Octavio Aburto-Oropeza, 2008

Mangroves in the Gulf of California increase fishery yields

* Mangroves positive relationship with fisheries
* Used as nursery and feeding grounds for many commercial species
* Mangrove-related fish and crab species account for 32% of the small-scale fisheries landings in the region, $37,500 per hectare per year of mangrove fringe
* Lack of understanding of benefits of mangroves vs the projected benefits of development results in management crises.
* GOOD CITATIONS:
  + Benefits of mangroves (1-7), 34 and 35 have similar results

Zafar Adeel · Robert Pomeroy, 2002 Assessment and management of mangrove ecosystems in developing countries

* Assessment of anthropogenic threats to mangroves
* Coastal zones provide living space for about 55% of the world’s pop
* Potential impact of the degradation of coastal and marine ecosystems on communities, human health, food security, biodiversity conservation, and local economies will be multiplied as population increases
* Mangroves provide protective habitat as spawning, nursery, and feeding grounds for juvenile fish, crabs, shrimps and mollusks. Estimates indicate that nearly 90% of all [tropical] marine organisms spend some portion of their life cycle within mangrove systems. Mangroves are also prime nesting sites for hundreds of bird species.
* Indonesia had about 42,550 of mangroves in 1997 (see Spalding et all source)
* Threats: extraction, oil spills, pollutants, attacks by parasites, and prolonged flooding and freshwater intrusion, often as a result of artificial dams and causeways, charcoal and timber, shrimp aquaculture
* Est 2-8% loss per year globally
* Indonesia has lost about 55% extent since 1980s

Alongi 2012

Carbon sequestration in mangrove forests

* Mangroves are among the most carbon-rich biomes, containing an average of 937 tC ha-1, facilitating the accumulation of fine particles, and fostering rapid rates of sediment accretion (~5  mm  year-1) and carbon burial (174 gC m-2 year-1). Therefore if mangroves are disturbed, carbon emission is high
* Major contributor to carbon storage
* Multiple estimates conclude mangroves are the worlds most carbon rich forests, but only occupy a small percentage of area compared to other forests
* Gives Indonesia-specific ecosystem inventory of above/below ground carbon biomass storage
* 14% of carbon sequestration in the ocean, despite only accounting for 0.5% of total coastal ocean area

Alongi 2008

Mangrove forests: Resilience, protection from tsunamis, and responses to global climate change

* assesses the degree of resilience of mangrove forests to large, infrequent disturbance (tsunamis) and their role in coastal protection, and to chronic disturbance events (climate change) and the future of mangroves in the face of global change
* The magnitude of energy absorption strongly depends on tree density, stem and root diameter, shore slope, bathymetry, spectral characteristics of incident waves, and tidal stage upon entering the forest. – Old growth probs better
* ultimate disturbance, climate change, may lead to a maximum global loss of 10e15% of mangrove forest, but must be considered of secondary importance compared with current average annual rates of 1e2% deforestation. – deforestation more dire than climate change
* Aboveground biomass increases with age
* Continuous disturbance can erode sediment, remove propagules, waterlog biota, and change physiochemical conditions, interrupting recolonization
* Magnitude of wave absorption depends on forest density
* Mangroves in Sulawesi specifically are among the more vulnerable systems to climate change (fig 8). Based on current deforestation and lack of sediment sources

Anneboina and Kumar 2017

Economic analysis of mangrove and marine fishery linkages in India

* economic analysis to examine the role of mangroves in increasing marine fish output in India.
* The annual per hectare contribution of mangroves to total marine fish production is therefore 1.86 tonnes
* the percentage contribution of mangroves to marine fish output was calculated as 23 percent in India in 2011.
* the estimates of mangroves’ contribution to fisheries worldwide are in the range of 10–32 percent.

Arifanti et al 2022

Challenges and Strategies for Sustainable Mangrove Management in Indonesia: A Review

* in-depth study on and critical review of mangrove management in Indonesia
* found that strategies on mangrove ecosystem protection, such as improving the function and value of mangrove forests, integrating mangrove ecosystem management, strengthening political commitments and law enforcement, involving all stakeholders (especially coastal communities), and advancing research and innovations, are crucial for sustainable mangrove management and to support the national blue carbon agenda
* Citations 1-10 benefits of mangroves
* 11-13 mangrove species in Indonesia (#13 breaks it down by island)
* Conservation is split between ministry of forestry and ministry of marine fisheries
* Table 1 history of management: Coordinating Ministry of Economy Regulation No. 4/2017 on the Policy, Strategy, Programs, and Performance Indicators of National Mangrove Ecosystem Management: Recovery target of 3.49 million ha of mangroves by 2045
* Citation #30: management efforts should consider related stakeholders with various interests (social, economic, and ecological)
* rom a socioeconomic perspective, sustainable mangrove management is full of challenges due to (a) different understandings of the value and benefit of mangrove ecosystems and the urgency of rehabilitation efforts; (b) local involvement not being optimal; (c) the majority of the families living next to the mangrove ecosystem being classified as low-income families; (d) sustainable mangrove ecosystem utilization not yet having been developed; and (e) a high rate of population growth and economic needs having triggered land use and land cover change.
* total value that can be generated from the environmental services of the mangrove ecosystem is estimated to be USD 13,860,000,000. (Source 52)
  + Central Java: Central Java, Indonesia, ranges from USD 1202 to 2189 year−1 household−1 [54], whereas, in the coastal area of Lampung, Indonesia, it ranges from IDR 12,000,000 to 24,000,000 year−1 household−1 (Source 45)
  + West Kalimantan: IDR 27,386,581,500 year−1 (see source 53).
* Environmental challenges include tides/abrasion, species intolerance to salinity and tidal inundation, and pests and diseases. Propagule supply and wave and tidal flooding must be considered (citation 55 and 56)
* Goes over technological developments

Ayunda et al 2018

The impact of small-scale fisheries activities toward fisheries sustainability in Indonesia

* The fisheries sector has contributed 3% of gross domestic product (GDP) in 2012. More than 80% of Indonesian fish catches are from small-scale fishery. (DJPT 2013, 2015)
* investigate the performance of Indonesian small-scale fisheries in relation to the sustainable development, focusing on eastern little tuna, skipjack tuna, red snappers, blue lined seabass, and halibut
* Results show exploitation between 2004 and 2014
* Challenges in regulation because a lot of SSF is for household consumption, so reducing fishing days doesn’t work
* Working with NGOs has helped. The program offer managing selected gears, improving the landing quota and quality, raising fish price by about 10%, banning catch and assassinate endangered species (e.g., mahi-mahi, dolphin, sea turtles, etc.), and also introducing the fishing license.

Adaptive collaborative management – BF. Just lots of facts

Brown et al 2014

Case study: community based ecological mangrove rehabilitation (CBEMR) in Indonesia

* Most projects of mangrove replanting in Indonesia have failed
* Assesses EMR approach in Indonesia, esp in SulSel
* Goes over rehab process in LTP

Carmeron et al

Estimating the full greenhouse gas emissions offset potential and profile between rehabilitating and established mangroves

* Mangroves have a relatively high carbon density
* GREAT TANAKEKE SITE DESCRIPTION EXAMPLE
* Established and rehabbed mangroves have been shown to be better carbon sink

Carugati et al 2018

Impact of mangrove forests degredation on biodiversity and ecosystem functioning

* START HERE

Gilman et al 2008

Threats to mangroves from climate change and adaptation options: A review

* Sea level rise is probs the greatest threat in the face of climate change (not including more direct anthropogenic drivers). Mangroves are historically resilient ot change over historic timescales, but anthropogenic stressors could threaten that resilience
* Citation Ramsar Secretariat 2001 has info on financial impact of mangroves on one Australia fishery

Then see papers on ipad and in readings folder of Tanakeke Project