POLITICAL ECOLOGY, STRUCTURAL ADJUSTMENT AND CORAL REEF CHANGE IN THE COOK ISLANDS, A MICRO-STATE

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ABSTRACT

This thesis applies an approach of political ecology to analyze environmental change in the Cook Islands in the context of the fiscal crisis of the state in the 1990's. Questions and methods from both human and physical geography are brought to the empirical case. Corruption and financial management surrounding a hotel development on Rarotonga, Cook Islands presents a case of 'criminal ecology' This research finds that the Pacific Island state is characterised by thin layers of bureaucracy making it extremely vulnerable to international crime, national debt and environmental change. Structural adjustment placed further pressure on the Cook Islands environment. The significance of this research lies in its illumination of the widening environmental consequences of misguided development and debt.

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PREFACE

My best friend and I used to spend a lot of time at Muri beach on Rarotonga when we were teenagers. It was the best place to swim and relax. I would pick her up on a little Yamaha 50 scooter after school. She would finish her household chores and we would take off for the beach. We would swim across to the islet and lie on the sand. I remember squinting over the bright, white sand at the turquoise lagoon and telling myself that this was the best place in the world.

That was 18 years ago and much has changed at Muri beach since then. Tourist accommodation has been built along the coastline and the beach has become occupied with tourists, boats, windsurfers and kayaks. The development is exciting and many local people seem to have benefited from it. But I have observed changes in Muri lagoon that are less favourable. I see more seaweed than usual, murky and bubbly water and I often notice a bad smell at low tide.

I have also observed changes in the Vaima'anga lagoon adjacent to an unfinished Italian-Cook Islands hotel development (the proposed Sheraton hotel). During coral surveys there just over ten years ago, I saw soil washing directly into the lagoon. I have also observed the accumulation of volcanic pebbles along that beach turning the sand from white to grey.

With my undergraduate training in environmental science and biology, I have examined the physical reasons for environmental change. For example, I have attributed the decline in abundance of living coral to sedimentation from a nearby stream. In this thesis, I endeavour to look at the reasons *behind* the physical reasons for environmental change. In particular, I am interested in the political factors that influence development resulting in environmental change on Rarotonga's coral reef. In examining the political factors affecting Rarotonga's coral reef, I demonstrate aspects of political ecology in the Cook Islands unique to Pacific Island states.

CHAPTER 1. INTRODUCTION

1.1 THE COOK ISLANDS: A MICRO-STATE

With a resident population of only 14,000, the Cook Islands are one of the smallest nation states in the world (Statistics Office, 2002). The national budget of the Cook Islands is NZ$101 million (US$71 million) and the entire public service consists of 1,757 people (Kurai-Marrie, 2005). Located in the South Pacific north-east of New Zealand and directly south of Hawai'i (Figure 1), the total land area of all 15 islands put together is 237km^2 (Statistics Office, 2002).

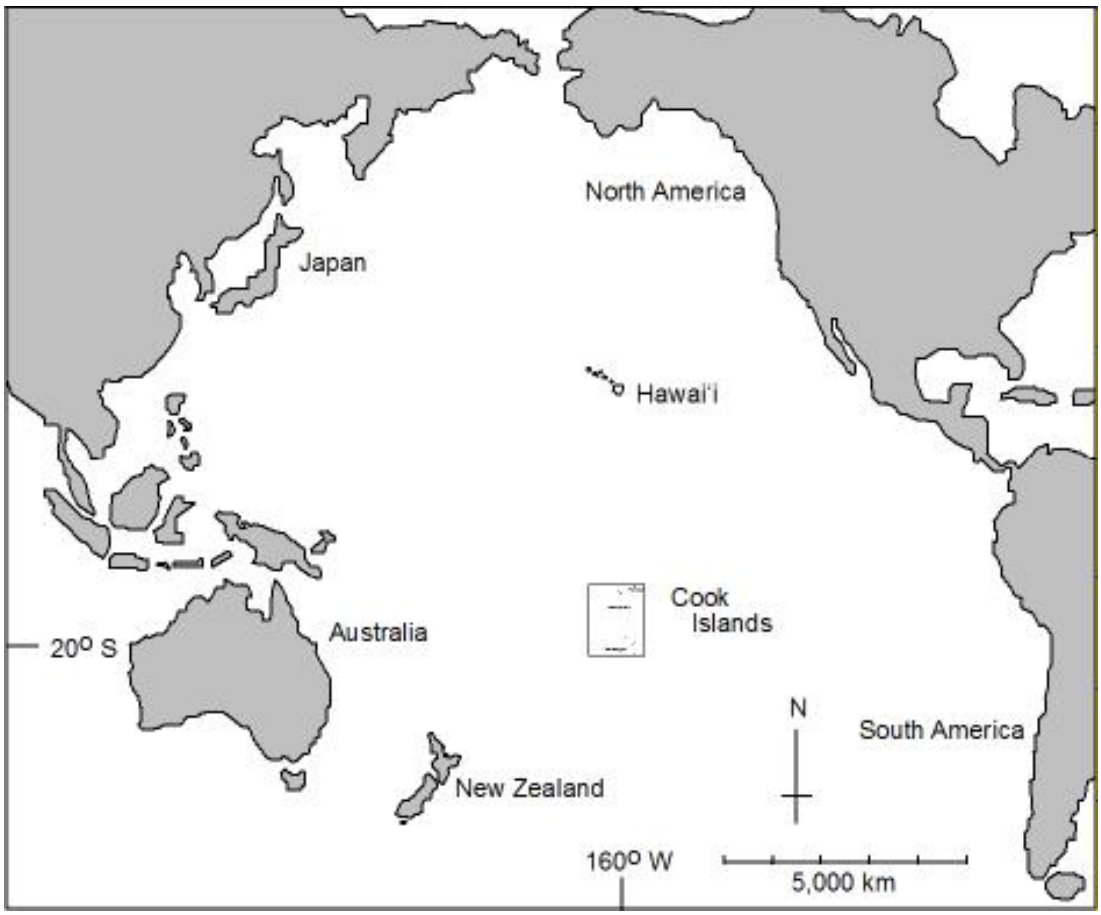

Figure 1: Location of the Cook Islands

This thesis uses Rarotonga, an island of the Cook Islands to study the physical, social and political reasons behind environmental change in a micro-state. I examine the political factors affecting an Italian-Cook Islands hotel development, which caused significant change to the adjacent coral lagoon. I intend to demonstrate how the few layers of authority in the Cook Islands government at the time of the development combined with a lack of transparency made the country more vulnerable to international corruption and overwhelming debt. Next I look at the program of economic reform that was adopted to address this debt crisis and determine whether this program influenced environmental change in Muri lagoon on the south-eastern side of Rarotonga.

It has been argued that to emphasise the smallness of the Pacific Islands is to belittle them and it encourages the view that they have little potential for economic growth (Hau'ofa, 1993). It is not intended here to belittle the Cook Islands, but to consider the vulnerability of a small nation to corruption, debt and international politics. Information may be easier to disseminate around an island the size of Rarotonga but if there is no transparency AND an independent media, this information may be contrary to what is good for the country. This thesis attempts to demonstrate how the few layers of authority in past governments of the Cook Islands combined with a lack of transparency made the country more vulnerable to political forces. The thesis intends to show how this vulnerability resulted in crippling national debt and significant environmental impact on Rarotonga's coral reef. The effect of politics on environmental change may have unique characteristics in a micro-state.

1.1.1 Government

Once administered by New Zealand, the Cook Islands became an independent nation state in 1965 and the country is now a parliamentary democracy. The Cook Islands parliament is made up of 24 members. Elections are held every five years and each Member of Parliament represents as few as 70 to 900 people (Aisake, 2004). In the 2003 election, the Rakahanga Member of Parliament won with a total of 42 votes (Aisake, 2004). Parliament selects the Prime Minister of the country which is normally the leader of the winning party. The Prime Minister selects 6-9 Members for Cabinet, the executive branch of government where critical administrative decisions are made.

The government is made of a very thin layer of administration. Each Member of Parliament belonging to Cabinet is responsible for a number of Ministries. Under the Member of Parliament or Minister is a Secretary for each Ministry. The Secretary runs the Ministry with the help in some cases of Directors of departments and/or senior officials. Below the Director or senior official is the government worker. The connection between the government worker, the Member of Parliament and the international realm is a short one.

Cook Islanders are New Zealand passport-holders and are entitled to New Zealand unemployment and family benefits. This has a significant effect on the demographics of the country. If one is dissatisfied with life in the islands because of, for example, a downturn in the economy or the poor performance of government one can easily emigrate

and start a new life in New Zealand. In particularly difficult times, such as the economic crisis of the mid-1990's described in section 1.2.2, the country's population can decline significantly.

1.1.2 Population

During the 2001 census, the Cook Islands population totalled 18,027 but had a resident population of 14,000 (Statistics Office, 2002). Since the turn of the century the population steadily increased from a minimum of 8,213 in 1902 to 21,322 in 1971. After the international airport opened in 1974 the population declined as Cook Islanders sought employment in New Zealand (Figure 2; Hall, 1994). Population growth occurred in the late 1980's and early 1990's until the economic crisis of the mid-1990's (see section 1.2.2).

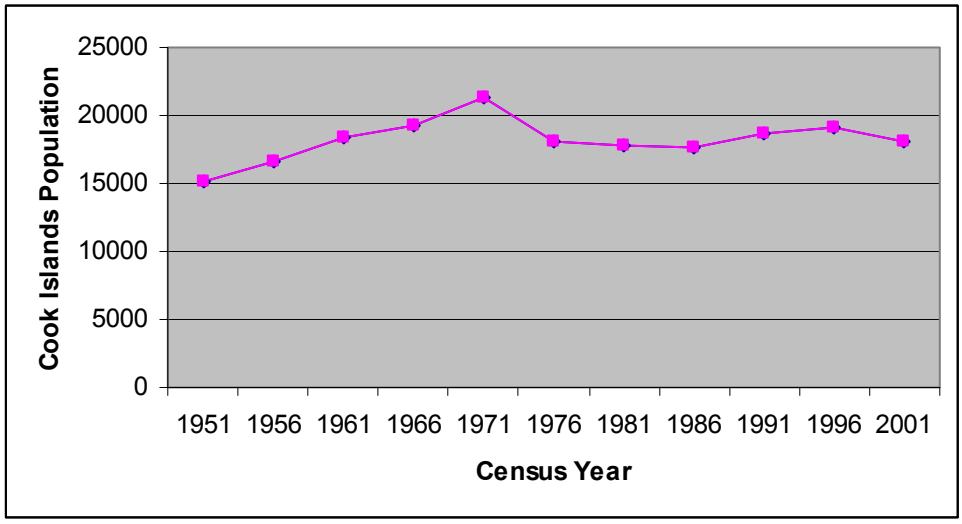

Figure 2: Population Change in the Cook Islands 1951-2001

1.1.3 Land

Traditionally land in Rarotonga was owned by patrilineal descent groups and managed by high chiefs (Crocombe, 1987). Land units extended from the tops of mountains to the sea so that marine resource use was also controlled by chiefs. The registration of land under the New Zealand administration in 1901 aimed to make more land available for European use and to increase land productivity by awarding families a land management role. This reduced the authority of the chiefs significantly (Crocombe, 1987). These land units can now be inherited by all descendents through both parents. This has resulted in increasing land fragmentation (Crocombe, 1987). Cook Islanders can have perpetual rights to land as owners or as holders of "occupation rights". Leases are also allowed for a maximum of 60 years. Leases can be traded and there are a growing number of leases to non-Cook Islanders to provide space for business purposes.

1.1.4 Development

Rarotonga is the most developed island and contains most of the national population. It is the location of parliament, the international airport and international shipping facilities (Plate I). The population on Rarotonga during the 2001 census was 12,206 (Statistics Office, 2002). Aside from Aitutaki which has physical features conducive to tourism, the other islands of the Cook Islands are far less developed. A great problem for the other islands is their isolation, all of them being at least 100 to 700 miles away from Rarotonga and up to 800 miles away from each other (Statistics Office, 2002). Inter-island shipping

is sporadic and for those that have airstrips, air travel is expensive relative to local incomes. This geography has meant that many Cook Islanders subsisted on farming and fishing prior to and along with, the growth of the cash economy.

Plate I: Aerial View of Rarotonga. Photo by Ewan Smith.

Natural resources in the Cook Islands are limited. The small land area means there is little forest. There are also no mineral deposits except for manganese nodules over three kilometres below the sea surface on the deep sea floor. The depth of the nodules is so great that their extraction is economically infeasible with current technology. Living marine resources are also limited. Catches of tuna and even reef fish are small compared to those in other countries of the Pacific. This is most likely because of the great distances between islands which limit the recruitment of coral reef life resulting in a poor basis for the local marine food chain. Marine productivity is also generally known to be low in the eastern Pacific Ocean due to its location relative to ocean currents.

While aquaculture may provide another option for revenue it has not yet developed beyond the black pearl industry. This may be because of the small returns in most fields of aquaculture compared with pearl farming and tourism development.

The limited natural resources for conventional resource extraction mean that Cook Islanders have relatively few options for generating income. The population must therefore be innovative or largely dependent on the tourism industry.

1.1.5 Tourism

The most economically important industry in the Cook Islands is tourism, followed by the tuna export industry, the black pearl industry and agricultural exports. The number of visitors to the Cook Islands has steadily increased in the last two decades but has particularly picked up since 1991 (Figure 3). During the 2001 census residents who are predominantly made up of the indigenous Polynesians accounted for 78 percent of the population while visitors accounted for 22 percent (Statistics Office, 2002:4). Rarotonga is the destination of the majority of visitors and Aitutaki is the second most frequented destination.

With the growth of tourism, beachfront properties have become particularly important for tourist accommodation and this is leading to a higher density of people living on the coast and a concentration of septic tanks and sewage treatment facilities along the coastline. Septic tanks are a crude method of sewage treatment normally used in rural areas where

the density of housing is low. On Rarotonga, the effluent from septic tanks is typically disposed of into soak pits underground. The high nitrate and phosphate content of septic tank effluent can contaminate the groundwater which seeps into the surrounding coral lagoon. Septic tanks and soak pits are used on most properties, and some resorts have their own sewage treatment plants. A government report in 1995 stated that two of these treatment plants were operating beyond capacity (Tourism Task Force, 1995:25). An Urban Infrastructure development report by the Asian Development Bank states that even,

> *"at existing population levels, Rarotonga is beyond its capacity to assimilate these impacts without a noticeable effect on the environment…..Sewage discharge issues could represent a fundamental constraint to all development on the island" (Barrett Consulting Group, 1995:55).*

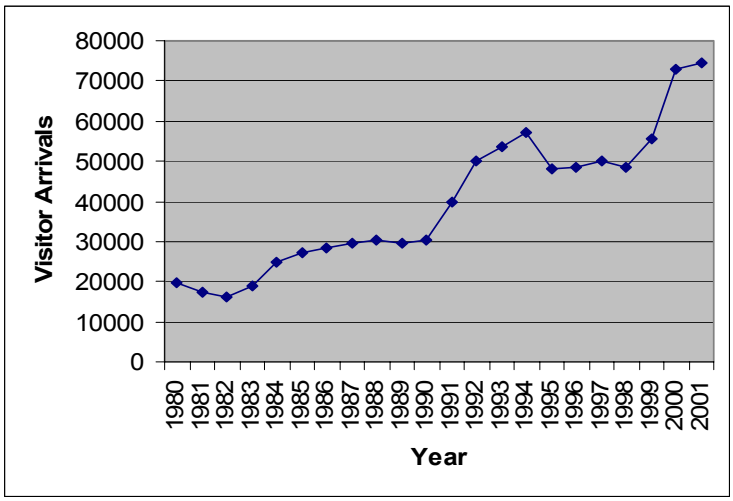

Figure 3: Growth in Visitor Arrivals in Cook Islands 1980-2001

Therefore, the management of sewage was identified as a potential issue as long ago as 1995. Others have said that this problem has been known for a quarter of a century (Harwood, 2003).

1.1.6 Agriculture

Agriculture is not as significant an industry today as it was in the 1960's. Citrus and pineapple were important exports during that time (Mataio and Syed, 1993:75). Commercial agricultural production has declined overall since 1973 (Mataio and Syed, 1993:77). On the other hand, there has been an increase in commercial livestock farming. Pig farming has always been a part of the Rarotongan subsistence lifestyle. Pigs were kept in pens with dirt floors or tied by the hoof (Plate II).

In order to decrease reliance on imported meats and make extra income, some people have now ventured into commercial pig farming on a larger scale. They may have more than 100 pigs contained in concrete-floored pens (Plate III). These pens are often located

Plate II: Pig Tied by the Hoof to a Tree. Pigs have always been a part of the Rarotongan subsistence lifestyle and were kept in pens with dirt floors or tied by the hoof

alongside a stream so that the waste is easily washed into the stream and 'taken away' (Plate IV). Therefore, instead of being mixed into the soil, pig waste is going directly into streams which empty into the coral lagoon. With Rarotonga, being such a small island, only 8km across its longest dimension, the lagoon is never far downstream.

Plate III: A Commercial Pig Pen. Commercial pig farmers may have more than 100 pigs contained in concrete floored pens

Plate IV: Typical Waste Disposal from Pig Pens.
Waste from pig pens is typically washed into ditches and streams

While pig farming is no doubt having a negative impact on the streams, lagoon and reef of Rarotonga this thesis will focus on the impact of tourist accommodation development.

1.2 Conceptual Framework

1.2.1 The Environmental Problem

The environmental problem to be investigated in this thesis is the deterioration of the coral reef around Rarotonga. Rarotonga's coast is bordered by a tropical lagoon and barrier reef which narrows to a fringing reef on the northern and north-eastern sides of the island (Figure 4). There are only six passages in the reef and the lagoon ranges in depth during high tide from about 0.5m to 3.0m. The island is around 32km in circumference.

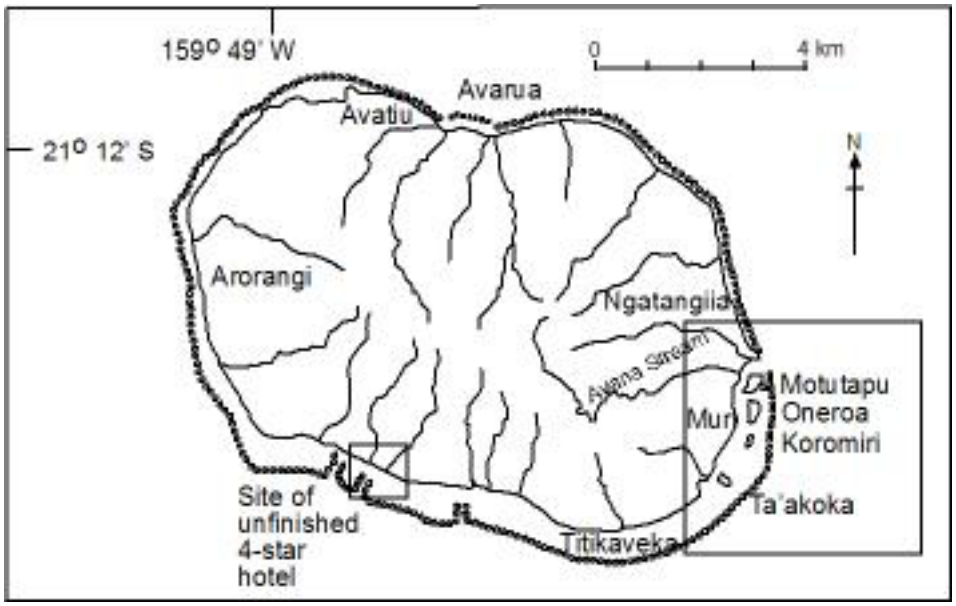

Figure 4: Map of Rarotonga Showing the Two Study Areas

A number of things have impacted Rarotonga's reef and lagoon. Many corals within the lagoon have been affected by coral bleaching, a phenomenon where coral turns white, usually as a result of unusually high sea surface temperatures. Crown of thorns starfish infestations have also devastated parts of Rarotonga's reef, the biggest event being in 1973 and smaller localised outbreaks in the 1990's up to the present (Andrews, unpublished: no date). The reef has also been plagued with ciguatera (Raumea, 1998). Ciguatera was not present on Rarotonga during a study over 20 years ago (Lewis, 1981). The toxin that causes ciguatera fish poisoning comes from a microscopic marine organism called a dinoflagellate (Lehane, 1999). Several species of dinoflagellates may be responsible for ciguatera fish poisoning but the one most studied is *Gambierdiscus toxicus* (Lehane, 1999).

Another factor causing the deterioration of Rarotonga's reef and lagoon is sedimentation. This is particularly the case for reefs located near reef passages. Clearance of vegetation and construction on sloping lands results in increased soil runoff from the land. Most coral can tolerate short term sedimentation but prolonged exposure leads to loss of their symbiotic zooxanthellae, polyp swelling and excessive mucous secretion (Connell and Hawker, 1992:182). One study found that in average sediment loads of 160 to 200mg/cm^3/day, coral communities had low live coral cover and are low in diversity (Connell and Hawker, 1992:183). In sediment loads of 5 – 32 mg/cm^3/day coral diversity and live coral cover is higher (Connell and Hawker, 1992:183). Sedimentation also results in increased nutrient levels in the water column.

Reefs that receive high inputs of nutrients from sewage or runoff from agricultural areas may be degraded if the elevated nutrients stimulate the overgrowth of algae (Bell 1992). Comprehensive research has been done on the effects of excess nutrients on the health of coral reefs (Maragos et al, 1985, Connell, 1997, Ginsberg 1997, Richmond 1993, Bell 1992). High nutrient levels often encourage the growth of phytoplankton resulting in algae blooms. They also cause seaweed to smother coral and inhibit the settlement of coral larvae (Burke et al, 2002:24). Such reefs don't recover well from cyclone damage (Goreau & Thacker, 1994:1). Tomascik and Sander (1987) also found that the coral *Porites porites* produced fewer larvae and showed a decreased gonad index and increased rate of hermaphroditism in areas with high nutrient inputs. A reduction in fertilization success and egg size was observed in some species of corals in nutrient enriched water (Harrison and Ward, 2001; Cox and Ward, 2002). Some studies demonstrated that coral calcification rate is reduced by high levels of phosphate in the water, subsequently reducing coral growth (Yamazato, 1970).

Recent work argues that elevated nutrients may not be as significant a cause of coral reef degradation as previously believed (Szmant, 2002). Land runoff has a high nutrient content but also has a low salinity and may contain land-based pollutants. This makes it difficult to distinguish the cause of poor coral reef growth in areas affected by land runoff because low salinity and pollution also affect reef health. Studies that model the effects of elevated nutrients on coral reef community structure fail to take into account the effects of herbivores. Over-fishing herbivorous fish may reduce fish grazing on algae and may be the real reason for the overgrowth of algae, rather than nutrient enrichment, although

this is not likely the case in Rarotonga where ciguatera and marine protected areas limit fishing. Furthermore, laboratory studies done to examine the effects of elevated nutrients on calcification used nutrient concentrations in their treatments that were much higher than would be encountered naturally in the field (Szmant, 2002). These studies were also performed over a short time and so they failed to determine the long term effects of nutrient enrichment. One study found that elevated nutrient levels in artificial conditions actually facilitated coral growth in the long term when the water was supersaturated with carbon dioxide and the pH was low (Szmant, 2002).

While this recent work reveals some inconsistencies in the research on the effects of elevated nutrients on coral reefs it also leaves many unanswered questions. Further research is needed to determine whether nutrient enrichment might in fact have a positive effect on coral reefs. Despite the contrasting conclusions within the literature regarding nutrient enrichment and coral reefs, this study will focus on nutrient enrichment because this may be a contributing factor to two of the most important changes on Rarotonga's reef: crown of thorns starfish and ciguatera fish poisoning outbreaks.

Crown of thorns starfish outbreaks have been correlated with terrestrial runoff of nutrient-rich water after periods of wet weather (Birkeland, 1982). Nutrients increase the number of phytoplankton in the water and phytoplankton are believed to be an important food source for crown of thorns starfish larvae (Birkeland and Lucas, 1990). The theory is that the survival of larvae is improved when their food supply is increased, resulting in an infestation by a greater number of adult starfish. However this argument has been

contested by some (Moran, 1986). Several studies have been done to measure the importance of nutrient enrichment on the feeding and survival of crown of thorns starfish larvae (Hoegh-Guldberg, 1994; Okaji et al, 1997; Babcock and Mundy, 1993), but no firm conclusions have been drawn about whether the growth and development of larvae are determined by food availability in the field (Okaji et al, 1997).

Ciguatera may also be exacerbated by nutrient enrichment. Ciguatera fish poisoning outbreaks often follow natural (e.g., cyclone) or human-induced damage to reefs (WHO, 1981; Ruff, 1989, Juranovic and Park, 1991). It is believed that the increase in dead coral provides more surface area for algae to grow (Lehane, 1999). The most well known cause of ciguatera, the dinoflagellate *Gambierdiscus toxicus*, requires algae for its habitat (Lehane, 1999). Furthermore, populations of *Gambierdiscus toxicus* have been shown to increase in response to increased rainfall (Lehane, 1999). This increase may be due to several factors, but *Gambierdiscus toxicus* populations were positively correlated with all nutrient parameters measured in another study (Lehane, 1999).

Sewage not only adds nutrients to the lagoon and reef ecosystem, but if not treated properly, sewage may also present a public health threat. Consumption of seafood contaminated with inadequately treated sewage can result in disease such as typhoid, cholera, amoebic dysentery, hepatitis A and poliomyelitis (Connell and Hawker, 1991:196). There are currently no known outbreaks of these diseases in Rarotonga. Nutrient-rich effluent from both untreated and treated sewage waste may also stimulate ciguatera fish poisoning and other toxic algae blooms which are public health issues.

Therefore, nutrient enrichment may be an important factor in the health of Rarotonga's coral reef. Since sedimentation facilitates the flow of land-based nutrients into the lagoon and reef, nutrient enrichment and sedimentation will be the focus of this study.

1.2.2 The Environmental Problem and Structural Adjustment

With economic development and debt crises in developing countries, environmental problems have multiplied (Watts, 2000:45). Structural adjustment programs aim to stimulate economic development by improving the balance of trade in developing countries (Peet and Hartwick, 1999:56; Redclift, 1995). These programs involve the reduction in government spending, contractions in the money supply, decreasing consumption and encouragement of investment, stimulation of exports and reduction of imports, devaluation of the currency, increasing income taxes, market liberalization and privatization (Peet and Hartwick, 1999:56). The environmental impact of structural adjustment policies has concerned many (Knowler, 2001) largely because the policies lacked consideration of environmental consequences (Redclift, 1995). Much work has been done to examine the effects of structural adjustment on the environment (Reed, 1992; Munasinghe, 1996; Redclift, 1995).

The Cook Islands underwent a structural adjustment program in the late 1990's after the government declared a financial crisis because it could not meet its financial commitments to the end of the 1995/1996 financial year. The crisis arose largely because

of financial mismanagement including mismanagement of Cook Islands currency reserves. This led to a relatively high external debt of NZ$161 million (US$112 million) or just over 108% percent of GDP that year (Vainerere, 1996c). A significant part of that debt was the multi-million dollar Italian bank loan for the unfinished Italian-Cook Islands hotel development. To worsen matters, a 16.4 percent decline in tourist arrivals in 1995 had reduced government revenues (ADB, 2001:3). Holidaymakers had cancelled their bookings to the Cook Islands and travelled to other regions when in 1995 dengue fever broke out in Rarotonga and the French resumed nuclear testing in neighbouring French Polynesia. The appreciation of the New Zealand dollar, the currency used in the Cook Islands, is also likely to have reduced tourist arrivals (ADB, 2001:3).

In response to this financial crisis, the Asian Development Bank and consultants for the New Zealand government advised the Cook Islands government to undergo an economic reform program. The program focused on private sector-led development, a reduction in government spending and encouragement of foreign investment. Consequently, some state owned enterprises were privatised, the public service was radically downsized, the Development Investment Board was empowered to streamline foreign investment and policies were adopted to facilitate investment in the key growth areas of tourism, agriculture and marine resources (ADB, 2001:29). The Public Expenditure Review Committee and Audit (PERCA) was established in an attempt to increase accountability.

The downsizing of the public service had a substantial impact on Cook Islands society economically, politically and even demographically. The government first called for

voluntary redundancies and retirements which became effective in July 1996. This was followed by forced redundancies in August and September. The public service was eventually reduced by over 50 percent within two years. Many of those that were made redundant were given six months salary and advised to go into private business. Some heeded this advice and took advantage of the small business training offered by the temporarily established 'Transition Service.' Most used their option as New Zealand passport holders to migrate to New Zealand and Australia in search of seemingly brighter futures. The economy was so poor at this stage that many other Cook Islanders followed suit. The result was a drastic decline in resident population from 18,800 in 1996 to 14,000 in 2001, a reduction of 25 percent (Statistics Office, 2002:4). For the first three years after the redundancies there was little economic growth, but after 1998, economic activity picked up so markedly that businesses began experiencing a major labour shortage (ADB, 2001:4, 42).

Redclift (1995) examined the growing research on the effects of structural adjustment on the environment. He says that the common view of environmental problems in developing countries is that they are caused by either overpopulation or economic policy interventions that don't account for the real environmental costs of development. He suggests that these two analytical approaches are insufficient because human agency is also an important factor. He uses examples from the poverty and the environment thesis to show that factors such as property rights, social relations (including gender) and capital endowments have influence over the decisions poor people make at the household level regarding resource use.

In other studies, a clear link between structural adjustment policies and environmental degradation has been difficult to make (Knowler, 2001:71). This study will examine whether these policies exacerbated existing environmental problems and whether these policies are appropriate for small island countries like the Cook Islands. Both the human agency and macro-economic analytical approaches will be used in this thesis.

1.2.3 The Political Ecology Approach

Political ecology is an approach used to determine the political factors affecting environmental change. The approach was first developed during the time of radical development geography and cultural ecology in the 1970's (Bryant, 1998:80). Radical geographers attacked the neo-Malthusian viewpoint of environmental deterioration by saying that human over-population is not the only cause of environmental degradation and that technology and over-consumption is also important (Robbins, 2004:8). Radical geographers believed that resource use was undoubtedly affected by politics so they insisted that the political economy be considered during any analysis of environmental degradation.

So called 'third world political ecology' began in the late 1970's and early 1980's. This type of analysis was influenced by neo-Marxist ideas. Environmental degradation was explained using a structuralist argument. This argument is that the overexploitation of natural resources by local producers is a response to forces at the state or international

level. An example of work with this structuralist basis and one origin of the concept of political ecology is Blaikie's *Political Economy of Soil Erosion in Developing Countries* (1985).

Political ecology then began to draw on post-structuralism and discourse theory (Jewitt, 1995, Escobar 1996, Peet and Watts 1996). This approach is concerned with how environmental problems are represented and how concepts like 'indigenous people' are constructed.

Recent work points out that the political ecology approach should not be restricted to the third world but is equally applicable to first world scenarios (McCarthy, 2002). Zimmerer and Bassett (2003) present studies that extend into the urban and industrial settings of the global 'North' and 'South'. One study says that using the divisions 'first world' and 'third world' is just as restrictive and there is a need to apply political ecology at the regional level (Walker, 2003).

Political ecology is an approach that can be used to analyse the environmental effects of politics at different scales (Blaikie and Brookfield, 1987; Zimmerer and Bassett, 2003). Blaikie and Brookfield refer to this aspect of political ecology as 'chains of explanation'. Robbins (2004) demonstrates that in reality, there are networks of explanation about environmental change, rather than chains of explanation. Different groups, each with their own politics, may exist within each level thus forming a web of influence. Zimmerer and Bassett (2003) believe the various scales (e.g., rural-urban, local, national, regional,

international) are not ontologically given but social-environmentally produced. They talk about political ecological processes generating 'scaled spaces of interaction' (Zimmerer and Bassett, 2003:4).

Robbins (2004) outlines four main themes that have been characteristic in political ecology research. These are degradation and marginalization, environmental conflict, conservation and control and environmental identity and social movements. The degradation and marginalization theme uses the structuralist argument that environmental change happens in response to forces beyond the level of local production because local producers are marginalized and forced to degrade the environment to make ends meet. The environmental conflict theme is concerned with access to environmental resources and conflicts over access. The conservation and control theme refers to state or environmental initiatives to take control over resources in the name of conservation and subsequently remove control normally held by local producers. Finally the environmental identity and social movements theme refers to movements that arise to counter powerful global political and economic forces (Robbins, 2004).

Robbins (2004) argues that 'environmental degradation' is in itself a political term. He says the question of why an environment has changed should also be accompanied by the questions: "How are the terms of change defined and by whom?" (Robbins, 2004). The clearance of forest for agriculture may be viewed as degradation from the perspective of forest conservationists, but this forest may itself have been produced by people through careful planting and cultivation of trees (Robbins, 2004:88). Also, because the

biodiversity and environment of an area changes over geological time according to climatic fluctuations and geological processes, it is difficult to define what the 'natural state' is. The political forces behind science used to determine the natural or degraded have been highlighted in other work which argues that science is inherently driven by politics (Forsythe, 2003).

Rather than talking about the 'degradation of nature', Robbins suggests talking about the 'production of nature'. He believes all nature is produced by both human and non-human processes and by using this concept we can eliminate the political inferences made by using the term 'degradation'. He therefore recommends that political ecology research include a study to distinguish between human and non-human drivers of environmental change. Robbins also argues that we should move away from a reference to the term 'peasants' to the recognition that everyone involved in resource use are 'producers' both in the first and third worlds alike. His final argument is that there is a need to move from examining chains of influence to networks of influence over production.

One other political ecology study has been done on coral reefs in the Cook Islands (Churcher-Hoffman, 2001). This study examined the effects of changing marine property regimes and the commodification of reef resources on coral reef health (Churcher-Hoffman, 2001). Churcher-Hoffman compared the health of coral reefs in different locations and managed under different property regimes. She concluded that communal/private property regimes were better for coral reef health than open access. She also concluded that the commodification of reef resources degraded coral reefs.

Political ecology in Churcher-Hoffman's study is confined to the local tenure question and does not examine the politics behind national government institutions and decision-making or the influence of politics at the local producer scale.

This study will use the political ecology approach to look at the socio-political forces behind international, national and local groups which affect environmental change in the lagoon and reef of Rarotonga. Two case studies will be examined. The first is environmental change following a hotel development involving the Cook Islands government and a foreign financier: (the unfinished Italian-Cook Islands hotel at Vaima'anga). The second is environmental change related to small-scale tourist accommodation developments in Muri beach (Figure 5).

The treatment of micro-states using the political ecology approach is yet to be examined. Zimmerer and Basset (2003) raise the importance of the scalar dimension of political ecology. In micro-states, the links between the local, national and international levels are very short. Often these levels are overlapping. Also, layers of bureaucracy in micro-states are very thin.

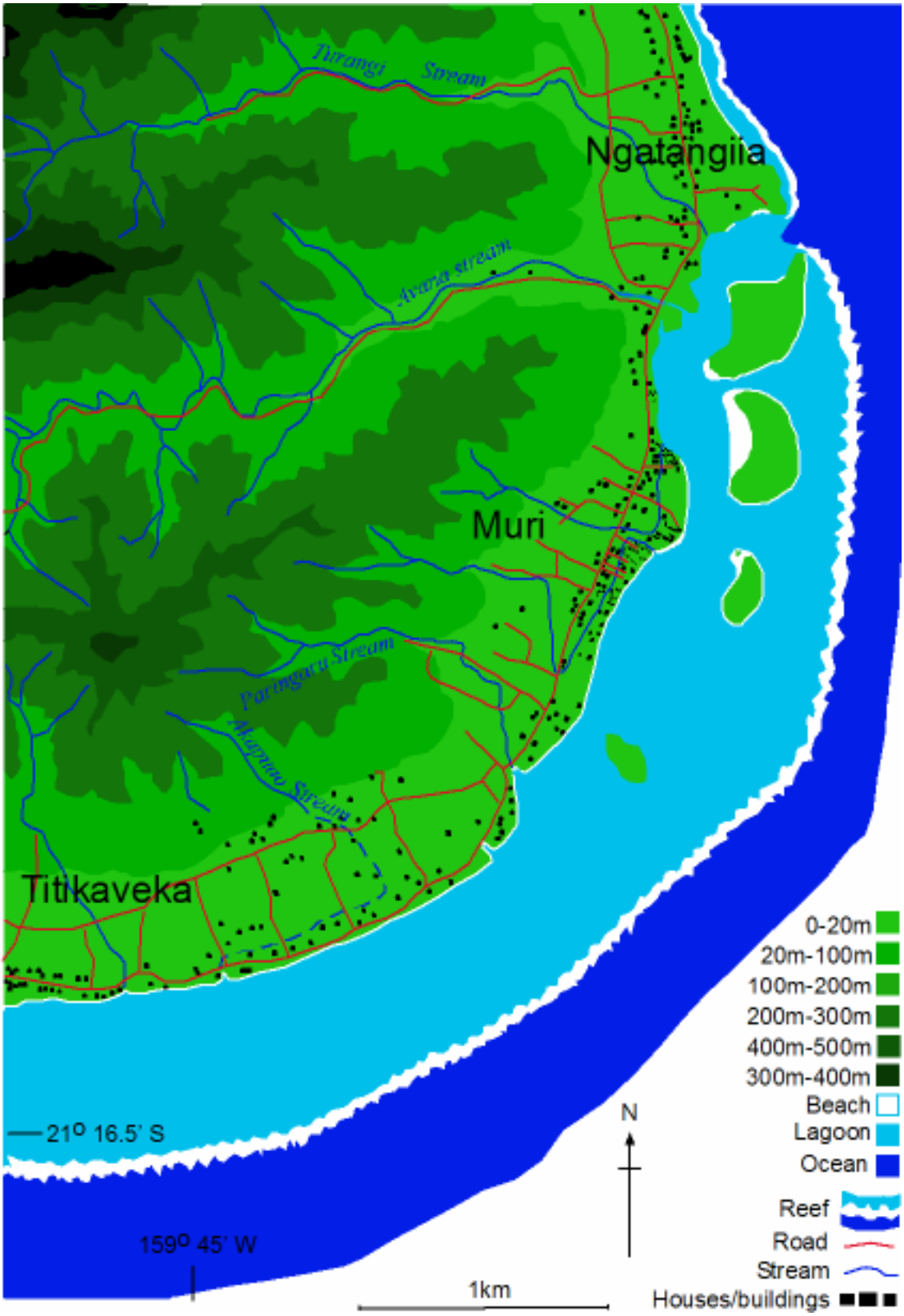

Figure 5: Map of the Muri Study Area

1.3 METHODOLOGY

Information for this study was collected using four methods. These were 1) secondary sources, 2) a questionnaire survey, 3) interviews and 4) data from an unpublished coral lagoon survey done by the author soon after the construction of the Italian-Cook Islands hotel development.

1.3.1 Secondary Sources

A search of newspaper articles was done to find information on the Italian-Cook Islands hotel development as well as perceptions of the community regarding this development, the deterioration of the coastal environment and other relevant issues. Three hundred news articles were reviewed about the Italian-Cook Islands development and 118 articles were reviewed about other relevant topics. I also studied government reports that I thought would give some information regarding policies for addressing the nutrient enrichment issue, tourism development policies and guidelines for building construction and law enforcement. Relevant laws were also reviewed.

One flaw with using the Cook Islands News database was that it did not pick up all the information I wanted. One article on ciguatera fish poisoning and its causes written in 1992 was not picked up when searching for articles using the keyword ‘ciguatera’. Furthermore, as I reviewed the articles about the Italian-Cook Islands hotel development

I noticed that some appeared to be missing. Whilst it is impressive that the local daily newspaper even has archival information on a searchable database, the database still needs fine tuning, as the owner and manager acknowledged.

1.3.2 Questionnaire

A four page questionnaire (Appendix) was given to 25 people in the community adjacent to Muri beach, a beach located on the south-eastern side of Rarotonga. For the most part, I sat with interviewees and went through the questionnaire with them. For two interviewees who were busy, I left the questionnaire for them to complete at a more convenient time. A total of 25 questionnaires were distributed and 23 were returned, representing three percent of the Muri population of 727. All respondents had to be over 30 years of age in order to give their impressions about Muri lagoon 15 years ago.

During the questionnaire survey, respondents were asked to mark on a scale of one to ten how polluted Muri lagoon is now, how polluted it was five years ago and how polluted it was 15 years ago, with 1 being not polluted at all and 10 being extremely polluted. Because this was a subjective assessment, I didn't use individual scores of pollution when analysing results because one person's "eight" may be another person's "five". Instead, I looked at the difference in scale between each person's assessment for the present and five years ago or 15 years ago respectively. For example, John Doe may have given eight for the level of pollution in Muri now, and then he may have given a five for the level of pollution five years ago. Therefore, he believes that Muri has become polluted by a level

of three (8-5=3) over the last five years. In this way, I can compare results between different individuals.

1.3.3 Interviews

I interviewed government officials, tourist accommodators and people who live or work in the Muri community. I interviewed 36 people, 25 of whom were formal interviews with the other eleven being informal conversations. Twelve of the people interviewed had completed a questionnaire during the questionnaire survey. Those interviewed included people working in tourist accommodation, shops, tours, school and people who work at home. I believe these people were representative of the kinds of people over the age of 30 living in the Muri community. All in all, 47 adults were consulted for this study, representing seven percent of the total population in Muri.

1.3.4 Coral lagoon survey

Data from an unpublished coral lagoon survey is used to show the impact of the Italian-Cook Islands hotel construction on the adjacent coral lagoon. The survey was done by this author during three periods after the construction of the hotel. These periods were December/January 1992/1993, December/January 1993/1994, and December/January 1994/1995.

1.3.5 Flaws in the Methodology

The coral lagoon survey had a flaw which may have introduced a large degree of error in the data. Firstly, percent live coral cover was taken as a percentage of total substrate rather than a percentage of total coral rock (live or dead). The lagoon floor adjacent to the hotel construction site consists mostly of sand and live/dead coral rock. The inclusion of the sandy substrate when calculating percent live coral cover introduces an error that makes it difficult to see the most likely ratio of live to dead coral cover.

CHAPTER 2. THE CASE OF THE ITALIAN-COOK ISLANDS HOTEL DEVELOPMENT

2.1 INTRODUCTION

Zimmerer and Basset consider the scalar dimension of the political ecology approach an important one (2003). In this chapter, I want to demonstrate how politics and corruption at the national and international scale had an impact on the coral lagoon on Rarotonga. I will use the case study of the Cook Islands government hotel development financed by an Italian bank. This case study will not only demonstrate the effect of politics on the environment but it will also show how politics at different scales affect the Rarotongan coral lagoon. It will also show how human agency and macro-economic policy are intertwined in a micro-state and how thin layers of bureaucracy in a micro-state along with a lack of transparency make the local more vulnerable to the politics of the international.

2.2 THE STORY OF THE ITALIAN-COOK ISLANDS HOTEL DEVELOPMENT

2.2.1 A Poorly Planned Initiative

In 1987 an Italian construction company Sicel SpA, approached the General Manager of the Cook Islands Tourist Authority, the government tourism department, to discuss the construction of an international standard hotel on Rarotonga (Ingram, 1991a). The government at the time was led by Prime Minister Pupuke Robati. After considering a

highly optimistic feasibility study done by Sicel SpA, and without the knowledge of the rest of cabinet, the Minister for Tourism, Mr Norman George, directed the General Manager of the Tourist Authority to sign a building contract in December of 1987 (Commission of Inquiry, 1989:7; Figure 6). This contract gave Sicel SpA the authority to involve the Instituto Nazionale di Credito per il Lavoro Italiano all'Estro (ICLE) bank of Rome as the financiers of a NZ$51.2 million (US$36 million) loan to the Cook Islands government.

It was not until four months after the building contract had been signed that an independent financial feasibility study was done on the project. When the Minister for Tourism presented a cabinet submission for approval of the ICLE bank loan, the Cook Islands cabinet established a Committee of Officials to consider the loan. On the basis of projected occupancy and room rates the committee concluded that the terms of the proposed loan would make hotel income insufficient to meet loan repayments. The Cook Islands government would have to subsidize the hotel by around NZ$0.9 to NZ$7.9 million per year (US$600,000 to US$5.6 million), placing an unacceptable burden on public financial resources (Commission of Inquiry, 1989:18). The committee introduced the idea of a casino to increase income through gaming revenue but found that the hotel would still operate with substantial deficits in most years (Commission of Inquiry, 1989:23). The committee recommended that easier terms be negotiated for the loan. At this stage, except for the Minister for Tourism, cabinet was unaware that a building contract had already been signed (Commission of Inquiry, 1989:14).

Whilst the committee had rightly pointed out the financial burden the ICLE loan would place on the Cook Islands government, it failed to make it clear to cabinet the extent of this burden. The loan was to be negotiated in Deutschmarks presenting a substantial currency exchange risk (Commission of Inquiry, 1989:18). In addition, the Committee overlooked the risk associated with fluctuations in the interest rate (Commission of Inquiry, 1989:19). A number of scenarios should have been outlined to quantify this risk (Commission of Inquiry, 1989:19). Cabinet was not sufficiently alerted to the stakes involved in the Italian loan.

Because of this ignorance and likely pressure from Sicel SpA through the Minister of Tourism, the Robati government signed a loan contract with the ICLE bank in July 1988 for NZ$51.2 million (US$36 million) at an interest rate of 4.5 percent (Commission of Inquiry, 1989:24). The total national budget for that year was NZ$57 million (US$40 million) (Treasury Department, 1988). At the time of the first drawdown of funds, the interest rate had increased to six percent (Commission of Inquiry, 1989:20). The loan was the largest in Cook Islands history and was the most risky because it would be responsible for 100 percent financing of the hotel (Commission of Inquiry, 1989:37).

The hotel was so poorly planned the proposed location changed three times (Commission of Inquiry, 1989:4, 15, 25). Two proposals involved high rise buildings making the hotel the first building on Rarotonga to be taller than three floors. The last proposal lacked

1987	1988	1989	1990
Italian construction company Sicel SpA approaches Cook Islands government (under Prime Minister Pupuke Robati) and offers to construct a hotel in Rarotonga. Minister of Tourism and Tourism General Manager sign contract with Sicel SpA to build a four-star 200 room hotel	Cook Islands government signs loan contract with ICLE bank of Rome for 51.57 million Deutschmarks (US$32 million) 7 million Deutschmarks (US$4.38 million) is drawn down by Sicel SpA from ICLE National Budget: NZ$57 million (US$40 million)	Robati government defeated by Henry government in general elections 2 million Deutschmarks (US$1.25 million) is drawn down by Sicel SpA from ICLE	Cook Islands Government (under Prime Minister Sir Geoffrey Henry) establishes hotel owning company ECIL 23 million Deutschmarks (US$14.39 million) is drawn down by Sicel SpA from ICLE Sicel SpA begins work Italian court puts Sicel SpA into 'controlled administration' and workers go back to Italy

1991	1992	1993	1994
CI Government signs second building contract with Italian building company Stephany SpA CI Government requests another NZ$20 million (US$14 million) loan from ICLE Stephany SpA begins work	First coral lagoon survey	Second coral lagoon survey Italian mafia roundup Apparent loan insurer SACE freezes loan payments to ECIL Stephany SpA walks off the job and returns to Italy claiming non-payment of wages from ECIL	Third coral lagoon survey Total public debt is now NZ$81 million (US56.7 million)

Figure 6: Timeline for Events Relating to the Italian-Cook Islands Hotel Development

detail regarding what the hotel would look like and how it would be constructed. This made it difficult to determine the true cost of the hotel (Commission of Inquiry, 1989:4-5).

The possibility of pressure from the Minister of Tourism and the building contractors for government to sign the bank loan contract should not be ignored. The Minister and Sicel had already signed a building contract and Sicel was eager to secure financing.

2.2.2 A New Government

Before construction could even begin, the Robati government was replaced with a new government during the 1989 general elections. With Prime Minister Geoffrey Henry at its helm, the new government established a Commission of Inquiry into the project. The terms of reference for the inquiry were firstly, to identify the commitments the previous government had already made and secondly, to advise on likely financial, legal and other implications if alternative courses of action were to be pursued (Commission of Inquiry, 1989:1).

The Commission of Inquiry was not successful in determining the government's commitments saying that expertise in public administrative law, building contract law and Italian law (the binding law for the contracts) was needed to do an adequate investigation (Commission of Inquiry, 1989:8-9). Apparently none of this expertise was available on island. The inquiry did find that in order for the government to break the

contracts, legislation would need to be passed in parliament to avoid litigation. It recommended that this option be pursued only after all other courses of action had been explored and other creditors to the country consulted. The inquiry raised the issue of international credibility and the susceptibility of overseas assets to seizure if this course of action was chosen (Commission of Inquiry, 1989:52).

Despite finding that the project was not financially viable, the Prime Minister visited Italy, met with the developers and chose to proceed. Seven million New Zealand dollars had already been drawn down from the Italian bank during the time of the previous administration so the new Henry government said they were obliged to continue so they could generate income to repay the loan. The Prime Minister said his government did not want to be known,

> *"as a banana republic...or just a third world country which borrows millions of dollars from the World Bank and not pay its debts*." (Browne, 1990a)

The new government also developed a new, two-storey, multi-block design for the hotel, which admittedly made the hotel more harmonious with the surrounding environment compared with the earlier multi-storey designs. The government needed a larger piece of land for the new design and after landowners opposed a proposal to situate the hotel in Muri, the state secured a ten acre block of land in Vaima'anga on the southern side of the island (Plate V; Browne, 1990a). This land belongs to a high chief but had been leased to a grower who agreed to sell the lease. The 200-room, four-star hotel, with an artificial lagoon would be done on a turnkey basis for a fixed price of 51,570,000 Deutschmarks

(US$33 million; Anonymous, 1990a). A turnkey basis means the construction contractor would be responsible for providing goods and services from the beginning of construction to the end when it would hand over the hotel to the owner complete with furnishings right down to linen, soap, and cutlery, ready for opening.

A government hotel-owning company, Essington Cook Islands Ltd (ECIL) was established and tasked with monitoring the performance of the contractors. Preparation of the groundwork for construction began in May 1990 and a completion date was set for November 1991 (Sword, 1990). The Sheraton hotel management group was contracted to operate the hotel once it was complete (Browne, 1990b).

Early in the project, in response to rumours that the hotel would include a casino, the public protested strongly to the inclusion. They also expressed concern that the government did not have an equity partner secured for the project (Browne, 1990b). Tax-payers would therefore be accountable for 100 percent of the loan. The Prime Minister reassured them at a meeting in May 1990 that his government was searching for an equity partner and there would be no casino (Browne, 1990b). He would later make reference to the possibility of a casino saying that ‘it would help’ with paying back the loan (Browne, 1990c). An equity partner was never obtained for the project.

2.2.3 Building Contractor Sicel SpA Goes Into Receivership

In June of 1990, only a month after construction began, it became apparent in Italy that the construction company Sicel SpA was having financial difficulties. The Italian courts put it into "controlled administration", a situation reportedly similar to receivership except the Board of Directors still have a say in how the company is run (Bailey, 1990a; Bailey, 1990b). By October of 1990, Sicel employees in Rarotonga had stopped work and had left for Italy. ECIL served the company a notice for breach of contract (Bailey, 1990c).

The loan contract allowed the money from the ICLE bank to be drawn down directly to Sicel SpA (Vainerere, 1996a). Also according to the loan contract, Sicel was not to be paid upon work completed, but upon proof of shipment of materials from Italy (Ingram, 1991b). By November of 1990 the Cook Islands government announced that NZ$30 million (US$21 million) had been drawn down from the Italian bank with very little to show for it at the construction site (Anonymous, 1990b; Bailey, 1990a; Cook Islands News, 1990). Materials Sicel claimed they had shipped from Italy never arrived on Rarotonga. Prime Minister Henry said during a press conference later,

> *"...this was where the agreement went wrong, the materials for the hotel were paid for, but we did not receive anything."*
> (Anonymous, 1992)

Much of this money should have been spent on buildings, plant equipment and materials but the only things left at the construction site was a construction workers camp, odd

pieces of equipment and a large hole in the ground. The government filed a lawsuit against Sicel for losses (Anonymous, 1992). Bosses in the Italian company were arrested 16 months later for fraudulent bankruptcy (Brown, 1993a).

2.2.4 A Second Building Contract: Stephany SpA

This was not the end of the Cook Islands' disastrous experience with the hotel. ECIL negotiated a second building contract to finish the project. Under the original loan with the ICLE Bank of Rome, the bank had all rights to select the building contractor and subsequently chose Stephany SpA, another Italian construction company (Bailey, 1990d). Prime Minister Henry announced the hotel would now be smaller with 176 rooms and 13 suites and that the artificial lagoon would be reduced in size (Sword, 1991). Still, another NZ$20 million (US$14 million) would be required to complete the hotel so the government asked for an additional loan from the ICLE Bank of Rome (Sword, 1991).

Stephany contractors arrived in Rarotonga to begin construction in July of 1991. But in May 1993, only three months before the hotel was due to open, an Italian insurance company, SACE SpA, insurer of the ICLE bank loan, froze further payments to the Cook Islands government hotel-owning company, ECIL. Six SACE employees had been arrested during the 1993 Italian mafia roundup (Brown, 1993a). The ECIL Chairman and Member of Parliament Vincent Ingram described the problem as 'bureaucratic paralysis':

> *"The actual funds from our financing bank to complete the hotel are available to us, subject to the Italian `para-statal' insurance*

> *corporation, SACE, continuing to guarantee the loan. SACE's problem is that its Director-General, Sig. Roberto Ruberti, has been arrested, and the previous Board is under investigation. The resultant ethos, therefore, is to do nothing, approve nothing, remain blameless*." (Ingram, 1993)

Ingram's reference to SACE as the guarantor of the loan was later found to be untrue. The Cook Islands government was actually the guarantor of the loan (Vainerere, 1996b). It is uncertain how SACE successfully assumed their mandate to freeze loan payments.

With the freeze on payments from the ICLE bank, ECIL had no funds to pay the contractors. Subsequently, in June 1993, Stephany SpA walked off the job. Returning to Italy, they left an empty ghost town of a construction site marked by shells of hotel blocks and left a small country, just 28 years independent, with its first major debt of NZ$81 million (US$57 million) (Dreaver, 1994a; AFP, 1998; NZPA, 1996) (Plate V).

Plate V: The Unopened Four-star Italian-Cook Islands Hotel Development (photo courtesy of Cook Islands News).

Four years later, after the government was unable to pay the landowner the NZ$75,000 (US$53,000) it owed in rent, the landowner claimed back the land and everything on it (Williams, 1998). The landowner, a traditional paramount chief, has since held talks with many investors and has had difficulty making a sale, though recently an investor has suggested raising funds to finish the hotel by selling each unit using newly enacted unit title legislation. Despite this the hotel still stands unfinished as it was in 1993.

2.2.5 The Curse

The hotel development has had so many problems associated with it that some locals believe the site is cursed by the ancestors of the landowner (Anonymous, 1993). Besides the country losing millions of dollars over the project, which would later bring the nation to the greatest economic crisis in its history, several other incidents happened that shocked the peaceful, South Pacific nation. The landowner, a paramount chief, died of natural causes a few days after informing other chiefs that the land had been leased out for the hotel project. Later, in 1991, an employee of the hotel construction project was found murdered outside a nightclub in Rarotonga. A person who was at the nightclub that evening told the daily newspaper,

> *"It's a shame that something like this has happened on our little island. It's something you'd only see on a video."* (Bailey, 1991)

Following this, a construction worker working for Stephany SpA was arrested for four counts of first degree murder in Florida, after a 20 month manhunt by the FBI (Dreaver,

1992a). In 1993 a wave of organised crime arrests in Italy brought more than 2000 Italians under investigation including three former prime ministers, members of parliament, government officials and business people (Brown, 1993b). As a result, most of the business people from the ICLE bank and SACE, the insurance company were either jailed or under investigation (Vainerere, 1996a). Four years after leaving Rarotonga, the area manager for Sicel SpA was murdered in Vanuatu. His badly beaten body was found in his truck which was dumped at the bottom of a 300 meter hill in Port Vila. Australian Federal Police investigators and Vanuatu Police said his murder was well-planned and methods used to kill him pointed to the involvement of foreigners (Sword, 1994). Despite both government and the landowner holding talks with a multitude of investors, some of whom were later arrested for various crimes, the hotel has so far never been sold.

2.3 The Effect of the Hotel Construction on the Coastal Environment

From the early inception of the project to well after construction had begun no Environmental Impact Assessment (EIA) was done for the Italian-Cook Islands hotel. Only after Stephany was well into the construction phase was a consultant from Fiji contracted to do an EIA. The study revealed several environmental concerns. The intention to use an alternative to the already stretched town water supply was found to be 'clearly wishful thinking' (Watling, 1991:12). For the artificial saltwater lagoons, about 4,250 cubic metres of sand would be required to line the 3.5 acres of lagoon but there was no source on Rarotonga (Watling, 1991:11). Because of existing coastal erosion and its

poor general appearance, the foreshore at the site of the hotel was described as being a 'one star beach for a four star hotel' (Watling, 1991:11). Plans to introduce over 75 percent of the plants used for landscaping purposes were a cause for concern regarding the potential for the introduction of pests. Some of the plants on the preliminary list were temperate species and would not even survive the environment on Rarotonga (Watling, 1991:14). The EIA report noted significant socio-cultural concerns but said these were now moot because construction had already commenced (Watling, 1991:8).

Of particular concern was soil erosion and runoff at the construction site. Before work began, contractors discovered that the land was unsuitable for construction. In many areas there was a 30cm layer of ground water a metre below the ground (Bailey, 1990e). Consequently, builders had to remove 30,000 cubic metres of topsoil from the site to make a hole 1.5metres deep (Bailey, 1990e). They then excavated a quarry in the foothills behind the site and used the material as fill (Watling, 1991:16). The plan was to dig 15,000 cubic metres from the side of this hill (Anonymous, 1990c). The EIA report referred to this action as an 'afterthought' and was critical of the way that the borrow pit was selected and managed (Watling, 1991:16).

The EIA report lead to an impasse between the Conservation Service (now Environment Service) which had commissioned the EIA and the Prime Minister together with ECIL. The Conservation Service said a full EIA could not be completed because not all the plans were made available to the consultant who wrote the report (Hatcher, 1991a). A United Nations Food and Agricultural Organisation legal officer remarked,

> *"It is a development unlike any other development that I have ever seen. There were no guides, no plans, no diagrams, no drawings that I could see attached to the EIA.*" (Hatcher, 1991b).

The Prime Minister responded

> *"…at the time the report was written true enough there were no developmental drawings from which anyone could make specific comments about whether it's being constructed the right way or not."* (Dreaver, 1992b)

He then said that the Conservation Service could apparently '*now get the details of these matters*' (Dreaver, 1992b) but not without criticizing the Director of the Conservation Service for proposing that a '*24 or 36 member committee*' be set up to look at the EIA. The Director corrected the Prime Minister saying that he recommended three committees of 3 or 4 people each be established. The Prime Minister also condemned the Director for not being present at the construction site to ensure minimal environmental impact and for making a public statement contrary to government's position. He threatened the Director's job. Referring to the Director, the Prime Minister said,

> "*…That is what the Hon. Vincent Ingram meant when he described him as a brave but foolish public servant – now whether the Public Service Commissioner decides to take action that is something that he has to decide.*" (Dreaver, 1992b).

The severity of the soil erosion and runoff problem was described by a writer to the editor of the daily news paper,

> *"How many others have noticed how muddy the lagoon is in front of the Sheraton during and after any rain? If you look at the dirt quarry in the hills directly behind the hotel, you see massive*

erosion. When it is raining, the mud flows by the tonne into the stream and from there to the beach and lagoon.' (Anonymous, 1994a)."

2.4 CORAL LAGOON SURVEY DATA

I saw direct evidence of soil runoff during coral lagoon surveys after the construction phase of the project. This section presents data related to this observation as well as data on live coral cover in an attempt to demonstrate the impact of the Italian-Cook Islands hotel development on the coral lagoon in Vaima'anga.

Eight line transects were laid perpendicular to the beach at two sites (Figure 7). Site one is located down-current of the construction site and site two is located up-current. During

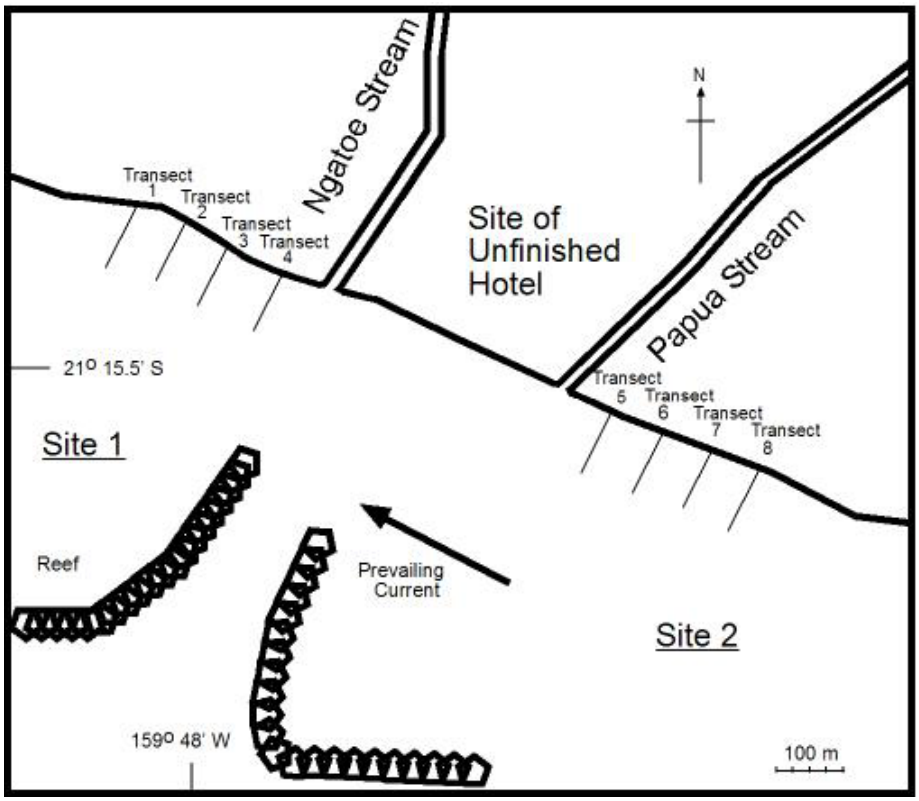

Figure 7: Map of the Coral Lagoon Survey Site Showing the Position of Line Transects

the first survey in December/January 1992/1993, I took photos showing the exact locations of each transect. During each, one metre squared quadrants with subdivisions of $10cm^2$ were placed every five metres along each line transect and substrate type and the percentage of live coral recorded. The lagoon depth averaged around 1 metre at high tide.

The nature of the substrate was recorded for each survey and the results for the inner lagoon area at site 1 are shown in Table 1. The data show soil to be present in quadrants during the survey in December of 1994 and January of 1995. Volcanic pebble also increased over time. The characteristic substrate on the lagoon bottom is coral sand. Volcanic pebbles originate from land so a change in lagoon substrate from coral sand to volcanic pebbles shows that the area is affected by land runoff and sedimentation.

Table 2 presents data on live coral cover for the inner lagoon of site 1. The figures represent the percentage of substrate that consists of live coral. As shown in the previous table, much of the substrate in the lagoon adjacent to the hotel site is naturally sand and coral rock. Transect 4 is located closest to the Ngatoe stream and the prevailing current in the lagoon moves in a westerly direction from transect 4 to transect 1. Consequently, any runoff will affect transect 4 most and transect 1 least.

The percentage of live coral on each transect has declined over time. This is likely to be a consequence of the soil runoff entering the lagoon from the Ngatoe stream located up-current of the site.

Table 1: Substrate Type in the Inner Lagoon on the Western Side of the Hotel Site (site 1) During Three Consecutive Surveys in Dec 1992-Jan 1993, Dec 1993-Jan 1994, Dec 1994-Jan 1995.

Distance from beach (metres)	1992/93 Survey				1993/94 Survey			1994/95 Survey			
	Transect 1	Transect 2	Transect 3	Transect 4	Transect 2	Transect 3	Transect 4	Transect 1	Transect 2	Transect 3	Transect 4
5	S/R*	S/R	S/R	VP/S*	VP/S	S	VP/S	S/R	VP/S	VP/S	VP/S/SOIL*
10	S/R	S/R	S/R	VP/S	VP/S	S	VP/S	S/R	VP/S	VP/S	VP/S/SOIL
15	S/R	S/R	S/R	VP/S	VP/S	S	VP/S	S/R	VP/S/SOIL	VP/S	VP/S/SOIL
20	S/R	S/R	S/R	VP/S	VP/S	S	VP/S	S/R	VP/S/SOIL	VP/S	VP/S/SOIL
25	S/R	S/R	S/R	VP/S	VP/S	VP	VP/S	S/R	VP/S/SOIL	VP/S	VP/S/SOIL
30	S/R	S/R	S/R	VP/S	VP/S	VP/S	VP/S	S/R	VP/S/SOIL	VP/S	VP/S/SOIL
35	S/R	S/R	S/R	VP/S	VP/S	VP/S	VP/S	S/R	VP/S/SOIL	VP/S	VP/S/SOIL
40	S/R	S/R	S/R	VP/S	VP/S/R	VP/S	VP/S	S/R	VP/S/SOIL	VP/S	VP/S/SOIL
45	S/R	S/R	S/R	VP/S	VP/S	VP/S	VP/S	S/R	S/R/SOIL	VP/S	VP/S/SOIL
50	S/R	S/R	S/R	VP/S	VP/S/R	VP/S	VP/S	S/R	S/R/SOIL	VP/S	VP/S/SOIL
55	S/R	S/R	S/R	VP/S	S/R	VP/S	VP/S	S/R	S/R	VP/S	VP/S/SOIL
60	S/R	S/R	S/R	VP/S	S	VP/S	VP/S	S/R	S/R	VP/S	VP/S/SOIL/R

*S=coral sand, R=coral rock, VP=volcanic pebbles, SOIL=soil from land. Transect 1 was not surveyed during the Dec 1993-Jan 1994 survey.

Table 2: Percent Live Coral Cover on Each Transect in the Inner Lagoon on the Western Side of the Hotel Site (site 1) during three Consecutive Surveys in Dec 1992-Jan 1993, Dec 1993-Jan 1994, Dec 1994-Jan 1995.

Survey Period	Transect 1	Transect 2	Transect 3	Transect 4
Dec 92-Jan 93	2.25	1.58	0.67	0.08
Dec 93-Jan 94	No data*	0.50	0.08	0.00
Dec 94-Jan 95	1.33	0.33	0.00	0.00

*Transect 1 was not surveyed during the Dec 1993-Jan 1994 survey.

The percentage of live coral cover on each transect at site 2 for each survey period is presented in Table 3. Site 2 is the control site and it was expected that this site would not undergo as significant a change as site 1. In comparison with site 1, percent live coral cover at site 2 remains relatively the same.

Table 3: Percent Live Coral Cover on each Transect in the Inner Lagoon on the Eastern Side of the Hotel Site (site 2) during three Consecutive Surveys in Dec 1992-Jan 1993, Dec 1993-Jan 1994, Dec 1994-Jan 1995.

Survey Period	Transect 5	Transect 6	Transect 7	Transect 8
Dec 92-Jan 93	0.00	0.50	2.67	1.25
Dec 93-Jan 94	0.00	0.42	1.75	1.92
Dec 94-Jan 95	0.00	0.08	4.83	1.58

The seriousness of proceeding with a development project without an EIA is clearly demonstrated by the Italian-Cook Islands hotel project. If an EIA had preceded the construction phase of the project, the groundwater issue could have been identified and an alternative construction site or alternative hotel design selected. An EIA would also outline how to minimise environmental impacts when excavating fill. The lesson learnt from this environmental disaster was made clear when the government subsequently incorporated EIA into new environmental legislation (Rarotonga Environment Act 1994-95).

2.5 Political Factors Affecting the Italian-Cook Islands Hotel Development

The key point of this chapter is that this project was begun without consideration of the environmental, social or economic impact because its inception was based on the political motive of personal gain. In fact, the nature of the development extends from the political realm into the criminal realm. The project, feigned as a development venture that would bring income to Cook Islanders and boost the local economy, was actually a money laundering exercise for the Italian mafia. Both Cook Islands governments under Prime Ministers Robati and Henry were romanced into participating through expensive trips to Italy and at least one well funded side agreement. The signing of the original building contract as directed by the Minister for Tourism under the previous government forced the Cook Islands into a poorly planned commitment that had long term consequences for the coastal environment. In addition to the lack of an EIA, there was no study to determine what the market wanted, no assessment of the local available work-force, no social impact assessment, an inadequate due diligence check on Italian contractors, a lack of alternative consultation on financial feasibility and insufficient legal advice on the loan contract. The execution of the loan contract appeared to commence with barely any consideration of these factors at all. The large sum of money involved and the Commission of Inquiry's conclusion that the government may become party to fraud by the ICLE bank raises suspicion as to the true motives behind dealings with the Italians.

The Robati government claims they were genuinely pursuing a development project to provide an income for many Cook Islanders, but any sincere intention to foster such a

project for this purpose would have required a much more extensive evaluation of the contractors, the terms and conditions of the contract, the commercial viability of the project as well as the environmental impact.

Under the subsequent Henry government, construction of the hotel proceeded without a timely Environmental Impact Assessment or any serious involvement of environmental expertise to assist ECIL with the planning and monitoring of the project. The consultant contracted to do the EIA did not have building plans made available to him and the environmental regulatory body (Conservation Service) was not well prepared for monitoring the hotel construction. The resulting conflict between the state developer (ECIL) and the Conservation Service is typical of development projects that fail to integrate EIA in the planning process.

Considering the findings of the 1989 Commission of Inquiry, it was unwise for the Henry government to go ahead with the project but there is no doubt that certain officials in that government fared well out of dealings with the Italians. In November of 1993 Cook Islands police said they were investigating a report of stolen files from the ECIL office. The information in those files later turned up in a book released by the opposition party entitled '*The Book of Shame*'. Inside was evidence of extravagant spending including NZ$35,203.11 (US$25,000) in three months by the ECIL Chairman for food, travel and accommodation (Dreaver, 1994b). *The Book of Shame* also showed evidence of a side agreement for Stephany SpA to pay ECIL 7.7 million Deutschmarks (US$4.82 million) once they were awarded the building contract (Dreaver, 1994b). The ECIL chairman later

said that 5.9 million Deutschmarks (US$3.69 million) was to pay for work, equipment and facilities which Stephany would inherit on site and 1.9 million Deutschmarks (US$1.2 million) was to cover ECIL's costs (Anonymous, 1994b). A complete audited account of ECIL's expenditure dated from the time of its establishment has never eventuated.

The examination of criminal activities and their effect on the environment suggest a new kind of political ecology approach – one that has developed from the study of political factors that cause environmental change to the study of criminal factors that affect the environment. The changes observed in the coral lagoon are the product of criminal activity. Fraudulent bankruptcy, money laundering and corruption in this environmental story turn the political ecology analysis into a *criminal ecology* analysis.

2.6 The Vulnerability of a Micro-State

The thin layers of bureaucracy in a micro-state combined with a lack of transparency, accountability and due process make it vulnerable to politics and even crime at the international and national levels. The Cook Islands commitment to the Italian-Cook Islands hotel development was made through a single Member of Parliament upon the signing of a building contract. The country's commitment to a NZ$51.2 million (US$36 million) bank loan was discussed and made by Cabinet, a group of no more than nine Members of Parliament. In the current world of globalization, time-space compression for a micro-state means increased vulnerability.

The criminal activities reviewed in this chapter left the Cook Islands state in unprecedented debt by 1994, as shown in Figure 6, and with an environmental debacle that all could see at the hotel site. The consequences of these twin crises were an initial concern for environmental protection but also a period of fiscal structural adjustment in 1996-97 that immediately weakened environmental regulation in favour of shoreline construction. The vulnerability of the micro-state was to widen further in attempts to repay the public debt, the subject of the next chapter.

CHAPTER 3. THE CASE OF TOURIST ACCOMMODATION DEVELOPMENT IN MURI: STRUCTURAL ADJUSTMENT AND EVIDENCE OF ENVIRONMENTAL CHANGE

3.1 INTRODUCTION

The debt incurred by the Cook Islands in the early 1990's had to be paid by its near pristine environment in the subsequent decade. This chapter examines macroeconomic policies that sought economic growth through increased tourism while the same policies curtailed environmental oversight. The chapter first examines structural adjustment and the expansion of tourism, the largest source of revenues in the Cook Islands economy. The chapter then examines environmental change in Muri lagoon (Figure 5), the location of a large number of tourist bungalows. The scene shifts to Muri lagoon because this is where the economic and environmental repercussions of the failed hotel project have been felt most dramatically.

I have gathered information for this chapter through my own interviews with tourist accommodators, my questionnaire survey, and through other studies of environmental change in the lagoon. The question of the social factors that curtail Cook Islanders' ability to protect the environment, even while cognizant of the environmental degradation, will be the subject of Chapter 4.

3.2 Tourist Accommodation Development and Structural Adjustment

Structural adjustment programs implemented by institutions such as the World Bank lean towards the neo-liberal economic model (Peet and Hartwick, 1999). As mentioned in Chapter 1, these programs usually involve the following remedies to improve the balance of trade: reduce government spending, contract the money supply, decrease consumption and encourage investment, stimulate exports and reduce imports, devalue the currency, increase income taxes and establish market liberalization and privatization (Peet and Hartwick, 1999:56).

When the Cook Islands government faced financial crisis in 1996 they turned to aid donors and money lenders to help them out of the desperate situation they found themselves in, The national debt was NZ$186 million (US$130 million), including NZ$161 million (US$112 million) in overseas debt and NZ$113 million (US$79 million) from the Italian-Cook Islands hotel loan (Vainerere, 1996c). The Cook Islands Prime Minister Sir Geoffrey Henry travelled to Fiji with two private sector representatives, the Secretary of the Ministry of Finance and the Public Service Commissioner to meet with donors and money lenders. The Asian Development Bank chaired the meeting and the Cook Islands were directed to implement economic reforms. The reforms included several neo-liberal policies including reducing government spending by over 50%, encouraging foreign investment, tax reform and privatising state owned enterprises (ADB, 2001). Later the Cook Islands government was told by a representative of ADB

that if it does not continue with the reform program, much needed funds to develop its infrastructure would be withdrawn (Vainerere, 1996d). The representative said:

> *"If the conditions are not met, the next transfer will not be made available and that will be a difficult thing for Sir Geoffrey to tell his people,"* (Vainerere, 1996d)

The desperate situation the Cook Islands government found itself in meant that money lenders had the upper hand in discussions about economic reform. The governments relationship with the Asian Development Bank sometimes bordered on subservience. When the Prime Minister made a speech about the financial crisis he was locally criticized for "fudging on crucial cost-cutting issues" (Vainerere, 1996c). He responded to the criticism by saying that the ADB had congratulated him on his speech implying that ADB endorsement was more worthy than local opinion (Vainerere, 1996c).

The neo-liberal economic model was developed by economists and development specialists from outside of the Cook Islands. Previous work has drawn attention to the political nature of prescribing neo-liberal development policies to developing countries (Peck, 2001). Peck examined the political-economic context in which structural adjustment policies were formulated and showed how the macro context was "dominated by neo-liberal conviction politics" (Peck, 2001). Politics at the international scale may consequently be an ingredient of environmental change in structurally adjusted countries.

This section is an attempt to find a correlation between the Cook Islands structural adjustment program and tourist accommodation development to see if structural

adjustment influenced the growth in tourist accommodation in the Muri area. I would subsequently be able to draw an inference that politics at an international scale had some influence over tourist accommodation development in Muri and possibly over environmental change. First I will attempt to find a temporal correlation and then I will use information taken from interviews to determine whether the structural adjustment program had any influence over each developer's motivation to build tourist accommodation.

Tourist accommodation development in the Muri area has been growing steadily since I frequented the area in the late 1980's (Figures 8 and 9). There are now fourteen tourist accommodation establishments along the beach in the Muri area (Table 4). Table 4 and Figures 8 and 9 show data for tourist accommodation on the beach side of the main road between Avana Stream and Parengaru Stream only. There are two establishments on the mountain side of the main road. The capacity of tourist accommodation is presented in terms of the maximum number of visitors the establishment can accommodate. Accommodators say that the occupancy rate is usually between 75 and 85 percent, although for some establishments the occupancy rate is higher at times because some accommodators indicated that there was overflow and increased demand (Interview #15, #17, #14, #36). This occurred during what was described by one accommodator as a 'boom' period between 1999 and 2003 (Interview #36). The increase in the growth rate of the number of establishments and extensions between 2000 and 2004 reflect this boom period (Figure 8).

While there have been small growth spurts in the number of establishment/extensions in 1997 and 2001 the overall growth rate actually increased at around 1994 (Figure 8). Therefore, the rapid growth in tourist accommodation began before the reforms in 1996-97. Figure 10 presents a timeline of the growth in tourist accommodation development in Muri village, changes in environmental legislation and macro-economic interventions (including debts from the Italian-Cook Islands hotel and other factors that contributed to the 1996 financial crisis).

In terms of the change in capacity of tourist accommodation on the beach at Muri, the greatest increase was in 1989 when the Pacific Resort was built (Figure 9). There were also smaller growth spurts in 1994 and 2000. The capacity of tourist accommodation on the beach side at Muri between Avana Stream and Parengaru Stream has increased from 52 visitors in 1985 to 574 in 2004 (Figure 9; Plate VI)

An accommodation worker said one accommodator turned her focus to the tourist accommodation business after she was made redundant during the economic reforms in 1996 (Interview #16). She said another person in the community could also see how profitable that business was so she decided to go into it as well (Interview #16). Another accommodator less than half a mile along the beach said he decided to go into the tourist accommodation business because he saw others doing it,

> *"Everyone else was building so I thought 'why shouldn't we do that too?' We have the land and a beautiful location*" (Interview #14).

Another accommodator who moved from New Zealand to build units in 2001 said whilst she had always intended to move back to Rarotonga, it was a relative in the industry that had convinced her to get into the accommodation business (Interview #27).

Table 4: Capacity of Tourist Accommodation on the Beach Side at Muri before and after the Economic Reform Program in 1996-97

Name of tourist accommodation	Year first built (and capacity in maximum number of visitors per day)	Year of extension (and additional capacity in maximum number of visitors per day)	Final Total capacity (maximum number of visitors per day)
Pre-1997 and 1997			
Aroko Bungalows	1993 (15)	1997 (18)	33
Sokala Villas	1992 (28)	2004 (14*)	14
Pacific Resort	1989 (196)	1998 (26)	222
Muri Beachcomber	1985 (52)	1997 (6) 2001 (2)	60
Vara's Beach House	1994 (24)	2000 (34) 2001 (16)	74
Shangri-La Beach Cottages	1997 (4)	1999 (6) 2001 (2) 2003 (6) 2004 (6)	24
Are Mango	1994 (33)		33
Taakoka Island Villas	1994 (6)	Yet to open (30)	6
Total capacity in 1997:		**382**	
Post-1997 (after the economic reforms)			
Kura's Kabanas	2001 (8)	2003 (12)	20
Manea Beach	2000 (40)		40
Areiti Beach Units	2003 (8)		8
Tina Lamberts	2003 (8)		8
Muri Beach Hideaway	2001 (6)	2004 (4)	10
Tiana's Bungalows	2000 (8)	2003 (8) 2004 (6)	22
Total capacity in 2004:			**574**

*Sokala Villas have reduced the capacity of their rooms by catering only to couples beginning in 2004

In another interview, an accommodator chose to go into the business because she could see the demand:

> *"Tourists were looking for places to stay so I thought, why not build a couple of units in the back of my section – because they like the beach and I had a good location. I may build more because there are still people coming and I have to turn them away."* (Interview #34)

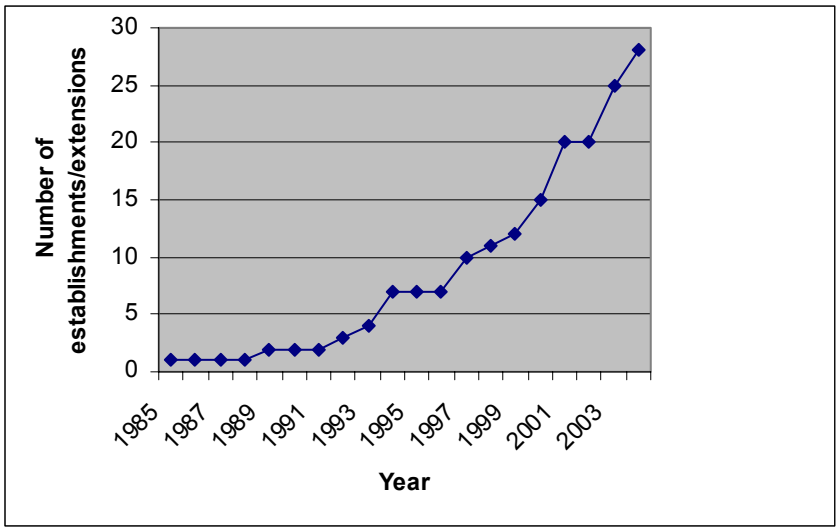

Figure 8: Number of Tourist Accommodation Establishments or Extensions to Existing Establishments on the Beach Side at Muri.

After 1989, the change in the growth rate of tourist accommodation development happened at around 1994 well before the structural adjustment program of 1996-97. It appears that the early proliferation of tourist accommodation in Muri happened independently of the economic reforms. When each accommodator was interviewed to determine why they decided to enter the tourist accommodation business, it was found that the economic reforms did not have a direct influence in most cases. However, one accommodator went into the business as a direct result of the reforms and others chose to enter the business because they saw the demand for accommodation and they had the land to cater for it.

The demand for accommodation may have been stimulated by the maturation of the Cook Islands in the marketplace but governments renewed focus on tourism development during the economic reforms undoubtedly had a significant influence. Its commitment to business-led development improved business confidence so that more people became

entrepreneurs particularly in the area of tourist accommodation. Indeed, an owner of one of the backpackers accommodation properties gave this as her reason for expanding her business but complained that the government was not meeting its end of the commitment by providing the infrastructure needed for this growth (Interview # 17). Air New Zealand supported the growth in business with an increase in flight services to Rarotonga (Figure 11). Therefore it's likely that the structural adjustment program had an indirect influence over the growth in tourist accommodation on the beach side at Muri in later years.

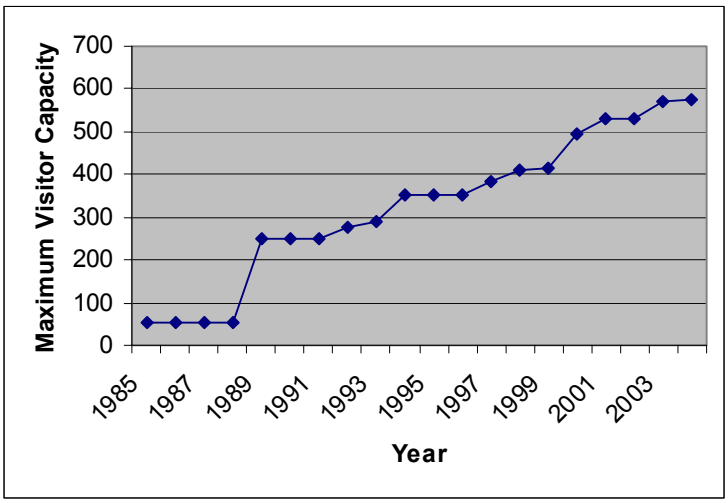

Figure 9: Change in the capacity of tourist accommodation by year on the beach side at Muri

Plate VI: An example of a tourist accommodation unit in Muri.

Year	1987	1988	1989	1990	1991	1992	1993	1994	1995
Tourist accommodation capacity on the beach side in Muri village	52	52	248	248	248	276	291	354	354
Macro-economic interventions/ debts from Italian-Cook Islands Hotel in Vaima'anga village	Government signs contract with Sicel SpA to build a four-star 200 room hotel	51.57 million Deutschmark loan (US$32 million) from ICLE. National budget: NZ$57 milion (US$40 million)			CI Government requests another NZ$20 million (US$14 million) loan from ICLE		Apparent loan insurer SACE freezes payments to ECIL. Hotel unfinished.	Total Public Debt is now NZ$81 million (US$56.7 million)	French resume nuclear testing in French Polynesia Dengue Fever outbreak in Rarotonga Flights to Rarotonga decrease. Visitor arrivals fall by 16.4%
Changes in environmental legislation									EIA introduced in 1994-95 Rarotonga Environment Act
Year	1996	1997	1998	1999	2000	2001	2002	2003	2004
Tourist accommodation capacity on the beach side in Muri village	354	382	408	414	496	530	530	572	574
Macro-economic interventions	Financial crisis. Debt at NZ$186 miillion (US$130 million). Begin Economic Reforms	Environment Service staff reduced from 21 to 7 Economic Reforms End							
Changes in environmental legislation								Members of Parliament on Environment Authority in 2003 Environment Act	

Figure 10: Timeline for tourist accommodation development in Muri village, macro-economic interventions/debts, and changes in environmental legislation

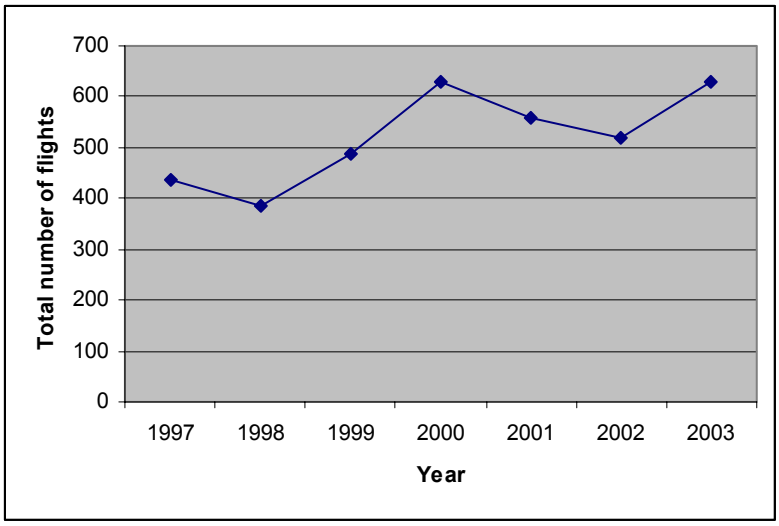

Figure 11: Total number of flights per year to the Cook Islands 1997-2003

3.3 Environmental Regulation under Structural Adjustment

Before the structural adjustment program which began in 1996, the Asian Development Bank recommended in 1995 that a sewage treatment facility be developed to serve the Muri area (Barrett Consulting Group, 1995). A treatment design and loan proposal was developed and these were presented to the government but the project was not approved. The government could not commit the country to another loan in light of the financial crisis that was to arise in 1996.

The structural adjustment program had a catastrophic effect on the government department responsible for environmental protection, the Environment Service. This department fared poorly during the economic reforms. I was an employee of the Service at the time. As part of the public service downsizing process, the staff was reduced by two thirds in 1996, from 21 to seven. Except for the Environmental Impact Assessment

(EIA) program, all other programs were eliminated including environmental education and awareness, wildlife management, coral reef monitoring and the conservation of traditionally important plant species and horticultural practices.

In 1996 and 1997, a team of financial consultants from New Zealand was dedicated to the newly established Ministry of Finance and Economic Management (MFEM). Existing staff at MFEM were motivated through working with their New Zealand consultant counterparts. MFEM was a buzz of activity. In contrast, the young Environment Service staffs of seven were moved from our newly built office to a dilapidated house out of town. Several of the computers and the fax machine were transferred to other departments. The Environment Service was without a phone line for some time and staff did not receive any professional counterparts to help make sense of our new role as EIA enforcement officers (although some funding assistance was provided for a consultant to develop EIA guidelines). There was also a considerable reduction in leadership because for some months in 1996 the Environment Service was without a Director.

Therefore, the structural adjustment program had a considerable negative impact on the government environment department and also likely stimulated the growth of tourist accommodation in later years. Perhaps the greatest setback for the Environment Service was cutting the research and education projects and transforming it into a law enforcement body. The problem with relying on law enforcement in the Cook Islands will be examined in Chapter 4.

3.4 Empirical Evidence of Environmental Change in Muri Lagoon

In order to shed some empirical light on my own observations of environmental change in Muri lagoon, I sought other researchers' studies to get some measurable evidence of change. Here I present the findings of a historical physical geography study at Muri lagoon. I also examine studies relevant to nutrient enrichment in Muri lagoon including nutrient analyses of water samples by Skinner (forthcoming) and ongoing research to identify a possible toxic algae bloom. I end this section with observations of wetland reclamation since wetlands are excellent sinks for land-based nutrients, helping to filter nutrients out of surface water before they reach the lagoon.

3.4.1 Siltation and erosion

A problem that may be aggravating lagoon pollution in Muri is the gradual siltation of Muri lagoon resulting in a significant decline in lagoon depth over the years. Consequently, an even smaller volume of water is held in the lagoon particularly at low tide and this may be concentrating pollutants in the water.

A report written by a visiting consultant in 1980 suggests that the decline in lagoon depth has occurred over a period of 80 years (Kirk, 1980:2). Two reasons were given for this decline. Firstly, the reef passage at Ngatangiia harbour, which is the outlet for water flowing through Muri lagoon, has filled with sand and gravel (Figure 12).

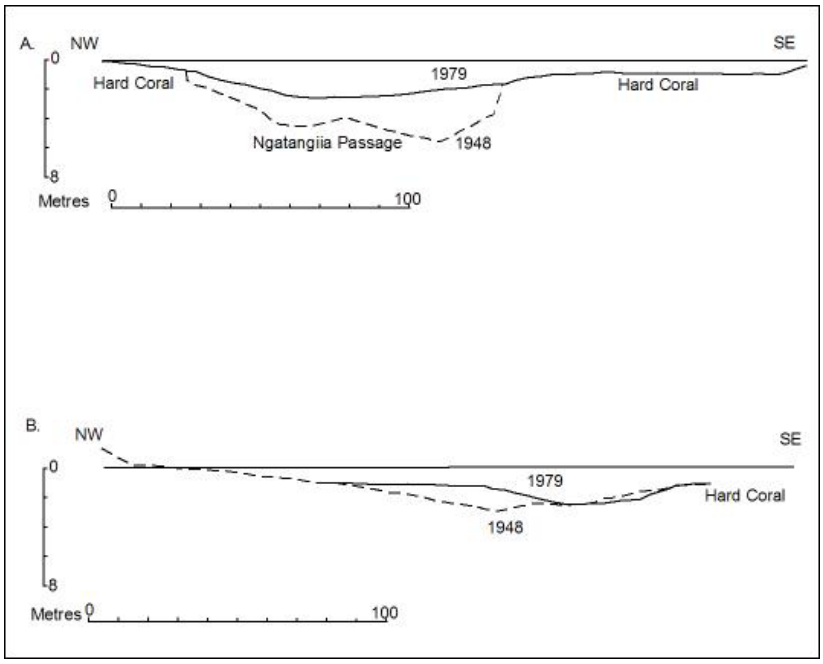

Figure 12: Cross sections of Ngatangiia harbour in 1979 and 1948 (Reproduced from Kirk, 1980). Locations of the sections are shown in Figure 13.

Much of the material that has accumulated at the reef passage is volcanic gravels. Kirk proposed that the gravels found their way down Avana river after being dislodged from the land during agricultural activity and house construction. The filling of Ngatangiia passage has caused a 'dam-effect' which has slowed flushing of Muri lagoon and hindered the transportation of coral sand out of the system (Kirk, 1980:5). The normal flow of the sand would be in a northerly direction as shown by the current patterns depicted in Figure 13.

A second reason given for the siltation of Muri lagoon was the growth of a delta at the mouth of Avana river. A comparison was made between aerial photographs taken in 1955 and 1979 (Figure 14). According to Kirk, the growth of the delta has hindered flushing of the lagoon. Kirk says the delta is the result of soil runoff from land and a change in the

course of Avana River in response to flooding. The new position of the river outlet further constricted the flow of water from Muri lagoon[1] (Kirk 1980:18).

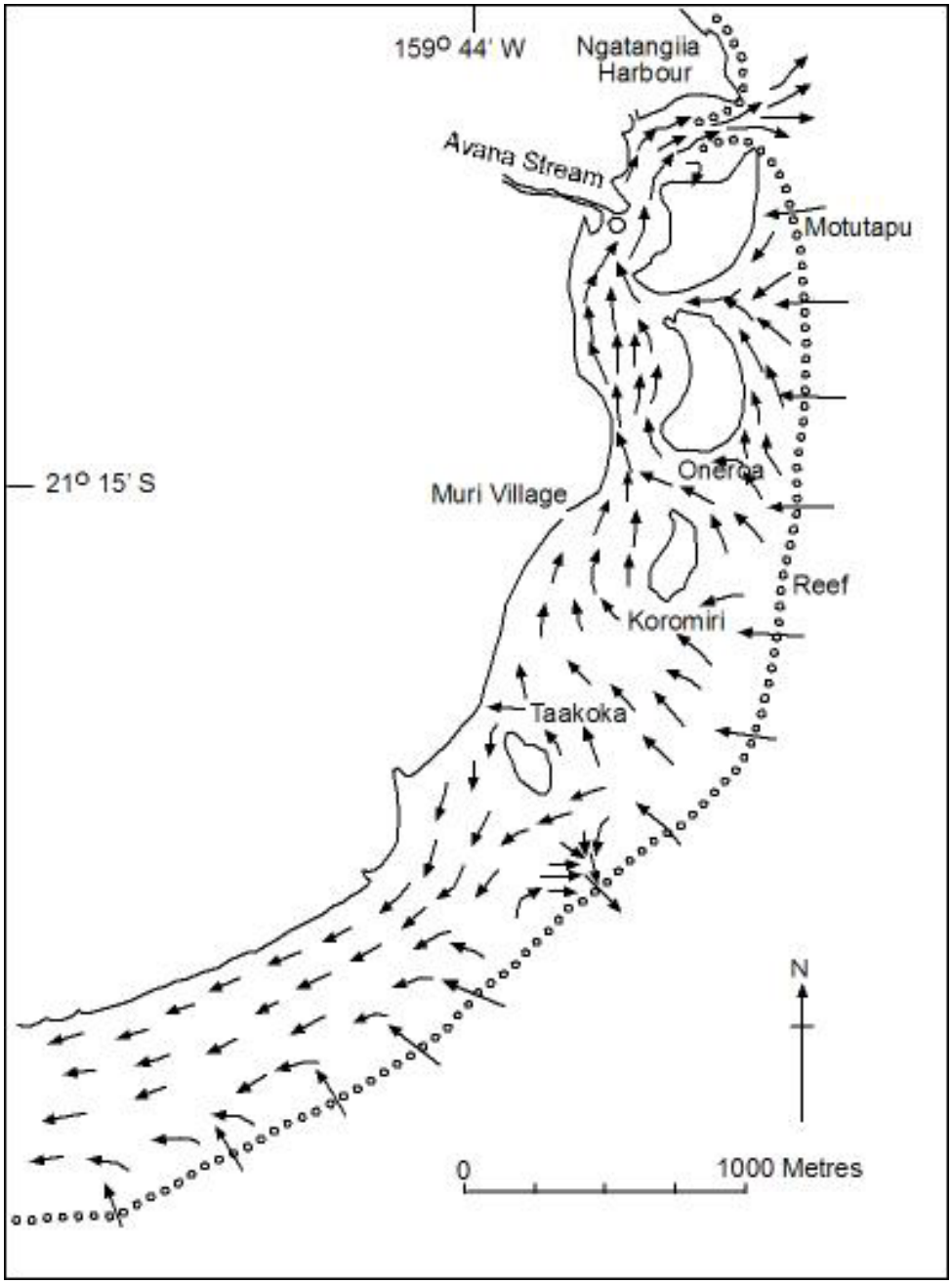

Figure 13: Current directions in Muri lagoon. Water comes in over the reef and most moves in a Northerly direction and out Ngatangiia passage (Reproduced from Kirk, 1980).

[1]For the record, it's important to note that contrary to popular belief, Kirk found that the V-shaped fish traps leeward of Motutapu and Oneroa islets do not heed the flow of water from Muri lagoon, except at a very small and local scale. Kirk does not recommend the removal of these historical fish traps.

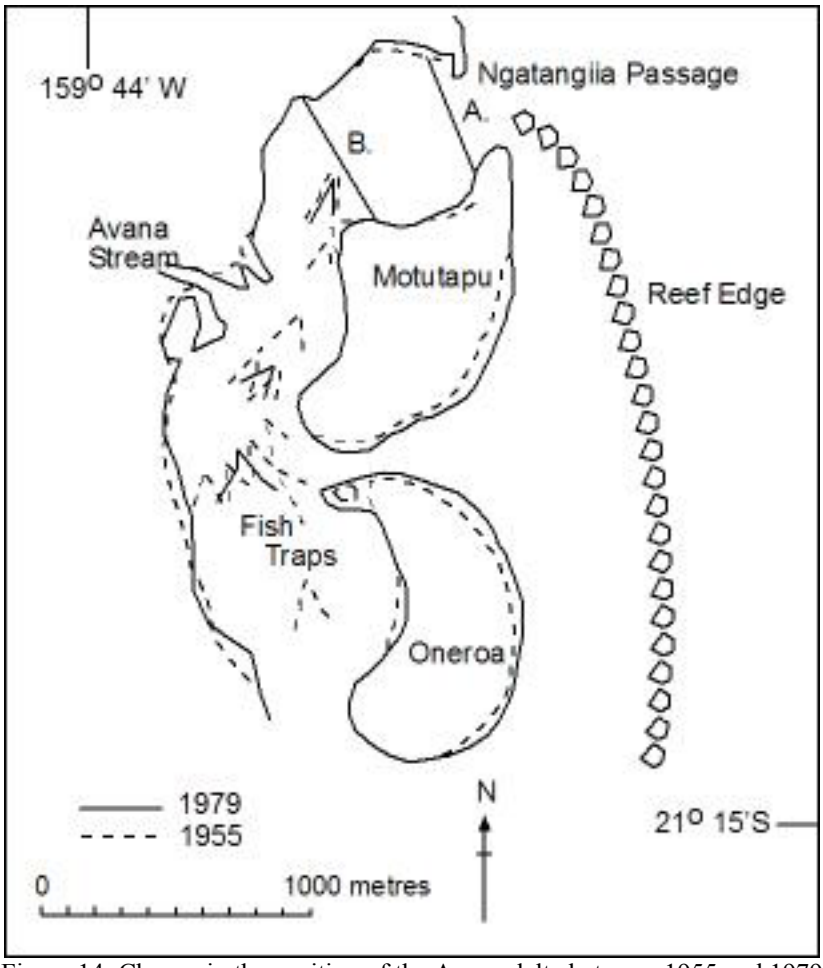

Figure 14: Change in the position of the Avana delta between 1955 and 1979

As the flow of water was hindered by the filling of Ngatangiia passage and the growth of Avana delta, current velocity in the lagoon also declined. This had two effects. Pollutants from agricultural activity that might enter the lagoon are kept there for longer periods and have a detrimental effect on marine life, including sand-producing organisms (Kirk 1980:17). Also, the onshore movement of sand is reduced (Kirk 1980:24). These two factors combined with the practice of sand-mining, a common activity during the 1970's, have resulted in severe coastal erosion (Plate VII).

Plate VII: Coastal erosion at Muri Beach

Today, pollution from horticulture should be less significant because horticulture has declined in the last couple of decades (Mataio and Syed, 1993). Also, a vigorous campaign initiated by the government Conservation Service during the 1980's has stopped sand mining. Therefore, we would expect beach erosion to have slowed down but this has not happened.

This may be because the Avana delta continues to restrict the flow of water from Muri lagoon, reducing the current velocity and inhibiting the onshore movement of sand. This may particularly be the case because parts of the delta that were once inter-tidal have been reclaimed for the Maire Nui festival in 1992. In addition, the gradual siltation of Muri lagoon is causing the water to become shallow and may be raising the average temperature so that most organisms cannot inhabit the lagoon.

There is another factor that may be causing beach erosion. Sea level monitoring at Avarua harbour on the northern side of the island has shown that the sea has risen at a rate of 2-3mm each year since records began in 1974 (Utanga, 2004). This is an overall increase of 6-9 cm over 30 years which though seemingly small, is a significant change on a sloping beach. It's possible that this rise is the result of climate change but it has also been proposed that the island of Rarotonga is still sinking since its creation 2 million years ago (Utanga, 2004). Sea level has not been monitored at Muri beach.

Therefore, siltation of the lagoon and coastal erosion are significant environmental problems at Muri. These processes are relevant to the current study because they result in a decline in lagoon depth and subsequent concentration of pollutants and rise in water temperature, thereby reducing the quality of the water in the lagoon.

3.4.2 Toxic algae

Between November 2003 and May 2004, people on the southern side of the island complained of symptoms such as skin rashes, itchiness, sore throats, running noses, asthma attacks, shortness of breath and conjunctivitis-like symptoms such as redness and burning in the eyes. A visiting World Health Organization consultant suggested that these symptoms were the result of a toxic dinoflagellate bloom in the lagoon. The consultant said that on windy days, this dinoflagellate, likely to contain brevetoxins, is probably blown to shore and affects people on land. Suspicions that the illnesses were caused by agricultural pesticides washed from newly deposited soil in on a nearby school field were

allayed when tests came up with no conclusive evidence. The Ministry of Marine Resources has been sending water samples to New Zealand for testing. To date, tests have not identified the cause of the health problems. Other investigations have pointed to the possibility that the syndrome was caused by a toxic cyanobacteria bloom observed at the time (Evans, 2004). A bloom of *Ulva flexuosa*[2] was observed in Titikaveka lagoon during the research period of this thesis in February-March 2004 (Plate VIII). This is not the cause of the health problems described above but is an indication of nutrient enrichment in the lagoon.

Plate VIII: Bloom of *Ulva flexuosa* in Titikaveka lagoon. This is an indication of nutrient enrichment in the lagoon.

Ciguatera, also caused by dinoflagellates, is a problem in Rarotonga and has been studied by the Ministry of Marine Resources (Raumea, 1998). Ciguatera dinoflagellate blooms may be triggered by nutrient enrichment. Ciguatera has particularly been a problem in the

[2] This algae was pressed and sent to Dr. Antoine N'Yeurt, algae biologist at the University of French Polynesia for identification.

Tikioki area of Rarotonga, south of Muri, where Akapu'ao stream contains effluent from pig farms (Plate IV).

3.4.3 Nutrient levels

Recent data collected by Skinner (forthcoming) on nutrient levels in Muri lagoon are presented in Figures 15 and 16. A map of the location of sampling sites is displayed in Figure 17. The standard for total nitrogen and total phosphorus for healthy coral reefs according to Goreaux and Thacker (1994) is 0.014 ppm N and 0.003 ppm P.

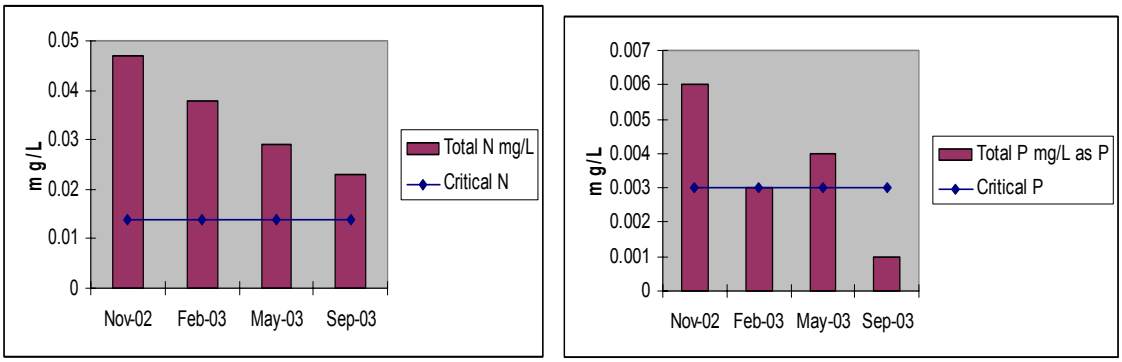

Figure 15: Total nitrogen (mg/L) and phosphorus (mg/L) compared with the critical nitrogen and phosphorus levels (ppm) for coral reefs (Goreaux and Thacker, 1994) at inner Muri lagoon (MI) on four different sampling dates. Data are from Skinner (forthcoming).

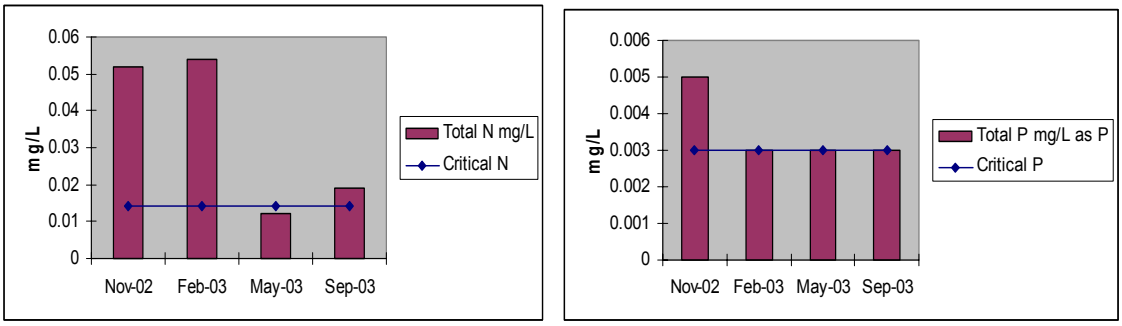

Figure 16: Total nitrogen (mg/L) and phosphorus (mg/L) compared with the critical nitrogen and phosphorus levels (ppm) for coral reefs (Goreaux and Thacker, 1994) at outer Muri lagoon (MO) on four different sampling dates. Data are from Skinner (forthcoming).

Total nitrogen levels at both sites exceed the maximum standard except for the May 2003 sampling date in the outer Muri lagoon. Total phosphorus levels in the inner lagoon exceed the maximum standard on two sampling dates. Total phosphorus levels are normal for the most part in the outer lagoon where there is more flushing and any runoff from the land is more diluted.

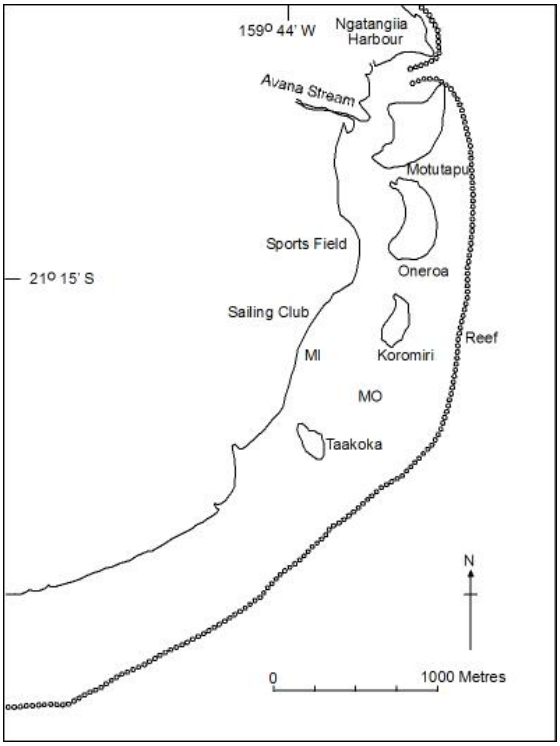

Figure 17: Location of sampling stations for nutrient analysis. MO is the outer Muri lagoon site and MI is the inner Muri lagoon site.

3.4.4 Reclamation of wetlands

One issue of concern to the government Environment Service is the reclamation of wetlands (Interview #20). With the growth in tourism and its associated economic benefits in the accommodation industry, more taro swamps have been reclaimed to allow for the construction of tourist accommodation (Plate IX). Water is redirected through

channels that empty directly into the lagoon (Plate X). When the taro swamps were actively cultivated, the plants would take up much of the nutrients gathered from the watershed. Now that the water has been redirected through channels, these nutrients go directly into the lagoon to feed marine algae.

3.5 Perceptions of Environmental Change in Muri

While I have made my own observations of environmental change in Muri, I have also gathered the observations and opinions of others. This section presents the results of a questionnaire survey and interviews with those people who live and work in the area. I made sure that all of these people were at least 30 years of age and have lived or worked in Muri at least 15 years so that I could record observations of change over a relatively extended period of time.

3.5.1 Perceptions of pollution

Changes that have been observed in Muri include a bad smell during low tide (Interviews #9, #27), 'green slime' on the sand during low tide (Interview #1, Plate XI), smelly grey sand on the lagoon floor where it was once white (Interview #21, Plate XII), discoloration of beach sand from 'white to brown' (Interview #33, Plate XIII), abundance of seaweed (Interview #1), 'slimy' seaweed (Interview #21), decline in lagoon depth (Interview #6, #21), overheating of the lagoon (Interviews #15, #21, #25, #27), death of invertebrates (Interviews #15, #25) and decline in animal populations (Interviews #10, #11, #15, #24).

Plate IX: Example of a wetland area that has been partially reclaimed using boulders and sand (see rear of photo). This area has been reclaimed for the construction of tourist accommodation. The area in the foreground is some of the remaining taro swamp

Plate X: Water that normally flows through a taro patch where nutrients are taken up by the plants is now redirected to the lagoon through channels like this one. Fewer nutrients are removed from the water this way. They end up in the lagoon instead.

Plate XI: The inter-tidal area of Muri lagoon at low tide showing a green algae film on the lagoon floor.

One person declared seeing 'mud' on the coral in the back-reef between Ta'akoka and Oneroa motu (islets) and past Ta'akoka on the Titikaveka (southern) side (Interview #10). Two people said Muri is only polluted during low tide (Interview #16 and #27) and is clean during other times. One of these respondents said despite the pollution being sporadic, she still won't let her own child swim in Muri lagoon. She was saddened because she used to swim there herself when she was a child around 30 years ago (Interview #16). One person said the grey sand has always been present in Muri, but was deeper before. She said in the 1970's, one would only find grey sand when digging for the bivalve *ka'i* (*Asaphis violescens*) (Interview #21). Through my personal observations I have found that the grey sand has the smell of hydrogen sulphide.

Three respondents said there has not been much change in Muri lagoon (Interview #1, #14, #25) but one of these respondents said the exception is the lagoon gets too hot now and sea cucumbers die (Interview #25).

Plate XII: Grey sand that smells of hydrogen sulphide on the Muri lagoon floor

Plate XIII: Muri beach 'on a bad day' during low tide showing discolouration of sand from white to brown.

The current state of Muri lagoon during low tide was described in the local daily newspaper when the community began raising concerns:

> *"People are swimming lazily around Muri lagoon at low tide. No one says much but the cool, blue, crystal clear water of the*

> *tourism brochures is nowhere to be seen. Instead, the water is warm and soapy. Froth gathers at the water's edge, bubbles slowly popping next to vivid green algae covered rocks*" (Brown, 2001a, Plate XIV)

The froth that gathers at the shoreline is apparently the emulsion of oil from phytoplankton cells and seawater (Okubo, 2004). Wave action breaks up the phytoplankton and mixes the oil from the cells with seawater. The phytoplankton, *Phaeocystis sp.* is apparently a significant contributor to this phenomenon. Therefore, this foam is representative of a phytoplankton bloom possibly caused by high nutrient levels in the lagoon.

Plate XIV: Foam at the water's edge at Muri beach

Looking at data from the questionnaire survey, we can see that most people think that the degree of change in Muri lagoon has been large over the last 15 years. Thirteen people said there has been a change by 4 or more points and ten said there has been a change by 3 or fewer points (Table 5).

Table 5: Degree of change in environmental quality perceived by people in the Muri area who responded to the questionnaire survey

Degree of change since 15 years ago	Number of people saying there has been this degree of change
No change	3
A change by 1	3
A change by 2	1
A change by 3	3
A change by 4	5
A change by 5	5
A change by 6	2
A change by 7	1

Most people thought that the pollution is a recent problem. Of the 17 people who responded to this question, eight said pollution started in 1999 or 2000, one said 1997, five said it started during the late 1980's or early 1990's and three said during the 1960's and 1970's. Thus most people believe pollution began within the last 15 to 20 years.

Of those over age 40 who completed the questionnaire, four said the pollution started within the last 15 years, three said it began during the 1960's and 1970's and three didn't give an answer. Thus slightly more of those who are over 40 generally believe that the pollution started in the last 15 years.

Lastly, tourist accommodation was chosen by more people to be the most important contributor to pollution in Muri lagoon than other sources. Nine respondents believed tourist accommodation was an important contributor, compared with three who said sewage from households was important, three who said fertilizers from agriculture and two who said waste from pig pens was the most important contributor. All other respondents, except two, said they were not able to choose and that all of these were

equally important. Of the final two respondents, one said pollution comes from leaves and debris that are washed into the lagoon and the other gave no response.

3.5.2 Perceptions of Siltation and Coastal Erosion

People in the Muri area have also observed siltation of the lagoon and beach erosion. One person has perceived abnormally high water temperatures during low tide which may be the result of the decline in lagoon depth (Interview #25).

The sediment that is accumulating on the lagoon floor is coral sand. One person in her sixties who has lived in Muri most her life talks about siltation of the lagoon at Muri:

> *"At that time [1975] the lagoon was deep. You couldn't just walk across to the motu [islet]*" (Interview #21)

She also describes how beach erosion has developed over the last 30 years:

> *"You know those ironwood trees along the beach? In those days [1970's] we didn't see the roots. There would be the trees and then the sand starts there and then the water. The high tide doesn't touch the tree at all"* (Interview #21, Plate VII)

Many residents have consequently built sea walls and rock revetments to protect their property (Plate XV). Whilst this protects them from losing their property to the ocean, the installation of volcanic rock on the beach will have long term consequences on the appearance of the beach as the rock weathers and alters the colour of the sand. As the

person interviewed above explains, the rocks also exacerbate coastal erosion (Interview #21)

> *"It's a shame they put the rocks on the beach. The waves hit the rocks and the water goes to the sides where there are no rocks and they take all the sand. The sand goes into the lagoon."*(Interview #21)

Some people I interviewed believe the shallowness of the lagoon is responsible for the recent disappearance of sea cucumbers on the sandy floor of Muri lagoon because the water temperature gets too high during low tide (Interview #15, #25).

Plate XV: Rock revetments at Muri Beach

3.5.3 Perceptions of over-development

Some people believe that Muri has become too commercialised (Interview #16), noisy (Interview #21), over-developed (Interview #18, #24) and overpopulated with tourists (Interview #16, #18, Plate XVI). One person said there are too many septic tanks

(Interview #21) and another said the number of large trees and shade has declined and the air does not smell as good (Interview #24).

In the questionnaire survey, 17 out of 23 people say there is too much tourism development in Muri. Eleven of these people gave a score of 10 meaning they strongly agree there is too much tourism development. Two people said there is no monitoring of development (Questionnaire #8, #14). One said there are no consistent guidelines and no

Plate XVI: Muri beach is said to be overpopulated with tourists. Most respondents in the questionnaire survey believed there was too much tourism development in Muri

government follow-through on environmental impacts (Questionnaire #14) or guidelines should be more strict (Questionnaire #17). Another respondent said the island is so small it can only absorb a limited number of impacts (Questionnaire #23) and another said the area is '*saturated*' already (Questionnaire #19). Two people said Muri is overpopulated (Questionnaire #3, #20). One person said there needs to be '*a moratorium for a while*' (Questionnaire #2). Three others said the infrastructure needs to improve (Questionnaire

#15, #14, #20). One respondent said Rarotonga will end up like Hawai‘i or Tahiti if it develops more (Questionnaire #5).

Six people disagree there is too much tourism development in Muri. One person says there are many empty sections and he sees this as an ‘opportunity’ [for people to generate income] (Questionnaire #6). Four people believe that there could be more development but the government just needs to provide the infrastructure to support it (Questionnaire #1, #6, #13, and #17). One said old septic tanks just need to be replaced (Questionnaire #10). Another respondent said tougher enforcement is a preferred option compared with restricting landowner’s use of their land (Questionnaire #13).

3.5.4 Ciguatera

In recent years there have been a significant number of ciguatera fish poisoning incidents on Rarotonga. Around 200 people are diagnosed with this sickness each year (Statistics Office, 2004). Ciguatera is caused by a toxic microscopic marine organism known as a dinoflagellate. High numbers of this dinoflagellate have been correlated with high nutrient levels in the water (Lehane, 1999). The toxicity of the dinoflagellate is increased by an unknown environmental factor and fish become toxic when they ingest large quantities of toxic dinoflagellates (Lehane, 1999). The toxin affects humans when they eat the fish.

During interviews, one person said he no longer goes fishing in Muri because of increased chances of fish poisoning (Interview #18). In the questionnaire survey, three people said they go fishing but don't fish in Muri because of fish poisoning (Questionnaire #4, #9, #22), two said they no longer fish at all because of the poor health of sea life or fish poisoning (Questionnaire #16, #21). The changes in fishing habits show that not only has ciguatera lead to severe health problems, it has eroded Rarotongan culture as fishing has long been a traditional practice in Rarotonga.

3.6 CONCLUSION

The information gleaned from other studies as well as local community observations indicate that Muri lagoon has undergone significant environmental change. The lagoon has changed physically through the accumulation of land-based sediments, siltation of coral sand and coastal erosion. The reduction in lagoon depth is likely to have accentuated the effects of any pollutants. Nutrient levels are high relative to ideal levels suggested by coral reef ecologists (Goreau and Thacker, 1994). The reclamation of wetlands and the clearing of trees are also likely to have increased nutrient input to the lagoon.

These physical changes are likely to have resulted in an increase in nutrient levels which in turn may stimulate algae blooms. The descriptions of '*slimy seaweed*' and '*abundant seaweed*' given by questionnaire/interview respondents indicate the presence of algae blooms. Ciguatera fish poisoning events are also representative of dinoflagellate blooms.

The reduction in fishing activity because of ciguatera seems to indicate that macro-alga has not increased as a result of over-fishing herbivorous fish. Herbivorous fish such as *Maito* (*Acanthurus sp.*) have been reported to be ciguatoxic (Koroa and Fukofuka, 1994). *Ra'ui*, a traditional ban on the harvesting of resources, were established in the lagoon between February 1998 and February 2000 and have also reduced fishing activity. These *ra'ui* would have allowed herbivore populations such as *Maito* to increase as did most important species of invertebrates (Ponia et al, 1998).

The growth in tourist accommodation has been steady in the last fifteen years. This period coincides with the period of environmental change observed by most of the respondents to the questionnaires and interviews. Most of the respondents believed the environmental change occurred within the last fifteen years, with eight of the respondents saying it occurred in the last five years.

The period of structural adjustment, during 1996 and 1997, did not coincide with the increase in the growth rate of tourist accommodation development but undoubtedly stimulated further growth between the years 1999 and 2004. Many public servants had been made redundant. Aside from tourism, few economic options exist in the Cook Islands where natural resources are so limited. One accommodator decided to go into the tourist accommodation business as a direct result of the economic reforms when she was made redundant. Another said government's renewed focus on business-led development encouraged her to expand her backpacker accommodation business. Others followed suit when they saw the demand for tourist accommodation and the profitability of the

business. Therefore, the debt crisis that resulted from the Italian-Cook Islands hotel development, lead to economic reforms which consequently placed more pressure within the economy to earn foreign revenues through tourism. This emphasis on tourism development combined with weakened environmental management made the Cook Islands environment more vulnerable to change.

My study will now proceed to examine local politics related to tourist accommodation development. In particular, I will focus on the constraints to enforcing environment regulations related to tourist accommodation development and the socio-political factors affecting the enforcement of those regulations.

CHAPTER 4. THE POLITICS OF TOURIST ACCOMMODATION DEVELOPMENT IN MURI

Chapter 2 showed the vulnerability of an island nation to the criminal ecology of abuse by insiders and outsiders. The incomplete hotel is a monument to that vulnerability and the large public debt its legacy. Chapter 3 showed that structural adjustment in the mid 1990's was intended to revive the private economy in order to recoup revenues to repay public debt. Tourism growth almost doubled the number of families providing rooms and the total visitor capacity beside Muri lagoon in the six years from 1998 and 2004. Significant and cumulative environmental change in the lagoon is evident today. Why is it difficult for Cook Islanders to know and act in ways that would better protect the lagoon as a concomitant to tourism growth? This chapter will extend the scalar political analysis to include the local scale using tourist accommodation development in Muri. By using the term 'local' I refer to the politics at the level of the small business entrepreneur, the local government official and the landowner. National government politics affecting the proliferation of tourist accommodation in Muri will also be considered here.

4.1 SEWAGE IN THE LAGOON: SECRECY AND SILENCE

In 2001, government officials sampled Muri lagoon for sewage contamination in response to concerns from the community about the quality of water in the lagoon. The media watched closely and waited for test results. When the tests were completed, the Public Health department would not release the data to the media saying that the tests had *"not been carried out scientifically"* (Brown, 2001a). They went on to say that *"a new*

series of tests would be carried out to see whether the first one was accurate or not" and that these tests would be according to WHO standards (Brown, 2001a).

When the second set of tests was completed a Public Health official would not release the data saying that it was *"incomplete*" or *"of no value*" (Bataillard, 2001). However, during another interview, a different Public Health official said that the results were "*significant enough to warrant a call to action*" (Brown, 2001c). Describing the action taken, the official said,

> *"Initial test figures prompted Health to get on with the job of information gathering, as well as anti-pollutant control measures, including the desludging of septic tanks of accommodation facilities in the area."* (Brown, 2001c)

Two years later in September 2003, the Ministry of Health finally released water quality results when tests showed low levels of faecal coliforms and said that there was '*no cause for alarm*'. Yet when health officials commented on how the water samples were collected, it became clear that there was significant bias in sampling:

> "*Obviously the figures are different after flooding, and we try not to take samples during wet weather. We wait for a week to make sure that the lagoon is flushed by the system*" (Harwood, 2003)

Therefore, it appears that the Public Health department is trying to keep information about sewage pollution from the media. With tourism being the leading industry in the Cook Islands, the public and private sector place great importance on the reputation of the islands overseas. The Cook Islands media has been pressured to 'report responsibly'

because some of the bigger stories tend to be taken up by the media in countries where tourists come from. At one point, during the row between the media and health officials over releasing lagoon water quality test results, health officials said they wouldn't release the results for fear of *'reckless interpretation in the media'* (Brown, 2001c).

According to those in the public and private sector who want to prevent visitor cancellations, something like sewage contamination in the lagoon must be kept under wraps. An exception was the Director of the Tourism Corporation who welcomed transparent water quality test results in 2001 (Brown, 2001d).

In an attempt to bring some urgency to the problem of coastal deterioration, an environmentalist said in 2000 that it was 'crunch time' for a moratorium on tourism development (Brown, 2000). In a letter she later wrote to the daily newspaper, she said,

> *"...I have asked the Chamber of Commerce to approach the Government of the Cook Islands and ask them to not allow such developments as the extension to the Rarotongan (100 rooms) and the completion of the Vaima'anga [Sheraton] Hotel (190 rooms) until we have in place an appropriate waste disposal system. This covers our rubbish and our sewerage.*" (Bosanquet, 2000)

This call for a moratorium reached the media in New Zealand. Later it appeared as if the environmentalist, who was also a tourist accommodator and member of the Chamber of Commerce, faced pressure for voicing her concern.

> *"That New Zealand article was very detrimental to me personally. As you know me and where I come from, it is not to*

> *cause embarrassment but to bring to the attention of the Cook Islands areas that need addressing. For some reason they see me as the 'enemy' which saddens me greatly*" (Brown, 2001a).

Therefore there appears to be pressure not to voice the problem of coastal deterioration in Rarotonga. This pressure stems from fears of an immediate and possibly long term loss of income if tourists planning to visit the Cook Islands hear news reports about the issue and cancel their travel plans.

When people on the southern side of Rarotonga suffered skin rashes, respiratory problems and burning in the eyes suspected to be caused by an aerosolised toxic algae bloom in 2004 (see section 3.3.2), tourist accommodators in the area made a press release that implied the problem was not the result of human activities. A representative said:

> *"We have been told it is a natural phenomenon which can occur anywhere, if climatic and lagoon nutrient conditions happen to be right"* (Govmedia, 2004)

They said that the problem happens at many other beaches around the world and that there was no reason for visitors to be alarmed about it.

Insisting that the phenomenon is natural and not human induced does nothing to encourage people on Rarotonga to act. The less the public believes they have a responsibility to take action, the more the lagoon will become subject to coastal deterioration. The media is a mode of communication that has a wide audience. Stories in the media tend to be taken more seriously than news spread by word of mouth. The

Rarotonga community ought to accept responsibility for negative news stories that reach overseas media because as government officials, business developers and voters, the community at large is responsible for the problem of sewage pollution. Negative news stories can only be kept from the media by ensuring the use of effective sewage treatment facilities.

Withholding information from the media also prevents visitors from being warned about the state of the lagoon and the risk of disease. There is a responsibility to warn visitors and the local population if there are risks from swimming in Rarotonga's lagoon. Visitors should continue to be warned until the problem is resolved.

4.2 The Politics of Proliferation

The Environment Service has the mandate to request landowners to comply with environmental regulations. Those provisions of the Environment Act 2003 relevant to nutrient enrichment of the lagoon include *Section 50, Protection of foreshore and Cook Islands waters* and *Section 58, Protection of wetlands*. In these provisions nobody is permitted to construct anything in the foreshore zone or do any wetland reclamation without the consent in writing of the Island Environment Authority (IEA, previously the 'Environment Council'). The IEA has the power to deny permission to do these activities. The Environment Service also has the power to prosecute anyone who has done these activities without consent. Yet residents in Muri have observed the proliferation of coastal tourist accommodation units even when the community believes that the

environment is unable to absorb anymore development (see section 3.4.3). Furthermore, wetlands continue to be reclaimed.

One reason these activities continue is because environmental legislation provides leeway for them to continue. The permission needed to do these activities is given by a government body that is influenced by so called 'landowners rights', the pressures of living in a small community and in some cases, political point-scoring.

4.2.1 Balancing 'Landowners' Rights'

Cook Islanders (including those working in the Environment Service) believe that they have landowning rights which are more important than any environmental regulation. Despite the Environment Service's attempts to protect the environment through policies and legislation, the conflict with landowners' rights presents a challenge to Environment Service staff.

Environment Officers have revealed that there is a problem balancing 'landowners' rights' with the provisions of the Environment Act.

> *"We have to play that weighing game between landowners' rights and the provisions of the Act. The Act has all the provisions there. We have the Act but it's very stressful for the compliance officers because they have to play that weighing game every day."* (Interview #20)

Although the Environment Service is aware of the need to prevent the reclamation of wetlands, they have difficulty adopting such a policy because of the need to balance 'landowners' rights' with the provisions of the act. A taro swamp in Muri was reclaimed in November of 2003 by a landowner who intends to build two tourist accommodation units there. Referring to that specific case an Environment Officer said the Environment Council found it difficult to turn down the application to reclaim the wetland area because they were mindful of 'landowners' rights' (Interview #20). According to that landowner, it took two months for the Environment Council (now the Island Environment Authority) to reach a decision (Interview # 1) probably indicating their hesitation to approve the reclamation.

4.2.2 The Power of the Minister for Environment

The approval of a development activity that is likely to cause further deterioration of coastal waters is left to the discretion of the Rarotonga IEA. Being appointed by the Minister for Environment, the IEA is prone to political interference by the Minister. Furthermore, since the Environment Act 2003 was passed in parliament, all Rarotonga Members of Parliament are on the Rarotonga IEA as voting members. In a conversation I had with an Environment Officer before conducting this research, the officer said the IEA often makes decisions contrary to the recommendations of the Environment Service who are more experienced in environmental impact assessment.

One respondent during the questionnaire survey said that there is favouritism when authorities set environmental standards:

> *"There needs to be more real standards that are met – rather than allowing family friends etc of those in power to get away with what is against the legislation (as they are doing now). Not ethical"* (Questionnaire #10)

On one occasion the Minister for Environment Norman George amended the Rarotonga Environment Act 1994-95 because he had difficulty firing the Environment Council chairman he had inherited from the previous government. Before the amendment, the Minister could only fire a member of the Council as follows:

> *"The Minister with the approval of Cabinet may by notice in writing remove a member from the Council in the case of a member becoming bankrupt, or incapacitated by illness, or if he is absent from three consecutive Council meetings without leave of the Council, or is otherwise unable or unfit by reason of incompetence or misbehaviour to discharge his functions as a member"* (Rarotonga Environment Act 1994-95 Section 11 Subsection 3).

This clause was replaced with the following:

> *"Any member of the Council may from time to time be removed from office by the Minister"* (Rarotonga Environment Amendment 1999, Section 2)

This situation was reversed with the passing of the Environment Act 2003 so that the Minister of Environment must have legitimate reasons for removing an Environment Council (IEA) member. However, the new act still empowers the Minister for Environment considerably. The Minister is free to attend any meeting of the IEA

(Environment Act 2003 section 15, subsection 3) and Rarotonga members of parliament have voting rights (Environment Act 2003 schedule 1 I). The Minister for Environment must also be consulted by the Director of the Environment Service when the Director appoints Island Environment Officers (Environment Act 2003 section 24 subsection 1). Even more alarming, if the IEA denies a development permit, the applicant can appeal to the Minister for the Environment who has the power to overturn the decision single-handedly (Environment Act 2003 section 36 subsection 9).

Thus the Minister for Environment has total final decision-making power over the decisions made by the IEA. The opportunity is there for the Minister to use his/her power to ensure a favourable outcome for developers in return for undisclosed benefits.

4.2.3 Aggressive Developers

Although government bodies are often given the majority of the blame for coastal environmental deterioration, developers are equally responsible. During my experience at the Environment Service, developers would often come in and apply pressure to Environment Officers to speed the approval process. Constant phone calls, bullying and discourse about the incompetence and inefficiency of the Environment Service were tactics used to pressure Environment Officers into speeding up the process.

Developers are equally vigilant about pressuring the Island Environment Authority or the Minister for Environment into giving approval for their development. According to one

study, in response to pressures from developers to speed the approval process, the IEA sometimes approves applications after circulating them amongst members without a meeting. In this way a full discussion of applications is compromised (Island Friends Consultancy, 2002:23). Environment Officers referred to cases where approval was given by people in the higher ranks of government even though they believed approval shouldn't have been given for certain development activities (Interview #4).

In addition, developers sometimes neglect to notify authorities before their contractors begin work (Island Friends Consultancy, 2002:18, 24). Sometimes a newly constructed septic tank has already been buried by the time the Public Health officer arrives to inspect it (Island Friends Consultancy, 2002:25). There are no records to determine the timeliness of responses to requests for inspection.

The developer may even completely avoid the environmental approval process and commence construction with only a building permit (Island Friends Consultancy, 2002:15, 24). This happened in nearly 30% of cases between 1997 and 2001, a time when 35% of the land built upon was in the foreshore area (Island Friends Consultancy 2002:24).

Therefore, despite the checks and balances put in place to assess the significance of the environmental impact of a development, developers find ways to pressure relevant authorities into giving quick approval. Developers also appear to get away with avoiding the environmental approval process completely.

4.2.4 Non-Enforcement: Cultural Considerations

Culture may also play a role in the poor enforcement of environmental regulations. For example, the Public Health department is responsible for prescribing the design of septic tanks and inspecting newly installed tanks. An officer who has been working at the department for over two decades said that the law has traditionally been used as a guideline rather than as a tool for prosecuting offenders.

> *"When I was first employed, there was a law. But we used our law as a guideline. Because if you take someone to court the church will ask you 'why are you taking your own people to court?*" (Interview #12)

The Public Health officer said that consultation was the way to enforce environmental regulations in those days.

> *"Say this is the law – see this document? It is our bible. So I go to a house. I say, 'Please can I inspect your house?' They say 'No, you go away.' So we go away then come back and ask again, 'Can I inspect your house?' and they say 'No.' So we go away. But if you go in there as their son, they'll tell you to come in. They'll say they want to help, they'll try their best. They'll be honest with you."* (Interview #12)

So rather than laying down the law, environmental law enforcement in the Cook Islands tends to be a process of consultation. The adoption of this form of law enforcement by the Environment Service is noted in the following extract from the Rarotonga Environment Council Policy on the Foreshore,

> *"At all times the ES [Environment Service] staff exercise the principle that it may better serve the community by consultation, negotiation and education. Therefore court cases are always seen [to be] the last option. There is always an attempt to work with the client to ensure that what was improperly done is corrected."* (Island Friends Consultancy, 2002)

Indeed there is a provision in the Environment Act 2003, which states that the Environment Service should have regard for the principle of consultation, negotiation and education (Environment Act 2003 section 10, subsection 4). When questioned how often the Environment Service prosecutes offenders, the Director of the Environment Service was quoted in the local daily newspaper as saying:

> *"Environment Services is not really a place to prosecute on the spot. What we normally do is advise the public of activities that they need to carry out. If they continue to do these illegal works, that's when we get Crown Law to prosecute."* (Brown, 2002)

As outlined in that news article, the Environment Service only made three prosecutions in ten years (Brown, 2002).

The lack of enforcement of regulations has been blamed for the rapid advance of development on the island. An article written by the National Coordination Unit for development in the Cook Islands News said,

> *"Regarding the environment there has been little enforcement of regulations and development has advanced free of any constraints due to consideration of environmental damage and sustainability."* (Tyler, 2004)

The rarity of prosecutions may promote a lack of care amongst tourist accommodators. One study found that few accommodators believed environmental management practices provide an opportunity for them to limit legal risks because the risk of being prosecuted is minimal (O'Grady, 2003:81). In other words, those tourist accommodators implementing environmental management practices are doing so, not because they fear prosecution if they impact the environment with their business but because they want a 'green business'. Those tourist accommodators not implementing environmental management practices believe they are not at risk of being prosecuted.

An observer at the Cook Islands Tourism Forum of 2002 said that developers who get stopped by the Environment Service, waste time, energy and money but,

> *"If developers knew they could not get away with cheating on environmental and other codes, they would get it done right the first time."* (Brown, 2002)

The rarity of prosecutions may tie in with the nature of population on Rarotonga. The population is small enough for everyone to know most other people and there are also close kinship ties on Rarotonga. This presents a problem for law enforcement that isn't experienced in large cities or regionally managed towns. The article by the National Coordination Unit quoted above clearly outlines this issue.

> *"The usual response when questioning an apparent failing of enforcement is the lack of resources, either financial – 'we had a budget cut' – or technical, where equipment or expertise is not adequate. Both are valid, but there are circumstances where either lax practice or obvious reluctance to enforce occurs too often. Certainly a degree of responsibility lies with the agencies,*

> *but it may be a problem ingrained in our larger cultural identity. This is linked to the country's size and social system because on an island as small as this, enforcement will often lead to the penalising of friends, family, and community figureheads."* (Tyler, 2004)

Therefore, Rarotongan culture dictates that law enforcement be done via a process of consultation, negotiation and education. In addition, the small size of Rarotonga and the close kinship ties amongst its population make it difficult to enforce environmental laws and regulations. However, if the deterioration of coastal waters is to be curbed, there needs to be a balance between consultation/negotiation/education and prosecution. At present the former dominates and there is a need to draw the line after there has been sufficient warning in each case.

4.3 Limited Expertise in Environmental Matters

Although the proliferation of tourist accommodation and the poor enforcement of environmental regulations are important factors in environmental change on Rarotonga's coral reef, the limited expertise available on the island is also a contributing factor. Nobody in the Environment Service has engineering expertise to advise environmentally sound earthworks which make up a large portion of the workload.

There is a public perception that Environment Officers are not qualified to provide advice in the field and this can be detrimental to enforcement. If an Environment Officer lacks confidence in his/her own ability, he/she is less likely to pursue prosecution of an

infringement because he/she will be uncertain whether an infringement exists. The low number of prosecutions may also be because the Environment Service lacked a dedicated legal advisor. This was a concern expressed by compliance officers (Interview #4). Having a dedicated lawyer on hand was probably a key factor in the three prosecutions that the Environment Service has made. During the time of those prosecutions in 1997, the Environment Service was administered under MOWEPP (then known as the Ministry of Works, Environment and Physical Planning) which had its own lawyer who worked extensively on those three cases. The Environment Service was later in 1999 separated from MOWEPP for various reasons. Now that the Environment Service is a separate body, the Service no longer has the mandate to seek advice from the MOWEPP lawyer. To address this gap in legal capacity, the Environment Service has in the last six months employed a legal advisor.

There are also problems when Public Health Inspectors inspect septic tanks because they do not have building expertise and cannot ascertain whether the tank is properly sealed (Island Friends Consultancy, 2002:25). Building controllers strongly recommend that inspectors have a background in septic tank construction to ensure that tanks are built with the appropriate materials and are constructed properly (Island Friends Consultancy, 2002:25).

In the case of private, packaged sewage treatment facilities on-site, developers apparently decide for themselves the design of their facility without regulation by the Public Health department. According to a local environmental consultant, rather than Public Health

advising the developer the type of system that should be used, the developer 'convinces' the Public Health department of the effectiveness of a system they have researched before they install it (Island Friends Consultancy, 2002:25). Thus limited expertise in this department has resulted in shortcomings when identifying and enforcing adequate sewage treatment.

Shortcomings in the level of expertise present on Rarotonga are also seen amongst contractors. In one case the IEA approved the reclamation of a wetland area with guidelines and conditions but the earthmoving contractor ignored these guidelines when he began work (Interview #1). The developer said he felt powerless to stop the contractor and his protests were ignored. He said an Environment Officer was present to supervise the work but didn't object to the contractor's actions (Interview #1). This is probably due to a lack of qualifications required to supervise earthwork (Island Friends Consultancy, 2002:18). The failure of developers to follow conditions of approval is also a problem in the case of building permits (Island Friends Consultancy, 2002:24).

The low number of qualified people among environmental regulatory authorities and contractors is partly because there are few people on the island with these qualifications. Most Cook Islanders pursue degrees in other fields such as accounting, law, management and business studies. Furthermore most Cook Islanders who may have the potential to pursue careers in the environment field migrate overseas in search of better salaries. Some believe that dissatisfaction with governance is another reason for their emigration. In order to increase local expertise, there is a need to encourage careers in science,

particularly environmental engineering and environmental science. Good governance will also stem migration overseas and improve the economy allowing for higher incomes.

4.4 Conclusion

The coral lagoon in Muri is affected not only by the international politics of structural adjustment policies but also by politics at the national and local levels. Government officials and entrepreneurs in the tourism industry attempt to apply bias in the media in order to prevent visitor cancellations and the resulting loss in income. This is against the public interest and risks the exposure of locals and visitors to illnesses associated with sewage contamination of the lagoon. There is a need for the community as a whole to take responsibility for the state of the lagoon and implement measures that will prevent sewage contamination so that news stories about this issue need not be published.

The Environment Service has expressed frustration over the daily challenge of balancing 'landowners' rights' with the provisions of the Environment Act. There appears to be a common attitude that 'landowners' rights' are more important than environmental protection. Those with rights to land should be mindful that they do not own the land but are caretakers of the land for future generations. Land use practices must be implemented with care in order to ensure sustainable use.

The Minister for Environment has final decision-making power over development proposals. This opens up an opportunity for the Minister to approve environmentally

hazardous projects in exchange for undisclosed personal benefits. Furthermore, the Island Environment Authority consists of people nominated for their leadership status rather than their technical expertise. This shifts the basis of decision-making to political grounds rather than the environmental impact of development projects.

Developers are also responsible for the environmental impact of tourist accommodation in Muri. Some developers have been known to apply pressure to authorities and this could be a tactic used on decision-makers to obtain approval for their development project. Sometimes developers avoid the EIA process altogether. The need for environment approval before implementing a development project is now widely acknowledged by the public so environmental regulatory authorities can afford to be more vigilant with respect to prosecuting developers who proceed without approval. Although this is complicated by the cultural considerations of a small island which are dictated by close kinship ties, prosecution should follow if consultation and education fail to meet the objectives of the Environment Act.

Aside from the political factors affecting the environmental impact of development in Muri, a lack of technical expertise is also a contributing factor. Expertise is lacking in the area of environmental engineering, sewage treatment facility design and inspection and environmental law. Competition between earthmoving contractors is also limited so contractors are reported to be careless when following terms and conditions of environment approval. Good governance is likely to stem migration overseas by

improving the economy and will help to increase the number of professionals pursuing careers in these areas.

CHAPTER 5: DISCUSSION AND CONCLUSION

The boom in the Pacific Basin in the late 1980's and early 1990's took the specific form in the Cook Islands of high hopes for an Italian hotel project. The bust experienced in the 1990's took the form in the Cook Islands of the bankruptcy and collapse of the Italian-Cook Islands hotel and the exposure of criminal dimensions of the entire project. This set the stage for a sober period of structural adjustment in 1996-97 in which new terms for capital accumulation were established on the islands. The ensuing growth of tourist accommodation was the engine of renewed economic growth, but at great environmental cost. This thesis has examined the ways in which debt and renewed attempts at growth have shaped land uses, shaped political decisions, affected the environment, and inhibited Cook Islanders' ability to set right their environmental governance. From the geographical traditions of human-environment interaction and political ecology, I have studied both the social and ecological dimensions of these interwoven stories. In this chapter I review findings and draw conclusions about island nations' environmental vulnerability to the cure of structural adjustment.

5.1 Environmental Change Related to Structural Adjustment: Muri Lagoon

The community has observed significant environmental change in Muri lagoon in the last five to fifteen years. The decline in depth of the lagoon combined with the proliferation of tourist accommodation, coastal erosion and poor enforcement of sewage standards has resulted in algae blooms and poor water quality.

The structural adjustment program that was implemented in the Cook Islands in 1996-97 is likely to have played a major part in the proliferation of tourist accommodation in Muri in latter years (1999-2004). When accommodators were asked what motivated them to enter the tourist accommodation business, they indicated that access to land, capital and the demand for accommodation were important factors. The governments renewed focus on tourism is likely to have stimulated demand for accommodation through its role in marketing and increasing flights into Rarotonga. Business confidence also improved upon the governments' decision to support business-led development. More Cook Islanders entered into business as a result.

The structural adjustment program did not pay sufficient attention to environmental management. The transformation of the Environment Service into a purely regulatory body was an inappropriate approach for a small state where there is little enforcement of regulations. Little support was given to the Environment Service to cope with the rapid development that was to follow the structural adjustment program. The environmental approval process was rushed and sometimes even skipped altogether. The small size of the community with its close kinship ties and a shortage of environmental expertise make it very difficult to enforce environmental regulations. These factors are not as significant in large cities and regionally managed towns.

Because of the small size of the community, Cook Islands culture requires an approach that relies on consultation and education rather than hard line law enforcement. However,

in balancing so called ‘landowners rights’ with the Environment Act, environmental regulators do need to be more stringent about enforcing regulations than at the present time. Public confidence in the Environment Service will increase with improved technical expertise and increased prosecutions.

5.2 Politics and Environmental Change

Both the proposed Italian-Cook Islands hotel and the Muri tourist accommodation examples demonstrate that politics have a substantial influence over environmental change. They also demonstrate that political forces act at various scales and across state borders. Small states are more vulnerable to these political forces than countries with ‘greater’ layers of bureaucracy. The proposed Italian-Cook Islands hotel shows the effects of politics at the international and national scales. The development was largely unplanned and criminally motivated and this lead to severe soil erosion and sedimentation of the adjacent Vaima’anga lagoon.

Money lenders and other donor representatives had greater power over the economic reform process. They set the reform agenda and the terms and conditions for assistance. The domination of the program by economists and the virtual neglect of the environmental sector meant that the Cook Islands had little capacity to cope with the environmental changes that would accompany rapid economic development. While money lenders and donors took some measures to cushion the social and environmental

repercussions of the severely radical economic restructuring program, there was no serious long term effort to support these sectors.

The case study in Muri demonstrates that not only were political forces important at the national and international level, but local politics had an influence over how resources are used. Some tourist accommodators and government officials attempt to keep information about sewage pollution from the media compromising widespread community awareness. The short term loss in income that may follow negative news stories is negligible compared with the long term loss in income resulting from a serious outbreak of disease because the community was either unaware or in denial. If the tourism industry and government are not honest about the state of the lagoon they compromise the trust of the market. It was unsettling to hear one accommodator saying that Muri lagoon has not changed at all and that there were no environmental problems (see section 3.4.1). This statement was a manifestation of this denial.

Political influence is also integrated into the government Environment Service institutional framework. The Environment Act 2003 provides too much decision-making power to one person (the Minister for Environment). Every decision made by the Island Environment Authority may be appealed by the applicant and the appeal committee consists solely of the Minister for Environment. The Minister for Environment may be tempted to approve or disapprove projects if he/she can receive undisclosed benefits.

The Island Environment Authority (IEA) should be a technical body in those islands where there is technical capacity. Decisions on the environmental impact of development activities can only be made by those qualified in the relevant fields. I suggest that the Rarotonga and Aitutaki IEA be made up of a group of qualified technical advisors such as a biologist, an environmental engineer, a waste management engineer, and a coastal geologist. A technical advisor from the Department of Water Supply should also be included.

Equally important in the EIA process is post-audit. This is an examination of the actual impacts of a development compared with the predicted impacts (Carpenter and Maragos, 1989). The lessons learnt from this process will help to make more accurate predictions of impacts for future projects of a similar nature and scale. It is also a useful way to ensure compliance with suggested mitigation measures (Carpenter and Maragos, 1989). During construction, the Environment Service should give written advice whilst monitoring the project so that this documentation, together with the suggested mitigation measures can be used in court if the developer does not comply.

5.3 The Vulnerable Micro-State

The micro-state is vulnerable to international, national and local politics, crime and environmental change. The close kinship ties in a micro-state can hinder the enforcement of environmental regulations. The thin layers of bureaucracy combined with a lack of

transparency, accountability and proper due process also increase a micro-states' vulnerability.

This study has supported Redclift's (1995) finding that human agency as well as macro-economic policy are important factors in influencing the way in which environmental resources are used. In fact, because of the thin layers of bureaucracy, macro-economic policy and human agency is one in the same thing in a micro-state. The Cook Islands commitment to the Italian-Cook Islands hotel development was made by a single Member of Parliament through the signing of a building contract. The country's commitment to a NZ$51.2 million (US$36 million) loan was made through a single decision by the Cook Islands cabinet, a group of no more than 9 people. Under the Environment Act 2003, the Minister for Environment now has the power to approve or disapprove of development projects single-handedly. The very thin layers of bureaucracy in a micro-state make it highly vulnerable to international (foreign) and national (local) politics. The 'rolling back' of state frontiers described by Peck (2001) not only increases participation of the micro-state in the global economy but also increases its vulnerability.

5.4 Conclusion

An analysis of the local and foreign political factors that affect the environment allows us to tease out some of the cause of national debt and environmental change in a small state. When we examine the case of the Italian-Cook Islands hotel development we see that international crime brought the country to debt and changed the lagoon environment. The

small state, with thin layers of bureaucracy, is particularly vulnerable to crime without transparency, accountability, due process and an independent media. This thesis brings us from a political ecology analysis to a criminal ecology analysis of environmental change.

The national debt that arose from the hotel development was remedied with structural adjustment policies prescribed by donors and money lenders. The Cook Islands government was disciplined into speaking the vocabulary of structural adjustment because of its desperate position of indebtedness. Inadequate attention to strengthening environmental management combined with rapid development as a result of the implementation of structural adjustment policies caused a significant impact on the environment. This may affect tourism and reduce revenues in future.

Using the geographical traditions of the human-environment interaction and political ecology, this study has allowed us to take a broader and deeper historical perspective when finding the cause for environmental change. The wider questions about the cause of environmental change can only be addressed by the holistic and critical geography of the political ecology approach.

APPENDIX: QUESTIONNAIRE SURVEY

This questionnaire is part of research that is being done towards a Masters degree. No personal identifying information will be included in the research results. Completion of the questionnaire should take around 15 minutes.

A. On a scale of 1 to 10, how polluted to do you think Muri lagoon is? (1 being not polluted at all, 10 being extremely polluted)

1_____2_____3_____4_____5_____6_____7_____8_____9_____10
Not polluted Extremely polluted

B. Have you seen or do you know the results of water quality tests done on water samples taken from Muri lagoon?

1) Yes
2) No

C. If you scored 2 OR MORE on the above scale, what YEAR do you think this pollution began?

D. Five years ago, i.e., in 1999, how polluted DID you think Muri was? i.e., what was your opinion back then?

1_____2_____3_____4_____5_____6_____7_____8_____9_____10
Not polluted Extremely polluted

E. On a scale of 1 to 10, how polluted do you think Muri was 15 years ago i.e., during the 1980's?

1_____2_____3_____4_____5_____6_____7_____8_____9_____10
Not polluted Extremely polluted

F. What do you think is the MOST important form of pollution?

1) Sewage from pig pens
2) Sewage from tourist accommodation
3) Sewage from households
4) Fertilizers from agriculture
5) Other (please specify)_____

G. On a scale of 1 to 10 how strongly do you agree that there is currently too much tourism development in Muri? (1 being strongly disagree, 10 being strongly agree)

1_____2_____3_____4_____5_____6_____7_____8_____9_____10
Strongly disagree Strongly agree

H. Do you believe there should be a moratorium on tourism development in Muri?

1) Yes Why?

2) No Why not?

_____
_____
_____
_____
_____

I. What do you think should be done about pollution in Muri? (You may choose more than one answer)

1) stronger legislation to stop polluters
2) increased enforcement to stop polluters
3) education
4) government/Vaka Council should build a village sewage treatment facility and each household/business pay a monthly sewage disposal bill
5) none of the above
6) other (please specify):

J. Out of the following uses of Muri, which use is MOST important to you? Prioritise each use from most important to least important (write a number 1 to 4 next to each use with 1 being most important)

- swimming and watersports
- gathering food and fishing
- snorkelling/observing the coral reef
- as a scenic setting for tourists
- other (please specify):_____
  _____
  _____
  _____
  _____

K. Which of the following categories do you belong? (YOU CAN CHOOSE MORE THAN ONE)

1) Resident
2) Tourist accommodator
3) Government worker
4) Livestock farmer

5) Commercial grower
6) Restaurant owner
7) Shop owner
8) Recreational user (swimming/water sports)
9) Tour operator
10) Accommodation worker
11) Restaurant worker
12) Shop worker

L. Do you have land or do you intend to lease land in the Avana to Muri area upon which you have built/plan to build?

1) Yes Is it for a house or for a business?
2) No

M. Do you think gillnets should be banned in the reef/lagoon?

1) Yes Why?

2) No Why not?

N. Do you fish on the reef/in the lagoon on Rarotonga?

1) Yes

2) No Why not?

O. If you fish, what method(s) do you use?

P. What do you catch?

Q. Where on Rarotonga do you fish?

R. Do you fish in Muri?

1) Yes How often?
   a) daily
   b) weekly
   c) occasionally

2) No Why not?

_____

_____

_____Did you ever fish in Muri before?

_____

_____Why did you stop fishing in Muri?_____

S. If you have tourist accommodation, how many people can you accommodate at most?

T. What year did you start building?

U. Did you consult SBEC for advice?

1) Yes
2) No

V. Did the economic reforms of the late 1990's affect your decision to go into business/invest in Rarotonga?

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