MPAs

* Only 2% highly protected. Initial goal set in 2010 was 10% by 2020

Challenges

* Establishment and protection
* People
  + Protection often excludes people or activities
  + A lot of conflict and people being marginalized
    - Need to always consider the context
* LEK/IEK can often involve conservation
* Areas beyond national jurisdiction
  + Beyond 200 nm is the high seas
  + High seas treaties still needs to be ratified

Examples

Locally managed MPA

* Project seahorse
* Trade of seahorses- at the heart is the central phillipines
* Collaborated with community organizers
* Mainly Filipino team
* MPA placement decided by communitites, emphasis on coral reefs, finding out info from surveys, and also participatory monitoring with the fishers
  + Even small reserves can increase abundance of most valuable species
  + More diverse benefits from community in engaging with the MPA process.
* Gender inclusion in management:
* Focus of MPAs at the time centered around coral reefs. But many species deoend on different habitats over their life history
  + Looked into diversifying habitats in MPAs ie. Mangroves
  + Typhoon: less damage in reforested mangrove areas. Now has been integrated into disaster response planning.

How to make conservation pro-poor?

* It takes a long time to put in place conservation and restoration, especially before you see any impacts.
* Probablly requires a lot of extra, unpaid work. For what is sometimes not that big of a difference.
* Boom and bust grant/funding, how do you continue the conservation and management: financing.
* How to sustainably finance?

Livelihood limitations;

* Less pressure on marine environment and allow people to have an income
* But research discovered that daily income goes up and down. Fishing gives some form of immediate food security.
* Difficult to disconnect people from fishing + lack of access to capital to start something new (no insurance)
* Overfishing threatens local livelihoods. More effort because places are severely depleted.

Waste involved in fishing

* Fishing nets made of plastic.
* Islands with little waste management,
* New nets made of Nylon 6. Interface are carpet manufacturers with a lot of environmental goals
  + How to build circular economy around carpets? Nylon 6 is good for carpet making
  + Interested in the social aspect. Fairer and more inclusive supply chain.
  + Scope to connect fishing communities
  + Econyl: regeneration process.
* Feasibility:
  + Net collection
  + Net cleaning
  + Net baling without electricity.
  + Net aggregation
  + Net transport
  + Net export to Econyl (based in Slovenia) to be recycled into carpets. The carpets themselves can also be recycled
  + Business model: so communities are paid per kg of nets.
* The communities had no financial structures (banks)
  + Made community banks
  + Could save money
  + Could save for insurance and environment.
* Benefits:
  + 300 tons nets collected’
  + 64k people benefited
  + Business model impacted by COVID and cost of oil (recycled was then more expensive than the virgin oil otherwise used)

Seaweed farming

* Used for caragenin
* How can this help MPAs?
  + People working at sea can monitor
  + Financial sustainability
  + Reduce plastic…
* Currently 8 of these MPAs
* Coast 4C finalist for the Erthshot prize

Large scale MPAs- Chagos

58 small islands. Has been a UK Overseas territory because was established as a US military base in the 60s.

* Forcibly removed people on Diego Garcia
* In 2010 established as a full no take area.
* Largest living coral reef atoll in the world
* Some of the healthiest reefs in the Indian Ocean
* Gives us insight into what the ocean should look like (shifting baselines make us forget what the ‘normal’ is).

Mobile Species:

* Nesting site for turtles
* Seabirds: tracking red footed boobies and see that colonies mainly stay within the MPA.
  + Using the ocean for feeding.
* Pelagic fish
  + A lot of commercial fishing
  + Tracking and tagging mobile fish species. Shark, tuna, marlin, manta
  + Mostly stayed within boundaries of the MPA. Similar work being done in Ascension
  + How to sharks aggregate in certain parts of the archipelago
  + Recent designation of an Important shark and ray area.
* BRUVs: Blue Abacu initiative + NatGeo Pristine BRUVs
  + Pelagic monitoring surveys
  + Jessica Meeuwig
  + Regular deployments, maybe with fishing vessels (UHI? Potential)
* EDNA: very helpful
  + Rel abundance of shark species around ZSL
  + Dunn,N et al
* Mobile species -> plastic pollution
  + Plastic debris density vs nesting activity
  + Target where to beach clean at critical locations.
  + A lot of data on a plastic bottle: brand, country, manufacturer
    - Most from Indonesia made by Danone and Coca Cola. Many bottles must have been dropped from ships.
    - Impact of shipping on plastic pollution.
  + Tracking bottle movements.
  + UN Global Plastics treaty.

Regional Fisheries

* Closure of big tuna fishery.
* One challenge of MPAs: not in isolation, need to look outside of the area too. A lot of fishing maybe happening right outside the MPAs

Connectivity and Vulnerability

* Shark connectivity, physics, poaching risks
* Bring together ecological info with enforcement strategy

Thinking in 3D:

* How are animals moving horizontally and vertically
* Combining tagging data and looking at the depth profile: important for fishing.
* Sharks are targeted around CHagos, primarily Indian and Sri Lankan boats. Some of these boats are old and don’t have satellite tracking.
* Claire Collins: supply chain and why are people fishing for the sharks and what drives the trade?
* Strong connections between villages.
  + Low chance of prosecution and lower risks.
  + Factors of why people take the risk to poach.

Illegal Fishing in Chagos

* Effect of COVID: changed enforcement and how boats are boarded
* People were more motivated because there were less financial options

Global bleaching events:

* 2024 most recent and also reached chagos
* In earlier events, the reefs bounce back relatively quicker. But changes the community structure of the reefs
* Last year, mass bleaching in mesophotic reefs. Deeper reefs
* Looking at resilience factors. How is the reef structure changing over time.
* Reef transects which convert into photogrammetry models.

4th global beaching because of el nino

Coral rescue program

(acting rather than studying things to extinction)

* Ctenella chagios
* Fragmented them at the aquarium
* There was reproduction, so know about its breeding strategy

Coral Connectivity

* Mass mortality to recover, looking at recruitment and reef connectivity
* Trying to model larval paths. Releasing tags in chagos then went to Indonesia.

Connectivity between islands and reefs

* Faster coral growth on islands with brids
* Some islands infested with rats and little birds = less live and slower growing corals
* Important to rewild the islands

MPAs do not work in isolation

Pulling together regional work

Range of regional partners.

Talent equally distributed but opportunity is not.

Marine science capacity is dominated by the global north, not global south.

The Marine sCIENCE pORGRAM.

Ecops

Open and FAIR data

* Harvard dataverse

Fairer conservation program

* Better co-design
* More equitable
* More sustainable
* De

Communication

* Indian Ocean journalist training
* Art Basel: The Art of Saving the Ocean
* UN Decade, how we change humanity’s relationship with the ocean: gaming, installations, film

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