

AQUACULTURE RESEARCH AND DEVELOPMENT IN KENYA

By

BETTY MINDRAA NYONJE and HARRISON KARISA-CHARO

INTERNATIONAL WORKSHOP ON

SUSTAINABLE USE OF COASTAL AND MARINE RESOURCES IN KENYA:

FROM RESEARCH TO SOCIETAL BENEFITS

North Coast Hotel, Kilifi County, Kenya

27th – 29th October 2014




AQUACULTURE OVERVIEW - KENYA

- **Production moved from 4000 mt 2007 to 48,000 mt currently representing growth from 2.5% - 25% of fish production in Kenya**
- **Growth mostly in inland sector – attributed to significant government intervention from 2009**
- **Marine sector has so far had no major intervention**
- **Vision - to move aquaculture to 50% fish production in Kenya**

KMFRI R&D INITIATIVES

KMFRI tasked with leading National Aquaculture Development through Scientific Research – **Policy** – Demand driven Research

- Develop adaptive aquaculture technologies
- Genetic characterization and improvement of aquaculture species
- Formulation of inexpensive and quality fish feeds
- Development of cost effective culture systems
  - Cages, tanks, RAS, ponds (lined and earthen)
- Integrated production systems (rice/fish/livestock/horticulture)
- Post harvest handling technologies and innovations
- Market research (outlets and linkages) for farmed products
- Ornamental fish research
- Live feed research and production (Artemia and other live feeds)
- Community based Aquaculture projects
- Socio-economic evaluation of aquaculture ventures
- Environmental sustainability emphasized (EIAs and EMPs)

Selective Breeding (Inland)

Labeo victorianus

INLAND AQUACULTURE RESEARCH INLAND

TILAPIA BREEDING PROGRAM - SAGANA

FEED FORMULATION

- Focuses on locally available ingredients and by-products
- Proximate analyses done for 40 ingredients
- Fish feed formulations done for a number of key species
- Feed testing experiments performed
- Mass production of formulated feeds encouraged for industry (PPP)


Omenta (*Galisonga parsiflora)*


Farm-made omenta feed

FISH FEED PRODUCTION

CULTURE SYSTEMS

POST HARVEST HANDLING AND VALUE ADDITION

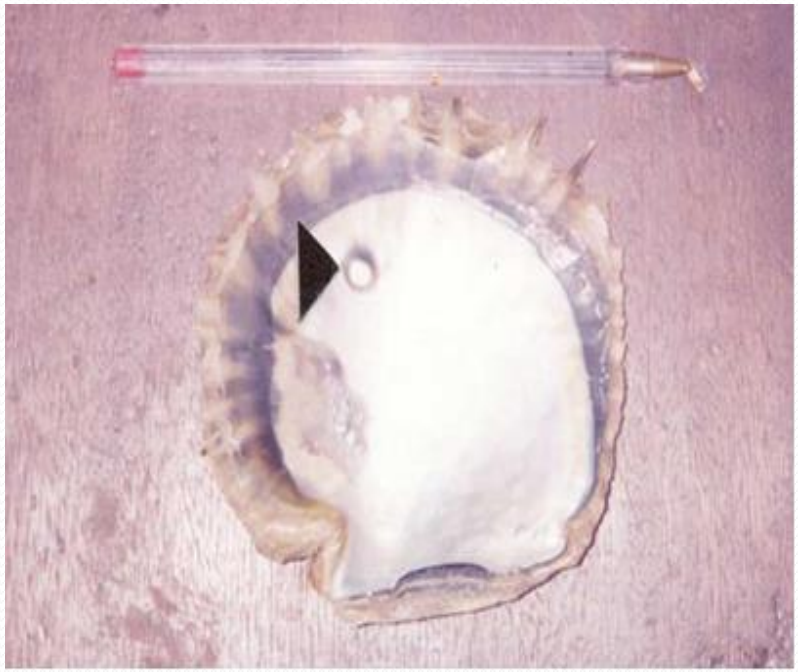
SEAWEED FARMING INITIATIVES

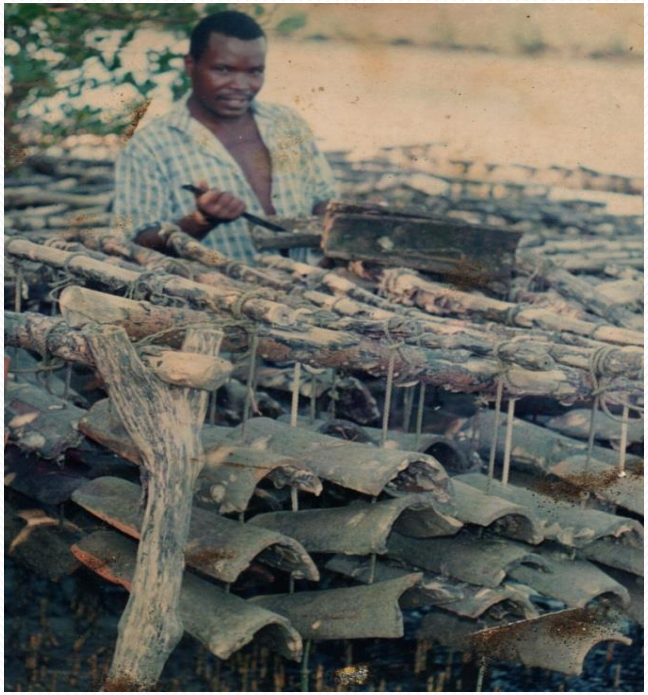
- **Remarkable achievement in evaluation - Technical feasibility in 2 sites 15 years ago**
- **Four villages in S. Coast Gazi, Shimoni, Mkwiro, Funzi have ventured into commercial (*Kappaphycus & Eucheuma*)- 400 farmers – encouraging prospects (90% women)**
- **Evaluating the alternative farming technique for the preferred strain *Kappaphycus alvarezi (cottoni) – to enhance production***
- **Addressing stressors; herbivores, pests and diseases affecting production.**
- **Looking at marketing and value addition to develop industry along the entire value chain (Seaweed EA)**

MUD CRAB *(SCYLLA SERRATA)* CULTURE

- Feasibility of penculture mudcrab/milkfish established
- Current- community-based project Dabaso community Mida-creek
- Compare yield/econ. Returns crabs reared in pens and cages
  - Optimum stocking densities
  - Appropriate diet/harvest regimes
- 250-300 g crabs rejects by fishers- seed
  - 3 months culture period
  - Harvested at > 500 g
- Plan to establish a hatchery for the mudcrab

OYSTER FARMING





Pearl Oyster *Pinctada margarifera*

- ***Expt. In Tudor creek and marine park***
- ***Results indicate viability of pearl oyster for commercial production***
- ***Uptake by communities next step***

Edible oyster *Crassostrea cuculata*

- ***Expt Gazi 1985 – 1990 KBP***
- ***Intertidal zone – 24 months – maturity***
- ***Technology introduced to Shirazo women group (marketing challenges)***
- ***Targeted for further community init.***

ARTEMIA RESEARCH/PRODUCTION

- **Big Potential exist for production of good quality Artemia cysts in Kenya (10,000 ha salt-works).**

- **KMFRI demonstrated technical feasibility Artemia production (1984 – 1986 through Kenya – Belgium Project)**
  - **Explored Artemia production to fulfill Kenyan requirements & even. Enter Intern. Market**
  - **Improve use of Artemia as source of live food**

- **Kenyan salinas considered as new natural resource – could be further developed**
- **Commercialization of production being pursued – VLIR-UOS project – pilot phase closing – Artisanal farmers/corporate firms targeted for up-scaling production**


PARTNERS

1. Kenya Marine and Fisheries Research Institute
2. Laboratory for Aquaculture and Artemia Reference Center, Department of Animal Science, Ghent University, Belgium
3. Can Tho University, Department for Fisheries and Aquaculture, Vietnam
4. Kensalt, Krystalline, Malindi, (Corporate Salt Firms)
5. 7 Private (Artisanal) Salt Farmers, Malindi-Kenya

SOCIO – ECONOMIC SURVEY

- Socio – economic surveys conducted to assess the perceptions of the local communities on the projects
  - Success and ownership – depends on entry point
  - Bottom-up approach more successful with communities
  - Social scientists participation a must for success of projects

LINKAGE WITH POLICY/FARMING COMMUNITY

- KMFRI Scientists members of the NADWG (formed 2008) – tasked with driving national agenda – NASDP, Aquaculture Policy , Concept for National program (FFEPP), etc
- Members of the secretariat for the National Aquaculture Program (FFEPP)
- Accreditation of hatcheries and feed producers nationally
  - 150 hatcheries and 15 Feed producers accredited; last 5 years

Capacity building of the farming community

- Training of hatchery managers and workers – over 500 trained – last 5 years
- Training of farmers clusters on cottage industry for feed production
- Training of fish farmers at grassroots level on BMP in aquaculture – over 10,000 farmers trained under the national program
- Dissemination and outreach
  - Development of manuals, fact sheets and brochures in aid of BMPs; publications for scientific community and technical reports for policy makers
  - Publicity and awareness campaigns through print and electronic media
- On-farm experiments with community members

LINKAGE WITH FARMING COMMUNITY

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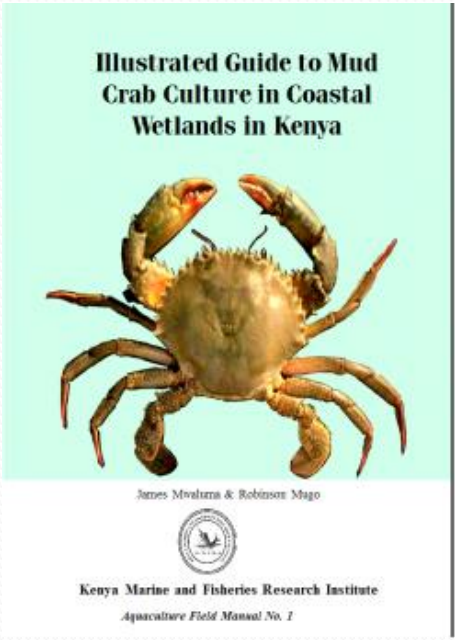
- **Dissemination/outreach**



ASARECA

Building public private sector partnership to enhance the productivity and competitiveness of aquaculture in the ECA region (WB - funded)

- **Key intervention strategies**
  - Increase productivity through intensive cage and tank culture
  - Empowering producers of quality seed and affordable feeds
  - Enhancing fish market information linkages between stakeholders

- **Implementing Institutions**
  - National Fisheries Resources Institute (NaFIRRI), Uganda
  - World Fish Center, Zambia
  - Source of the Nile (SON) Fish Ltd, Uganda
  - Kenya Marine and Fisheries Research Institute(KMFRI), Kenya
  - Tanzania Fisheries Research Institute (TAFIRI), Tanzania

- **Beneficiaries**
  - Fish farmers
  - Hatchery operators
  - Fish traders
  - Fish consumers

KAPAP – Collaborative Research

Commercializing Aquaculture Production Through Sustainable Technologies And Market Linkages (WB – funded)

Objectives

- Development, production and distribution of quality seeds and feeds for tilapia, catfish and ningu (*Labeo*).
- Evaluation and innovation of value addition technologies for post-harvest handling
- Promotion of marketing outlets and creation of market linkages AVC.

Collaborating Institutions

- Kenya Marine and Fisheries Research Institute (Lead Organization)
- State Department of Fisheries
- Maseno University
- International Livestock Research Institute (ILRI)
- Kenya Fish Processors and Exporters Association
- Crop King Hatchery
- Aquaculture Association of Kenya (AAK)

COASTAL POTENTIAL

- 640 km coastline
- 200 nm miles EEZ
- Various culture species
- Easily adoptable technologies (cage culture/ranching)
- Suitability mapping needed
- Challenge currently, no investment
- Regulations governing aquaculture development not in place.

Areas for collaboration

- Multi disciplinary projects addressing societal challenges and development needs of local communities
  - Food security
  - Additional livelihoods
  - Environmental Integrity
  - Climate change
- Institutional capacity building

Acknowledgement:

- Special thanks to VLIR-UOS and Belgian Government for Support to Conference, Research and Capacity building.
- KMFRI Management
- NACOSTI
- IORA
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THANK YOU