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FOREWORD

This section will be completed as part of the final document.

ABBREVIATIONS AND ACORNYMS

AMA	aquaculture management area
AqGR	aquatic genetic resources for food and agriculture
ASD	2030 Agenda for Sustainable Development
AVC	aquaculture value chain
BMP	better management practice
CAC	Codex Alimentarius Commission
CBD	Convention on Biological Diversity
CEDAW	Convention on the Elimination of All Forms of Discrimination Against Women
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
COFI-SCA	Sub-Committee on Aquaculture of the FAO Committee on Fisheries
COP	Conference of the Parties
CSO	civil society organization
EAA	ecosystem approach to aquaculture
FAO	Food and Agriculture Organization of the United Nations
GSA	Guidelines for Sustainable Aquaculture
IAS	invasive alien species
NGO	non-governmental organization
SDG	Sustainable Development Goal
UNFCCC	United Nations Framework Convention on Climate Change
WTO	World Trade Organization

GLOSSARY

This section will be completed as part of the final document.

PREFACE

The Guidelines for Sustainable Aquaculture (GSA) have been developed with the aim to provide complementary guidance with respect to the aquaculture sector in support of the implementation of the overall principles and provisions of the 1995 Code of Conduct for Responsible Fisheries (the Code) of the Food and Agriculture Organization of the United Nations (FAO) and the achievement of the 2030 Agenda for Sustainable Development (ASD) and its Sustainable Development Goals (SDGs). The Guidelines are intended to support the visibility, recognition, and enhancement of the important role of the aquaculture sector in contributing to global, regional and national efforts towards the eradication of hunger and poverty and to support socio-economic development for the benefit of current and future generations.

Aquaculture is a millennia-old activity that has expanded slowly for centuries, integrated with its natural, social, economic, and cultural environments. However, aquaculture experienced rapid expansion and major developments in recent decades fuelled by scientific progress, technological innovations, and investment, amid a consistent and fast-growing global demand of aquatic food. Compared to the 1970 levels, aquaculture production has grown almost forty fold, fish trade value has multiplied thirty-three fold, and per capita fish consumption more than doubled. Aquaculture supplies more than half of the world's fish for human consumption since 2014, as compared to only 7 percent in 1970, and provides tens of millions employment opportunities along the aquaculture value chain.

However, these developments have also caused undesirable social and environmental impacts in several parts of the world, often leading to social conflicts between users of land, water, and aquatic resources, and negatively affecting the aquatic environment and its valuable ecosystem services. In particular, they have raised concerns and societal debate regarding habitat destruction (for example of mangroves); the use of harmful chemicals and veterinary drugs; the impact of escapees on wild stocks; and negative social and cultural impacts on aquaculture dependent communities and workers.

The need to develop and promote sustainable aquaculture practices emerged in the 1990s and has since gained strong momentum. In 1995, FAO adopted the Code, the reference framework for national, regional, and international efforts to ensure sustainable production and harvesting of aquatic living resources in harmony with the environment, taking into account all their relevant biological, technological, economic, social, environmental and commercial aspects.

Several other international instruments of relevance to sustainable aquaculture have been developed concurrently to the Code. The Convention on Biological Diversity (CBD), which entered into force on 29 December 1993, features important strategic goals translated into biodiversity conservation targets (Aichi Targets), including several targets of high relevance to the protection of aquatic biodiversity and sustainable aquaculture.

Since 1997, the Code has been enriched by a strategy to improve information on status and trends of aquaculture and several policy and technical guidelines to promote responsible aquaculture, best practices and responsible fish utilization and trade (Annex 1). At the same time, because of the rise in food safety concerns and consumer protection since the 1990s, the expansion of global fisheries and aquaculture trade led to the emergence of stricter international sanitary measures, food laws and regulations, private standards and market access requirements. The initial aim was to tackle food safety issues by promoting good aquaculture and hygienic practices, but gradually the aim expanded to

encompass environmental, economic, social as well as animal well-being considerations for market access.

In September 2015, the United Nations Members adopted the ASD. The ASD includes 17 SDGs and 169 targets, covering a comprehensive set of issues on technical, institutional and policy changes needed to achieve sustainable development. The ASD integrates the three dimensions of sustainable development that are economic, social, and environmental). It calls on countries to express their priorities and commitments, and to formulate strategies and adopt policies, programmes and partnerships to achieve their national goals and targets.

Food and nutrition security, poverty alleviation, and sustainable management and use of natural resources are at the very core of FAO's mandate, strategy and work. They are highly featured across the ASD and its SDGs, making FAO a key organization in their achievement. FAO has strategized supporting the ASD, through transformation to more efficient, inclusive, resilient and sustainable agri-food systems for achieving better production, better nutrition, better environment and better life leaving no one behind. Development of sustainable aquaculture has significant linkages and bearing for most SDGs of the 2030 agenda.

In December 2015, the twenty-first session of the Conference of the Parties (COP21) to the United Nations Framework Convention on Climate Change (UNFCCC) concluded with the adoption of the Paris Agreement. The Paris Agreement aims to strengthen the global response to climate change, including sustainable development and efforts to eradicate poverty. COP21 emphasizes the importance of oceans and aquatic ecosystems for temperature regulation and carbon sequestration, and highlights the need to counter pollution, over-exploitation and restore productivity and ecosystem services. It also highlights the need to increase resilience of food production systems in the face of climate change and a growing population.

Other instruments of relevance to the development of sustainable aquaculture include: (i) Principles for Responsible Agricultural Investment that Respects Rights, Livelihoods and Resources (PRAI) developed by the FAO, International Fund for Agricultural Development (IFAD), United Nations Conference on Trade and Development (UNCTAD), and the World Bank (2010); (ii) the FAO Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests in the Context of National Food Security (2012); (iii) the FAO Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries in the Context of Food Security and Poverty Eradication (the SSF Guidelines-2015); (iv) the Principles for Responsible Investment in Agriculture and Food Systems of the Committee on World Food Security (2014) and (iv) The Global Plan of Action for the Conservation, Sustainable Use and Development of Aquatic Genetic Resources for Food and Agriculture, adopted by the FAO Council in 2021.

In 2017, the Ninth Session of the Sub-Committee on Aquaculture of the FAO Committee on Fisheries (COFI-SCA) called for the identification of successful initiatives in support of sustainable aquaculture and their documentation and compilation into Guidelines for Sustainable Aquaculture. The aim is to help countries improve implementation of the Code, while engaging and enabling their aquaculture sector to participate effectively in the implementation of the 2030 Agenda and building collectively the future of a sustainable aquaculture sector.

The GSA, that target primarily policymakers, have been developed by making use of, and sharing policy and scientific developments and technological innovations, and the lessons learned in different regions, countries, and contexts. In parallel, existing national and regional guidelines were reviewed during expert and regional consultations, to identify the gaps that need to be filled, the updates to be undertaken, as well as the specific constraints, needs and expectations of Members.

These Guidelines have been developed through a participatory and consultative process, involving representatives of farmers, civil society organizations (CSOs), governments, regional organizations, and other stakeholders. Their development considers a wide range of important issues and principles, including equality and non-discrimination, participation and inclusion, accountability, transparency and the rule of law. To integrate fully with applicable obligations, voluntary commitments and available guidance, Members and other stakeholders are encouraged to consult also other relevant guidelines, international and regional instruments, and codes (Annex 1).

PART 1: INTRODUCTION

1. Objectives

1.1 The objectives of the Guidelines for Sustainable Aquaculture (GSA) are:

- a) to enhance the contribution of aquaculture to global food security, nutrition and poverty eradication as well as to ecosystems resiliency and wellbeing, noting also the importance of aquaculture in making use of marginal lands and water sources;
- b) to improve the socio-economic situation of communities depending on aquaculture for their income and livelihoods through decent work and economic growth;
- c) to achieve the sustainable use, responsible management, and conservation of living aquatic resources consistent with the Code and other international instruments relevant to aquaculture;
- d) to contribute to the achievements of the ASD and future global undertakings for sustainable development beyond 2030;
- e) to promote the contribution of the aquaculture sector to an economically, socially, and environmentally sustainable future for the planet and better life for its people leaving no one behind;
- f) to provide normative guidance for consideration by Members and stakeholders for the development and implementation of public policies, strategies, and legal and institutional frameworks for the enhancement of sustainable aquaculture; and
- g) to reinforce public awareness and promote the advancement of science, technology, innovations, and knowledge to enhance the cultural, economic, social and environmental contributions of sustainable aquaculture.

1.2 These objectives are achievable through the promotion of equitable development, creation of an enabling environment and empowerment of aquaculture stakeholders, (including all men, women, and youth), participating in decision-making processes, and assuming responsibilities for sustainable use and conservation of living aquatic resources, sustainable production and consumption.

2. Nature and scope

2.1 These Guidelines are voluntary. They are global in scope and should be adapted to apply to aquaculture in its varied contexts.

2.2 These Guidelines are relevant to aquaculture in marine, inland and brackish waters. They concern women and men, working in the full range of activities along the entire aquaculture value chain, including pre-farming, grow out and post-harvest activities. The important linkages between aquaculture and other sectors such as fisheries, agriculture, forestry, coastal and marine tourism, mining and transportation are recognized, but these Guidelines principally focus on the aquaculture sector.

2.3 These Guidelines are addressed to FAO Members and non-Members, at all levels of the country, as well as to subregional, regional, international, and intergovernmental organizations (IGOs) and aquaculture actors (farmers, workers, their communities, traditional and customary authorities), and related professional organizations and CSOs. They are also aimed at research and academic institutions, the private sector, non-governmental organizations (NGOs) and all other entities concerned with the aquaculture sector, coastal and rural development and the use of the aquatic environment, including in urban and peri-urban zones.

2.4 These Guidelines recognize the great diversity of aquaculture systems, operation scales (from subsistence to commercial farms and from small-scale family operated farms to large-scale corporate operations) and farmed species. To ensure transparency and accountability in the application of the Guidelines, it is important to ascertain meaningful and substantive participatory and consultative processes so that the voices of men, women, youth, and vulnerable and marginalized groups are heard. All parties should support and participate in such processes, as appropriate, in the form of co-management.

2.5 These Guidelines should be interpreted and applied in accordance with national legal systems and their institutions.

3. Guiding principles

3.1 These Guidelines are based on principles, standards and practices of sustainable development according to the ASD and its relevant SDGs, the Code and other instruments with relevant bearing on sustainable aquaculture development:

- a) Sustainability in its three dimensions: acknowledging that sustainability means the duty to use, safeguard, and preserve natural resources to satisfy our needs and wants today in such a way that future generations too can satisfy theirs. This requires promoting aquaculture development and operations that support a balance of the three dimensions of sustainability: economic profitability, social and environmental responsibility.
- b) Economic sustainability: acknowledging that economic sustainability is an integrated part of sustainability which calls for the responsible use of natural resources when pursuing economic benefits, and encouraging farmers to optimize profits while ensuring that they are not generating unintended effects that could cause harm to society and the environment, encouraging aquaculture operators to strike a balance between pursuing economic performance and ensuring societal wellbeing and environmental protection.
- c) Social responsibility: recognizing that social responsibility means that future generations should have the same or greater access to social resources as the current generation. The resources should be used in a manner that benefits society at large, calling individuals, the private sector and stakeholders in aquaculture to adopt policies that optimize economic profits, promote the well-being of society and the environment while lessening negative impacts on them.
- d) Environmental sustainability: recognizing that environmental sustainability refers to acting in a way that guarantees current and future generations have the natural resources available to live an equal or better way of life and encouraging aquaculture operations to adopt policies and practices that ensure avoidance of undesirable outcomes such as degradation of ecosystems,

- habitats and ecosystem services, loss of genetic resources and biodiversity, food safety risks, and spread of aquatic animal diseases and pathogens.
- e) Rule of law: adopting a rules-based approach for a sustainable aquaculture sector through laws and regulations that are widely accessible, applicable to all, equally enforced and independently adjudicated, and that are consistent with existing obligations under national, regional and international agreement/law, and with due regard to voluntary commitments under applicable regional and international instruments.
 - f) Respect of cultures: recognizing and respecting existing forms of organization, traditional and local knowledge, and practices of aquaculture communities, including indigenous peoples and ethnic minorities, encouraging the role of women in leadership.
 - g) Non-discrimination: promoting the elimination of all kinds of discrimination in policies and in practice in aquaculture sector, and considering Article 5 of the Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW).
 - h) Equity and equality: promoting justice and fair treatment – both legally and in practice – of all peoples, including gender equity and equality of rights and opportunities. At the same time, differences between women and men should be acknowledged and specific measures taken to accelerate de facto equality, i.e. using affirmative action or preferential treatment where required to achieve equitable outcomes, particularly for vulnerable and marginalized groups, including women, youth and the people with disabilities.
 - i) Consultation and participation: ensuring active, free, effective, meaningful, and informed participation of all aquaculture stakeholders and considering existing power imbalances between different parties. This should include feedback and support from those who could be affected by decisions prior to these being taken and responding to their contributions.
 - j) Transparency: clearly defining, widely publicizing, and making accessible policies, laws, regulations, enforcement and procedures, and widely publicizing decisions in applicable languages and in formats accessible to all.
 - k) Accountability: holding individuals, public institutions, and non-state actors responsible for their actions and decisions according to the principles of the rule of law.
 - l) Holistic and integrated approaches: recognizing the ecosystem approach to aquaculture (EAA) as an important guiding principle to develop policies and strategies that balance economic, social, and environmental objectives, embracing the notions of comprehensiveness and sustainability, and ensuring cross-sectoral coordination as aquaculture operations are closely linked to and dependent on many other sectors that use the coastal and aquatic environment.

4. Sustainable aquaculture and the Sustainable Development Goals

4.1 These GSA aim to support the achievement of the ASD, which calls on countries to declare their priorities and commitments, to formulate strategies and adopt policies, programmes and partnerships to achieve their national goals and associated targets.

- a) These Guidelines recognize that the development of a sustainable aquaculture sector has significant linkages and bearing for most SDG of the 2030 Agenda. The SDGs of high bearing are: 1 (end poverty in all its forms everywhere), 2 (end hunger, achieve food security and improved nutrition and promote sustainable agriculture), 5 (achieve gender equality and empower all women and girls), 8 (Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all), 12 (ensure sustainable consumption and production patterns), 13 (take urgent action to combat climate change and its impacts), 14 (Conserve and sustainably use the oceans, seas and marine genetic resources for sustainable development) and 15 (Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, halt biodiversity loss, halt and reverse land degradation, and 17 (Strengthen the means of implementation and revitalize the global partnership for sustainable development).
- b) These Guidelines acknowledge that planning, implementing, and reporting on SDGs should be country led and country driven, and that emphasis at the national or local levels can change according to contexts, circumstances, conditions, and Members' priorities. As a result, certain

SDGs and targets in given situations will weigh more than others in terms of importance and impact on sustainable development.

- c) These Guidelines further recognize that relevant SDGs and associated targets offer significant opportunities for raising the profile of sustainable aquaculture development. They equally recognize that sustainable aquaculture, when developed appropriately, can contribute significantly to the achievement of many SDGs and their targets.
- d) These Guidelines encourage Members to align their sustainable aquaculture sector development policies and strategies to the relevant SDGs and their targets, ensuring regular mapping and update, monitoring, reporting and analysis of progress.
- e) These Guidelines acknowledge that, in aligning sustainable aquaculture development policies and strategies to the relevant SDGs and targets of the ASD, and when deciding on trade-offs across national development sectors and within the aquaculture sector, Members should ensure:
 - (i) the creation of an enabling environment for sustainable aquaculture development;
 - (ii) equitable access to natural resources and use rights;
 - (iii) environmental sustainability and efficiency of resource use;
 - (iv) conservation;
 - (v) access and benefit sharing of aquatic genetic resources;
 - (vi) equitable access to basic services and infrastructure;
 - (vi) decent working conditions along the aquaculture value chain, and facilitating access to markets and fair competition;
 - (vii) adoption of climate smart aquaculture practices to mitigate the impact of climate change;
 - (viii) integrated and streamlined monitoring and reporting to minimize reporting burdens, reduce duplication of efforts and ensure consistency of data.

5. Relationship with other international instruments

5.1 These Guidelines should be interpreted and applied in a voluntary, responsible and consistent manner with existing rights and obligations under national and international law and with due regard to voluntary commitments under applicable regional and international instruments. They are complementary to and support national, regional, and international initiatives that address sustainable aquaculture development. The Guidelines were developed to complement the Code and to support the ASD and sustainable use of resources in accordance with the Code and other related instruments.

5.2 Nothing in the Guidelines should be read as limiting or undermining any rights or obligations to which a Member may be subject under international law. These Guidelines may be used to guide amendments and inspire new or supplementary policy, legislative and regulatory provisions.

PART 2: UNDERLYING MINIMUM SUBSTANTIVE CONSIDERATIONS FOR SUSTAINABLE AQUACULTURE DEVELOPMENT

This part presents minimum substantive considerations to ensure sustainable aquaculture development. They include: (i) governance and planning for aquaculture development; (ii) sustainable resources management; (iii) social responsibility and, gender equality; (iv) value chains, market access and trade; and (v) Climate change and disaster risks.

6. Governance and planning for aquaculture development

These Guidelines recognize the need for responsible and sustainable use of terrestrial and aquatic biodiversity, to meet the developmental and environmental requirements of present and future generations by supporting the achievements of the ASD and future global sustainable development undertakings. This requires proper governance and planning of sustainable aquaculture, taking into consideration the local conditions and the principles of sustainable development and management of natural resources.

These Guidelines recognize that although aquaculture is a millennia-old activity, its development into a structured food production system and commercial activity is recent. Whereas successful national aquaculture governance frameworks exist and are well documented, there are still many nations with weak and/ or non- enforceable governance mechanisms, which renders the latter ineffective. Aquaculture governance has often been considered under the governance framework of other sectors such fisheries, agriculture, water and forestry, trade, or environment, with fragmented policy and regulations and multiple institutional actors.

These Guidelines recognize the increasing need for the governance of the sector in a holistic manner to address its specificities and the complexities of the life cycles and requirements of aquatic organisms, the diversity of aquaculture: (i) systems, (ii) sites, (iii) practices and ecosystem services.

6.1. Governance

6.1.1 These Guidelines define aquaculture governance as the set of processes by which a jurisdiction manages its resources, how aquaculture stakeholders participate in making and implementing decisions, how decision-makers are held accountable to aquaculture stakeholders and how the rule of law is applied and enforced.

6.1.2 To ensure the development of a sustainable aquaculture sector in a holistic manner, Members are encouraged to develop national aquaculture governance frameworks bringing coherence within the various legal framework and institutional arrangements and providing a predictable and transparent environment for investment in the development of sustainable aquaculture.

6.1.3 Governance frameworks should facilitate the development and implementation of policies, strategies and plans, laws and regulations, institutional and administrative arrangements, that promote economically efficient, environmentally friendly, technically feasible, and socially responsible aquaculture.

6.1.4 Aquaculture sector governance should reconcile the multiple and sometimes competing objectives of aquaculture development to ensure optimum utilization of resources, equitable distribution of the costs and benefits, long term visibility and transparency, consistency, and fairness in decision making and enforcement.

6.1.5 In developing aquaculture governance frameworks, Members should be guided by the following principles:

- a) Cost effectiveness and efficiency: the Governance framework should enable effective enforcement of rules and regulations, efficient delivery of essential services and tools to use natural resources and mitigate risks in the most cost-effective way, promote best aquaculture practices, provide incentives, and support market instruments promoting sustainability. The Governance framework should promote evidence-based and fair rules and regulations, avoid duplication and unnecessary multiple administrative layers, at local and national levels, and support participatory and transparent decision-making processes.
- b) Equity: the Governance framework should take into consideration and balance interests of the different groups, without any type of discrimination, with a particular focus on women and youth, persons with disabilities and marginalized groups, as well as safeguard the interest of future generations. The Governance framework should promote participatory approaches, consensus building, and transparent and equitable institutional responsiveness to the stakeholders.
- c) Accountability: the Governance framework should hold public institutions and other aquaculture actors responsible for their actions and decisions according to the principles of the rule of law.

The Governance framework should promote transparency in decision making based on well-established criteria, evidence and updated and reliable scientific information, including from industry, provided confidentiality is respected.

- d) Predictability and stability: the Governance framework should ensure that the application of rules and regulations is fair and consistent and that decision-making is consistent and transparent.

The Governance framework should ensure the security of property and lease rights, tenure and water access rights, participation, and transparency in elaborating and applying criteria and procedures for licensing, license renewal or taxation.

6.2. Planning and management

6.2.1 These Guidelines recognize that planning and managing aquaculture development has proven most useful to prevent negative environmental and social impacts that can outweigh the benefits of growing more aquatic organisms. Aquaculture planning and management enable a balance between environmental carrying capacity, social risks and economic opportunities to minimize negative impacts while permitting the industry to contribute to the national economy and benefit society at large.

6.2.2 These Guidelines support the EAA which offers a suitable stepwise process through which aquaculture can be spatially planned and managed and integrated into the local ecological and social context and economy. It provides a planning and management framework to effectively integrate aquaculture into local planning and offers solutions for engaging with producers and the government for the effective sustainable management of aquaculture operations by considering local and national social, economic, environmental and governance objectives.

6.2.3 To promote the development of sustainable aquaculture, Members should consider spatial planning and management to allocate suitable farming areas and farm sites and management frameworks to: (i) meet the specific biological needs of the aquatic organisms; (ii) ensure that the ecological, productive and social capacity of the ecosystem hosting aquaculture is sufficient to support a defined production; (iii) enable economic profitability; (iv) minimize stress and the risks of diseases; (v) secures access to land and water while preventing conflicts with other users (fisheries, agriculture, forestry, tourism, and so on) of inland and coastal zone resources; (vi) provides access to infrastructure (roads, electricity, post-harvest and marketing infrastructure); (vii) support resilience to climatic variability, climate change and other external threats and disasters; (viii) improve public perception and acceptability about potential social and environmental benefits and impacts, as well as externalities of aquaculture sector through transparent and efficient information sharing.

6.2.4 To promote planning and management of aquaculture development through zoning, site selection and the design of aquaculture management areas (AMAs), Members should consider the EAA to balance between the social, economic, environmental and governance objectives of local communities and sustainable development. Based on the EAA, Members should consider the best available knowledge and resources to perform a scoping study to enable proper zoning, site selection and AMAs with special consideration of the carrying capacity of ecosystems.

6.2.5 In planning and managing aquaculture using the EAA, Members should be guided by the following principles: (i) take account of the full range of ecosystem functions and services, including biodiversity, and not threaten the sustained delivery of these to society or lead to their degradation beyond their resilience; (ii) support the improvement of human well-being with equity for all stakeholders (for example access rights, decent livelihoods and fair share of incomes), in particular for women; (iii) consider the linkages and interactions across freshwater, brackish and marine environments; (iv) take account of other sectors, policies and goals, as appropriate.

6.3. Policy, legal and institutional frameworks

6.3.1 Commercial aquaculture has developed relatively recently, with no dedicated national legislation or strong support institutions in many countries. Instead, aquaculture relies on laws and regulations fragmented over various institutions and regulatory agencies of sectors such as fisheries, agriculture, water and forestry, labour, social, trade, or environment. As a result, the sector faces multiple and sometimes conflicting regulations over access to land, water, infrastructure and services, environmental requirements, zoning, food safety, health and welfare, and implementation of innovative practices.

6.3.2 To guide the development and implementation of an EAA for aquaculture planning and management, Members should improve existing or develop new national policy, institutional and legal frameworks for fair and transparent regulations on user rights and operations. Such frameworks should be enforced by a competent authority and underpinned by effective and transparent stakeholders' consultations and use of best available knowledge and science.

6.3.3 Building on existing laws, traditions, and institutional structures, Members should regularly review and update legal and institutional frameworks that support EAA planning and management, to ensure continued relevance and improved effectiveness.

6.3.4 The overall policy framework should balance binding rules and regulations of user rights, licensing, zoning, and other non-binding instruments that promote on-farm best practices and product quality. Where feasible, appropriate incentives, fiscal or otherwise, should be considered to promote adherence to rules and regulations and codes of best practice.

6.3.5 The legal framework should ensure the visibility and representativeness of aquaculture in national and local integrated coastal zone management (ICZM) initiatives.

6.3.6 The institutional framework for planning and managing aquaculture development should clearly identify the competent authorities, their organizational structure, the various roles and responsibilities for enforcement, communication, coordination and cooperation between institutions, tiers of governments, the private sector, and other stakeholders. The roles and responsibilities should be explicit, accountable, and where necessary, supported by a robust legal framework.

6.3.7 The legal framework and the institutional arrangement for implementation should provide for monitoring, regular evaluation and reporting of relevance and effectiveness, using reliable and cost-effective methods and enabling feed back into the process of policy formulation. It encourages Members to develop systems that link all concerned departments and institutions to ensure better coordination.

7. Sustainable resources management

7.1. General considerations

7.1.1 Members and all those engaged in management of terrestrial and aquatic resources relevant to aquaculture should adopt measures for the long-term conservation and sustainable use of these resources. They should promote and implement appropriate management systems, consistent with their existing obligations under national and international law and voluntary commitments, including the Code and its supporting instruments, as well as the relevant ASD and its SDGs that give due recognition to the requirements and opportunities of aquaculture. Aquaculture is supported by ecosystem services that must be valued and protected to ensure their long-term delivery.

7.1.2 All parties should recognize that rights and responsibilities come together; users' rights are balanced by duties and support the long-term conservation and sustainable use of resources and the maintenance of the ecological foundation for aquatic food production. Aquaculture operators should

utilize best practices that minimize harm to the terrestrial and aquatic environment and associated species and support decent livelihoods.

7.1.3 Members should facilitate, train and support aquaculture stakeholders to participate in and take responsibility for the management of the aquatic resources on which they depend for their well-being and livelihoods, with due consideration of their legitimate users' rights and systems. Accordingly, Members should involve all aquaculture dependent communities – with special attention to equitable participation of women, youth, vulnerable and marginalized groups – and other aquaculture stakeholders in the design, planning and, as appropriate, implementation of aquaculture management measures.

7.1.4 Participatory resources management systems, such as co-management and so on, should be promoted in accordance with national policies within the boundaries of its laws and regulations, taking into account regional cooperation mechanisms.

7.1.5 Members should ensure that the roles and responsibilities within the context of co-management arrangements of concerned parties and stakeholders are clarified and agreed upon through a participatory and legally supported process. All parties are responsible for assuming the management roles agreed to.

7.1.6 All FAO Members should ensure that all aquaculture stakeholders, women, vulnerable and marginalized groups are represented in relevant local and national organizations and bodies and actively take part in relevant decision-making and policy-making processes.

7.1.7 All stakeholders should encourage and support the role and equitable involvement/engagement of women and men, especially youth, promote Indigenous Peoples' and vulnerable groups' participation in aquaculture, whether engaged in input (seed and feed) production and distribution activities, pre-farming, grow-out or post-harvest operations, in the context of co-management and in the promotion of sustainable aquaculture, contributing their particular knowledge, perspectives and needs. Where necessary, special measures should be designed to achieve this objective.

7.1.8 Members should establish effective procedures specific to aquaculture to undertake appropriate environmental risk assessment and monitoring with the aim of minimizing adverse environmental impacts and related economic and social consequences resulting from water extraction, land use, discharge of effluents, introduction and production of invasive alien species (IAS), use of drugs and chemicals.

While it is necessary to consider impacts of individual farms it is also necessary to consider the added synergistic impacts of many farms, even small farms, since what matters is the capacity of the holding ecosystem to support the farming process and outputs.

7.1.9 Where transboundary and other similar issues exist, for example shared waters and aquatic resources, Members should work together to ensure that the users rights of aquaculture operators are protected, including rights to claims of damage and to compensation.

7.1.10 Members should promote permanent environmental monitoring of water bodies/watersheds that support aquaculture. Indicators of water quality and ecosystems wellbeing benchmarks should be developed. Such monitoring should also be connected to early warning systems and could generate prevention and mitigation measures.

7.2. Conservation, sustainable use and development of aquatic biodiversity in aquaculture

7.2.1 These guidelines are consistent with the Global Plan of Action for the Conservation, Sustainable Use and Development of Aquatic Genetic Resources for Food and Agriculture, developed by FAO following extensive consultation and adopted by the members of the FAO Council in 2021. They

recognize three fundamental needs and challenges for sustainable management of aquatic genetic resources for food and agriculture (AqGR):

- a) wild and farmed AqGR will underpin the future role of AqGR in aquatic food systems, and important AqGR under threat must be conserved;
- b) it is essential to apply basic principles of genetic management to domesticated AqGR to ensure their sustainable use in aquaculture; and
- c) genetic improvement in aquaculture lags far behind that in terrestrial agriculture and that accelerated adoption of appropriate genetic improvement can positively affect aquaculture production efficiency and sustainability.

7.2.2 These Guidelines recognize that: (i) effective management of AqGR is constrained by the shortage of information on their national, regional, and global status; (ii) AqGR are underrepresented in the development and monitoring of the status of global biodiversity within international instruments, due in part to the absence of indicators of their status; (iii) more effective management of AqGR must be underpinned by greater knowledge of the resource and effective monitoring of its status.

7.2.3 These Guidelines recognize that genetic effects may arise from the interaction of farmed types with wild resources, especially from introduced species and developed farmed types. Undesirable genetic effects include contamination of native gene pools through hybridization and introgression, which may render them less fit, and loss of native species, or change in species composition or abundance, through competition, predation, or habitat degradation. Some important aquaculture species are at risk in the wild, including through anthropogenic effects including habitat destruction, illegal catch, poaching and overfishing. Also, some unique farmed types may also be at risk. It is important to recognize and monitor species, wild stocks and farmed types under threat and promote their effective conservation. Risk assessment should also consider current and future impacts of environmental change including climate change.

7.2.4 Members and relevant stakeholders should recognize that at-risk genetic resources should be conserved, prioritizing *in situ* conservation when possible such as through aquatic protected areas and even fisheries management. *In situ* conservation may be supplemented or, in extreme cases, supplanted by *ex situ* conservation in the form of live gene banks or *in vitro* gene banks such as cryo-conservation of gametes or embryos. Research is needed to expand options for *ex situ in vitro* conservation for endangered aquatic species.

7.2.5 Members and relevant stakeholders should undertake efforts to minimize the harmful effects of introducing non-native species and developed farmed types for aquaculture, whether introduction is accidental or deliberate. Introductions should be based on the precautionary principle and based on sound risk assessment and management. Members should, whenever possible, promote steps to minimize adverse genetic, disease and other effects of such introductions on wild stocks. Specific and targeted guidelines based on risk-based best practice and existing codes of practice should be developed and widely distributed.

7.2.6 All parties should recognize that due to the recent domestication of most aquaculture species, they generally retain high levels of genetic variability, thus retaining great potential for future adaptation and development. However, lack of attention to principles of genetic management is eroding this variability in many important seed supply systems, causing inbreeding and genetic drift. Loss of species purity through inadequately controlled hybridization is also occurring in some species. These practices can have long-term negative impacts on productivity and should be avoided.

7.2.7 All parties should promote application of basic principles of genetic management, especially within major seed supply systems. This should be accompanied by monitoring of the genetic status of stocks at different steps in the seed supply value chain. Affordable and robust tools to support monitoring (such as targeted genetic marker systems) need to be developed, promoted and disseminated to support this monitoring.

7.2.8 These Guidelines recognize that genetic improvement in aquatic species lags far behind that in terrestrial agriculture, with the exception of a few species, and uptake is slow, especially for many species cultured in the developing world that are important components of food and nutritional security. Selective breeding has huge potential to improve production efficiency in aquaculture, with genetic gains of 13 percent per generation achievable for many commercially important traits.

7.2.9 Members and other stakeholders should promote and accelerate uptake of appropriate genetic improvement, with a focus on well managed selective breeding programmes as a core technology. Promotion should include awareness raising, capacity building, appropriate research and development and effective engagement of the private sector. Approaches to selective breeding must necessarily take a long-term approach, with consideration of appropriate resourcing and dissemination strategies.

7.2.10 All parties should develop targeted policies and strategies, nationally and regionally for effective conservation, sustainable use and development of genetic diversity. These policies and strategies should be underpinned by appropriate levels of investment, capacity building and institutions. Equitable access and benefit sharing measures, which respect the key features of AqGR, should be a core principle in the development of these strategies and policies.

7.3. Best practices for sustainable aquaculture

7.3.1 Members should promote best practices for sustainable aquaculture in support of rural communities, fish workers, producer organizations, fish farmers and a broad range of other stakeholders.

7.3.2 All the stakeholders involved in aquaculture should make a strong commitment towards developing, disseminating, and implementing codes of best and cost-effective practices for sustainable aquaculture based on the learning from successful and non-successful experiences.

7.3.3 To promote cooperation and self-regulation, Members should support small-scale famers, aquafarmers and the aquaculture industry in general to establish self-help aquafarmer groups and producer associations, with a particular attention to the youth, women, vulnerable and marginalized groups.

7.3.4 Collaboration should be fostered between the aquaculture industry and governments, but also with local authorities, regional and international organizations, trade unions, research institutions and other relevant stakeholders involved in the aquaculture value chain, in order to adopt best practices for sustainable aquaculture.

7.3.5 To attract investors and to retain farmers in the sector, Members must develop a realistic and simplified holistic framework for the operation of aquaculture business ventures and determine how the regulatory frameworks can be made operational for the development of the sector.

7.3.6 All commercial farms treated as a business venture must adopt better management practices (BMPs) and be technically, socially, economically, and environmentally sustainable to remain in business over a given period.

7.3.7 Government should assist farmers to increase access to credit, financial support and risk insurance to enable them to adopt BMPs, increase production and improve the net income of the farmers.

7.3.8 Members should promote training, capacity building and active participation of fish workers, fish farmers and aquaculture communities in the development of sustainable aquaculture management practices. Such practices should bear in consideration the rights and access of other users of common ecosystems.

7.3.9 All parties should promote the involvement of aquatic and terrestrial farmers, their organizations, as well as their communities, in setting research priorities and directions, including specific cross-cutting objectives and needs for research projects, and to make research findings accessible to them and applicable in the local and national contexts.

7.3.10 Members should promote efforts that improve selection and use of appropriate feeds, feed ingredients, feed additives and fertilizers, including manures.

7.3.11 Members should conduct research to seek alternative sources of quality plant protein that generates fish growth to replace more expensive sources of animal-based proteins, lower feed costs to increase business profits while environmentally and socially responsible.

7.3.12 The use of agriculture by-products must be carefully regulated to avoid contamination of the aquaculture products with pathogens, parasites, heavy metals, antimicrobials (antibiotics, parasiticide, antifungal and antiviral drugs) and other substances potentially harmful to humans, aquaculture facilities and the surrounding ecosystems.

7.3.13 Members should promote effective on-farm biosecurity strategies and practices favouring hygienic measures and vaccines, and ensure safe, effective, and responsible use of veterinary drugs authorized for use in aquaculture. These drugs may include hormones, antimicrobials, vaccines, anaesthetics, sedatives, and chemical products applied to the aquatic organisms and not to the aquatic environment.

7.3.14 Members should promote collaboration regarding on-farm biosecurity strategies or practices aspects among farmers, extension specialists, veterinarians, para-veterinarians and other fish and aquatic plants health experts to raise awareness and build capacity for fish and aquatic plants health maintenance and farm management efficiency.

7.3.15 Members should regulate the use of chemical and other biological inputs in aquaculture which could be hazardous to human health, aquaculture facilities and the environment. Regulations should consider the carrying and dilution capacity of recipient aquatic ecosystems.

7.3.16 Members should require that the disposal of aquaculture wastes such as offal, sludge, dead or diseased fish, excess veterinary drugs and other hazardous chemical inputs does not constitute a hazard to human health and the environment. Where necessary, Members should require the treatment of such waste prior to disposal to protect aquaculture facilities and the environment.

7.3.17 Members should ensure that farming, harvesting, handling, processing, and distribution of aquaculture products are carried out in a manner that will maintain the nutritional value, quality and safety of the products, reduce aquaculture waste and minimize negative impacts on the environment, and, where feasible, ensure their traceability.

7.3.18 Members should promote responsible and sustainable practices of citizens and practitioners for the reduction of loss and waste in aquaculture and proper efficient use of resources, such as water or energy.

7.3.19 Members should develop and enforce standards for chemical and biological inputs for aquaculture operations including use in enhancement, treatment, improvement of water, wastewater, soil and sediment, feeds, culture organism, pre, post and during culture. The standard should require labelling including product information, composition, concentration and content, potential side effects and adverse reactions, source of origin, expiry date, usage and storage instruction, and so on.

7.3.20 To strengthen governance and transparent information on aquaculture activities, Members, should provide an information exchange platform of knowledge, attitudes, values, practices and perceptions of interested parties concerning risks associated with aquaculture production.

7.3.21 Members should strengthen disaster risk governance to manage disaster risk by promoting consistency and transparency in risk management decisions, invest in disaster risk reduction for resilience and contribute to development and delivery of effective risk reduction techniques.

8. Social responsibility and gender equality

8.1. Social responsibility

8.1.1 All parties should consider integrated, ecosystem and holistic approaches to aquaculture planning and management that take the livelihoods of aquaculture workers, farmers and other aquaculture stakeholders into account. Due attention to social and economic development should include all relevant stakeholders in discussions related to aquaculture use of space and water; facilitation mechanisms of social dialogs, benefits and opportunities should be sought especially for local populations.

8.1.2 All parties should improve social responsibility of the aquaculture sector with respect to other sectors that share common ecosystems and care for the use and conservation of natural resources, to improve aquaculture public perception and social acceptability. This is particularly relevant in areas, and regions where aquaculture is a new enterprise.

8.1.3 Members should promote investment in human resource development services such as social protection and health, education and training, literacy, digital inclusion and other skills of a technical nature that generate added value to the conservation and use of aquaculture resources as well as awareness raising, realizing non-discrimination and to ensure equitable benefits.

8.1.4 Members should promote social security protection and decent working conditions for workers along the entire aquaculture value chain, considering the characteristics of farmers and aquaculture dependent communities, and recognize or formalize family-based engagement as a mechanism to allow for access to social security

8.1.5 Members should support the development of and access to other services that are appropriate for aquaculture stakeholders, for example, savings, credit and insurance schemes, extension, animal health, with special emphasis on ensuring the access of women, persons with disabilities, vulnerable and marginalized groups, to such services.

8.1.6 Members should recognize as economic and professional operations the full range of activities along the aquaculture value chain – both pre- and post-harvest; whether in an aquatic environment or on land; undertaken by men or by women. All activities should be considered whether part-time, occasional, commercial and/or for subsistence. Professional and organizational development opportunities should be promoted, including for vulnerable groups working within the aquaculture value chain.

8.1.7 Members should promote decent work for all aquaculture workers, including both the formal and informal sectors and create the appropriate conditions to ensure that aquaculture activities in both the formal and informal sectors contribute to the local and national economies and the sustainability of aquaculture sector in accordance with national law.

8.1.8 Members should create an enabling environment for sustainable development of aquaculture sector and its stakeholders, pursue inclusive, non-discriminatory, and sound economic policies for the use of marine, freshwater and land areas to permit aquaculture stakeholders, particularly women, youth,

Indigenous Peoples' and vulnerable groups to earn a fair return from their labour, investment, skills and management, and encourage conservation and sustainable management of natural resources.

8.1.9 Members and other stakeholders should support already existing, or the development of complementary and alternative income-generating opportunities – in addition to earnings from aquaculture-related activities – for small scale holders, as required and in support of sustainable use of natural resources and livelihood diversification. The role of aquaculture in local economies and its link to the wider economy need to be recognized and benefited from. Aquaculture dependent communities and workers should equitably benefit from developments such as aquaculture community-based tourism.

8.1.10 All parties should create conditions for men and women in aquaculture to work in an environment free from crime, violence, organized crime activities, piracy, theft, sexual exploitation, corruption, and abuse of authority. All parties should take steps to institute measures that aim to eliminate gender-based violence and to protect anyone exposed to such violence in aquaculture workplace and communities. Members should ensure access to justice for victims of inter alia violence and abuse.

8.1.11 Members and aquaculture actors, including traditional and customary authorities, should understand, recognize and respect the role of migrant workers in aquaculture. Members and aquaculture actors should cooperate to create the appropriate frameworks for the protection of human and labour rights, either under statutory or customary law, to realize for fair and adequate integration of migrants who engage in aquaculture operations and who do not undermine local community-based governance and development in aquaculture in accordance with national law. Members should recognize the importance of coordination among their respective national governments regarding migration of aquaculture workers across national borders. Policies and management measures should be determined in consultation with fisheries and aquaculture organizations and institutions.

8.1.12 Members should address occupational health and safety issues and unfair working conditions of all aquaculture workers, especially the youth, women, vulnerable and marginalized groups, by ensuring that the necessary legislation is in place and is implemented in accordance with international standards, conventions and instruments into their national legislation to which a Member is a contracting party, such as the relevant recommendations, guidelines and conventions of the International Labour Organization (ILO). All parties should strive to ensure decent working conditions, and that occupational health and safety is essential and an integral part of aquaculture management and development initiatives.

8.1.13 Members should eliminate any sort of illegal practices, such as forced labour, prevent debt-bondage, child labour, among others, especially with migrant workers, women, children, and other people in vulnerable situations. The adoption of effective measures to protect aquaculture operators and workers in the aquaculture sector is needed.

8.1.14 Members should provide and enable access to schools and education facilities that meet the needs of aquaculture dependent communities and that facilitate gainful and decent employment of youth, respecting their career choices and providing equal opportunities for youth, men and women as well as Indigenous Peoples' and vulnerable groups.

8.2. Gender equity and equality

8.2.1 All parties should recognize the role of women in aquaculture activities. Achieving gender equity and equality requires concerted efforts by all and that gender mainstreaming should be an integral part of all aquaculture development strategies. These strategies require different approaches in different cultural contexts to achieve gender equity and equality and should challenge practices that are discriminatory against women.

8.2.2 Members should comply with their obligations under international human rights law and implement the relevant instruments, in particular the CEDAW, the Beijing Declaration and Platform for action, promoting gender equity and equality to which they are party.

8.2.3 Members should endeavour to secure women's equal participation in decision-making processes for policies directed towards aquaculture. Members should adopt specific measures to address discrimination against women, while creating spaces for CSOs, for women workers and their organizations, to participate in monitoring their implementation. Women should be encouraged to participate in aquaculture organizations, and relevant organizational development support should be provided.

8.2.4 Members should propound policies and legislation to promote gender equity as a means of achieving the objective of gender equality and, as appropriate, adapt legislation, policies and measures that are not compatible with gender equity and equality, considering social, economic, historical and cultural aspects which perpetuate the subjugation of women.

8.2.5 Members should be at the forefront of implementing actions for achieving gender equity and equality by, inter alia, recruiting more women as extension staff and ensuring that both men and women have equal access to extension and technical services, including legal support, related to aquaculture.

8.2.6 All parties should collaborate to develop monitoring and evaluation indicators and systems to assess the impact of legislation, policies, and actions for improving women's status and achieving gender equality.

Members and relevant stakeholders and institutions should collect and provide gender disaggregated information on aquaculture employment engagement, aquaculture licenses, and so on.

8.2.7 All parties should encourage the development of better technologies of importance and appropriate to women's work in aquaculture.

9. Value chains, market access and trade

9.1 These Guidelines recognize that as aquaculture has developed into a major commercial food system, providing the majority of aquatic food protein worldwide, aquaculture value chain analysis, development and governance have emerged as a valuable and complementary approaches to promote sustainable aquaculture. It aims to analyse and understand the dynamics at value chain nodes, involving key players, costs and benefits, value addition and value creation, and to inform the development of policy options and suitable market instruments for the promotion of sustainable aquaculture in international food trade.

9.2 The interaction and synergies amongst the aquaculture value chain (AVC) actors and between them and their business and policy environment should be analysed to assess how access and entry barriers are created, the role and influence of the different AVC actors and how gains and risks can be distributed equitably.

9.3 Members are encouraged to use AVC analysis to develop a holistic understanding of how a specific AVC performs economically, socially and environmentally. They should develop a vision shared by government institutions, private actors and other stakeholders) on how to improve the AVC performance and competitiveness such as through policy interventions, public investment and capacity building opportunities, fiscal and economic incentives, monitoring and corrective measures, public-private partnerships (PPPs).

9.4 All parties should ensure that AVC actors are part of decision-making processes, recognizing that sometimes unequal power relationships between value chain actors and that vulnerable and marginalized groups may require special attention and support.

9.5 All parties should recognize the role women often play along the value chain, and support improvements to facilitate women's participation in such work. Members should ensure that amenities and services appropriate for women are available as required in order to enable women to retain and enhance their livelihoods along the aquaculture value chain.

9.6 All parties should prevent food loss and waste along the AVC and seek ways to create and add value to aquaculture products, building also on existing traditional and local cost-efficient, gender-sensitive and climate smart technologies, local innovations and culturally appropriate technology transfers. Environmentally sustainable practices within an ecosystem approach should be promoted, deterring, for example, waste of inputs (water, fuel, feed and so on) along the AVC operations.

9.7 Members should facilitate equal access to local, national, regional and international markets and promote equitable and non-discriminatory trade of aquaculture products. Members should work together to introduce trade regulations and procedures that support regional and international responsible trade in aquaculture products and taking into account the agreements under the World Trade Organization (WTO), bearing in mind the rights and obligations of WTO members where appropriate.

9.8 Members should give due consideration to the impact of international fish trade and associated restructuring of the AVC on local small-scale farmers, workers and their communities. Members should ensure that promotion of international trade of aquaculture products does not adversely affect the nutritional needs of people for whom fish is critical to a nutritious diet, their health and well-being and for whom other comparable sources of food are not readily available or affordable. They should ensure that benefits from international trade are equitably distributed.

9.9 Members should enable access to relevant market and trade information and services for stakeholders in the AVC. In particular small-scale aquaculture farmers and other operators must be able to access timely and accurate market information and services to help them adjust to changing market conditions. Capacity building is also required so that all aquaculture actors and especially women, youth, Indigenous Peoples' and vulnerable groups can adapt to, and benefit equitably from, opportunities of global market trends and local situations while minimizing any potential negative impacts.

9.10 Members should ensure that market entry rules are consistent with the Agreements of the WTO, in particular the Sanitary and Phytosanitary Measures (SPS) Agreement and the Technical Barriers to Trade (TBT) Agreement, in particular for setting standards and technical regulations. These standards and technical regulations should be fit for the purpose of protecting the environment, consumers, animal health and welfare and social integrity. They should not be used as disguised obstacles to trade.

9.11 Members should promote the harmonization of technical regulations and standards for aquaculture products using internationally recognized norms such as those of the Codex Alimentarius Commission (CAC) for food safety and quality, the World Organisation for Animal Health (OIE) for animal health, the International Plant Protection Convention (IPPC) for aquatic plants, the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), and the norms of other international organizations where applicable such as the CBD Protocols: The Nagoya Protocol on Access and Benefit-sharing, The Cartagena Protocol on Biosafety, and The Nagoya – Kuala Lumpur Supplementary Protocol on Liability and Redress to the Cartagena Protocol on Biosafety.

9.12 Members should facilitate trade and market entry by promoting Mutual Recognition Agreements (MRA), Equivalence and Transparency of standards and technical regulations, based on internationally agreed norms and on scientific evidence using the risk assessment methodology and recognized institutions.

9.13 All parties should promote voluntary standards for aquaculture sustainability that are cost effective, predictable, and meet the minimum substantive criteria of the FAO guidelines for certification in aquaculture.

9.14. All parties and actors should promote and adopt traceability norms and standards in view of building trust and increasing transparency in aquaculture value chains.

10. Investment in sustainable aquaculture

10.1 These Guidelines recognize that investment in sustainable aquaculture can increase production and improve productivity, with significant impact on economic development, food security and poverty alleviation.

10.2 These Guidelines recognize that private investment in sustainable aquaculture, including foreign direct investments, offers significant potential and opportunities to complement national public resources and that countries with reasonably functioning, predictable and transparent markets can derive significant benefits from it in terms of better access to capital, technology and skills, market access, generation of employment and productivity increases.

10.3 Members and financial institutions should promote investment and insurance in the aquaculture sector, including from foreign direct investments, that recognizes and respects the rights of access to land, water and natural resources, whether statutory or customary, owned by individuals or communities.

10.4 All parties should ensure that Investments in aquaculture should strengthen food security and should not jeopardize it through adverse effects on any aspect of food security in terms of availability, access, utilization or stability.

10.5 Members should ensure that rules and processes relating to investment in aquaculture are transparent, verifiable, allowing accountability of investors and other stakeholders, within a proper business, legal, and regulatory environment.

10.6 Members should ensure that investors and other stakeholders respect the rule of law, reflect the industry best practice, are viable economically, and result in durable and equitable shared prosperity and values.

10.7 Members should ensure that investment projects in aquaculture undertake studies to quantify social and environmental impacts and identify implementable measures for sustainable natural resources use, by mitigating and minimizing the risk and magnitude of negative impacts of the aquaculture project. Such studies may be funded through public resources if so required, by undertaking Strategic Environmental Assessment (SEA).

10.8 Members should invest and promote investment in aquaculture research and innovation, appropriate to national and local needs. Models of research and innovation that link and strengthen collaboration amongst stakeholders and relevant parties, to improve production should be promoted.

10.9 Members should provide financial investment support for farmers who are not normally able to access financing from financial institutions and lower the risk of borrowing for the financial institutions.

10.10 Members should organize, facilitate and provide funds, loans to modify and restructure crowded intensive farming areas that lack inlet, outlet, reservoir, treatment facilities, which are necessary to implement BMPs.

11. Climate change and disaster risks

11.1. Members should recognize that combating climate change, including in the context of promoting sustainable aquaculture development, requires urgent and ambitious action, in accordance with the objectives, principles and provisions of the UNFCCC, taking into account the Paris Agreement on Climate Change and relevant targets of SDGs of the ASD, in particular SDG 13.

11.2 All parties should recognize and take into account the differential impact of natural and human-induced climate change and disasters on aquaculture. Members should develop policies and plans to address climate change in aquaculture, in particular strategies for adaptation and mitigation, where applicable, as well as for building resilience, in full and effective consultation with aquaculture stakeholders including indigenous peoples, men and women, paying particular attention to vulnerable and marginalized groups. Special support should be given to small-scale aquaculture farmers living in areas where climate change may have particular implications for food security, nutrition, housing and livelihoods.

11.3 All parties should recognize the need for integrated and holistic approaches, including cross-sectoral collaboration to address climate change and disaster risks in aquaculture. Members and other relevant parties should take steps to address issues such as pollution, coastal erosion and destruction of coastal habitats due to human-induced factors. Such issues tend to increase vulnerability of aquaculture systems to climate change seriously, undermining the livelihoods of aquaculture stakeholders in these areas as well as their ability to adapt to possible impacts of climate change.

11.4 Members should assist and support aquaculture dependent communities affected by climate change or natural and human-induced disasters, including through risk and vulnerability assessment, adaptation, mitigation, recovery and aid plans, where appropriate. In particular, Members should establish, in collaboration with the private sector, brood stock and seed production centres to supply quality seed to disaster affected areas.

11.5 Members should promote necessary science and information to understand main natural and climate hazards and their impacts on aquaculture, as well as identify opportunities to mitigate the impacts, including through capacity building, awareness raising and extension for resiliency and adaptation, with due attention to gender sensitivity.

11.6 In case of disasters caused by humans, affecting aquaculture operations, the responsible party should be held accountable for the damage caused.

11.7 All parties should take into account the impact that climate change and disasters may have on the entire AVC, in the form of changes of production systems, farmed species and farmed types and quantities, fish quality and shelf life, and implications with regard to infrastructure and market outlets. Members should provide support to aquaculture stakeholders with regard to adjustment measures in order to reduce negative impacts. When new technologies are introduced, they need to be flexible and adaptive to future changes in species, products and markets, and climatic variability.

11.8 Members and concerned stakeholders should understand how emergency response and disaster preparedness are related and coordinated in aquaculture sector and apply the concept of the relief-development continuum. Longer-term development objectives need to be considered throughout the emergency sequence, that is, the immediate relief phase, rehabilitation, reconstruction and recovery phases, including actions to reduce vulnerabilities to potential future threats. The concept of 'building back better' should be applied in disaster response and rehabilitation.

11.9 Members should emphasize the role of better planning and management as the first essential steps to reduce risks in the face of many hazards. All parties should promote the role of sustainable aquaculture in efforts related to climate change and should encourage and support energy efficiency in the subsector and throughout the whole AVC.

11.10 Members should consider making available to all aquaculture stakeholders, with a particular focus on small- and medium-scale farmers, transparent and equal access to adaptation funds, facilities and appropriate technologies for climate change adaptation, as appropriate.

PART 3: ENSURING AN ENABLING ENVIRONMENT AND SUPPORTING IMPLEMENTATION

12. Policy coherence, stakeholder's involvement, institutional coordination, and collaboration

12.1 Members should recognize the need for and work towards policy coherence with regard to, inter alia: national legislation; regional and international instruments, arrangements and mechanisms for economic development policies; sustainable and efficient use of natural resources and energy, education, health and rural policies; environmental protection; food security and nutrition policies; labour and employment policies; trade policies; disaster risk management and climate change adaptation policies; access arrangements; and other aquaculture related policies, plans, actions and investments in order to promote sustainable aquaculture, with special attention to gender equity and equality.

12.2 Members should, as appropriate, develop and use spatial planning approaches, including inland and marine spatial planning, which take due account of the aquaculture stakeholders' interests and role in integrated coastal zone management. Through consultation, participation and publicity, gender-sensitive policies and laws on regulated spatial planning should be developed as appropriate. Where appropriate, formal planning systems should consider methods of planning and territorial development used by aquaculture systems, aquaculture dependent communities and other communities with customary tenure systems, and decision-making processes within those communities.

12.3 Members should ensure that aquaculture policy provides a long-term vision for sustainable aquaculture to support the eradication of hunger and poverty, using an ecosystem approach. The overall policy framework for aquaculture should be coherent with the long-term vision and policy framework for aquaculture in support of the ASD and aquaculture relevant SDGs and targets.

12.4 Members should establish and promote the institutional structures and linkages – including local–national–regional–global linkages and networks – necessary for achieving policy coherence, cross-sectoral collaboration and the implementation of holistic and inclusive ecosystem approaches in the aquaculture sector. At the same time, there is a need for inclusion of active stakeholder participation mechanism within institutional structure, clear responsibilities and well-defined focal points in government authorities and agencies for aquaculture stakeholders.

12.5 Aquaculture stakeholders should promote collaboration among their professional associations, including cooperatives, clusters, NGOs and CSOs. They should establish networks and platforms for the exchange of experiences and information to facilitate their involvement in policy- and decision-making processes relevant to sustainable aquaculture sector development.

12.6 Members should recognize, and promote as appropriate, that local governance structures may contribute to an effective and sustainable management of aquaculture, taking into account the EAA in accordance with national legal frameworks.

12.7 Members should promote enhanced international, regional and subregional cooperation in achieving sustainable aquaculture. Members, as well as international, regional and subregional organizations, should support capacity development to enhance the understanding of aquaculture and

assist the sector in matters that require subregional, regional or international collaboration, including appropriate and mutually agreed technology transfer, capacity building and information sharing.

13. Information, research, and communication

13.1 Members should establish and harmonize systems of collecting and disseminating aquaculture data, including bioecological, social, cultural and economic data relevant for decision-making and investment in sustainable management of aquaculture with a view to ensuring sustainability of land and aquatic ecosystems, in a transparent manner. Efforts should also be made to produce gender-disaggregated data in official statistics, as well as data supporting improved understanding and visibility of the importance of sustainable aquaculture and its different value chain components, including environmental and socioeconomic aspects.

13.2 Members should develop simple, effective and easily understandable educational packages for aquaculture that explain BMPs from operational and economic perspectives, and distribute to stakeholders, investors and extension personnel.

13.3 Members should establish systems of data collection that enable them to assess the contribution of aquaculture to the SDGs targeting the reduction of food insecurity, poverty alleviation, natural resources' conservation (including genetic resource management), and economic development.

13.4 All aquaculture stakeholders and communities should recognize the importance of communication and information, which are necessary for effective decision-making. This should include mechanisms and tool for effective information and outreach of farmers, aquaculture workers, investors, their organizations and other concerned aquaculture value chain stakeholders.

13.5 Members and other stakeholders should promote citizen science initiatives that recognize the role of aquaculture stakeholders in collecting and disseminating reliable information and knowledge, including through the use of information technology and digital platforms.

13.6 All parties should recognize aquaculture stakeholders, in particular small-scale ones, as holders, providers and receivers of information and knowledge. It is particularly important to understand the need for access to appropriate information by small-scale farmers and their organizations in order to help them cope with existing problems and empower them to improve their operations and livelihoods. These information requirements depend on current issues facing communities and concern the biological, legal, economic, social and cultural aspects of aquaculture and livelihoods.

13.7 Members should ensure that the information necessary for sustainable aquaculture development is available and equitably accessible. It should relate to, inter alia, bioecological, social, cultural and economic data, disaster risks, climate change, livelihoods and food security leaving no one behind especially women, youth, Indigenous Peoples' and vulnerable groups. Effective information systems with low data requirements should be developed for data-poor situations.

13.8 All parties should ensure that the knowledge, culture, traditions and practices of aquaculture dependent communities are recognized and as appropriate, supported, and that they inform responsible local governance and sustainable development processes. The specific knowledge of women farmers and workers must be recognized and supported. Members should investigate and document traditional aquaculture knowledge and technologies in order to assess their application to sustainable aquaculture, management, development and conservation of living aquatic resources.

13.9 Members and other relevant parties should provide support to aquaculture dependent communities, in particular to indigenous peoples, women and those that rely on aquaculture for subsistence, including, as appropriate, the technical and financial assistance programmes to organize, maintain, exchange and improve traditional knowledge of aquatic living resources and aquaculture techniques, and upgrade knowledge on aquatic ecosystems.

13.10 All parties should promote the availability, flow and exchange of reliable information, including information on aquatic transboundary resources and health status of shared/transboundary aquatic stocks, through the establishment or use of appropriate existing platforms and networks at community, national, subregional and regional levels, including both horizontal and vertical two-way information flows. Taking into account the social and cultural dimensions, appropriate approaches, tools and media should be used for communication with and capacity development of aquaculture stakeholders.

13.11 Members and other parties should ensure that funds are available for aquaculture research, and collaborative and participatory data collection, analyses and research. Members and other parties should integrate research findings into their decision-making processes.

13.12 Research organizations and institutions should support capacity development to allow aquaculture stakeholders to participate in research and in the utilization of research findings. Research priorities should be agreed upon through a consultative process focusing on the role of aquaculture in sustainable resource utilization, food security and nutrition, poverty eradication, and equitable development, including also disaster risk management and climate change adaptation considerations.

13.13 Members and other relevant parties should promote research into the conditions of work in aquaculture, including systematic collection and analysis of sex-disaggregated data in the context of gender relations, in order to inform strategies for ensuring equitable benefits for men and women in aquaculture. Efforts to mainstream gender considerations in sustainable aquaculture development should undertake a gender analysis in the design phase of policies, programmes and projects in order to design gender-sensitive interventions. Gender-sensitive indicators should be used to monitor and address gender inequalities and to assess how interventions have contributed towards social change and gender mainstreaming.

13.14 Recognizing the role of sustainable aquaculture in providing healthy and nutritious aquatic foods, Members and other parties should promote the image of aquaculture products within consumer education programmes in order to improve public perception, increase awareness of the nutritional benefits of eating aquatic foods and impart knowledge on how to assess the quality of aquaculture products.

14. Capacity development

14.1 Members and other parties should enhance the capacity of aquaculture stakeholders, in particular small-scale farmers, to enable them to participate in decision-making processes and to implement best practices. To this effect, it should be ensured that the range and diversity of the aquaculture systems and species along the entire value chain is appropriately represented through the creation of legitimate, democratic and representative structures, ensuring equitable participation of women, vulnerable and marginalized groups, in such structures. Where appropriate and necessary, separate spaces and mechanisms should also be provided to enable women to organize autonomously at various levels on issues of particular relevance to them.

14.2 Members and other stakeholders should provide capacity building, for example through development programmes, to allow farmers and aquaculture dependent communities to benefit from improved efficiency, innovations, and market opportunities. In this case, development and implementation of demonstration units that featured sustainable commercial practices with economic, operational and environmental aspects should be considered and delivered.

14.3 All parties should recognize that capacity development should build on existing knowledge and skills and be a two-way process of knowledge transfer, providing for flexible and suitable learning pathways to meet the needs of individuals, including both men and women and vulnerable and

marginalized groups. Moreover, capacity development should include building the resilience and adaptive capacity of aquaculture dependent communities in relation to disaster risk management and climate change adaptation. Capacity development should include relevant government institutions at all levels.

14.4 Government authorities and agencies at all levels should work together to develop knowledge and skills to support sustainable aquaculture development and successful co-management arrangements, as appropriate. Particular attention should be given to decentralized and local government structures directly involved in governance and development processes together with aquaculture dependent communities, including the area of research and extension.

15. Implementation, support and monitoring

15.1 All parties are encouraged to implement these Guidelines for Sustainable Aquaculture in accordance with national priorities and circumstances.

15.2 Members and all other parties should promote financial and technical aid' effectiveness and responsible use of technical and financial resources. Development partners, specialized Agencies of the United Nations, and regional organizations are encouraged to support efforts by Members to implement these Guidelines, including through South–South cooperation. Such support could include technical cooperation, financial assistance, institutional capacity development, knowledge sharing and exchange of experiences, assistance in developing national policies for sustainable aquaculture and transfer of know-how, innovation and technology.

15.3 Members and all other parties should work together to create awareness of the Guidelines for Sustainable Aquaculture, including by disseminating simplified and translated versions. Members and all other parties should develop a specific set of materials on gender to secure the effective dissemination of information on gender and women's role in aquaculture and to highlight steps that need to be taken to improve women's status and their work and enhance effective participation in aquaculture development.

15.4 Members should recognize the importance of monitoring and reporting systems that allow their institutions to assess progress towards implementation of the objectives and recommendations in these Guidelines for Sustainable Aquaculture. Mechanisms allowing the results of monitoring to feed back into policy formulation and implementation should be included. Gender should be taken into consideration in monitoring and reporting by using gender-sensitive approaches, indicators and data. Members and all parties should elaborate participatory assessment methodologies that support a better understanding and documentation of the true contribution of aquaculture to sustainable resource management for food security and poverty eradication, including both men and women.

15.5 Members should facilitate the formation of national-level platforms, with cross-sectoral representation, to oversee implementation of the Guidelines for Sustainable Aquaculture, as appropriate. Legitimate representatives of aquaculture dependent communities and related stakeholders should be involved both in the development and implementation strategies and in monitoring and reporting on the implementation of the Guidelines for Sustainable Aquaculture.

15.6 Members and all other parties should streamline implementation, monitoring and reporting on the contribution of sustainable aquaculture within the framework of national reporting on the achievements of the relevant SDGs and of the ASD.

15.7 FAO should lead efforts to develop and promote a Global Umbrella Programme to support the dissemination and implementation of these Guidelines for Sustainable Aquaculture in support of achieving the ASD.

15.8 The FAO-led Global Umbrella Programme, should support, in collaboration with technical and financial institutions, NGOs, CSOs and industry representatives, the development and implementation of local, national, regional and international strategies and plans of actions to support the implementation of these Guidelines for Sustainable Aquaculture in support of achieving the ASD.