

CHAPTER 21

BIODIVERSITY AND CONSERVATION IN THE PACIFIC ISLANDS: WHY ARE WE NOT SUCCEEDING?

Gilianne Brodie¹, Patrick Pikacha² and Marika Tuiwawa³

¹*School of Biological and Chemical Sciences, University of the South Pacific, Suva, Fiji Islands*

²*Solomon Islands Community Conservation Partnership, Honiara, Solomon Islands*

³*South Pacific Regional Herbarium, University of the South Pacific, Suva, Fiji Islands*

SUMMARY

There are more than 25,000 relatively small islands located in the Pacific region. The flora and fauna of these islands are highly diverse, and many of the species that occur in the region have limited ranges and are not found elsewhere in the world. By nature of their small size, the majority of Pacific Islands are ecologically fragile and particularly vulnerable to climate change, overexploitation of natural resources, and invasive species. Many of the human-induced ecosystem changes currently occurring on these fragile islands are irreversible; they often relate to changes in community values and beliefs as well as the growing desire for income generation. In light of the continuing loss of traditional knowledge and practices, we are in dire need of strong, creative, ethical leaders who are not afraid to think outside the box. The education of our Pacific Island youth (emerging leaders) and a considerable strengthening of our human resource development are essential foundations for us to have any chance of making the necessary changes in human behavior needed to achieve long-term conservation

success and sustainable environmental practices that will enhance the future health of Pacific Island communities.

INTRODUCTION

The Pacific Ocean contains approximately 25,000 islands of variable size and topography with a total coastline of 135,663 kilometers and an ocean surface area of 165 million square kilometers (IUCN, 2009a). This area is larger than the world's total land surface, with the islands divided among 56 different Pacific Island and Rim countries and territories. Within the Pacific Ocean lies the region referred to as Oceania, which includes the islands of the tropical Pacific Ocean. The terrestrial diversity and endemism per unit area in Oceania are among the highest in the world, with more than half the diversity in independent, developing island nations (Keppel *et al.*, 2012).

Globally, biologists have identified up to 34 biodiversity "hotspots" that are extremely rich in endemic species and considered highly threatened by human

activities (Myers *et al.*, 2000; Mittermeier *et al.*, 2005). These hotspots include the Oceania island sub-regions of Polynesia, Micronesia, and Melanesia. Six major threatening processes are driving biodiversity decline in Oceania: habitat loss and degradation, invasive species, climate change, overexploitation, pollution and disease, and implementation capacity (see Lees and Siwatibau, 2007; COS, 2008; Kingsford *et al.*, 2009). Good science is essential to achieve successful conservation outcomes in relation to these threats, since sound management and decision making cannot occur without adequate background information and an adequate understanding of the ecosystems and biodiversity we wish to conserve.

Simply knowing the facts will not lead to the conservation of biotas, however. What we need is a change in human behavior at the community, business, and political level. There is general agreement in the Pacific Island conservation sector that our biodiversity, and the essential ecosystem services it provides for human livelihoods, is in crisis. In contrast, the average person on the street sees this crisis as either not relevant to him or her or as a problem that someone else (e.g., village chief, local council, national government, or God) should and will solve. In other words, the local people do not think of themselves as either responsible for generating the problem or contributing to its solution.

ISLAND ECOSYSTEM FRAGILITY

The islands of Oceania are not only numerous but highly variable in size. The Solomon Islands, for example, consist of approximately 900 islands, but only seven have an area greater than 2000 km². The majority of Oceanic islands are relatively small, with fragile ecosystems that are functionally vulnerable to change.

In fragile island ecosystems, even a seemingly small change can have far-reaching effects, and the impact of a threat such as the introduction of an invasive species is greatly magnified as compared with that of a comparable introduction into a more robust mainland community. Often such changes can severely and irreversibly alter ecosystem function (Veitch, Clout and Towns, 2011). Examples of these irreversible changes to islands in the region are numerous. Well-documented accounts include (1) the impact of the alien crazy ant (*Anoplolepis gracilipes*) on Christmas Island, where a

rapid and catastrophic shift in the functioning of the rain forest ecosystem has occurred (O'Dowd, Green and Lake, 2003); and (2) the accidental introduction of the brown tree snake (*Boiga irregularis*) to the island of Guam, where most native vertebrates are now either endangered or extinct (see Rodda, Fritts and Conry, 1992; Wiles *et al.*, 2003). Similarly, the introduction of the cane toad (*Bufo marinus*) to areas like the Solomon Islands has had an impact on the native goanna (*Varanus indicus*), reducing their populations in the coastal forests on the main islands.

Once the ecosystems of small islands are irreversibly altered, there is no going back. The loss of ecosystem function and biodiversity often results in diminished contributions to human livelihoods (Daily, 1997).

LOSS OF TRADITIONAL KNOWLEDGE AND PRACTICES

In the past, sustainable resource use practices on and around islands occurred routinely and worked well (Johannes, 1978; Morauta, Pernetta and Heaney, 1980). However, much of this traditional knowledge is fast becoming lost or forgotten or is now underutilized (Thaman, 2010). Sadly, we are facing a major breakdown and continued decline in the transfer of traditional knowledge and the acceptance of its value to finding solutions for the future (Johannes, 1978; Berkes, Colding and Folke, 2000; Laird, 2002). Traditional biodiversity knowledge, and a clear understanding of the fact that such knowledge can often provide the foundation for the sustainability of island lifestyles, seems well recognized only by our active environmental youth groups, a relatively small number of government staff, and experienced regional conservation practitioners.

However, several regional programs (e.g., Secretariat of the Pacific Community Land Resources Division) have been working for many years to retain and revive past knowledge of the use of biological diversity in our historically diverse gardens, with their numerous crop varieties. Such knowledge can play an important role – for example, in adequately addressing and mitigating island climate change impacts.

In more “natural” systems, the gradual loss of traditional knowledge is evident by the way many communities currently perceive and manage their forest resources. Traditional societies held a comprehensive understanding of rainforest plants, distinguishing

edible plants from medicinal ones, and acknowledging many others kinds of plants with cultural uses. Knowledge of the diversity of plants, both domesticated and wild, was central to survival and those members of a community who had botanical wisdom commanded influence. However, this acquaintance and value of forest plants by traditional societies is today vanishing, along with the accompanying behaviors, perceptions, and appreciation of the forest. These days, logging and widespread removal of forests takes place on a regular basis and this loss results in changes in human behavior. A shift in interpretation of the value of the forest has occurred in many island communities, so that instead of perceiving it as a “garden” to utilize, it is now often perceived as “valueless” unless tamed.

SHIFT IN RESOURCE USE PURPOSE AND LAND OWNERSHIP

Although the total population of Oceania at present is only 15 million people, it is projected to rise to 24 million by mid-century (Population Reference Bureau, 2012). When coupled with the loss of traditional knowledge, human population growth in fragile areas such as New Guinea and several other Melanesian islands (Cincotta, Wisniewski and Engelman, 2000; Anonymous, 2006) has resulted in escalated land clearing. Mining activities in New Guinea and other parts of Melanesia have emerged and are particularly destructive trends. The endless demand for products such as wood, fish, shrimp, and sea cucumbers from the area by rich countries located elsewhere often leads to local destruction. In the Fiji Islands, the human population is low and increasing relatively slowly, but the redistribution of the population reflects significant increases in urbanization (Anonymous, 2008). This shift has contributed to a substantial demand for the commercial production of food and associated unsustainable land-use practices, which in turn have made land degradation a major problem in many parts of the region (see Lees and Siwatibau, 2007).

Much land clearing and overexploitation of resources such as mangroves and fish have occurred because of a substantial shift from subsistence to commercial resource use. In the past, for example, the majority of non-urban community members fished to feed their own families, with any excess routinely distributed to the rest of the community. Now, fishing or other resource use, outside special events, occurs primarily

with the aim of making a profit. Profit is desired to pay for basic items such as school fees, church contributions, cultural obligations (e.g., funerals), and “luxuries” such as television.

In most developed countries, the government controls and enforces regulations designed to prevent overuse. In contrast, community members directly own a very large proportion of the resources in many Pacific Island countries. Here, although regulations may exist, strong governance and enforcement capacity are often lacking.

In the Melanesian countries of Papua New Guinea, Fiji, and the Solomon Islands, the land tenure system plays a major role in achieving conservation outcomes. More than 80% of land is traditionally owned; such rights have evolved into a form of private landownership with a long history of human occupation, customary use, and ancestral relevance in terms of burial and customary sites.

SUSTAINABILITY AND CLIMATE CHANGE

Despite the obvious connection between sustainable development and the quality of Pacific Island human livelihoods, the clearly unsustainable exploitation of our natural resources continues unabated. The important question here is why do the majority of people or businesses continue to overexploit or trash our natural resources such as forests and coastlines, even in the face of obvious negative economic impacts and lifestyle loss? A clear example of this is provided by the increasing amount of human-made solid waste building up on our once pristine shorelines. These precious coastal resources are not only utilized by the public for recreational activities but perhaps more importantly form the basis for our high-value, income-producing, tourism activities.

In light of expected challenges related to climate change (Huang, 1997; Barnett, 2001) another good example of the environmental sustainability issues is the continued removal of mangrove habitat (Figure 21.1). Mangroves occur across the Pacific Islands with the world’s center of species diversity in Papua New Guinea. Healthy mangroves are a vital first line of defense in many areas against natural disasters, such as cyclones and tsunamis (Barbier, 2006). The largest mangrove forests are found in the Melanesia region. In particular, Papua New Guinea supports over 70% of the region’s mangrove area with at least 34 associated



Figure 21.1 Mangrove habitat removal in the Solomon Islands.

Photo courtesy of © Patrick Pikacha



Figure 21.2 Mangrove firewood for sale in the Fiji Islands.

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obligate species found only in mangroves (IUCN, 2009b).

Despite the obvious benefits mangrove ecosystems provide, they are one of the most threatened ecosystems in the Pacific. They are not only logged commercially but are also susceptible to overexploitation by local communities. In several Pacific Island areas, mangroves are routinely harvested and sold as firewood (Figure 21.2). It is hard to stop this behavior because many families are on or below the poverty line and may not be able to afford alternative fuels for cooking.

Pacific Islanders were, and still are, traditionally coastal resource based, with many early settlements close to mangrove areas. Mangroves continue to provide significant social, economic, and cultural benefits; however, because of a lack of adequate policy and legislation to guide and or constrain their use, the mangroves are rapidly disappearing. It is therefore not surprising that implementing governance arrangements over mangrove ecosystems, to sustain the benefits derived by humans, is now a key priority for the Pacific region (IUCN, 2009b). However, successful mangrove conservation still depends overall on changing human behavior.

VALUES, BELIEFS, AND RELIGION

From childhood, we grow to develop values and beliefs that determine our future behavior and priorities. In the past, for many Pacific Islanders this has included an intimate linkage to land and sea via cultural protocols such as totems. Sadly, with increasing urbanization, indigenous people are losing their bond with biodiversity. This can be seen today by asking young indigenous people in cities if they know what their totems are or if they can provide the name of 10 different plants in their backyards in their own native tongue.

There has been much recent discussion in the Pacific Islands on the topic of the use of religion in achieving conservation outcomes. This is a popular methodology with young conservationists who are keen to pass on their new ideas and education to their own personal communities. However, not all agree with such a use of religious principles, and some even blame elements of religion for a lack of individual social responsibility in the first place. So in the future we need to think hard about what the role of religion may be in conservation; perhaps it could become a key factor in changing human behavior with respect to sustainable natural resource use.

Religion has many assets for youth because it teaches principles of stewardship or being good proponents of the environment. In some Pacific Island areas, environmental sustainability is a common theme of youth programs, teaching young people how to manage and care for the environment. This has readily occurred because the basic principles of stewardship are slowly eroding with time, impacted by increasing commercialization, a desire for “better” education and the demand for wealth.

INCOME GENERATION

As in the majority of societies in the world today, money has come to be seen in most Pacific Island countries and territories as the highest necessity or indicator of quality of life. Thus, for communities without a strong focus on long-term benefits or long-term consequences, the immediate or promised cash rewards from activities such as commercial logging are hard to resist. How can we help land-owning communities find alternate environmentally sustainable sources of income generation?

Numerous papers have touched on this topic (e.g., Getz *et al.*, 1999; Isaacs 2000; Anonymous, 2003; Veitayaki *et al.*, 2005); however, terrestrially at least, the Sovi Basin conservation area (reserve) on the island of Viti Levu, Fiji, stands out. Here 13 different community groups (mataqali), with help from the Fiji government, Conservation International, and the University of the South Pacific, have united to conserve approximately 20,000 hectares of uninhabited forest of national significance. These organizations and the multiple land-owning communities have come together and set up a compensatory trust fund to generate income from leaving their forest intact and unlogged (Masibalavu and Dutson, 2006). Thus, a long-term benefit system has been put in place to reward landowners for keeping their native forest intact, demonstrating that successful cooperation is possible with sustained effort.

The focus of many communities over recent years has been on making changes in their behavior that improve only their own resources. This is a good start but what is really needed in addition is thinking more broadly and holistically about large-scale, long-term ecosystem function. This is a challenging obstacle that will require good governance and sound leadership at all levels if it is to be attained in the future.

LEADERSHIP, CORRUPTION, AND RESPONSIBILITY

Many will tell you that the grass roots people don't care much about biodiversity loss and the conservation of threatened species, but this is not the case in many areas once the right information is provided to the community in an understandable form. The Sovi Basin project discussed previously provides an excellent example of this relationship. However, there are many more successful initiatives, such as those linked by the

widespread locally managed marine areas (LMMA) network (e.g., Veitayaki *et al.*, 2005).

The quality of governance and ethics of the leaders we have at all levels in society in the Pacific Islands is critical to current and future successful conservation outcomes and for developing a new generation of sound decision makers. Leaders with integrity, a willingness to listen, and the ability to think beyond current practices are needed.

Unfortunately, in some Pacific Island countries and territories, and in many sectors of society, it is not unusual to find leaders who take on pivotal leadership roles for their own gain and not because they wish to look after their people and their natural resources in the long term. A failure or unwillingness to recognize conflicts of interest is also apparent – for example, thinking it is acceptable to hold public office in the environment sector while being a director or major shareholder for an overseas logging company recognized for its unethical and unsustainable environmental practices.

We need to continue to support our youth and develop their leadership potential while encouraging them also to remain ethical and connected with their traditional indigenous roots and foundations.

YOUTH EDUCATION AND IMPLEMENTATION CAPACITY

A very large number of conservation programs in the Pacific Islands now actively involve previously marginalized groups (e.g., women and youth) when addressing environmental problem solving. The education of a community's children is an effective way of communicating information to adults and decision makers, particularly when several different communities are involved and landownership may be disputed. An excellent example of this is currently being implemented in Fiji's only official RAMSAR wetlands site, where the local non-governmental organization (NatureFiji/MareqetiViti) is investing considerable effort into educating the children and youth living in the area surrounding the site about the wealth of unique natural resources they own. Since this site is one of only six RAMSAR wetlands sites registered in the Pacific Islands (several more are in progress), and one of the 33 sites on the Wetland directory list for Oceania (Scott, 1993), it is a very important role model for inland water protected area management.

The bottom line is biodiversity surveys of known wilderness areas, and measures of extinction and biodiversity loss, cannot occur in the Pacific Islands without scientifically trained people to undertake the often difficult work required. Taxonomic and identification training and expertise are essential at a local level, as is local knowledge of the areas to be surveyed.

The need for such taxonomic and identification expertise, particularly at a national level is often not well acknowledged. Human resource capacity building needs to be funded to occur at a local level because to date Pacific Island governments are severely under-resourced in the environment sector both in terms of funding and human resources (Watling, 2007). Although many international agencies contribute very effectively to overall conservation efforts, activities need to be nationally driven and directed (Keppel *et al.*, 2012).

CONCLUSION

It is clear that the key to addressing the biodiversity crisis and substantially improving our overall poor conservation outcomes to date lies in our ability to understand and produce changes in human behavior. Despite much good science, we are not succeeding in addressing biodiversity loss and conservation because we are not succeeding, at a large scale, in changing human behavior. The changes required need to be large scale and long term. Never before has any single animal species on the planet had the ability to manipulate and change the environment the way that humans can. The changes that are currently happening in the Pacific Islands are not reversible. Our fate lies in our own human hands.

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