikh Khalifa Marine Research Centre	<ul style="list-style-type: none"> • Production of fingerlings for local restocking programs and for the sustainable development of aquaculture by providing fingerlings for growing sites in the U.A.E.

2.1.3 A severely overexploited fishery

- Fifteen years of fisheries scientific studies by MOCCA, EAD and UAE-wide emirate Competent Authorities for fisheries management indicate that the UAE's key fisheries resources are severely overexploited.
- Studies conducted in the waters of the Emirate of Abu Dhabi, which make up around 72% of the total water in the Arabian Gulf, show that at least 13 species of commercial fish are caught at levels beyond the limits of sustainability.
- There are 13 overexploited species which account for 80% of the commercial catch and 88% of the commercial fishery revenue.

2.1.4 Fisheries Economic Overview

The fisheries sector economic contribution is relatively small in terms of the overall output of the UAE, however this is significantly outweighed by the cultural importance and attachment the fishery has to the people of the UAE.

Economically, the UAE fishing sector comprises only approximately 0.12% (AED 1.8 billion) of the country's GDP. The UAE imports 72 % of seafood products with 27% contributed to by local fisheries catch and 1% aquaculture.

2.1.5 Impacts of a Severely Overexploited fishery

The impacts of a severely overexploited fishery are social, environmental and economic and go to the heart of the UAE's cultural heritage. Fishing and being resourceful in the maritime domain is at the heart of Emirati culture. The current state of the fishery presents a challenge to the UAE to ensure that this resource that the UAE has depended on and been fundamental for survival, is here for future generations.

There are other social and economic impacts – the opportunities for employment in the sector are jeopardised, with a loss of recreational value and tourism opportunities. Environmentally, impacts include a reduction in ecosystem function – which may have far-reaching effects on the UAE's maritime domain.

2.1.6 Response: The UAE Sustainable Fisheries Programme

In recognition of the environmental state of the fishery, and the social importance of fisheries to the heritage of the UAE, in 2015 MOCCA and EAD partnered to establish the strategic UAE Sustainable Fisheries Programme (UAESFP) (2015-2018), a comprehensive four year plan with a Programme vision of 'Sustainable Fisheries for the UAE' and a desired national outcome of an environmentally sustainable, economically viable, and socially responsible fishing sector.

The Programme is a strategic priority and incorporates international (Convention on Biological Diversity, Aichi) and national targets – the primary environmental target is to have 70% of fisheries resources sustainably harvested by 2030. The programme has dedicated projects aimed at reducing the key fisheries management pressure - overexploitation and overcapacity of the fishing sector.

Aquaculture has been identified as an independent and new food-producing sector, that can contribute to reducing pressure on the fishery, whilst contributing towards economic growth, food security, and the social wellbeing of the emirate's citizens.

2. POLICY BACKGROUND

2.1 Fisheries Sector

Historically, fisheries resources sustained the UAE's ancestors – fishing and harvesting marine resources was integral to their survival, with the sea the link between the Arabian Gulf region, and the rest of the world. Whether on the coast or inland, all life in the UAE was fundamentally connected to fisheries resources and the maritime domain.

2.1.1 Maintaining traditional links

The UAE's fisheries sector, comprising of both commercial and recreational subsectors, has maintained these traditional links and is artisanal in nature, with a mix of *lansh* (motored dhows) and *tarad* (open fibreglass motor powered vessels) operating across the emirates using traditional methods including *gargoor* (fish traps) and *ghazel* (encircling gill nets). The traditional *Al hadhra* (fixed fish trap using wooden stakes) is used nearshore in Abu Dhabi Emirate with land based *dhagwa* (beach seining) confined to some of the northern and eastern emirates (Ras Al Khaimah and Fujairah). *Hadaq* (hook and line) is the traditional method practised in the recreational fishing subsector in the UAE, in addition to spearfishing which is gaining popularity with the younger generation.

2.1.2 Fisheries Drivers and Pressures

With the quadrupling of the population of the UAE over the past 20 years (from circa 2 million in 1990 to circa 9.4 million in 2016) and a resulting increased demand for seafood and other uses in the maritime domain, the UAE's fisheries, like those globally, have come under increasing pressure.

Consistent with the pressures on global fisheries resources, pressures on the UAE's fisheries resources have included:

- An increased demand for fish due to a rapidly growing population and tourism industry;
- Loss and degradation of key habitats and marine water quality due to coastal development.
- o Three different climate change models have predicted that by 2090, there will likely be an additional decline in fish catch of up to 26% due to climate change.
- o Ocean acidification due to climate change affects reproductive processes and juvenile survival of fish;
- Loss of mangroves and seagrass to coastal development has impacted fisheries resources due to a loss of nursery function;
- Illegal, unreported and unregulated fishing;
- Unreported and significant catch by the recreational fishing sector.

Dedicated UAE-wide socioeconomic studies indicate that one of the key pressures on the fishery is the overcapacity of the commercial and recreational fishing sectors – with the most landed demersal species, *Hamour* (*Epinephelus coioides*), *Shaari* (*Lethrinus nebulosus*) and *Farsh* (*Diagramma pictum*) being overexploited by an estimated five times the sustainable limit, with the pelagic, *Kanaad* (*Scomberomorus commerson*), being overexploited by up to three times the sustainable limit.

production, within environmental bounds, to support the achievement of a sustainable aquaculture sector.

2.3.3 Industrial and environmental activities associated with aquaculture projects

The growth and prosperity of the aquaculture sector is directly related to many environmental activities and industries that constitute the infrastructure for the development of the sector, including:

- Fish hatcheries to produce fish fingerlings;
- Fish feed mills;
- Aquaculture equipment, manufacturers and suppliers;
- Specialised consulting services in aquaculture;
- Environmental consulting services specialised in Environmental Impact Assessment for Aquaculture projects;
- Veterinary services and suppliers;
- Suppliers of aquaculture health related products;
- Vocational training courses in aquaculture;
- The food industry which includes many integrated production products including canning factories.

2.3.4 Abu Dhabi Plan (2014-2021)

Under the Abu Dhabi Plan, 'Goal 16: Sustainable environment and optimal use of resources to preserve natural heritage,' this policy is consistent with the following targeted 'Conserve biodiversity' programme initiatives:

- Goal 18. Program: Conserve Biodiversity. Initiative 1. Manage sensitive ecosystems,

natural habitats, protected areas, threatened and endangered species.

- Goal 18. Program: Conserve Biodiversity. Initiative 2. Ensure effective management of fishery and fish stocks.

Abu Dhabi's Biodiversity Strategy (2015-2020) and Plan Maritime 2030: Framework and Implementation Plans, provide further detail on how these goals will be achieved.

2.3.5 Abu Dhabi Biodiversity Strategy (2015-2020)

Abu Dhabi's Biodiversity Strategy (2015-2020) provides a detailed action in respect of developing aquaculture in the emirate:

- **Action 1.1.3:** Assist in implementing the Sustainability Life Cycle Assessment Approach. Aquaculture: A research project into the location of suitable aquaculture development zones, and the designation of identified appropriate areas for Aquaculture. Designated areas will also be incorporated into Plan Maritime sustainable development maps. A pilot study into sustainable aquaculture in the UAE with a focus on food security will be designed and commenced.

2.3.6 Plan Maritime 2030: Framework and Implementation Plans (2030)

The Plan Maritime 2030: Implementation Plan contains a plan policy and management actions in respect of aquaculture development in the emirate:

- Plan Policy NR4.1: Sustainable Fishing and Aquaculture Activity: All fishing activities (commercial, subsistence and traditional) will be conducted sustainably and the aquaculture industry will be guided by international standards.

2.2 Aquaculture Sector

Aquaculture production equates to less than 1% of fish consumption in the emirate, with Abu Dhabi emirate responsible for approximately 34% of the UAE's production.

There are nine licensed aquaculture farms in the Emirate of Abu Dhabi, six farms are in the vicinity of Abu Dhabi and suburbs; one farm in Liwa Oasis area of the Western Region and two farms in Al Ain. Moreover, there are 571 ponds in 365 farms in the three regions of the Emirate of Abu Dhabi, the total area of these ponds exceeds 3500 square meters.

Species produced include tilapia (*Oreochromis niloticus* and *Oreochromis mossambicus*), shrimp (*Penaeus indicus*), sea bream (*Sparus aurata*), sturgeon (*Acipenser baerii*) and caviar. Most of the aquaculture facilities are small scale culturing tilapia in lined ponds, with the exception of one large shrimp farm and a highly sophisticated, intensive sturgeon farm that re-circulates its water. A Hamour farm has recently been established at Al Wathba. The majority of the small scale aquaculture pond farm facilities are currently unlicensed.

Currently White shrimp is the principal species produced, accounting for more than 88% of output. Minor species include tilapia and sturgeon which represent only about 50 tonnes of annual production.

The total farm gate value associated with aquaculture production in 2015 was approximately 14,000,000 AED from five operations (3 small scale tilapia farms and two large scale farms producing shrimp and caviar). Shrimp accounted for 11,048,000 AED of this total, while the other species generated about 2,220,000 AED. The sector employs a modest number of emirati managers and expatriate staff.

2.3 Sustainable Aquaculture - A strategic priority

Aquaculture development has been identified as a strategic priority at both the national and emirate level in the UAE in a number of plans and strategies.

2.3.1 UAE National Biodiversity Strategy and Action Plan (2014-2021)

Achieving a sustainable aquaculture sector for the UAE is a national strategic priority under the UAE National Biodiversity Strategy and Action Plan (2014-2021). The relevant Action Plan targets are:

- **TARGET 4.1:** By 2021, at least 70% of important and vulnerable living marine resources are managed sustainably.
- **TARGET 4.2:** By 2021, 50% of government-owned and of non-government-owned areas under agriculture, aquaculture and forestry are managed sustainably to ensure the conservation of biodiversity.

These targets are the country's contribution towards the relevant international Convention on Biological Diversity Aichi Targets.

2.3.2 UAE Aquaculture production future targets

Aquaculture production now equates to approximately 50% of the world's fish consumption. Consistent with this global trend, the National Biodiversity Strategy and Action Plan 50% target, and the United Nations Food and Agriculture Organisation's (FAO) role in promoting sustainable aquaculture development, at the national level MOCCAEE seeks to grow the Aquaculture sector. In recognition that the sector in the UAE is currently in its infancy, MOCCAEE will develop with industry a UAE-wide Sustainable Aquaculture Strategy to set realistic national targets and develop the blueprint to achieve sector growth. EAD will be an active participant in this process and are committed to increase

Through the legal framework development and implementation of the new permitting procedure, mechanisms will be put in place to manage these environmental impacts, particularly the impact of aquaculture on groundwater.

2.4.2 Science and Research

Research into aquaculture in the UAE has been pursued since 1984 with the inception of the Marine Resources Research Centre in Umm Al Quwain. Some of the achievements of the centre have included:

- Successfully culturing more than 9 million juveniles during pilot studies;
- Releasing more than 2 million fingerlings of various local species;
- Supporting local aquaculture farmers by giving juveniles free of cost;
- Initiating public private partnerships to develop the UAE's first commercial hatchery; and
- Initiating the upgrade of the Sheikh Khalifa bin Zayed Marine Research Centre.

The Sheikh Khalifa Centre consists of a hatchery producing juveniles of local fish, with a capacity to produce 10 million juveniles per year.

2.4.3 Responsibilities within legal framework

A series of laws and decrees (see Section 1.4), with provisions relevant to roles and responsibilities for Aquaculture development, production, licensing, food safety and biosecurity, provide the current legal framework for aquaculture.

Generally, EAD's role includes developing policy, plans and procedures, reviewing environmental impact assessments on new project proposals, issuing Environmental Permits for aquaculture ventures and

conducting routine inspections for environmental-compliance. This includes a review of the overall sustainability of a project.

MOCCA's role is to develop regulation and strategic targets at the federal level and provide technical advice, with ADAFSA the competent authority for issuing a "Food Control Certificate" for aquaculture ventures and conducting routine inspections for animal welfare, animal biosecurity and food safety.

DED's role is to review the financial feasibility study (i.e. business plan) and confirm the economic viability of a project.

As the waterways managers for Abu Dhabi, DMAT are to be involved in the review of all applications involving the use of waterways (i.e. operations at sea).

DPM has a role in spatial planning of Aquaculture zones.

2.4.4 Abu Dhabi Aquaculture Coordination Committee

In 2014, EAD with its strategic partners established the Aquaculture Coordinating Committee, to improve the coordination between key stakeholders engaged in the management of the aquaculture sector.

This committee has met quarterly for the past two years and identified the following strategic items as key priority areas that need to be addressed to advance sustainable aquaculture development in the Emirate:

- Further developing the regulatory framework for Aquaculture;
- Strengthening the institutional Framework for Aquaculture;
- Proposed financial support, economic

- Management Action NR4.1.1: Complete the federal programme of nine concurrent fisheries projects.
- Management Action NR4.1.2: Ensure that future fishing practices and associated infrastructure design meets international requirements and standards.
- Management Action NR4.1.3: Conduct food safety research in relation to potential contaminant sources.
- Management Action NR4.1.4: Clarify the definition of aquaculture regarding permitting and other regulatory requirements.
- Management Action NR4.1.5: Prepare an Aquaculture Development Strategy to implement sustainable aquaculture.
- Management Action NR4.1.6: Streamline the aquaculture permitting process.
- Management Action: NR4.1.7: Establish an Aquaculture Review Committee (ARC) to process project approvals.
- Management Action: NR4.1.8: Develop an education programme to educate fisherman on sustainable methods of fishing.
- Management Action: NR4.1.9: Enhance the Choose Wisely Campaign to promote sustainable fish consumption.
- Management Action: NR4.1.10: Prepare a Sustainable Fisheries and Aquaculture Management Plan.

These management actions support the achievement of this policy.

2.4 Progress towards Sustainable Aquaculture

At the national level progress has been made in pursuing sustainable aquaculture with dedicated aquaculture research facilities established, a number of laws promulgated, and through commitment to develop an Aquaculture Strategy and production target.

2.4.1 Understanding the impacts of Aquaculture

Understanding has been gained on the different forms of aquaculture and the different degrees of risk to the environment - some have a greater interface with the surrounding ecosystem (e.g. wild fish and animals) than others.

Sea based aquaculture, if not appropriately managed, may pose a threat to biodiversity and native species with adverse impacts including:

- The exclusion of other uses and users from the chosen site;
- Build-up of organic wastes on the seafloor resulting in localised habitat modification;
- A possible vector for the spread of introduced pests – any escapees may out-compete native species (in the case of exotic species) or modify existing gene pools (in the case of indigenous species);
- A reduction in natural character and loss of landscape and amenity values in the area;
- Sustainability of feed supplies.

Land based aquaculture, if not appropriately managed, may pose a threat to groundwater resources, with the impact being groundwater and aquifer depletion, affecting biodiversity, and the agricultural sectors.

3. SUSTAINABLE AQUACULTURE POLICY STATEMENT

3.1 Policy Statement

Policy Aim: It is the policy of Abu Dhabi emirate to pursue a sustainable and competitive aquaculture industry for Abu Dhabi which contributes towards economic growth, food security, the provision of meaningful employment and the generation of wealth for its citizens by producing safe, wholesome and high-quality seafood products to satisfy market demand through the use of sustainable technologies that preserve biodiversity and ensure the protection of healthy, productive and resilient ecosystems."

Policy Purpose: The purpose of this policy is to:

1. Confirm the Sustainable Aquaculture definition in Abu Dhabi Emirate;
2. Build on Abu Dhabi government's progress on sustainable aquaculture development to date, and confirm as a whole-of-government policy that Abu Dhabi emirate is pursuing a sustainable aquaculture sector.
3. Clarify how sustainable aquaculture will be achieved in order to encourage the sustainable growth of the sector; and
4. Establish a framework of guiding principles to enhance and accelerate the development of a sustainable aquaculture sector in Abu Dhabi.

This policy is intended to clearly convey to all aquaculture stakeholders Abu Dhabi government's common vision for aquaculture; present certainty of process; and encourage investment in the sector within the context of a series of common principles that shall guide sustainable aquaculture development.

This policy confirms the commitment of Abu Dhabi Government to Aquaculture development and outlines the key enabling actions that will be completed to encourage investment in the sector.

3.2 Aquaculture Definitions

The definition of aquaculture adopted for Abu Dhabi Emirate is that of the United Nations Food & Agriculture Organization (FAO) with minor modifications to fit the UAE context:

"Aquaculture is the farming of aquatic organisms, including fish, molluscs, crustaceans, algae, and aquatic plants for food, the aquarium trade, restocking, recreational or commercial purposes and any other purpose as defined by the government. Farming implies some form of intervention in the rearing process to enhance production, such as regular stocking, feeding, protection from predators, etc. Farming also implies individual or corporate ownership of the stock being cultivated".

"Sustainable aquaculture" is further defined as "The cultivation of aquatic organisms by means that have a benign, if not positive, net impact on the environment, contribute to local community development, and generate an economic profit".

development and marketing;

- Raising public understanding and support for aquaculture;
- Establishing Aquaculture training and education programmes; and
- Fostering Abu Dhabi-specific research, innovation and technology development.

All of these issues remain priorities that this policy seeks to give direction to, in pursuit of a sustainable aquaculture sector.

2.5 New Aquaculture farm licensing procedure

A new permitting procedure will be launched to streamline aquaculture permitting.

To enable licensing there will be a single portal for license and permit applications, and reviews of applications by EAD, DED, ADAFSA, MOCCA, and DPM.

All operations producing aquatic organisms for sale, barter or pre-commercial research and development purposes and/or in ways in which there is potential for risk to the environment through fish escapes, disease transfer or water quality impacts on public waters, require an aquaculture license, no matter the scale of the operation.

This includes operations producing aquatic organisms to enhance natural populations (stock enhancement).

Licenses can be issued to citizens, corporations with a 51% citizen ownership, fishermen's cooperative societies and, scientific authorities.

This process presents a harmonized approach to aquaculture permitting that fosters consistency and efficiency in decision making, improves inter-agency coordination and collaboration, and increases capacity building through knowledge sharing.

3.4 How will Sustainable Aquaculture be achieved?

Consistent with strategic priorities, this policy will be achieved by pursuit of the following actions:

ACTION 1) Implementation of the integrated inter-agency new permitting system for aquaculture.

ACTION 2) Development of an Aquaculture Policy Implementation Strategy identifying suitable aquaculture models, species and sites for the designation as aquaculture development zones, and the development of management and investment plans for these zones.

ACTION 3) Encourage economic investment in the sector.

ACTION 4) Develop Aquaculture Guidelines and regulations.

ACTION 5) Encourage research and innovation in the field of aquaculture through the development of an aquaculture research plan.

ACTION 6) Develop marketing and communication's material to facilitate investment in the sector, including by fishermen.

The achievement of these actions are considered to provide industry with the key enablers required to achieve the sustainable aquaculture policy vision.

3.3 Sustainable Aquaculture Principles

The following principles shall inform the pursuit of sustainable aquaculture in Abu Dhabi emirate:

1. The government of Abu Dhabi has identified Aquaculture as a priority because of its potential economic significance to the emirate and country. The Emirate shall foster initiatives in support of sustainable aquaculture development. Consequently, aquaculture shall be:

- Recognized as a growth sector, within sustainable bounds, and given equitable consideration in marine and land-use planning;
- Driven by private sector initiatives and investment; the principal responsibility for commercial development will rest with the industry;
- Governed by policy, regulatory and business environment frameworks that provide certainty for the sector and its allied industries, enabling the sector to grow and prosper; and
- Supported by innovative research, development and technology transfer to advance the sustainability and competitiveness of the sector.

2. As an emerging sector, aquaculture must be integrated into the socio-economic fabric of Abu Dhabi. For aquaculture to flourish, it shall be developed in a manner that:

- Ensures that aquaculture facilities in marine waters will be sited and operated in a way that is compatible with other uses of the marine environment;
- Fosters open dialogue at the community level to ensure that community needs and concerns are understood when making aquaculture development and management decisions;
- Incorporates open and transparent communication to foster public awareness of sustainable aquaculture development and the associated environmental, social, and economic challenges and benefits; and

- Ensures that aquaculture products meet high standards for food safety and quality.

3. The government of Abu Dhabi is committed to maintaining the health and diversity of marine and terrestrial ecosystems and the responsible utilization of natural resources. Consequently, aquaculture ventures shall be developed in a manner that:

- Maintains high standards of environmental stewardship by utilizing environmentally-sustainable technologies and practises;
- Holds aquaculture producers accountable for protecting native flora and fauna and their surrounding ecosystems;
- Monitors the effects of aquaculture operations on the surrounding environment and reports the results to support best management and continuous improvement.

4. The government of Abu Dhabi recognises the benefits of streamlined, transparent and timely processes to support well-rounded decision-making. Consequently, aquaculture development shall be:

- Guided by an appropriate and harmonized enabling regulatory framework;
- Planned and managed by adopting the best-available science, technology and information;
- Guided by economic, social and cultural information in a risk-based decision framework;
- Supported by timely, equitable, and scientifically-sound decisions made in an efficient and transparent manner;
- Participatory and informed by communities, industry and other pertinent stakeholders; and
- Informed by international cooperation and learning that will support efforts to continually improve sustainable development and innovation.

5. POLICY IMPLEMENTATION & REVIEW

5.1 Implementation Mechanisms

The following critical implementation mechanisms to achieve the stated actions are fundamental to achieving this policy:

Table 2: Aquaculture Policy Actions and Implementation Mechanisms

Action	Implementation Mechanism
ACTION 1) Implementation of the integrated inter-agency new permitting system for aquaculture.	Implementation Mechanisms: Approval and implementation of the new permitting procedure for Aquaculture projects in Abu Dhabi, through the DED eservices portal. Lead Entities: DED. Timeframe: In progress (2019).
ACTION 2) Development of an Aquaculture Policy Implementation Strategy identifying suitable aquaculture models, species and sites for the designation of aquaculture development zones, and the development of management and investment plans for these zones.	Implementation Mechanisms: Identification of appropriate aquaculture models and species for Abu Dhabi emirate and the designation and allocation of land for aquaculture development. Hydrodynamic modelling assessments of sea areas identified as appropriate for aquaculture. The development of management and investment plans for these aquaculture zones. Lead Entities: EAD, DED, DPM. Timeframe: In progress (2019).
ACTION 3) Encourage economic investment in the sector.	Implementation Mechanisms: Propose mechanisms to support and encourage initial investment in aquaculture, subject to conditions and at the discretion of the government. Lead Entities: Khalifa Fund. Timeframe: Effective date – 2019.
ACTION 4) Develop Aquaculture Guidelines and Regulations.	Implementation Mechanisms: Drafting and declaring Aquaculture Guidelines and Regulations that streamline the existing legislation and permitting guideline. Lead Entities: EAD, ADAFSA. Timeframe: Effective date – 2019.
ACTION 5) Encourage research and innovation in the field of aquaculture through the development of an aquaculture research plan.	Implementation Mechanisms: Drafting and implementing an Aquaculture Research Plan with public and private stakeholders in Abu Dhabi emirate and the wider UAE. Lead Entities: EAD, ADAFSA. Timeframe: Effective date – 2019.
ACTION 6) Develop marketing and communication's material to facilitate investment in the sector, including by fishermen.	Implementation Mechanisms: Drafting a communications and marketing strategy to promote Aquaculture development and investment in Abu Dhabi emirate, and encouraging the investment of fishermen. Lead Entities: EAD, DED. Timeframe: Effective date – 2019.

The Abu Dhabi Agriculture and Food Safety Authority (ADAFSA) is the responsible entity for supervising the follow-up of the implementation of the policy procedures in coordination with the concerned entities to implement these procedures as specified in Table 2.

4. POLICY ANALYSIS

4.1 Policy Benefits

This policy provides certainty that Abu Dhabi government is committed to putting in place the key enablers, as stated in this policy's actions 1-6, to achieve a vibrant and sustainable aquaculture sector.

Pursuing sustainable aquaculture in Abu Dhabi emirate assists the UAE in fulfilling its international obligations under the likes of the Convention on Biological Diversity and Agenda 21, Aichi targets, and regionally the Regional Organization for Protection of the Marine Environment (ROPME) Conventions and Guidelines.

Nationally, pursuing sustainable aquaculture supports initiatives in the National Biodiversity Strategy and Action Plan (NBSAP) (2014-2021), the National Strategy for Sustainable Management of Coastal and Marine Environment (2014-2021), and at the emirate level, the Abu Dhabi Emirate Plan (2014-2021) and Plan Maritime (2030).

Holistically it is considered that in the long term a sustainable aquaculture sector will reduce pressure on the UAE's severely overexploited fisheries, increasing the current contribution of the sector of less than 1% of fish consumption to higher levels, the target amounts of which will be set by MOCCA as part of the development of a national Aquaculture Strategy.

This policy:

- **Is consistent with the overarching Abu Dhabi maritime strategy policy vision**, of: 'A safe, secure, and sustainable maritime domain for Abu Dhabi., and the sustainable fisheries policy vision of 'sustainable fisheries for the UAE,' with key fish stocks recovered to sustainable limits by 2030.
- **Is socially / culturally acceptable** – pursuing sustainable aquaculture continues the emirate's historic links with the sea, providing a modern alternative to wild catch fisheries.
- **Is consistent with international approaches**.
- **Informed decision making** – pursuing sustainable aquaculture through a streamlined permitting process results in informed decision-making and environmental, social and economic considerations all being taken into account.
- **Is a step towards achieving intergenerational equity and food security** – by pursuing sustainable aquaculture for locally based species that are severely overexploited, intergenerational equity and food security are more likely to be achieved with these species available for future generations.
- **Is a policy based on science** – the fishery is overexploited and initiatives are needed to reduce pressure on the fishery.
- **Supports economic development** of a sector and capacity building.
- **Is operationally practical** – adopting a process whereby the key government entities that make decisions in respect of aquaculture, come together regularly to make informed and integrated decisions in respect of future aquaculture facilities is considered practical and sustainable development in action.
- **Includes stakeholder engagement** – all relevant government entities have been engaged in the development of this policy.

It is not considered that there are negative externalities of pursuing sustainable aquaculture – the permitting process is intended to assist in resolving conflicting uses in the coastal zone.

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5.2 Resources needed to support and enable this Policy

The following will be needed to support this policy:

- Commitment from the government entities that this policy applies to - to implement actions in this policy, as far as is possible and appropriate.
- New Aquaculture Guidelines and Regulations;
- New Aquaculture permitting procedure implemented;
- Commitment by government to allocate land and sea areas for Aquaculture development;
- Propose mechanisms to support and encourage initial investment in aquaculture;
- Aquaculture Research Plan;
- Marketing and Communication Strategy.

5.3 Review of the policy

This policy will be reviewed one year after its effective date, and thereafter at intervals agreed. Key Performance Indicators, with weightings to be agreed by the ACC are:

- 1) **Policy Action Achievement:**
Overall progress toward, and eventual completion of the six key actions stated in this policy (which cover permitting streamlining; strategy development, land allocation and sea based hydrodynamic study; fund development; a new Aquaculture Decree; a new Aquaculture Research Plan; and a Communications and Marketing Strategy);
- 2) **Sustainable development indicator - progress towards national production targets:** Progress towards aquaculture production targets, measured annually and throughout the timespan of the targets.
- 3) **Environmental indicator - aquaculture farms compliance audit inspections for compliance with the Aquaculture facility environmental management plan:** A target of 90% of permitted farms being compliant with their environmental management plans.



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