

Session Report:

“Gathering Experiences of Octopus Closures in the WIO region: Towards a synthesis of actors, interactions and outcomes”

Special Session

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This report provides a summary of the discussions in the special session including transcriptions of the session notes and additional edits from case experts.

Organizers

OctoPINTS research project in collaboration with MWAMBAO Coastal Community Network and Flora and Fauna International. OctoPINTS (<https://octopints.wordpress.com/>) is a transdisciplinary research project based at the Stockholm Resilience Centre, Stockholm University, Sweden and funded by the Swedish Research Council Dnr 2018-05862.

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Keywords

Reef Closures, Closure models, WIO region, Success, Mechanisms, Frontiers.

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Abbreviations

BMU	Beach Management Unit (Kenya, mainland Tanzania)
BV	Blue Ventures
CCP	Conselho Comunitário de Pesca (Community Fisheries Council, Mozambique)
CECF	Community Environment Conservation Fund
FFI	Fauna and Flora International
MSC	Marine Stewardship Council
MWAMBAO	Mwambao Coastal Community Network, Tanzania
NRT	Northern Rangelands Trust
OctoPINTS	Octopus & People In Novel Transdisciplinary Simulations (Research project)
OSOL	Our Sea Our Life project (led by the Zoological Society of London, ZSL)
SFC	Shehia Fishers Committees (admin division of a ward in Zanzibar archipelago)
TNC	The Nature Conservancy
WIO	Western Indian Ocean region

Table of contents

EXECUTIVE SUMMARY	4
SESSION SYNTHESIS	5
Background and objectives of the WIOMSA symposium special session.....	5
Exploring Success: What Defines Successful Outcomes of Octopus Closures?	6
<i>Views of Academics</i>	6
<i>Views of Practitioners</i>	6
Mechanisms: Why have particular outcomes emerged in different cases?.....	7
<i>Planning and design: Framing, exchange visits, and gender aspects</i>	7
<i>Implementation: Patrolling and by-laws</i>	8
<i>Openings: incoming fishers and benefit sharing</i>	9
Frontiers of temporal closures.....	9
<i>Ecological effects</i>	9
<i>Gender effects & social differentiation</i>	10
<i>Success factors</i>	10
DETAILED NOTES FROM THE SESSION	10
Success exercise	10
<i>Individual thinking exercise</i>	11
<i>Collective thoughts on success from breakout group discussion</i>	13
<i>Detailed notes on group discussion of success</i>	14
Mechanisms exercise part 1.....	15
<i>George Maina (The Nature Conservancy, Kenya, KN)</i>	15
Mechanisms exercise part 2 & 3: Actors, interactions & timelines	15
<i>Jeremy Huet (OSOL, Mozambique, MZ)</i>	15
<i>Muhaji Chande (WWF experience, Tanzania, TZ)</i>	16
<i>Tanguy Nicolas (FFI, MWAMBAO, Pemba, Zanzibar, ZN)</i>	17
Closure frontiers: Questions & issues exercise	18
<i>Discussion on frontiers of octopus closures in the WIO</i>	18
<i>Frontier questions</i>	19
REFERENCES.....	20
LIST OF PARTICIPANTS	21

EXECUTIVE SUMMARY

Periodic reef closures for octopus (hence forth Octopus closures) are increasingly being promoted and adopted in the Western Indian Ocean. At the 2019 symposium of the Western Indian Ocean Marine Science Association (WIOMSA) the OctoPINTS project facilitated a special session of participants with experience of octopus closures from Kenya, Mozambique, Madagascar, Tanzania mainland and Zanzibar.

The aim of the session was to explore a) how success in Octopus closures was defined, and why successful outcomes are achieved in different scenarios b) explore commonalities and context specific factors across different cases and c) what are the most urgent research and management questions for octopus management in the region. This report provides a summary of the discussions and insights as well as detailed notes and a participant list from the session.

Academics and practitioners identified similar outcomes as constituting success in closures. Economic success included improved incomes, economic conditions and trade opportunities. Ecological success included increases in stocks, individual sizes, and catch per unit effort of target species, as well as positive impacts on other marine organisms. Social success related to acceptance of management by local communities, reduced conflict, and improved governance capacity.

Through a discussion of four cases, particular mechanisms influencing outcomes were identified. At the initial stage, exchange visits to other sites where octopus closures had been successfully introduced helped to facilitated learning and support for the closure model. Focused gender analysis and capacity building for women's associations helped improve women's voice in decision-making. The eventual location and timing of closures incorporated patrolling practicalities, reef productivity, differential effects on men and women as well as cultural, biological and market dynamics. An engagement with traders was in place in some communities which helped to minimize poaching as traders were not offering to buy from closed areas, but also to allow communities to sell collectively to increase their bargaining power.

Enforcement during closures was particularly challenging in the face of poachers from outside the local community particularly for longer closures. Paid guards could lead to jealousy relative to voluntary patrols managed by local institutions. At the opening, catches increased, however issues around distribution of benefits, the attraction of opportunistic fishers from within or outside the community, and making agreements with traders were prevalent. Each case dealt with these issues together with the community representatives and the NGOs to continuously improve a closure model that is suitable for the context.

Future urgent questions for Octopus closures in WIO span from social to ecological, from detailed planning issues to how to include women in the decision-making processes (from the community level up to the national level), and what is really defining success of closures. This session began to answer some of these questions through connecting with experience from across experts in WIO. The session aimed to capture emerging learning from across the region, while the OctoPINTS project aims to support synthesis through a combined process of case-study, expert consultation and agent-based modeling. We encourage other projects and NGOs to draw on this workshop and get in touch if interested to collaborate.

SESSION SYNTHESIS

Background and objectives of the WIOMSA symposium special session

Periodic octopus closures are increasingly implemented across the Western Indian Ocean (WIO) region. In only ten years after pilots in 2004, this intervention has been replicated more than 200 times. These closures are of particular interest to fishery researchers and managers as they are locally led, can act as catalysts for co-management, and in most cases directly engage gender dynamics. Whether a closure is perceived as successful, depends on the diverse expectations and interests of different stakeholders, including managers, conservationists, fishers, local communities, exporters and traders. The OctoPINTS project aims to collaboratively understand and make sense of short and longterm outcomes of octopus closures, and why they occur, by collating experiences of octopus closures, and synthesizing knowledge of how they best can contribute to sustainable and equitable outcomes. We do this by combining expert knowledge and participatory empirical research with agent-based modeling (Lindkvist et al. 2020) to understand the mechanisms and processes at play.

This WIOMSA special session was organized by OctoPINTS project in order to connect to and facilitate discussion amongst conference delegates with diverse experiences of periodic octopus closures from around the WIO. 19 delegates attended the workshop representing experience from Madagascar, Mozambique, Kenya, Tanzania, and other countries in the WIO region.

The objective of this special session was to provide a facilitated space to discuss:

1. What defines successful outcomes in the context of temporal closures according to different stakeholders? Successful outcomes such as e.g., sustainable food production, increased income, a healthier environment, addressing gendered power relationships, improved community cohesion and human wellbeing.
 - a. Why have particular outcomes emerged in different cases?
 - b. What processes have occurred (e.g., poaching, changes in livelihoods, investments) and what factors (e.g. external support, societal cohesion, gendered roles, geographical remoteness) seem to determine outcomes?
2. Are there common patterns between these cases, and how much does the outcomes depend on the context and history of particular sites?
3. What are the most urgent questions and issues in temporal closures for research and management?

This report is structured to summarize discussions and insights around these three questions, followed by the detailed notes from the session.

Exploring Success: What Defines Successful Outcomes of Octopus Closures?

In this exercise we discussed what defines successful outcomes in the context of temporal closures according to different participants of the workshop. Octopus closures (just like other common pool resource management interventions) may not work the same way in all communities. Consequently, outcomes whether real or perceived may also vary. Here we asked workshop participants (academicians and practitioners) their perceptions regarding successful outcomes. Responses were categorized by stakeholder type (academicians and practitioners) and broadly by the type of perceived success outcome as below.

Views of Academicians

According to academicians, successful closure outcomes are varied and can broadly be categorized as economic, ecological or social. Economically, a successful closure is one that has an economic impact on local people in terms of increased harvests, guaranteeing better access to markets for octopus leading to better income, but also improved wellbeing of local communities in terms of improved infrastructure. Other benefits arise from tourism.

Ecologically, closures are considered successful when they improve size and biomass of target species; catch per unit effort, and general ecosystem condition.

A closure that improved cooperation and reduced conflict was perceived to be successful. Additionally, a closure that is accepted by the local community is likely to be successful due to the sense of ownership. Academic participants also felt that successful closures provide an opportunity for diverse and inclusive management, by building capacity among actor groups as a chance to make more representative fishery organizations e.g., BMU, SFC.

Views of Practitioners

According to practitioners, successful closure outcomes improve socio-economic resilience and address opportunity cost of conservation effects by enabling communities to invest in sustainable livelihoods linked to co-management plans

More specifically, successful closures were perceived to improve stock status in the short and long term by allowing better recruitment and as an acceptable method of controlling access to stock and in so doing increase production (octopus weight) during the opening. This was perceived to sustain/recover populations, increase total catch and size/weight. Apart from these, successful closures were perceived to provide overall secondary ecosystem benefits on other resources within the closure.

Practitioners also perceived economic success as improved terms with buyers, and increased income allowing for long-term security of livelihoods.

Successful outcomes also related to acceptance by the community, improvement in cooperation (including with enforcers) as well as reduction in conflicts. In addition, successful closure outcomes resulted in shared benefits, which strengthens social cohesion, ownership

of resource and vision for continuing the closure/management at community's own volition and or with involvement of stakeholders (fishers, collectors, authorities, scientists)

In sum, the perceptions regarding the definition of successful outcomes in the context of temporal closures were similar for academicians and practitioners. Mechanisms through which successful outcomes are achieved may however be dissimilar for different stakeholders.

Mechanisms: Why have particular outcomes emerged in different cases?

In this exercise we discuss why certain outcomes emerged in different cases, what processes had occurred, and what were commonalities across cases. We discussed four different cases 1) (**KN**) Kenya Pate Island, Lamu county (North coast of Kenya) represented by George Maina, The Nature Conservancy/NRT-Coast 2) (**MZ**) Mozambique, represented by Jeremy Huet OSOL, 3) (**ZN**) Pemba Island, Zanzibar, represented by Tanguy Nicolas FFI/MWAMBAO, and 4) (**TZ**) Tanzania mainland (Rufiji and Kilwa districts) and Mafia Island, represented by Muhaji Chande. Here we summarize the different processes and factors that affected the closure models summarize the outcomes according to 1) planning & design, 2) implementation, 3) opening and benefit sharing.

Planning and design: Framing, exchange visits, and gender aspects

In KN the first challenge was **convincing** the community. Even though the communities had gone through training and capacity building sessions (e.g., on designing LMMAs; [Green 2014](#)) and designed fisheries BMU co-management areas with different management zones (LMMAs), people were still skeptical to how they would benefit. This was solved by **exchange visits** within Kenya and Madagascar to observe other fisher communities' doing closures models ([Quinlan and Maina, 2018](#)). The exchanges have helped increase support for the closures and facilitated dialogue, sharing of ideas and successful best practices among fisher community, fishermen groups and conservation practitioners ([Northern Rangelands Trust 2019](#)). Thus far, two temporary octopus closures, the first in Kenya, have been established in Pate Island managed by Pate Marine Community Conservancy and three BMUs operating in one Joint Co-management Area ([Northern Rangelands Trust 2019](#)). More BMUs from have requested support to replicate the model.

In MZ and ZN exchange visits were also to convince and create learning opportunities between communities. In MZ through communicating **replenishment** as a main motivation they started with permanent closures in combination with temporary closures. Permanent closures aimed at allowing replenishment for all species. At first coastal communities in northern Mozambique were reluctant to discuss the idea of managing fisheries, as it was a new concept for them. The project organized exchange visits in Madagascar and Kenya for local communities with experience in running closure models and fisheries management to share what they learnt and what they benefit from it with Mozambican fishers (Thompson et al. 2019). Back in Mozambique the fishers who participated to the exchange visit had less trouble to convince their own community to try temporary closures, which quickly showed positive results in terms of biomass yield. The obvious positive results have worked of the

combination of temporary closures and the permanent closures (replenishment areas) worked as an auto-promotion that neighboring communities embrace and replicate.

In KN the second challenge was addressing some of the existing **gender inequalities and gaps**: access and control; roles and activities; existing legal and political considerations; and social and cultural patterns. This was done through a gender analysis and assessment which lead to increased understanding of local gender context and potential entry points for more gender-responsive fisheries co-management initiatives in Pate and Kiunga Community Conservancies in Lamu, Kenya. As a follow-up to this, women associations from the fishing communities have been established and 37 of them (leaders and members) taken through a customized 4-module Leadership and Management Program training. The training has helped strengthen women's participation and decision making in fisheries (including mangroves) management within their community for livelihood and environment benefits. The women are now having increased voice in natural resource management (mangroves, fisheries; featured in local newspapers and TV e.g., [Akwabi 2019](#)), better represented in the leadership of the BMU, Community conservancies and other groups; women are increasing their numbers to effectively participate in decision making.

In ZN discussions with SFCs size and location of closure was important when considering difficulty to patrol and monitor. One village placed closures not too far from the villages to be able to patrol, but also considering the productivity of the reefs they were closing. In ZN gender aspects came up as women were affected through having to walk far when closures were active, but other micro-activities can help (as alternatives) e.g. seaweed farming.

In MZ the **timing of closures** was mentioned as important, i.e., when to close and for how long. **Cultural, Biological and Market dynamics** play a role and are more or less context dependent. For instance, the need to adapt to Ramadan when people need cash.

In ZN it was important also that **traders** were supporting closures, because during opening periods they need to support the SFC in upholding catch levys and agreed buying stations. Occasionally in some villages there was an influx of traders, but it is possible to sell collectively then (to have a better negotiating power).

Implementation: Patrolling and by-laws

In MZ longer closure time than planned lead to increased patrolling need. The long closure time lead to too high catches but increasingly high pressure from incoming fishers at opening. Many incoming fishers initially → CCP developed rules to deal with this.

Early closures In ZN utilized paid guards. In subsequent closures guards were not paid but volunteered. By-laws were formed to enable SFC members to control the poaching. However, by-laws are harder to enforce when outsiders come, than within the community, it often requires support from local police to fine the outside poachers. Also, in KN **formal** acknowledgment by the government was needed to enable setting up by-laws to overcome problems.

Openings: incoming fishers and benefit sharing

In KN a fourth challenge emerged at opening - **opportunistic** women and men entered the fishery. To keep women as the main beneficiaries a **women's organization** formed to e.g., organize better prices for instance.

In TZ the closure really increased catches, WWF invited neighboring villages for learning which lead to neighbors being upset - however this only happened once and big catches continued. The catches got so big that they couldn't sell them and they rotted. MWAMBAO has just now (Oct 2019) connected Songo-Songo to a trader in TZ.

In ZN some places they have only 2-4 days openings and then close, but this difference between communities depends on their preference. Many communities prefer to open and close more frequently as then SFC and fishers learn and have momentum and motivation. In some cases they open for all, in some cases they open for a limited number of people at a time to control effort and limit damage that can happen in the closure area when fished by too many.

Notably in northern MZ overall the situation is now caput due to the insurgency, only one island is still continuing with their closures and that is a migrant fisher island. In ZN there has been a positive spillover effect on other fish species, the number of pono/parrotfish has increased, and more juveniles are observed (especially in one community which has a permanent closure nested within their temporary closure).

In sum, in the first planning phase learning exchanges were important for motivating and sometimes convincing villages to start with closures. During the closure implementation challenges of dealing with poaching were prominent, and at openings challenges of overcoming gender inequalities, dealing with opportunistic fishers (local or incoming), and making agreements with traders were prominent. Each case has dealt with these issues continuously by working together with the community representatives and the NGOs to continuously improve a closure model that is suitable for the context. Thus, even though the model faces similar issues, each context will require active engagement to help deal with different problems as they emerge.

Frontiers of temporal closures

In plenary we discussed what the most urgent questions and issues in temporal closures for research and management. These were points raised by the participants, in no particular order.

Ecological effects

What are the side effects or impacts of octopus closures on other species and the ecosystem? Is pressure on other species increased? What is the effect on the ecosystem? These questions around ecological sustainability are important for MSC certification of Octopus (MSC representative)

Gender effects & social differentiation

How do you account for the effect on different social groups? E.g., Foot fishers (women, children, old) versus divers. What are the new gender dynamics? (M.A.). How does exclusive fishing rights play out across different social groups? How can different social groups be represented in the local committees or management units (e.g., SFC, BMU)? How do you create opportunities for women/social groups to meet and influence governance at different scales (local, regional, national, multi-scale process)? How can better gender analysis and assessments be done? How do we as scientists/researchers/practitioners include important dynamics like religion and culture into the design and planning of closures?

Some case-based solutions were discussed such as accounting for the spring tide (optimal time to fish for foot fishers) when opening the fishery, creating women's associations to lead women's interests. Promoting women's rights and values at the government level.

Success factors

What are critical factors for the success of closures? Some solutions were discussed such as access rights at openings, versions of benefit sharing, timing of closure (related to social, economic and environmental factors → collaboration with scientists and fishers), timing in relation to spring tide, Ramadan, biological cycle, recruitment cycles.

In conclusion, the questions raised as frontiers span from social from ecological in their focus, from detailed planning issues to how to include women from local to national levels in the decision-making processes, and what is really defining the success of closures. This session began to answer some of these questions and throughout OctoPINTS we hope to be one small step closer to some of the questions raised here. We encourage other projects and NGOs to help move forward. Finally, the terminology associated with of temporary or permanently closed reef areas comes in various forms. In this report we have tried to transcribe the terms as used by the participants in the workshop. We have tried to be explicit on the type of closure (temporary or permanent, but also stating specifically if the closure is for all species or just octopus). In general, the term "closure" refers to a temporarily closed reef area for octopus.

DETAILED NOTES FROM THE SESSION

Success exercise

The session was outlined as 1) As individuals participants think about what you define as success in your eyes for closures in the WIO 2) Please collect your thoughts in clear writing with a marker on a post-it 3) Please get into groups of 3 or 4 and see if there is common themes or clusters between you, group the post its in this way 3) Report back from you group with the clustered post-its- place them on a designated board 4) As a group we will discuss the post-its that have emerged, and then select 3 key clusters for the next part of the exercise.

Individual thinking exercise

As individuals' participants think about what you define as success in *your* eyes for closures in WIO?

Each **bullet** represents a point on a post-it in relation to success.

- Market impact?
 - Buyers to support the closures- awareness, to be included as stakeholders
 - Influx of new traders (in the 2nd village)
 - Collective catch making it easier to negotiate for better pricing
- What research/Monitoring done?
 - Women/markets/governance- engaging researchers
 - Ecological- UVC? Done simple, trained by community members, catch monitoring → provide evidence of positive impact to support buy-in from community and government
- Success based on group objectives
 - Income (economic)
 - Max biomass (resource sustainability)
 - Behavioral change (conflict resolution)
 - Buy-in to closure (acceptance) or ownership
 - Conservation benefits for secondary species/ ecosystems e.g., sea cucumbers
 - **Issues:** 1) Temporary no fishing closures of all resources vs. no take for octopus only vs. permanent closures 2) Solution creating another problem: Mozambique case – women fishing in intertidal, men got involved after price went up because of closures, they are targeting spawning stock in deeper areas.
- Well-managed in terms of enforcement, community involvement and commitment to well put rules the govern the closure and there after positive great harvest that brings profit and change to the community
- 3 types of “success” that have to be reached in the long-term for resource management and population well-being
 - Socioeconomic (“catalyst” effect)
 - Ownership, raising awareness
 - Benefits \$ to population, mostly benefits from fisheries but others can benefit e.g. tourism, education (on environment but can be broader), visits from others
 - First step for empowerment
 - In terms of fisheries it is the increased catch per unit effort
 - Long term ecological success
- Success for a closure is community have rights to own and manage it => right to establish, management devolved (legally) by government and stakeholders
- Success for a closure is community (or stakeholders) have the capacity and skills to manage the closures
- Success for a closure is community (or stakeholder) and nature (environment) are benefiting from the closure
- Increase the biomass, increase the recruitment in the population
- Increase the Catch per unit effort by fishermen → increase the economic benefits

- Empower communities to deal with different stressors (environmental change, market fluctuations, other)
- Improved marine environment for complete closures not just octopus
- Increased “wellbeing” in the community (better schools and other shared stuff)
- Successful closure ecologically when closed @ best times for octopus to regenerate thus increasing or maintaining healthy stock, also connectedness or coordination between closures for max. Ecological results *academic*
- Successful closures provide an opportunity for diverse and inclusive management building capacity among actor groups, chance to make more representative fishery organizations e.g. BMU, SFC *academic*
- Successful closures provide for reliant people in an “appropriate” way when they cant fish in that zone e.g. transport to other sites, funding from org. to cover basics *academic*
- To me successful closures refers to that closures where fishers get bigger catch during openings compared to before closure systems has been implemented
- A success is to get guaranteed markets of those fished octopus after opening
- Success in OSOL project: *practitioners*
 - Objectives 1) Protect marine biodiversity. 2) Improve socio-economic resilience and address opportunity cost of conservation measures effects by enabling communities to invest in sustainable livelihoods linked up to co-management plans.
 - Early issues in OSOL: Fishers didn’t buy in managing marine resources
 - Action of success: Exchange visit to Madagascar to learn impact of temporary closed areas in community (with BV). Consequences: Fishers (in MZ) started to implement temporary closed areas the week after. Learning: Temporary closed areas can be an entry point to managing marine resources
- Successful closures improve stock status of octopus population in the short and long term by allowing better recruitment and as an acceptable method of controlling access to stock *practitioners*
- Successful closures are a method of sustainably managing octopus harvesting, allowing long-term security of livelihoods *practitioners*
- Successful closures: this depends on objectives which are *academic*
 - Economic (improved prices due to size and therefore income)
 - Resource increase, increase in octopus catches
 - Behavioral/attitude change towards the resource (octopus)
- It is accepted by the local community (ownership), including all the related process *practitioners*
- Increases of production (octopus weight and size) during the opening *practitioners*
- Through the octopus reserve opening (or after) there is a will from local community to go forward with fisheries management/ governance and conservation *practitioners*
- Secondary ecosystem benefits (other resources within the closure i.e. sea cucumber) *academic*
- Increased yields of the target species and income *academic*
- Sustained populations or population recovery *academic*
- In particular case of Cabo Delgado in which the communities used to be difficult to convince to close areas, success could be defined when the community ask themselves to close the second time, so it means they understood the importance of this area and want to keep doing it even if they didn’t have a high catch *academic*

- Stakeholder involvement (fishers, collectors, authorities, scientists)
- Community enforcement
- Increased income for fishers
- Increased total catch at opening, increased octopus' size/weight when opening
- Added motivation which will continue local management to go further, to expand to other management also
- Better terms of trade with buyers
- Collective/community shared benefits which strengthens social cohesion, ownership of resource and vision for continuing
- Improved cooperation with local enforcement and fisheries/MPA authorities
- Increased understanding and attention to marine resources and habitats
- Selection of SFC members- composition of the new SFC
 - Leadership qualities
 - Respected by members
 - Fishers who have some integrity
 - Elders
 - Closing the area: lessons
 - Take into account the burden of the benefits to women (e.g. they have to walk further and balance with domestic chores)
 - It is suggested that the size of a closure is to initially not close more than 20% of the fishing area. NB. A suggestion from MWAMBAO, to voice this consideration during initial training of the SFC members: committing too much is risking more encroachments and/or opposition to the closure within the community (sacrifice of not fishing in the area is too hard to make)
 - The actual size has to be decided according to local fishing ground features, uses and esp. social consensus
 - Develop micro projects as alternative income sources e.g. aquaculture, trading, chicken farming

Collective thoughts on success from breakout group discussion

Biological success factors

- Increased population, individual sizes, conservation of stock, biology (2)
- Increased biomass short/long-term (1)
- General wider ecosystem/conservation benefits (1)

Economic success factors

- Increased employment opportunities (3)
- Better market access/income for fishers (2)
- Economic benefits (1)

Governance success factors

- Enabling legal framework (3)
- Entry point for more management action (2)
- Increased awareness of conservation/management opportunities (2)

- Behavioral change from resource users (1)

Local agency success factors

- Enforcement empowerment for communities (2)
- Better stakeholder engagement- internal (community)/external (buyers, institution) (2)
- Buy-in from communities to lead closures (1)
- Inclusive process in the community and improved social cohesion (1)
- True bottom up process (1)

Detailed notes on group discussion of success

(Liz notebook)

- *OSOL in Mozambique (Jeremy)*
 - *Overarching idea of success at OSOL: Biodiversity; Social-ecological resilience in livelihoods; Opportunity costs for conservation e.g. octopus prices*
 - *Their entry point is MANAGING MARINE RESOURCES*
 - *They started with an exchange trip of Mozambicans going to Madagascar*
 - *It was an entry point for a reluctant community to marine management*
 - *OSOL wanted to understand the optimal size of no-takes, how long to open for; we don't know the impact of openings on benthos and another spp. And there is a fair limitation with temporary closures only*
- *Chande, Tanzania*
 - *Success is about fishers getting bigger catches and sizes of octopus*
 - *It's also about good market access during the opening, having enough buyers and market opportunities, coordination and good prices*
 - *Success would be closing the right reef, a productive reef*
 - *It would also be linked to the life cycle of octopus and appropriate months. Linking biology to closure*
 - *Success is community enforcement*
- *Tanguy FFI in Pemba Zanzibar*
 - *Success is when size, weight and landings are increased into incomes to individuals and can partly fund the organizing committee*
 - *This is an entry point for management measures and other actions delving more into marine conservation*
 - *Success is an improved understanding of marine impacts by humans*
 - *Shared benefits are important- pooling income for schools, social cohesion among the community*
 - *Better negotiation of prices and market opportunities would be success*
 - *Also improved local enforcement and cooperation*
- *Fanantenana BV - WIO region*
 - *Success is about stakeholder involves and scientific engagement and engagement with authorities, with everyone for consensus*
 - *Also, when enforcement is by the community*

Mechanisms exercise part 1

George Maina was interviewed about his experiences from Kenya Pate Island, Lamu county (North coast of Kenya).

Guiding questions: Tell me about your octopus closure case? FROM YOUR OWN perspective as a certain type of actor (NOT what others thought). In what ways was it successful or not? Probes: Why do you think that happened? How did that affect the outcome? Who is important? What are they doing? Why do they behave like that?

George Maina (The Nature Conservancy, Kenya, KN)

(Emilie notes on board from Liz interviewing George)

- The case presented a mix of challenges and successes:
- The first challenge. Even though the communities set up an MoU people were still skeptical to how they would benefit from the closures. This was solved by having community members going to other communities where they were setting up closures, after this learning opportunity people were on board in general.
- Second challenge: Planning closure implementation. Questions that were discussed: Gender issues: How could women benefit from the closures? Geographical issue: How could they make sure equal access for all even though they lived near or far from the closure site? This was done through a gender analysis and assessment that they are in the process of mainstreaming results into fisheries co-management and other projects within the community (Dec 2019).
- Third challenge: A lot of work to get the closure(s) acknowledged by the government representatives, to make sure they could set up by-laws.
- Fourth challenge: Because of the opportunity for quick money, even more women entered the fishery. More people in general became interested. How to keep women as the main beneficiaries? A women's organization formed to look out for these issues. They could organize better prices and got support from the communities.

Mechanisms exercise part 2 & 3: Actors, interactions & timelines

Same exercise as we did in plenary with George but now in three different breakout groups.

Jeremy Huet (OSOL, Mozambique, MZ)

(Liz notes on board from the reporting back from the breakout groups)

- Conservation purpose is for positive impact with community
- They **started** with temporary closures not permanent
- Exchange visit of Mozambicans to Madagascar convinced people of the closures
- Afraid of initial results because community didn't go for 2-3-month closure but wanted 6 months
- Great or increased effort in control/patrol was needed
- There were increased resources on **opening** but they PRESSURE was high
- 6 months was too long

- Temporary-closed areas closures were also not enough → permanent areas (also called replenishment areas) closures were needed. Indeed, fishing areas and temporary-closed areas depends on replenishment areas' spillover effect to maintain and improve their yield capacity.
- Communication was also really needed, REPLENISHMENT rather than talking about *permanent* closures is a good thing
- What is best moment to do them/the closures then? Market and biology related/linked to this timing. Also, they need to be linked to the needs of the community e.g. at Ramadan one needs a lot of cash.
- How does the CCP keep the community motivated to follow the rules then? The CCP must be proactive and identify through large community consultations (focus group meetings) the most vulnerable community members to the conservation measures and address their opportunity cost. We empower these community members through the formation of VSLA (Village Saving and Loan Associations) that gives them opportunity to diversify their livelihoods (horticulture, bivalve aquaculture, etc.) and reduce their dependence on capture fishing. Also, at openings of temporary-closed areas or when vegetables are ready for selling, we set up Price Premium schemes which consists in negotiating with private companies higher prices on the basis that the products are of higher quality (Price Premium schemes) which as a result improve the income of producers (fishers and farmers. Also, the fines collected are redistributed to the community to support major need such as for school or hospital.
- How does OSOL support the CCPs? OSOL provides support for the CCP to get legalized (CCP office, documentation) and training to the CCP members in terms of leadership, literacy, negotiation skills, participatory processes, enforcement procedures and budget management. OSOL supports the CCPs to establish and implement their co-management plans in collaboration with the stakeholders. OSOL also aims to establish mechanisms (Environmental Funds in VSLAs, Price Premium schemes, legalization of the marine reserves to improve likelihood to access funding) that sustain the functioning of the CCPs and the implementation of the co-management plans.
- There were visitors (neighboring and itinerant fishers) at the first opening and the community were ok with this as they got their part
- But not prepared for outsider so CCP realized they needed rules around this
- Temporary and permanent closures **now established** together from the learning that took place
- OSOL supports the CCP to enforce the marine reserves and monitor the biological impact of the co-management plans
- But overall the situation is now CAPUT- due to the insurgency, only 1 island is still continuing with their closures and that is the migrant fisher island

Muhaji Chande (WWF experience, Tanzania, TZ)

(Liz notes on board)

- 3 communities worked with, Chande picking one here to talk about
- These closures in TZ are specific to October at low tide but they are open for finfish at low tide
- Local community ran the intervention with push from WWF
- Women typically doing seaweed farming but they will fish for octopus at spring tides
- There were more octopus after **the closure** and was spreading to other villages

- In order to get other villages interested they were invited to openings and the locals were angry
- It was then explained it was just a one-off
- It worked so well but there was so many octopus caught at the opening that there weren't enough buyers so lots of octopus were spoiled
- **Next** is to coordinate with the buyers and to link to the market
- Then the neighbors started and they chose a very productive reef to close
- Other neighbors chose an unproductive reef so they didn't see as big a benefit
- In the **future** the timing needs to be understood to make the closures most successful
- *Ruth from BV commenting- SSF WWF engaged in this village for a long time. It took a very long time to build trust here WWF had to put a lot of effort/work in these closures. 12 years after engagement with the BMUs they started with a management measure, it was about strengthening BMU.*

Tanguy Nicolas (FFI, MWAMBAO, Pemba, Zanzibar, ZN)

(Liz notes on board)

- Basically, it was the most feasible conservation measure to implement/start with
- The closure was for all species as it would have been too hard to control otherwise, however seaweed farmers are still able to farm in the temporary closed area
- The criteria for selecting the closure site was productivity and social acceptance (including distance from village to be able to monitor the area)
- Enforcement was incentivized, but then the community perceived that only the guards were benefiting
- Now volunteers patrol and this is working well
- SFC have by-laws to control poaching, they ID members of the SFC to represent the community
- By-laws are harder to enforce when outsiders come, than within the community, it often requires support from local police to fine the encroachers
- 2-4 days **openings**, others are different. Different opening dynamics depending on what they prefer in a community
- Its better to do them more frequently as then SFC learns and have momentum and motivation
- Lessons include → women bore the burden, close their areas and then they have to walk further. This needs accounting for and a balance must be met
- → MWAMBAO suggests to the SFC that the size of the closure should not be more than 20% of the fishing area initially.
- → Developing other micro-activities can help (as alternatives) e.g. aquaculture
- Some openings are a free for all, opening in other communities= 10 people limit per day to fish, controlling effort.
- They have a % for sharing for opening periods' fishing days which is decided and communicated to community before the opening
- There has been a positive spillover effect on other fish species, the number of pono/parrotfish has increased, and more juveniles are observed (especially in one community which has a permanent closure nested within their temporary closure)
- Buyers are supporting closures: this is needed or otherwise they sometimes make orders during closures, which is a strong incentive for some to break the by-laws (and fish in the closed area)

- There was an influx of traders in some communities, it's better to sell collectively then (to have a better negotiation power)
- There is lots of monitoring going on to provide info for government and donors etc.

Closure frontiers: Questions & issues exercise

(Liz notes from board)

- **OSOL TO FFI- questions and discussion**
 - How is there only 10 people fishing per day @ openings in one of your case studies? What are the conditions present for that?
 - Central pot of \$, strong social cohesion in said village. There was a base of property rules and rights and cooperative enterprise in the fishing. It wasn't our project (MWAMBAO/FFI) that set it up. Everything comes make to this central pot \$ and group. There is a certain % for different things.
 - How do you select the 10 fishers?
 - community decide collectively

Discussion on frontiers of octopus closures in the WIO

(Liz notes from board)

- If temporary closures are not combined with temporary closures of gear restrictions what will be the effect on octopus? **Combination of management measures as a frontier?** To reduce the impact of closure openings for example (OSOL)
- The first thing is to get the **governance** going well, then next is to figure out the area, timing and the periods (FFI)
- When are the best periods to do closures and openings? **Link them to market, societal events, ecology, and/or weather.** They need to be ideal for octopus and people (FFI & OSOL)
 - People don't want to skip times when larger catches are natural- so try link this to opening- is this best?
- There is a need to **document the local ecological knowledge** around closures e.g., local spring tides, ecological variability, and size availability (Chande). It is then possible **extrapolate biological information** across a relevant area/region e.g. SST peaks (sea surface temperature). 1 rule to spread across WIO. (MSC)
- Gender dynamics and women in general are vulnerable to closures. Need to **compensate** and make sure they not affected e.g. only women in one space fishing, how or what are the conditions required for overcoming social barriers and affording rights to stakeholder groups. E.g. in George's Kenyan case the men in the village were supportive (we don't know why though) (OSOL)
- *Mkuba* groups (*Mfuko wa kutunza bahari* - Fund to care for the sea) inspiring from the CECF model (Community Environment Conservation Fund) @ IUCN (**IUCN 2018**) - providing **seed funding** to community groups in one pilot community (model further developed by Greenfi International). Those groups (individuals composing them) have to comply with by-laws to access loans. This is aimed to enhance compliance to and understanding of the by-laws and local management plan. Women have to constitute at least 50% of individuals in the *Mkuba* groups. Through MWAMBAO, FFI

(and Greenfi) provided some seed funding since July 2018, repayment rate has been of 99% after over 150 loans completed.

- 2 days after spring tide, 12 days after new moon-> this is when women's ability to **access the seascape peaks** for about 2-3 days. (Chande)
- Women need an **association**, there needs to be capacity assessments of existing groups and the extent of participant and the quality of it (George)
- There is a diversity of octopus fishers with increasing values (FFI)
- In Tanzania there was a shift of sea cucumber divers into octopus fishing when sea cucumbers were banned - so we need to be aware of **connections to other fisheries**
- There is an increasing competition between genders with increasing entry of men, there is an attractiveness in octopus, both in fishing and cash returns (Mozambique)
- In the Kenyan case greater equity was desired, so 3 days of octopus fishing were allocated to women only, men said we are ok with 1 day for women only, so **targeted actions for equity**.
- In Mafia women went out alone to one area or reef for their target species, so this area was not closed for them during the whole closure, they were allowed 1 day on this reef spot to raise funds (Chande)
- Regulations needed within government to provide women a space in management and religious leaders, aspects that support women's participation (George)

Frontier questions

These questions were raised in plenary at the end of the session to summarize our discussions on what are the frontier questions in octopus closures.

(Notes from board by Emilie).

- **What are side effects or impacts of octopus closures on other species?** Octopus vs. all species. Is pressure on other species increased? **What is the effect on the ecosystem?** Important for MSC marking of Octopus (MSC representative)
- Gender studies: **What are the new gender dynamics?** How do you account for the effect on **different social groups**?
 - Foot fishers vs. divers
 - Spring tide
 - Exclusive fishing rights (Chande)
 - Representation in the SFC/BMU
 - Gender analysis and assessments (G.M.)
 - Men realize women marginalized -> create women associations!
 - Tanga. Women exposed-> now women included better
 - How do you create opportunities for women/social groups to meet and influence governance?
 - Gender values by the government
 - Religion/culture
- **What are critical factors of success of closures?** (G.M.)
- **How do you best design the access at opening and benefit sharing?** - How do you agree on e.g. 30 people access at opening? (Pemba closure) -> versions of openings (30 people, women only), versions of benefit sharing
- **How do you best plan the timing of closures?** Related to social, economic and environmental factors -> collaborate with scientists and fishers
 - Spring tide

- Ramadan
- Biological cycle
- Recruitment cycles

End of day!

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