



# Environmental and biosecurity management in aquaculture production systems

*presented by*  
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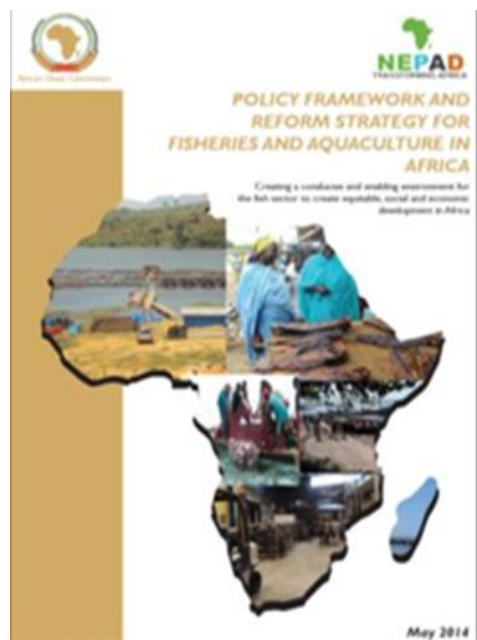


## Outline of the Presentation

- 1. The context and rationale**
- 2. Environmental management for sustainable aquaculture**
- 3. Biosecurity and biosafety control**
- 4. Genetics and Biodiversity conservation**



# The context and rationale



## Principles of for transforming Africa's fisheries and aquaculture sector

- AU Agenda 2063, the CAADP & its pillars, the Abuja Declaration
- FAO Code of Conduct for Responsible Fisheries
- Convention on Biodiversity
- Ecosystem approaches for responsible and sustainable development
- WTO SPS measures to facilitate free equitable and safe regional trade/access to markets
- One Health and One Welfare
- SDG's

## Sustainable Aquaculture Development

- ⇒ Sustainable management and utilization of natural resources
- ⇒ Expand the opportunities in the sector and its growth
- ⇒ Climate change resilience
- ⇒ Commodities for trade
- ⇒ Wholesome aquatic foods
- ⇒ Private-sector driven





# The context and rationale



Papa, F., et al. *Water Resources in Africa under Global Change: Monitoring Surface Waters from Space*. *Surv Geophys* (2022). <https://doi.org/10.1007/s10712-022-09700-9>

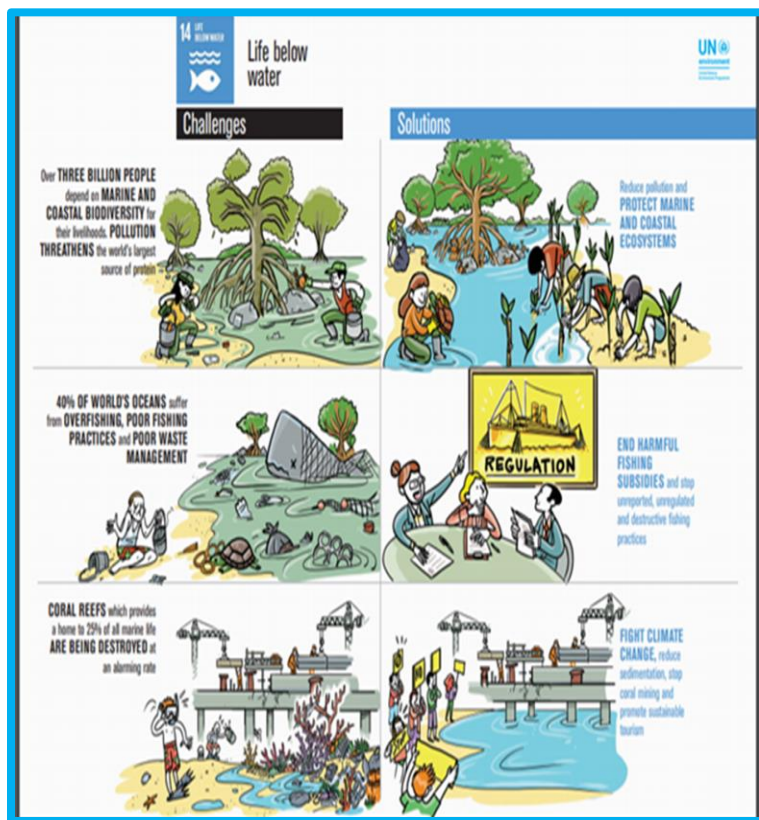
[www.au-ibar.org](http://www.au-ibar.org)

Source:

[https://www.undp.org/sites/g/files/zskgke326/files/publications/Large\\_Marine\\_Ecosystem\\_Approach\\_22062017.pdf](https://www.undp.org/sites/g/files/zskgke326/files/publications/Large_Marine_Ecosystem_Approach_22062017.pdf)



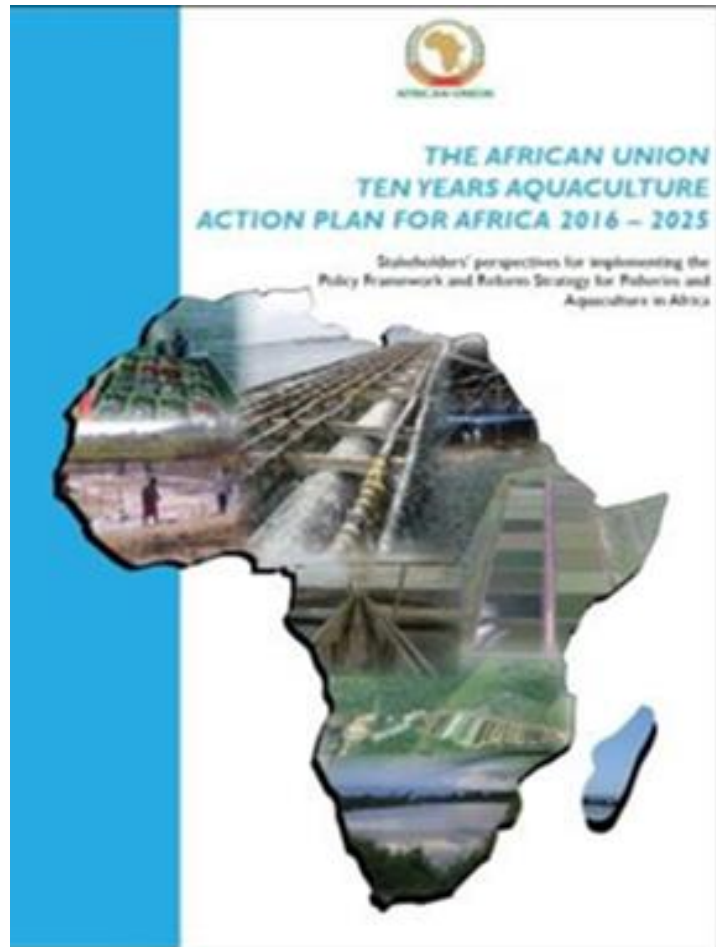
# The context and rationale



Regional integration => RECs primary role is to facilitate regional economic integration between member states (the 1980 Lagos Plan of Action for the Development of Africa and the Abuja Treaty of 1991). [www.au-ibar.org](http://www.au-ibar.org)



# The context and rationale



## Activity Area 5: Trans-Boundary Ecosystem Management for Aquaculture

### AIM

- address *Policy Arenas 1, 5 and 8* of the PFRS.
- Sustainable management of aquatic natural resources for sustainable aquaculture
- Biodiversity control, ecosystem health and biosecurity bearing in mind the trans-boundary nature of Africa's aquatic ecosystems.
- Climate change resilience building  
The quality of aquatic products produced depends a lot on the sustainable management of aquatic resources as a whole.

### KEY ACTIVITIES

- Environmental Management and climate change challenges
- Biodiversity control
- Aquatic Animal Disease Control and Surveillance
- systematic biosecurity control from farm continental level





## Regional Frameworks on Environmental Management for Sustainable Aquaculture Development

### ENVIRONMENTAL MANAGEMENT FOR SUSTAINABLE AQUACULTURE DEVELOPMENT

Founding principles for sustainable aquaculture development

### Regional Aquaculture Development Policy and Strategy

Guidelines for MS to follow

### National Aquaculture Development Policy and Strategy

Implementation (Development Plans)

Aquaculture Development Schemes/  
Private-Sector

Implement BMPs



## Issues

- Sustainable management and utilization of aquatic ecosystems for aquaculture and other uses.
- Sustainability issues arising from environmental impacts, climate change and biosecurity.
- Appropriate EIAs

## Guidelines Developed



## Expected Outcomes

Harmonized ecosystem approaches to aquaculture development within Africa's regional transboundary watersheds.

### Notably:

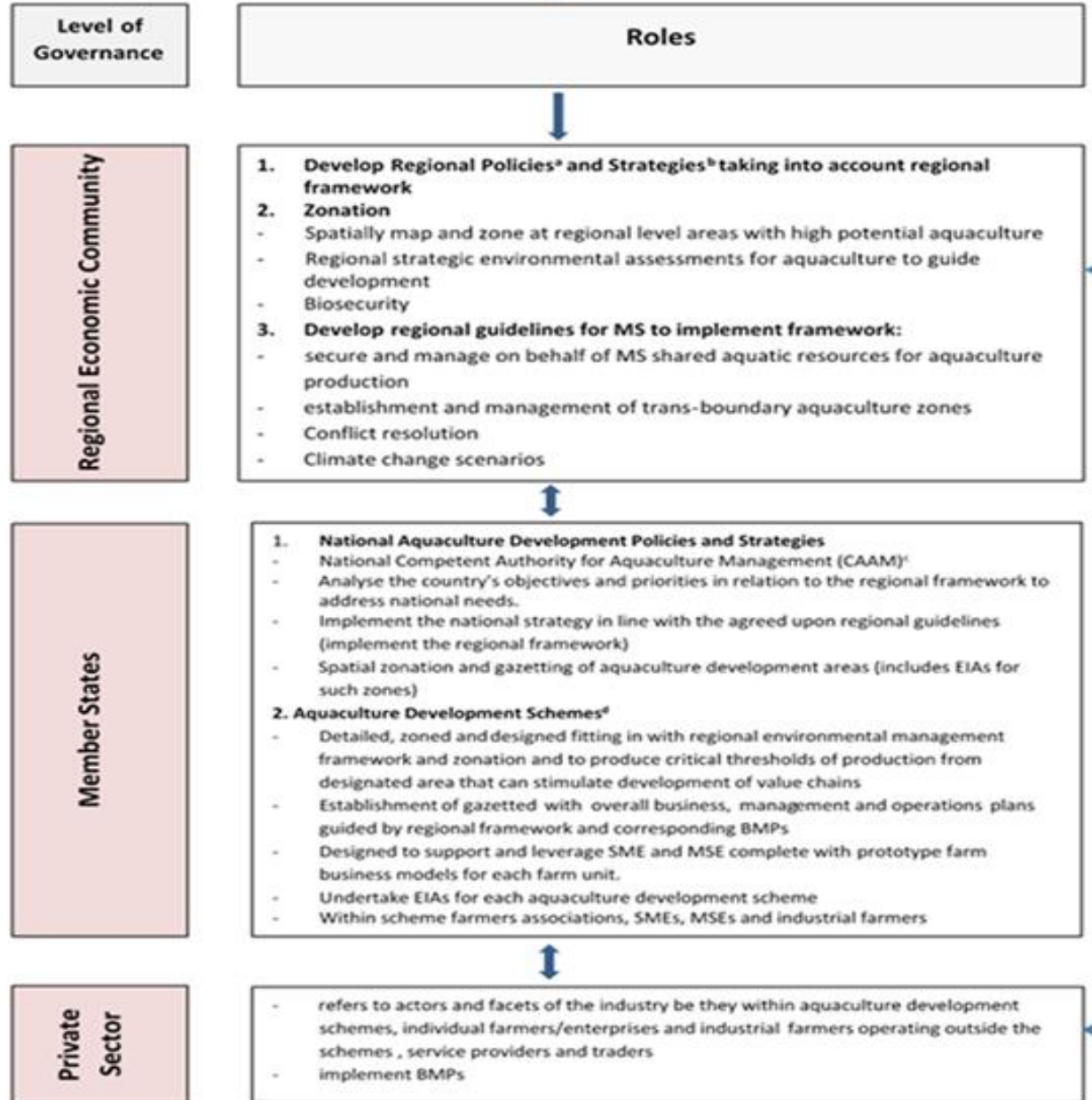
1. Guiding principles for regional collaboration in the rational management and utilisation of aquatic resources, safeguarding aquatic ecosystem health and ensuring the supply of aquatic resources goods and services for sustainable aquaculture development.
2. Mitigate against negative environmental impacts from aquaculture, including on biodiversity
3. Foster biosecurity, food-safety and access to markets for aquaculture produce and products.
4. Safeguard the interests and rights of other aquatic resource users far as aquaculture is concerned.
5. Climate smart aquaculture
6. Regionally harmonised scientific basis for conducting EIAA

A common appreciation and implementation approach of the regional aquaculture environmental frameworks among the wide-array of independent multi-sectoral aquatic resource stakeholders

Coherence and multi-stakeholder collaboration for sustainable aquaculture development; including in transboundary aquatic ecosystems.



# REGIONAL FRAMEWORKS ON ENVIRONMENTAL MANAGEMENT FOR SUSTAINABLE AQUACULTURE



Regional aquaculture networks/NSAs



## ARSO Sustainability standards/EcoMark Africa

Principles	Agriculture	Fisheries	Forestry	Tourism
Legal Compliance	✓	✓	✓	✓
S & E Management System	✓	✓	✓	✓
Good Social Practices	✓	✓	✓	✓
Conservation of Biodiversity	✓		✓	✓
Stock Management		✓		
Soil Management	✓	✓	✓	
Water Management	✓	✓		✓
Energy Efficiency	✓	✓	✓	
Air and GHG Management	✓	✓	✓	✓
Pesticide Management	✓	✓	✓	
Waste Management	✓	✓	✓	✓
Good Business Practices	✓	✓	✓	✓



## Integration of climate change and environmental management into NAIPs and RAIPs => PFRS



- The sustainable development of Africa's fisheries and aquaculture potential is unfortunately => growing threats to its aquatic resources arising from pollution, environmental degradation, inundation of wetlands, flooding, sedimentation, climate-change and inadequate fishery management policies and practices.
- negatively impacted water quality, breeding grounds and the status of fish populations.
- Increased reports of the destruction of aquaculture infrastructure after adverse climatic events are a growing concern.
- Traditional fish processing practices such as fish drying and smoking are weather and wood dependent. T
  - => *susceptible to climate-change events and contribute to deforestation and carbon-gas emissions.*
  - => *meeting sanitary and market standards under such these conditions remains an uphill task for producers.*
  - => *dedicated investment to address impacts related to environmental degradation and climate-change systematically across the continent's fishery and aquaculture value-chain to establish resilience => foster businesses and sustainability of sector.*
- Ensuring NAIPs and RAIPs become fully aligned to the PFRS and the respective environmental management and climate-Change adaptation plans will go a long way in fostering the resilience, performance and sustainability of Africa's fishery and aquaculture sectors.
- facilitate the strengthening the level of coherence and realistic policy making and budgeting for sustainable fisheries-aquaculture development as prospects for twinning those with and without PFRS aligned strategies and investment plans as a peer review mechanism will better be elaborated.
  - **Expect online questionnaire**



## BIOSECURITY & BIOSAFETY CONTROL

### Reg/int

Protect industry, rules and mechanisms of trade

- Competence levels of governments to implement legislation, surveillance and testing
- Compliance to WOAHA Aquatic Code

### National

Sanitary status, surveillance

- Establish sanitary status and compartments
- Develop and implement national biosecurity protocols (trade, production).
- response to disease outbreaks

### Producer

Implementation => BMPs

- Develop and implement appropriate SOPs/BMPs



# Biosecurity Control



## *Regional frameworks for the control of aquatic animal diseases in Africa drafted*

- *Developed draft ARIS - Aquatic Animal Health Data Collection Module*
- *Developed draft Regional Aquatic Animal Disease Control Frameworks*
- *Developed draft TORs Regional Aquatic Animal Health Networks to integrate as component of RAHN*

1. Region specific framework to guide regional coherence and cooperation in the detection, control and epidemio-surveillance of aquatic animal diseases
2. Enhanced and effective biosecurity controls to protect Africa's aquatic animal production systems from threats attributable to diseases, pests and invasive species.
3. Safe aquatic animal products
4. Safe trade of aquatic animals and their products and improved access to markets
5. Improved sharing of phyto-sanitary information among stakeholders



## Threats for sustainability and sectoral growth

- ? Impacts of increased anthropogenic factors, environmental degradation, pollution and climate change on hydrology, water quality and welfare of AA populations
- ? Level of biosecurity control within production systems and water bodies
- ? Assurance of inputs, management practices and value chains, including trade (*except for international markets*)
- ? Impacts for aquatic biodiversity
- ? Transboundary nature of aquatic ecosystems  $\approx$  differences in management approaches between countries + propensity for spread of negative impacts

***Concerns for aquatic animal health and welfare, biosecurity, biosafety of production systems, food-safety, public health, environmental sustainability, ecosystem health, biodiversity conservation, access to markets***



Without transboundary regional approach for aquatic biosecurity and biosafety control



**Articles on Biosecurity Control:**  
zonation, compartmentalization, disease free status, certificates of health

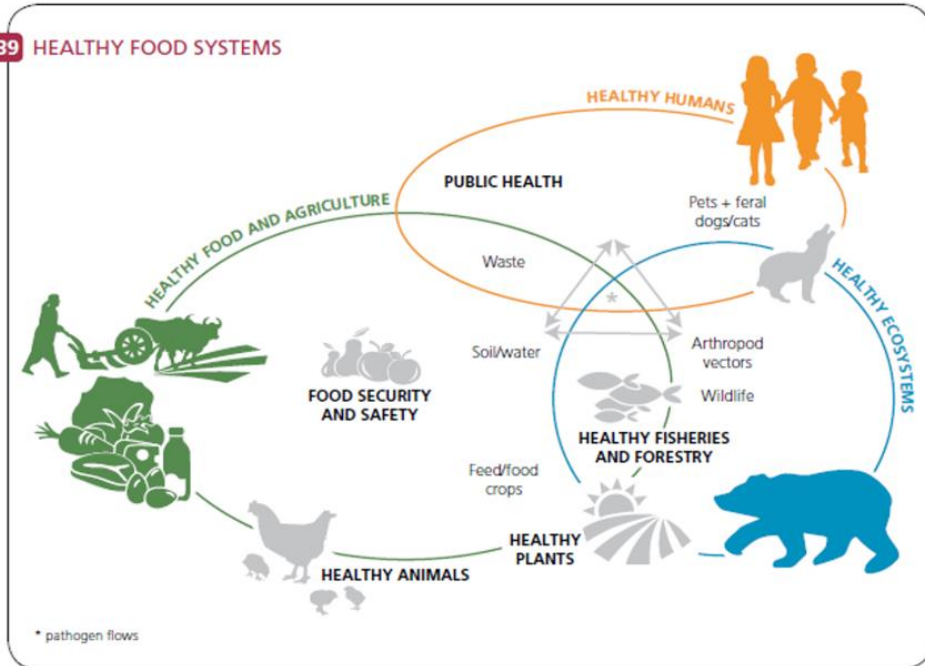
**Articles on AMR and use of other veterinary inputs:**

Diagnostics & Laboratory Services

Food safety

**Africa's ability for compliance to the Aquatic Code & its Manual**

39 HEALTHY FOOD SYSTEMS





### The issues of concern and recommendations

1. The growing number of new and recurrent outbreaks of TAADS without accurate data for evidence-based decision making
2. Lack of harmonized sanitary data collection and aquatic biosecurity control measures facilitate comprehensive epidemio-surveillance and biosecurity control in shared water bodies
3. Inadequate policy, institutional and human resource capacity
4. Knowledge of the actual distribution of TAADs across the continent and factors influencing outbreaks in new geographical areas and recurrences in both fisheries & aquaculture production systems
5. Current status is hindering access to markets for fisheries and aquaculture producers as they cannot certify sanitary status of their water-bodies

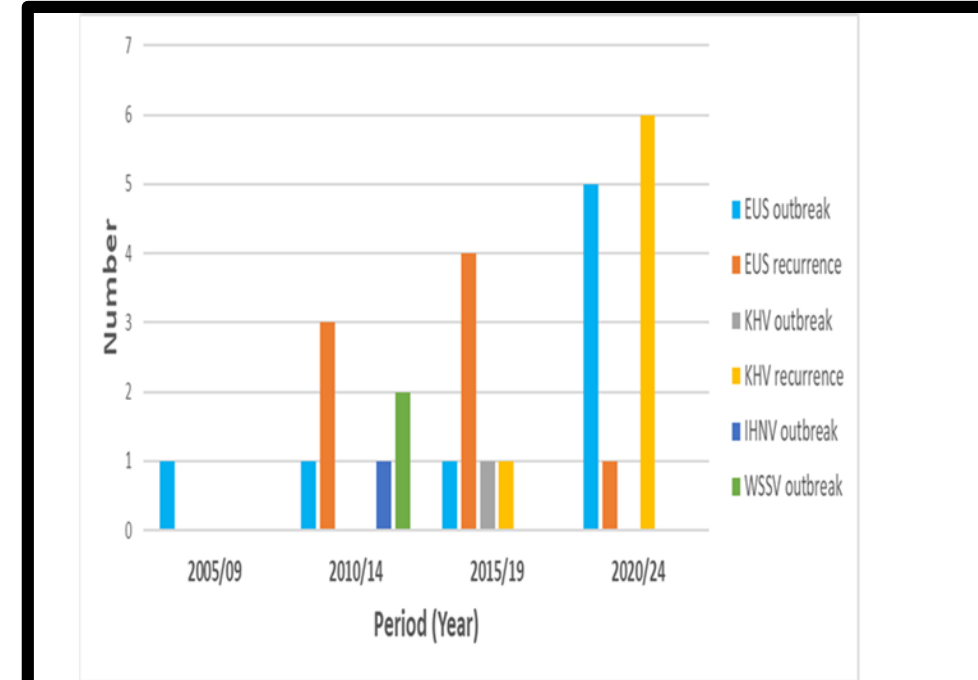


Figure 2. TAAD notifications reported to WOA from Africa. Source: <https://wahis.woah.org/> Accessed: September, 2023



In collaboration with WOAHA launched 2 RAAHN's (SADC and North Africa) plus continental laboratory network



## Regional Aquatic Animal Health Networks

The purpose of the RAAHNs is to strengthen coordination and information sharing among the sectors multiple stakeholders in matters related to aquatic animal health.

## Continental Aquatic Animal Laboratory Network

The objectives of the workshop were achieved. The workshop agreed on the networks':

- **Purpose** - Given the nature of Africa's fishery and aquaculture sector, addressing this challenge entails adopting a regional approach to strengthen AAH laboratory capacity coherently across the continent in line with transboundary aquatic ecosystem and regional market needs. A collaborative approach anchored on building institutional linkages, partnerships and effective networking to promote sharing of resources, expertise, knowledge and information to fast-track capacity building and cost-effectiveness.
- **Vision** - Healthy aquatic animal populations and aquatic ecosystems for sustainable fisheries and aquaculture development in Africa
- **Goal** - Contribute towards strengthening the sustainability, resilience and access to markets for Africa's fisheries and aquaculture sector by improving access to quality aquatic animal health laboratory services and information.





- strengthen continental and regional policy and governance to promote aquatic biosecurity control and improve access to markets; including:
  - i. undertaking a **continental assessment on the status of transboundary aquatic animal diseases and aquatic antimicrobial resistance** on the continent to facilitate evidence-based decision making for their control
  - ii. **reviewing the current continental water and aquatic environmental management guidelines** for strengthening and promoting sustainable fisheries and aquaculture management, aquatic biodiversity and ecosystem health
  - iii. developing a **continental Aquatic Animal Biosecurity Strategy**



## **Strengthening the capacity for aquatic biosecurity control following the Ecosystems and One Health approaches in Africa to:**

- **Safeguard aquatic animal health, welfare and aquatic ecosystem health**
- **Curb increasing number of TAAD occurrences**
- **Control the spread of antimicrobial resistance through aquatic (blue) food chains**
- **Strengthen access to markets and safe, free and equitable regional fish trade towards AfCTA**
- **Establish resilience and sustainability of the fisheries & aquaculture sectors and sustainable Blue Economy growth**
- **Strengthen coordination, intra-regional cooperation, multi-sectoral collaboration and coherence for effective regional transboundary aquatic biosecurity and biosafety control aligned to AU agenda**
- **Coordinate development of strong African Voice in international and regional fora**



# **GENETICS, BREEDING AND BIODIVERSITY CONSERVATION**



- **Aquatic genetic resources => sectors' fundamental asset**
  - ⇒ The species we produce and their inherent value (food, other uses, environmental services, potential and resilience)
  - ⇒ AU-MS and thus AU-IBAR/PFRS => Biodiversity convention, Cartagena Protocol, Nagoya Protocol
  - ⇒ Contributed to establishing 'Status of Aquatic Animal Genetic Resources' (FAO)
  - ⇒ Global action plan on animal genetic resources
- ⇒ **selective breeding, why?**
  - ⇒ bearing in mind global and continental best practices => species we farm should come from within same watershed
  - ⇒ Must have objectives



## Specifically producers concerns:



- the genetic potential of their farmed types for growth, disease resistance and resilience to environmental changes, remained largely unknown.
- choice of farmed types and decisions to improve productivity or resilience is based on fish appearance, feeding and growth, water quality, survival and market opportunities.
- Most commercial aquaculture was practiced in **transboundary aquatic ecosystems using wild relatives of the same species** between riparian states.
- **absence of robust regulatory frameworks** supporting the application of tools for the management of sustainable aquatic genetic resources had consequently fostered risks of genetic erosion and gene piracy.
- already cases of genetic erosion within water bodies where aquaculture is practiced



The imperative for establishing regional approaches for sustainable aquatic genetic resource management and selective breeding is evident.

- **A baseline of the genetic characteristics of farmed and wild populations** of commercial aquaculture and fishery species is a pre-requisite developing the appropriate policies and management tools to address the above challenges.
- **Continental Level**
  - ⇒ *Regional Gene Banks (=> equitable benefit sharing)*
  - ⇒ *Aquatic animal genetics characterization tool that links to production systems, production environments, socio-economics*
- **Regional approaches for brood-stock development, seed production, distribution and trade**
  - ⇒ Monitor impacts on environment/biodiversity, utilization, benefits
  - ⇒ Tools AquaGRIS: <https://www.fao.org/fishery/aquagris/home>
  - ⇒ ANAF – national focal points for aquatic genetic resources  
**(data & information already exists – fisheries/environmental/animal genetics/breeding national agencies)**



# RECOMMENDATIONS



- 1. ANAF and RECs hasten the endorsement of regional frameworks and approaches**
- 2. AU-MS endeavor to officially appoint aquatic animal genetic focal points and feed data**
- 3. Establish collaborative partnerships**
  - environmental & biosecurity management are a multi-disciplinary and multi-sectoral affair
  - Continental and regional frameworks and networks => aim to achieve this
  - primary technical partners for regional approaches in environmental and biosecurity management):
    - RAAHNs and RAAHLN
    - Environmental management
    - Veterinary services
    - Natural resource management departments
    - Water-basin commissions
    - Private-sector

**=> Role and responsibility for ANAF proactively providing leadership in these for the sustainability and growth of the sector**



# Thank You



**AU-IBAR: Providing leadership in the development of animal resources for Africa**