



REPORT
ON THE CONSULTATIVE WORKSHOP
ON THE
AQUARIUM FISHERY:

ENHANCING CONSERVATION, SUSTAINABLE MANAGEMENT AND
MONITORING OF THE MARINE AQUARIUM FISHERY IN KENYA

SAPPHIRE HOTEL, MOMBASA, 3RD – 4TH NOVEMBER, 2008



By
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ACRONYMS

ADF	Assistant Director of Fisheries
BMU	Beach Management unit
CORDIO	Coast Oceans Research and Development in the Indian Ocean
EAWLS	East African Wildlife Society
FAO	Food and Agriculture Organization
FiD	Fisheries Department
KEMFRI	Kenya Marine and Fisheries Research Institute
KRA	Kenya Revenue Authority
KWS	Kenya Wildlife Service
MOFD	Ministry of Fisheries Development
NGO	Non-Governmental Organization
PS	Permanent Secretary
UVC	Underwater Visual Survey
WCS	Wildlife Conservation Society
WIO	Western Indian Ocean
WWF	- World Wildlife Fund for nature – East Africa Marine Ecoregion
EAME	

ACKNOWLEDGEMENT

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We would like to express our sincere appreciation to Professor Micheni Ntiba (PS, MOFD) for finding time to grace the closing session of the workshop and providing the closing remarks.

We would also like to recognize and appreciate the support provided by the Executive Director of EAWLS Mr Ali Kaka in facilitating the workshop.

Our appreciation also goes to Ms Gladys Okemwa and John Wanyoike for their invaluable contribution and participation in preparing various presentations for the workshop and also for the support provided by the ADF Mrs Martha Mukira.

To all the KWS Wardens, NGO representatives from CORDIO and WCS, BMU representatives, representatives from the Aquarium Fish Dealers and Collectors and the management of Sapphire Hotel, Mombasa your participation and contribution made the workshop possible.

INTRODUCTION

In recent years, local stakeholders in the marine fisheries sector have raised a number of concerns in the way the aquarium fish trade is conducted and regulated in Kenya. In response, to this the East African Wild Life Society (EAWLS) with funding support from WWF-EAME and FAO through Coastal Oceans Research and Development – Indian Ocean (CORDIO), held a consultative stakeholders workshop on the 3rd November to 4th November, 2008 at the Sapphire Hotel, Mombasa bringing together stakeholders within the aquarium fishery, also called the marine ornamental fishery, to address issues relating to sustainable management and conservation of marine ornamental fishes (see Appendix 1 for workshop agenda and Appendix 2 for participants).

Ornamental aquarium species supply a global industry of significant importance, currently estimated at USD 250-300 million per year. The major importing countries include United States of America, United Kingdom, Germany, France, Italy, Japan and China.

On the global scene, populations of tropical marine fish are being depleted to supply a high demand occasioned by an increase in the popularity of marine aquarium keeping. The trade in marine tropical species and live coral reef appears to show a growing trend (Andrews, 1990; Olivier, 2001), with an estimated 1.5 to 2 million people believed to keep marine aquaria worldwide ((Wabnitz *et al* 2003). This is facilitated by improvement in capture and holding technology and air traffic. Most marine ornamental fish are harvested from the wild with only 1-10% of the species in trade estimated to be captive bred (Wabnitz *et al* 2003). Harvesting methods include such gears as hand/scoop nets, barrier nets, and snorkelling or diving equipment. Destructive techniques such cyanide to stun the fish and crow bars to open up the corals, to facilitate capture are also used.

According to a study conducted by Okemwa and co-authors (2006), Kenya is ranked among the top marine ornamental fish exporting countries within the Western Indian Ocean region. The trade was established in the mid 1970s and has witnessed rapid expansion since then. The trade is regulated by the Fisheries Department in non-protected marine waters and existing regulations consist of restriction of fishing methods. Key sites for collection include Diani, Shimoni, Nyali, Kilifi and Lamu (Okemwa *et al.*, 2006). However, there has been little/limited attention given to regulation, research and monitoring. The trade is highly competitive, and conflicts are rife between dealers, local communities, government agencies and other relevant stakeholders. Efforts to improve the management of the fishery have lagged behind the increase in the industry.

During the introductions, the workshop participants shared their expectations of the workshop. From these expectations the issues raised included:

- Conflict among the dealers, between the local community and the dealers and between the dealers and government agencies.
- The local community does not benefit from the industry.
- Licensing regulations and legislation have gaps.
- Lack of collaboration and consultation between government agencies.

- Need for Environmental Impact Assessment of the industry.
- Possibility of mariculture for marine ornamentals.
- Need for capacity building for the fisher folk.
- Need for a system of keeping clear and reliable records.
- Need for a common forum for researchers, government agencies, NGOs, dealers, collectors and the local community to share information.

In their opening speeches, the Executive Director, East African Wild Life Society and the Director, Fisheries Department represented in the meeting by the Fisheries Officer, Marine Office, Nairobi, acknowledged that there is a problem that needs to be solved. They urged the workshop participants to constructively participate in finding solutions to the various issues facing the ornamental fish industry in order to secure the existence of the resource and its ability to continue providing its ecological services. Mr. Kaka added that for the workshop to have had an impact, it is important that revised or new legislation and policies capture the recommendations made.

AIM AND OBJECTIVE OF THE WORKSHOP

The workshop aimed at “*enhancing conservation, sustainable management and monitoring of the marine aquarium fishery in Kenya*” and drew participation from various stakeholders from the government i.e. Ministry of Fisheries Development, Kenya Wildlife Service; representatives from NGOs such as CORDIO, WCS, Eco-Ethics, WWF; local communities representatives from BMUs from Lamu, Kilifi, Mombasa, Diani and Shimoni.

The specific objectives of the workshop were:-

- i) Presentations on the status of the ornamental fish industry, research and current issues by various stakeholders i.e. Ministry of Fisheries Development, KMFRI, EAWLS/CORDIO, aquarium dealers
- ii) Discussion and recommendation on various pertinent issues relating to the industry: i) collection, legislation and licensing; ii) monitoring and research; iii) community benefits and conflicts
- iii) Formation of an marine aquarium fishery working group

PRESENTATIONS

The following presentations were given:

1. The Kenya Marine Fisheries Research Institute by Gladys Okemwa that focused on the global status of the fishery and research findings on trade links in the industry, key collection sites in Kenya, species harvested, catch dynamics, Underwater Visual Census surveys of population densities undertaken in Shimoni.
2. The Ministry of Fisheries Development by John Wanyoike that highlighted the current status of the industry, assessment of economic impact to the local communities,

techniques used in collection, choices of species and quantities harvested, the limitation to management of the fishery, the aquaria fish markets, the importing countries, fisheries and international regulations regulating aquaria fish trade.

3. EAWLS/CORDIO by Dr. Melita Samoily and Dishon Murage that provided a brief outline of the aquarium fishery trade globally, discussed the sustainability and impacts of current practices, certification, monitoring and research, community benefits and conflicts, and management recommendations with a note that developing countries have a high dependence on coral reefs for food and livelihoods.

There was also a contribution from the Aquarium fish dealers and the local communities through a fisher engaged in the aquarium fishery and a BMU leader that clearly brought out the conflict between the two groups. The lack of knowledge of legislation and operation concerning the BMUs by both the dealers and the community was also apparent.

GROUP DISCUSSION AND RECOMMENDATIONS

Workshop participants were split into three break-out groups to discuss the three key categories of issues:

- Monitoring and research
- Community benefits and conflicts
- Collection, legislation and licensing

Each group was tasked with synthesising:

- a). The current state of knowledge (where known or applicable);
- b). Issues of concern and
- c). Recommendations

Their discussions are summarised as follows:

GROUP 1: MONITORING AND RESEARCH

Key Questions:

- Are targeted fish populations (numbers) declining as a result of collection for the aquarium trade along the coast?
- Are collecting activities of the aquarium trade adversely impacting the coral reef ecosystem?
- What are the socioeconomic impacts of the trade?

Current State of Knowledge

Some baseline historical information is available on population densities (from UVC surveys) of 48 aquarium fish species surveyed in 1987 (Samoilys 1988); 89 species in 2005 (Okemwa et al 2006). No collecting impact was observed in 1987 in the Shimoni area, whereas the 2005 survey showed significant declines in density of aquarium species in the collected area. The difference in number of species between the two studies may reflect growth of the fishery in terms of species harvested.

Issues of Concern

- Availability of research funds a constraint. Need to explore avenues for funding the work. Industry should contribute funding for research.
- The draft Fisheries Policy is not clear on sustainability issues of the aquarium fishery. Grouping “harvest” fisheries (hand caught/scooped) together (e.g. aquarium, sea cucumber, lobster, octopus) could be useful as these fisheries are mostly export oriented fisheries and have common issues.
- The impacts of beach seining are probably exceeding any impacts from aquarium fish collection. Therefore for a **holistic ecosystem approach** to the assessment and management of the aquarium fishery, impacts of other fishing activities in the collection sites need to be taken into consideration.

Research Gaps

- Extent of destructive harvesting practices is unknown
- The spatial distribution of species is not well understood.
- No information on the biology and ecology of targeted species (population structure and associated parameters (growth, age, sex ratios, recruitment))
- Comprehensive socioeconomic assessment of the fishery and a value chain analysis of the industry are lacking.
- Identity of species which need special consideration (either catch quotas or total banning) is not determined. Factors for consideration would be:
 - Poor survivorship in captivity (e.g. species which are easily stressed, obligate corallivores, release toxins).

- Easily over-exploited (rare, endemic)
- Species with important ecological roles

Research recommendations:

- Improve the knowledge base on the marine ornamental fishery by building on the available information to facilitate better decision-making.
- Conduct a survey to determine spatial distributions: where the species occur and their densities in parks, reserves and fished areas.
- Identify key indicator species for long-term monitoring.
- Promote participatory research and knowledge exchange through cooperative research and monitoring.
- Identify species of mariculture potential through collaborative pilot research to capture and grow out fish with communities. Coral mariculture and export, though currently prohibited by KWS, should also be considered.
- Involve fishers, exporters, scientists and managers so as to strengthen mutual understanding, trust, and likelihood of long lasting partnerships that enhance participatory management of the fishery.

Monitoring

It was noted that export figures do not reflect what is taken from the sea due to mortality and other losses. Nevertheless export figures will give an accurate relative estimate of quantity of fish exported which is very useful for monitoring over time. There is currently a weak monitoring structure in Fisheries Department for the aquarium fishery.

Recommendations:

- Streamline current monitoring structures in the Fisheries Department in order to improve on collection of export statistics. This includes:
 - Building capacity for inspection (species ID, handling standards)
 - Developing standard guidelines for inspection targeting Fisheries Department inspectors and customs officials.
 - Deploying fisheries inspectors at exit ports (airports).
 - Have a patrol boat to better equip the officers for their duty
 - Use Customs' export data as part of the fishery's monitoring data
- Develop management indicators for the fishery.
- Catch and effort (CPUE) should be used as a good fishery assessment indicator. KMFRI to steer regular periodic collection of this data for long term trends to ensure that species over-collection does not occur.
- Keep a record of aquarium fish mortality during harvest and trade.
- Validate export data with independent population (UVC) -surveys and CPUE data.
- Role of BMUs should be improved in regard to monitoring and evaluation.

GROUP 2: COMMUNITY BENEFITS AND CONFLICTS

It was noted that there are developmental benefits to the community from the aquarium fishery e.g. Kikambala Fish Station has built schools and equipped hospitals in Shimoni for the benefit of the local community, dealers also pay fees to various BMUs and fishermen are trained by the dealers and then employed to collect ornamental fish.

Issues of concern

- BMUs are charging aquarium fish dealers exorbitantly and each BMU has its own rate. How are the charges arrived at? Do BMUs have authority to charge?
- BMU by-laws are not uniform and in some cases they are absent.
- Most dealers do not want to be involved in BMUs.
- Great mistrust between dealers and the local community; locals feel ignored by dealers.
- Some dealers use gas tanks for fishing lobsters and octopus for commercial purposes at the beach.
- There is no policy on ornamental fisheries in place.
- Some aquarium fishing is taking place within marine reserves e.g. Mayungu (within Malindi-Watamu reserve).

Recommendations

- Set a standard fee structure: Charge per fish species as different species have different values; actual value of fish should be availed to avoid under-valuation. Dealers should continue paying what they are paying now until a standardised fee is set.
- Operational costs incurred by dealers to be considered when setting the standard fee structure.
- Time and environmental stress factors to be considered if a dealer has to bring fish to each BMU.
- Control ornamental fish harvesting to avoid over-exploitation and depletion of rare species.
- Dealers to get involved in BMU activities.
- Effect sharing of information between dealers and the local community to avoid suspicion and for an easy negotiation process.
- Locals should be trained in diving and be more engaged in ornamental fishing. Fishermen should be educated on the marketing and exporting of aquarium fish.
- BMUs to be educated especially on their roles. The Fisheries Department, dealers and other stakeholders to support BMU leaders in carrying out this education process.
- Community benefits should not necessarily be monetary but other developmental projects can also be initiated.
- The Chairman of BMUs in the whole of Coast province should brief all BMU leaders on what transpired in this workshop. He should be given a time frame for education activities to various BMUs.

- Aquarium fishing should not be allowed in any Marine Park or Reserve.
- Develop a management plan based on consensus.
- A consultative forum between BMUs, Fisheries Department and other stakeholders should be set up.
- Fish prices to be reviewed to reflect the current inflation rate.
- Fisheries Department and BMUs to form regional bodies that can easily participate in decision making.

Other concerns and recommendation that came up after the plenary discussion session were as follows:

1. The recommended area coverage of no-take MPAs when used as a fisheries management and biodiversity conservation tool for coral reef ecosystems is at least 20% (Fernandes, *et al* 2005). According to KWS Kenya's present MPAs cover 16% of which only 4% is fully protected area the rest being Reserves where traditional fishing is permitted. Therefore there is need for creation of more no-take areas which could be encouraged through community conserved areas and zoning within National Reserves; and enforcement of Reserve legislation where commercial fishing is prohibited.
2. Cultured corals (farmed through mariculture) could be looked into as an alternative source of income. Farmed corals should be considered for export. This necessitates prior research to determine how best to venture into this field.
3. The Fisheries Act should recognise honorary fishery officers to aid in its enforcement

GROUP 3: COLLECTION, LEGISLATION AND LICENSING

Issues of concern

- Gazetted landing sites are under utilised and some are not accessible
- Dealers know where to get fish whereas the authorities do not.
- The licensing regulations (terms and conditions) are inadequate; no mechanism for feedback to the Fisheries Department.
- Lack of collaboration and consultation between government agencies.
- There is no connection between BMUs and aquarium dealers and fish collectors.
- Migrating fishermen are often arrested at marine parks while on transit to other sites.
- Lack of disaster preparedness.
- Local fishermen lack the capacity to collect aquarium fish.
- Licensing institution confuses dealers and aquarium keepers in charging license fees.

Recommendations

- Fisheries Department should install landing facilities at all landing sites and ensure that all access routes to landing sites are opened.
- The Ministry of Fisheries Development should secure all landing sites with proper land ownership transfers.
- The government agencies should identify and document aquarium fish collection sites and keep records of species trends and numbers collected.
- The licensing regulation should include a feedback mechanism by dealers to the authorities (especially the Fisheries Department) about what they collect.
- The species to be collected should be specified on the license, threatened species should not be collected.
- Improvement in inspection by the FiD in the various landing sites.
- The concerned government institutions (KRA, KWS and FiD) should work together.
- Everyone whose livelihood is the sea should/must be a member of a BMU.
- KWS and Fisheries Department to work with BMUs so as to put a system that identifies migrating fishermen in place.
- All fishing investors should install radio equipment in the fishing vessels for disaster preparedness.
- The Fisheries Department should come up with a mechanism to train local fisher folk on aquarium fish collection.
- BMUs should network and develop working relationships with each other to share experiences and lessons learned.
- Fisheries Department should differentiate between aquarium dealers and aquarium keepers and deal differently with each group in terms of regulations.
- Better planning in control/allocation of the trade in terms of collection.
- Fees to BMUs need to be standardised and practical and should be streamlined through Fisheries Department.
- License fees to Fisheries Department should be increased to better reflect the value of this fishery.

FORMATION OF AN ORNAMENTAL FISHERY WORKING GROUP

In regard to the third aim of the workshop a task force that drew representation from all the stakeholder categories was put in place to work on the development of a management plan for aquarium fisheries in Kenya.

The following individuals/institutions were nominated to the taskforce to lead the process. They include:-

Name	Institution
Mr Dishon Murage	East African Wildlife Society
Mr John Wanyoike	Fisheries Department

Mr Arthur Tuda	Kenya Wildlife Service
Dr Melita Samoily/Paul Tuda	Coastal Research and Development Indian Ocean
Ms Gladys Okemwa	Kenya Marine & Fisheries Research Institute
Mr Halifa Omar Parago	Beach Management Unit
Mr Florian De Jacquelot	Eco Ethics
Mrs Martha Mukira	Fisheries Department
Mr Sam Njora	Tsavo Aquariums

The first task set for this group is to draw key recommendations from this workshop and to ensure they are conveyed to the Minister of Fisheries Development.

CONCLUSION

This workshop successfully brought together various stakeholders in the aquarium fish industry. Different views were collected from the scientific perspective, entrepreneurial perspective and legal perspective and also from the local community whose activities directly affect the aquarium fish resource and vice versa.

There was general consensus that the status of the species being exploited is not well known or understood. Anecdotal reports and some scientific study suggests that there is high potential for serious overexploitation leading to species and fishery collapse. This is largely due to inadequate regulations, lack of enforcement of this industry in the Marine Reserves and over fishing of some species due to significant and recent increases in fishing capacity in this fishery.

In his closing speech the Permanent Secretary Ministry of Fisheries Development, Prof. Micheni Ntiba noted that the marine aquarium fishery is a key resource whose exploitation over the years has been haphazard and unregulated leading to concerns about the environmental impact of the industry and lack of benefits accruing to host communities. He agreed that lack of reliable data on the true volume and value of fish exported from Kenya is a major challenge in the aquarium fishery. He added that there is need to understand the biology and population dynamics of key target species which influence the natural fluctuations and abundance, reproductive capacity, growth and larval settlement and recruitment and sex ratios in order to effectively and sustainably manage the resource.

The Permanent Secretary informed the participants that the Draft Oceans and Fisheries Policy was in the process of enactment. This will lead to an improved regulatory framework and monitoring mechanisms that will go a long way in streamlining the current management of aquarium fishery resources.

APPENDIX 1: WORKSHOP AGENDA

A CONSULTATIVE WORKSHOP ON AQUARIUM FISHERIES: ENHANCING CONSERVATION, SUSTAINABLE MANAGEMENT AND MONITORING OF THE MARINE AQUARIUM FISHERIES IN KENYA

3rd AND 4TH NOVEMBER, 2008 AT THE SAPPHIRE HOTEL, MOMBASA

TIME	ACTIVITY	RESPONSIBILITY
DAY 1 (3rd November, 2008)		
09:00 – 09:15 AM	Introductions	
09:15 – 09:30 AM	Welcome Address	Director EAWLS and Director Fisheries
09:30 – 10:00 AM	Kenya Marine and Fisheries Research Institute Presentation on the aquarium Fisheries survey	Gladys Okemwa, Edward Kimani and Jacob Ochiewo
10:00 – 10:30 AM	TEA BREAK	
10:30 – 11:00 AM	EAWLS/ CORDIO Presentation on sustainable management of the marine ornamental fisheries	Dr Melita Samoilys and Dishon Murage
11:00 -11:30 AM	Ministry of Fisheries Development presentation on the current status of marine aquarium fisheries in Kenya	John Wanyoike, Stephen Ndegwa and Stanley Nuguti
11:30 -12:00 PM	Discussions	Ali Kaka
12:00 - 12:15 AM	Local NGO network – community perspectives	Nicky Parazzi
12:15 – 12:30 PM	Aquarium fish collectors & traders	??
12.45 – 01:00 PM	Introduction to group work, area of focus, objectives and expected results	Dr Melita Samoilys
1.00 – 2.00 PM	LUNCH BREAK	
2.00 – 4.00 PM	Group work/discussion. Participants to be divided into 3 working groups on:- <ul style="list-style-type: none"> • Collection, legislation and licensing • Monitoring and Research • Addressing community benefits and conflicts 	Ali Kaka and Sam Weru
4.00 – 4.30 PM	TEA BREAK	
4.30 – 5.00 PM	Recap of the Day events/activities	Ali Kaka and Sam Weru
DAY 2		
8.30 – 8.45 AM	Outline of the Day programs and expected outcomes	Facilitator
8.45 – 9.15 AM	Presentation Group 1: Collection, legislation and licensing	Facilitator
9.15 – 9.45 AM	Presentation Group 2: Monitoring and Research	Facilitator
9.45 – 10.15 AM	TEA BREAK	

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TIME	ACTIVITY	RESPONSIBILITY
10.15 – 10.45 AM	Presentation Group 3: Addressing community benefits and conflicts	Facilitator
10.45 – 11.30 AM	Discussions on group presentations	Facilitator
11.45 – 12.15 PM	Next step and way forward	Facilitator
12.15 - 12.45 PM	Closing Remarks	Permanent Secretary, Ministry of Fisheries Development
12.15 -12.30 PM	Closure of the workshop	Facilitator
12.30 -1.30 PM	LUNCH BREAK	
1.30 PM	Participants Depart from Sapphire Hotel	

APPENDIX 2: LIST OF PARTICIPANTS

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ENHANCING CONSERVATION, SUSTAINABLE MANAGEMENT AND MONITORING OF THE MARINE AQUARIUM FISHERY IN KENYA

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