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Mangrove management in Solomon Islands: Case studies from Malaita Province

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Major findings and recommendations

- Mangrove forests are vital for the well being, food security and livelihoods of coastal communities in Solomon Islands
- The importance and use of, and pressures on, mangrove ecosystems are not consistent across Solomon Islands and local context needs to be understood when designing management approaches with stakeholders
- Market pressure for mangrove derived goods and increasing population pressure is resulting in the decline of mangrove resources prompting resource owners and users to request assistance with developing management protocols
- Mangrove resources are used and collected by men, women and youth, although the specific roles of men and women are highly gendered. Further research is required to understand gendered roles to effectively target mangrove management, training and awareness
- Locally driven initiatives to replant and rehabilitate mangrove forests are gaining strength in some regions and will be hastened by increased information dissemination and learning opportunities
- National and provincial policy that supports and enables communities to manage their own mangrove resources is required
- An ecosystem-based approach that includes multiple stakeholders is required for effective mangrove management
- Mangrove management initiatives need to be considered in light of a broader development approach to address drivers of mangrove degradation. For example efforts to bring alternative energy sources to Langalanga Lagoon would help relieve pressure on mangroves for fuel wood, providing a much needed boost to local management and replanting efforts
- Widespread awareness and education on the importance, use and implications of over-harvesting mangrove resources is essential to help communities to take steps towards looking after their mangrove forests

Background

Mangrove forests are important coastal ecosystems located at the interface of the land and sea, that support fisheries production, coastline protection, water quality control and provide a nursery habitat for fish and other marine life. In Solomon Islands there are 29 confirmed mangrove species (Duke pers comm 2013); around 45 % of the world's mangroves. Mangroves are found on most islands with dense forests located in Malaita Province (Lau Lagoon, Langalanga Lagoon and Maramasike Passage), Guadalcanal Province (Marau Sound), Western Province (Marovo Lagoon, Roviana and Vonavona Lagoons), Choiseul Province (Southeast) and Isabel Province (Arnavon Islands). In total mangroves cover a total area of ~ 47,100 hectares (Bhattari and Giri 2011), almost 2% of the total land area.

Mangrove forests are critical for food security and the livelihoods of coastal communities in Solomon Islands. In particular, mangroves are an important source of food (e.g. fish, mangrove fruit, shells and crabs) and timber (e.g. for firewood and building materials). Despite their value, there is evidence to suggest that mangrove forests and the livelihoods of the communities that rely on these valuable ecosystems are under threat (Warren-Rhodes *et al*. 2011).

Solomon Islands has one of the fastest growing populations in the Pacific region (SPC 2011) and this population pressure is driving the exploitation of mangrove resources, increasing the demand for mangrove firewood and building materials and is resulting in clearing of mangroves for village expansion (Pillai and Sirikolo 2001). In some regions climate induced sea level rise is accelerating mangrove loss through erosion, while the development of log ponds (log ship loading points) and clearing for agriculture is further reducing the area of mangrove forests (SPREP 2002).

To ensure that mangroves continue to contribute to the livelihoods and food security of communities living in and relying upon mangrove forests, there is an urgent need to review and enable the management of mangroves in Solomon Islands at national, provincial and community levels. This policy brief draws on lessons from recent community initiatives to outline some of the challenges and opportunities for managing mangroves in Solomon Islands.

The information presented here is based on two case study sites in Malaita Province (Langalanga Lagoon and Maramasike Passage). Research at these sites have been undertaken under the CGIAR Research Program on Aquatic Agricultural systems, through the Mangrove Ecosystem for Climate Change and Livelihoods project (Maramasike Passage) funded by the German Federal Ministry for The Environment, Nature and Conservation and Nuclear Safety (BMU) with support from IUCN and MECDM and a project on Ecosystem Approaches to Fisheries Management in Langalanga Lagoon funded by the European Union.

Mangrove management in Solomon Islands

Mangrove ownership and user rights are managed under customary tenure

Mangroves are used and accessed by men, women and youth, with some specific gendered roles with respect to how mangrove resources are exploited (e.g. Weiant and Aswani 2006). In most regions of Solomon Islands, mangroves are managed under customary tenure systems, with resource owners and/or chiefs making decisions with regards to the use and management of the mangrove forests. In general tribal members are allowed to access/use mangrove resources for subsistence purposes while 'outsiders' and those needing more than basic subsistence requirements, need to ask permission from resource owners (Warren-Rhodes *et al*. 2011). In some coastal regions however, the clarity of tenure and robustness of community governance structures is not as it once was (Govan *et al*. 2013) and traditional resource management mechanisms have weakened. In addition the act of mangrove replanting can further complicate local understanding of tenure. In some cases individuals that plant mangroves have clear ownership over the trees (regardless of land ownership), and may not be openly accessible for use by other people (Warren-Rhodes *et al*. 2011).

Mangrove specific legislation is lacking

Mangroves are recognized as important and valuable ecosystems requiring protection in the Solomon Islands (MECDM 2008; MECDM and MFMR 2010). Although there are several national and provincial legislative frameworks and strategic plans that support the management of marine resources in general, specific legislation pertaining to mangroves is lacking. Nevertheless mangrove management initiatives will be able to be registered under the National Fisheries Bill (revision of the 1998 Fisheries Act) as community managed fisheries areas, the Protected Areas Act (2010) or Provincial Ordinances that have that capability. There are currently no registered protected areas of mangrove in Solomon Islands.

Solomon Islands Government supports a community based management approach

The Solomon Islands Government is adopting a community based resource management approach to marine resource management (Ministry of Fisheries and Marine Resources 2010, 2011) and this includes mangroves (MECDM and MFMR 2010). Community-based resource management is a mechanism for communities to contribute to safe-guarding their future and the future of their resources. Having the option to register a management plan under appropriate legislation is expected to help communities if they are having issues with enforcement.

Malaita Province case studies

Langalanga Lagoon

Langalanga Lagoon is located on the west coast of Malaita Island. The lagoon is relatively close to Auki, the provincial capital which is accessible by boat or road. The lagoon is comprised of coral reefs interspersed with natural islands that support mangroves and artificial islands that have been built with coral 'stones' from the reef. People reside in the coastal margins and on the artificial islands.

Mangrove ecosystems are integral to the livelihoods of Langalanga people

Mangrove ecosystems are of great importance to the people of Langalanga lagoon. As salt water people many live within and utilize the mangrove forests. Mangroves provide an important ecosystem for fishing and harvesting shells and many village houses are constructed within the mangrove forest itself. Mangrove timber is the most common source of firewood, which is used by the majority of households for daily cooking of meals. Mangrove timber is used for building houses and boat shelters, garden tools and for shell money (Warren-Rhodes *et al*., 2011). Mangrove fruit (from *Bruguiera gymnorhiza*) is a traditional food source throughout the lagoon. Resources collected from the mangroves are often traded or sold to inland communities for garden and other products not easily available to the people of Langalanga.

Increasing population is putting pressure on mangrove ecosystems

Langalanga lagoon has one of the highest population densities in Malaita (> 75 people/km2, SPC (2008)). This population pressure is increasing demand on fisheries and mangrove timber for buildings and firewood. Access to terrestrial based firewood and timber is limited (Langalanga people have to purchase/ trade with neighbouring landowners) and mangrove timbers are superior firewood compared with their terrestrial counterparts, consequently there has been widespread over-harvest of mangroves throughout the lagoon for decades (Goto 1996).

Rehabilitating the mangroves of Langalanga Lagoon

Communities are working to rehabilitate mangroves

Locally driven initiatives to replant and rehabilitate mangroves are gaining strength in Langalanga Lagoon. Community champions are striving to re-establish mangrove forests through replanting and to encourage others to do the same. Mangrove replanting workshops have been held to precipitate community interest across the rest of the lagoon, although there is a long way to go yet to re-establish a thriving sustainable mangrove ecosystem.

Effective management requires looking at the wider development context

Mangroves are an integral part of the social-economic-ecological system of Langalanga lagoon and a number of ecosystem goods and services (e.g. freely available timber for firewood) can only be provided by mangroves. This means that replanting mangroves and increasing awareness alone, cannot be expected to resolve the problem of over-harvesting. People of Langalanga Lagoon have specifically highlighted the need to address the demand for mangrove timber in parallel to mangrove management initiatives. In particular there is a critical need to select, implement and understand the costs and benefits of alternative energy sources (e.g. solar, hydropower, grid etc.) and mechanisms for cooking (e.g. fuel efficient stoves, solar cookers, gas stoves).

Maramasike Passage

Maramasike Passage, in the southern part of Malaita Province, separates the islands of Big and Small Malaita. Dense mangrove forests line both sides of the passage and the people of Maramasike are heavily reliant on the mangrove and river systems for their daily subsistence and cash needs. Eliote village, located on Small Malaita, is the main community in the Passage from which the following information was derived.

Mangrove ecosystems provide a major source of dietary protein

For communities in the Maramasike passage, limited access to coral reef resources means that mangroves and associated rivers provide the major source of dietary protein. Mangrove mud shells, mud crab, fruit, fish and other shells form the basic foods that are consumed along with garden produce. Mangrove mud crabs and mud shells are also an important market product. Mangroves are utilized for their timber (for building) and firewood, although to a lesser degree than in Langalanga, as these communities are able to source the majority of their firewood and timber from terrestrial forests on adjacent lands.

Young women prepare mangrove mud shells for consumption

Market and population pressure is resulting in a decline in some mangrove resources

Fishing and gleaning of mangrove resources, for both consumption and sale, is a daily activity for the people living in Maramasike Passage. Maramasike passage is one of the largest suppliers of mud crabs to Honiara markets; rice bags filled with mud crabs and shells dominate ship cargoes on their regular routes between Small Malaita and Honiara. In recent years, there has been a change in mud crab harvesting techniques. Women and men used to collect mud crabs by walking through the mangroves at low tide, or by using line and bait; now most mud crabs are harvested by young men diving in the passages during incoming tide when the crabs are out feeding. Divers follow the crabs 'footprint' in the mud, collecting much higher numbers than with previous collection methods.

Local villagers have observed a decline in the abundance and size of mud crabs and mud shells. It is likely that increasing population pressure and market demand, coupled with high market prices and more efficient harvesting techniques, has resulted in over harvesting of these resources.

Young men dive for mud crab to sell at Honiara markets

Effective mangrove management requires a broad understanding by all people in the area of the threats and solutions

Like Langalanga Lagoon, mangroves in Maramasike are central to the social-ecological-economic system. Mangrove resource owners recognize their communities need for cash income and are reluctant to restrict people's access to mangrove resources. In contrast to Langalanga Lagoon, the mangrove trees themselves are relatively healthy and intact, few areas are subjected to heavy harvest for their timber and mangrove rehabilitation is not currently required, as the forests appear to be able to re-generate successfully by natural processes.

The people of Maramasike have specifically identified the need to initiate agriculture-based income generating activities to reduce the pressure on mangrove resources to support cash incomes, while initiating mangrove management measures and widespread awareness of mangrove resource management. In this context a broad understanding of the unsustainable nature of the existing harvest regimes and the identification of locally appropriate solutions is likely to improve mangrove management initiatives.

Agriculture based income can reduce pressure on mangroves

Recommendations for managing mangroves in Solomon Islands

Develop policy for mangrove management

Mangroves are recognized as important ecosystems in Solomon Islands, yet there is no existing legislation or policies that specifically pertain to the protection and management of mangroves. National and provincial policy that supports and provides an enabling environment for communities to manage their own mangrove resources would ideally:

- Enhance human, financial, technical and legal capacity for mangrove management at the community, provincial and national levels. This could include for example facilitating awareness of a community based management processes through training of provincial and national government employees
- Support an enabling environment for laws and regulations to be enacted and enforced. This is particularly important with regards to the regulation of destructive activities such as logging and mining that will impact on areas of mangrove as well as the enforcement of community management plans

Adopt an ecosystem approach for mangrove management

Mangrove ecosystems are at the interface between land and sea, thus can fall between the cracks of different governmental jurisdictional boundaries. Mangroves are classified a 'type of forest' by the Ministry of Forestry, they are an importance ecosystem for inshore fisheries production which is the jurisdiction of the Ministry of Fisheries, and Marine Resources and they are considered important for their biodiversity value by the Ministry of Environment, Conservation, Disaster Management and Meteorology. An ecosystem approach to management that includes multiple stakeholders (across national, provincial and local levels) will improve capacity to ensure effective mangrove management initiatives. An ecosystem based approach should:

- Encourage sustainable mangrove forestry practices for rotational planting of appropriate species of mangrove for timber and firewood
- Promote and increase mangrove replanting efforts in areas of mangrove loss. This may include increased information dissemination and learning oppottunities and supporting of rehabilitation efforts under the 'Clean Development Mechanism'.

Consider mangrove management in context of broader community development needs

The Solomon Islands Government supports community based management approaches, yet community initiatives are influenced by many factors and will benefit from partnerships with government and NGOs to embed such initiatives into broader development plans. In order to address food security issues, there is a need to support diverse livelihoods and provide incentives to address the specific drivers of mangrove ecosystem degradation, activities might include:

- The implementation of alternative fuel sources (to reduce the pressure on mangroves for firewood)
- The promotion of alternative income generating activities to alleviate market pressure on mangrove resources.
- Supporting mangrove management efforts under the Reduction of Emissions from Deforestation and Forest Degradation (REDD+) scheme (Albert *et al*. 2012).
- Value adding to existing mangrove-derived livelihoods; e.g. supporting existing local initiatives to improve methods for drying, packaging and marketing sustainably harvested mangrove fruit.
- Improve understanding on the gendered uses of mangrove to improve market chain value and management initiatives.

Further research is required to fully understand the roles of men, women and youth in mangrove resource use and extraction. Understanding these roles can help to better target awareness, training and needs at the community level.

Undertake widespread awareness and education on the implications of over harvesting mangrove resources

Communities reliant upon mangrove forests are well aware of the benefits that mangroves provide, however they may not be fully aware of the implications of over harvesting mangroves and their resources. Ongoing and widespread awareness and education about the importance of mangroves is essential to promote communities to take the steps required to manage their mangrove forests effectively.

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With communities, changing lives

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