SUSTAINABLE AQUACULTURE AND FISHERIES DEVELOPMENT IN SOUTHERN AFRICA: THE NAMIBIAN CASE
Henties Bay
NAMIBIA
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AIR CENTRE WEBINAR
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Sustainable fisheries management. ... Sustainability means ensuring the habitat and ecosystem supporting the fishery are in good condition. A sustainable fishery has sufficient spawning fish to produce the next generation, while allowing fishing to take place.

A fishery is socially sustainable if the fishery ecosystem maintains the ability to deliver products the society can use. Major species shifts within the ecosystem could be acceptable as long as the flow of such products continues.

Briefly, sustainable aquaculture is the cultivation of aquatic organism for commercial purposes by means that have a good natured impact on the environment, contribute to local social community development and to generate an economic profit.
Sustainable development is a way for people to use resources without the resources running out. ... Or simply put it is a development with sustainability that "meets the needs of the present and without compromising the ability of future generations to meet their own needs."
SDG – 17 Goals and 169 Targets

SDG13 Climate Action, SDG14 Life under Water, and SDG15 Life on Land constitute biosphere as a foundation to support human life.
SOCIETY

Blue/Ocean Economy

Rule Making
Rule Implementation
Rule Adjudication

Economy
Social Ecosystem

Research, Knowledge-bases
Capacity Development
Technology, Innovation

GOVERNMENT

SCIENCE
The Southern African Development Community (SADC) is currently composed of 15 Member States. The SADC Vision is ‘one of a common future, a future in a Regional Community that will ensure economic wellbeing, improvement of the standards of living and quality of life, freedom and social justice and peace and security for the peoples of Southern Africa’.
SADC Policy Framework

- Code of Conduct for Responsible Fisheries (CCRF), 1995
- SADC Protocol on Fisheries, 2001
- Dar es Salaam Declaration, 2004
- **ACP Strategic Plan of Action for Fisheries & Aquaculture, 2012-2016 (& its Implementing Roadmap to 2020)**
- Regional Agricultural Policy (RAP), 2014
- **Policy Framework & Reform Strategy for Fisheries and Aquaculture in Africa (PFRS), 2014**
- Agenda for Sustainable Development (2015-2030)
SADC Policy Framework

ARTICLE 2
SCOPE

This Protocol shall apply to, *inter alia*:

a) living aquatic resources and aquatic ecosystems within the jurisdiction of a State Party;
b) living aquatic resources of State Parties the ranges of which extend outside the areas under their jurisdiction, or high seas resources as may be considered to be of interest to State Parties;
c) fishing, by nationals of State Parties, and activities directly related thereto; and
d) international activities outside SADC that promote the objectives of this Protocol.

ARTICLE 3
OBJECTIVE

The objective of this Protocol is to promote responsible and sustainable use of the living aquatic resources and aquatic ecosystems of interest to State Parties in order to:

a) promote and enhance food security and human health;
b) safeguard the livelihood of fishing communities;
c) generate economic opportunities for nationals in the Region;
d) ensure that future generations benefit from these renewable resources; and
e) alleviate poverty with the ultimate objective of its eradication.

www.sadc.int
INTRODUCTION

Global Aquaculture Production
2015

African aquaculture in a global context = 2.33%
African aquaculture regional context (SADC = 3.5%)

SADC = 69,851 t

African Aquaculture Production 2015
INTRODUCTION

SADC Contributes 0.08% to the World Aquaculture output minus seaweed.


Hlatswayo, 2017 (www.sadc.int)
INTRODUCTION

Top 4 Countries = 77% of production and accounting for 75% of Value

Hlatswayo, 2017 (www.sadc.int)
1. Declining or stagnating capture fisheries (down by 260,920 tons)
2. Satisfying growing demand for fish (consumer knowledge driven)
3. SADC shortfall of ca. 191,069 tons per annum
4. Food security in rural areas
5. Economic growth, creation of wealth and employment

Hlatswayo, 2017 (www.sadc.int)
BENGUELA CURRENT CONVENTION (BCC)

Benguela Current Commission. The Benguela Current Commission, or BCC, is a multi-sectoral inter-governmental, initiative of Angola, Namibia and South Africa. It promotes the sustainable management and protection of the Benguela Current Large Marine Ecosystem, or BCLME.

Supports amongst others, the Sustainable and Responsible Fisheries and Aquaculture

www.benguelacc.org
Ecosystem Approach to Fisheries (EAF)

www.benguelacc.org
CLASSICAL CASE: NAMIBIA

- Namibia is the driest country in sub-Saharan Africa.
- Three quarters of the countries in the south central and western regions is categorized as arid or semi-arid.
- The only perennial rivers in Namibia are the Orange River (the southern border of the country) and the Kunene, Kavango, Kwando, Zambezi and Chobe Rivers, making up the northern and northeastern borders.

https://www.britannica.com/place/Namibia
• Namibia’s freshwater resources are mainly derived from groundwater and dams (some 28 major and minor dams, and a further 5000 farm dams).

• The marine environment entails the entire western side bordering the Atlantic Ocean.

• The country has 4 coastal towns (Lüderitz, Walvis Bay, Swakopmund and Henties Bay with only two harbours, at Lüderitz and Walvis Bay
SUSTAINABLE AQUACULTURE DEVELOPMENT

- Several conditions in Namibia are favourable for the development of aquaculture:
  - Vast unpopulated coastline
  - Abundant natural resources such as a large pool of potential aquaculture species
  - Unpolluted marine and freshwater waters bodies
  - Human resources trained in fisheries and aquatic sciences
  - Political support
LEGISLATIVE FRAMEWORK

• Cohesive, clear and efficient legal and regulatory environment for the development of aquaculture
  - Aquaculture Policy (2001)
  - Aquaculture Act (No.18 of 2002),
  - Aquaculture Master Plan (2014).

• Ministry of Fisheries and Marine Resources – Fisheries and Aquaculture sector

https://www.mfmr.gov.na
INSTITUTIONAL FRAMEWORK

- MFMR is composed of 4 directorates:
  - Directorate of Resource Management (DRM) is responsible for carrying out scientific research and providing information relevant to managing the fisheries.
  - Directorate of Operations (DOP) is charged with monitoring, control and surveillance.
  - Directorate of Policy Planning and Economics (DPPE) tasked with coordinating the formulation, implementation as well as monitoring and evaluation of fisheries policies and legislation as well as economic research and analyses
  - Directorate of Aquaculture is tasked to ensure the responsible and sustainable development of aquaculture to achieve socio-economic benefits and environmental sustainability.
DIRECTORATE: AQUACULTURE

• Serves as single point of contact “One-Stop-Shop” for:
  - permitting
  - liaison with other departments
  - decision-making
  - developmental role
  - bio-toxin testing laboratory
  - monitoring water quality at various sites along the Namibian Coast
  - extension services

• Divisions within the DoA,
  1. Disease and Quality Control (based at NatMIRC in Swakop)
     - bio-toxin testing
     - Disease surveillance
     - Water quality monitoring
     - Fisheries product quality testing (National Quality Standards)
  2. Management & Extension (Based at KIFI, Divundu)
     - Research & Management
     - Extension Services
AQUACULTURE DEVELOPMENT

- Mixture of extensive and semi-intensive culture systems both in fresh and marine waters.
- Freshwater aquaculture is a government-funded initiative and is a community based, cooperative activity.
- Requires a high degree of labour and relies on extensive culture methods.
- Focus is on food security, income generation and improvement of rural livelihoods.
- Freshwater aquaculture production is very low.
- Mariculture require significant start-up capital and technical expertise.
- Private investors are involved in the mariculture and only high value species are considered.
FRESHWATER AQUACULTURE

- No tradition of small scale or subsistence freshwater aquaculture in Namibia
- All activities in this sub-sector have been GRN or donor-driven.
- MFMR manages inland aquaculture according to the natural river catchment areas, for reasons relating to biodiversity.
- Hatcheries and extension services are set up to support each catchment
- New interest in aquaculture brought new private investors (Eco-fish farm) – renting government established aquaculture facilities
FRESHWATER SPECIES

Bream (Tilapia)
- Oreochromis andersonii
- O. mossambicus
- Coptodon rendali (previous Tilapia rendali)

African Catfish
- Clarias gariepinus
- Clarias ngamensis
INLAND AQUACULTURE

Mainly Pond Culture

https://www.mfmr.gov.na
INLAND FISHERIES

RIVERS & LAKES

- Artisanal
- Subsistence

- Management:
  - Traditional Authorities
  - MFMR
  - Limits Access
  - Controls (Input and Output)
  - Closed Season
INLAND FISHERIES

INDIGENOUS KNOWLEDGE SYSTEMS:

- Fishing
- Catch Processing
- Fish Preservation
- Sustainability
- Edible fish species
- Local names of fish

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Mafwila, 2014
MARICULTURE DEVELOPMENT

- **Mariculture** establishment only in sheltered bays (Lüderitz and Walvis Bay)
- Other sites require aquaculture facilities to have pump-ashore systems (high capital and operational costs) – private investments
- The Namibian Mariculture Industry extends back to **1984** with the production of Oysters and Abalone in **2003**
- Oyster spat was imported from Europe and Asia but an oyster seed-stock producer started a hatchery in **2004**
- Most of the oysters are exported to South Africa, and some consumed locally (**10 - 20%**)
- Newly established Asian markets provides the much needed market diversification of the Namibian oysters
MARICULTURE SPECIES

Oysters
- Pacific oyster (Ostrea edulis)
- European Oyster (Crassostrea gigas)
- Scallops (Agropecten maximus) – Experimental

Abalone
- South African abalone, perlemoen (Haliotis midea)
Ministry of Fisheries and Marine Resources (MFMR):
- National Marine Information and Research Centre (NatMIRC)

- Freshwater research institutes:
  - Hardap Inland Fisheries Institute (Hardap Dam)
  - Kamutjonga Inland Fisheries Institute (Okavango river)

University of Namibia established the Sam Nujoma Campus:

1. Sam Nujoma Marine & Coastal resources Research Centre (SANUMARC)
   - Fisheries research (oceanography, fish physiology, stock assessment, management)
   - Aquaculture (finfish, shellfish and seaweed)
2. Department of Fisheries and Aquatic Sciences
   - four year BSc degree in Fisheries and Aquatic Sciences
   - MSc. and PhD. In Fisheries and Aquatic Sciences
SANUMARC - Facilities

https://www.unam.na/sanumarc
SANUMARC - Facilities

https://www.unam.na/sanumarc
SUSTAINABLE FISHERIES DEVELOPMENT

Namibia’s Capture Fishery is predominantly MARINE

Few fishing activities in freshwater bodies: Rivers, Lakes, and Dams

Pre-Independence:  - Marine fisheries Resources free for ALL
  - Distant fleets exploiting fisheries resources
  - Maximum catches observed in the 60s and early 70s
  - Over-exploitation of resources took place in 80s
  - Collapse of some of stocks

Independence of Namibia:  - Issued Moratorium on Fishing in 1990
  - Fishery Sector White paper
  - Sea Fisheries Act, 1992
  - Rebuild the stocks, early 90s
  - EEZ Claims
  - Exclusion of foreign fishing fleets
A fishery sector white paper was developed with three main objectives:

(i) rebuilding fish stocks and controlling their exploitation;
(ii) establishing effective mechanisms for the monitoring and surveillance of resource use and exploitation; and
(iii) establishing a flourishing fishing industry that would add value to the resource and empower the Namibian public.

https://www.mfmr.gov.na
LEGAL FRAMEWORK

- The Marine Resources Regulations (2001)
- Namibia’s Marine Resources Policy (2004) and Territorial Sea and Exclusive Economic Zone of Namibia Act (1990)
- Policy statement on granting of right of exploitation to utilize marine resources and on the allocation of fishing quotas
- The Inland Fisheries Resources act (No.1 of 2003), which governs inland fisheries
- The Aquaculture Act (No.1 of 2002), Aquaculture policy of 2001

https://www.mfmr.gov.na
ACCESS TO FISHERIES RESOURCES

- Fishing Right
- Quota System as Determined by the TAC
- Fishing License
- Ownership of a vessel
- Namibian Company
- Processing of fish locally – land-based
- Employment Creation
MARINE ENVIRONMENT

Benguela cold current ecosystem and the straddling desert environment.
FISHING INDUSTRY

OTHER COMMERCIALY TARGETED SPECIES:

- Horse mackerel (*Tracurus tracurus capensis*)
- Sardines

https://www.fishingindustry.com.na
Namibia has one of the most productive fishing grounds in the world and its territorial water contains around 20 different species such as pilchard, anchovy and horse mackerel, as well as lobster, hake and monkfish. This sector has grown to become the country's second biggest export earner after mining.

https://www.fishingindustry.com.na

https://www.mfmr.gov.na
FISHING INDUSTRY

Namibian Fishery is pre-dominantly Industrial

Demersal Fishery of Namibia

- Hake Fishery: mainly *Merluccius capensis* and *M. paradoxus*
- Most important commercial fish
- Orange Roughy Fishery: *Hoplostethus atlanticus*
- Monkfish Fishery: *Lophius vomerinus* and *L. vaillanti*
- Crustaceans: Deep-sea Red Crab *Chaceon maritae*
- By-catch species
**RESEARCH, MONITORING & SURVEILANCE**

**SCIENTIFIC SURVEYS:**
- Conduct Annual Stock Biomass Surveys
- Environmental Surveys
- Recommend TAC

**OPERATIONS:**
- Aerial Patrols – fixed wing planes
- Fisheries Patrol Boats/Vessels
- Inspections

**FISHERIES OBSERVER AGENCY**
- Fisheries Observers onboard F/V

https://www.mfmr.gov.na

UNAM UNIVERSITY OF NAMIBIA
SUMMARY

- LEGAL AND POLICY FRAMEWORK EXISTS
- INSTITUTIONAL FRAMEWORK
- NATIONAL LEGAL & POLICY FRAMEWORK
- POLITICAL WILL & SUPPORT
- IMPLEMENTATION
- STOCK ASSESSMENT
- ENVIRONMENTAL MONITORING
- ECOLOGICAL SUSTAINABILITY
- ECONOMIC SUSTAINABILITY
- SOCIAL DIMENSION
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