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The Role of NGOs in Environmental Policy Failures in a Developing Country: The Mismanagement of Jamaica's Coral Reefs ¹

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ABSTRACT

Recent years have seen a proliferation of non-governmental organisations (NGOs) with a mission to help redress various social and environmental problems, but the effectiveness of these organisations in carrying out their stated goals is rarely assessed or critically examined. It has become increasingly clear, however, that these organisations vary greatly in their level of competence and professionalism. Many of them are ineffective, and in some cases they may even exacerbate the problems they set out to solve. These difficulties are based upon flawed assumptions about how civil society can correct social ills, and about how institutions that are intermediate between the individual and the state can carry out effective change.

To illustrate these points with an environmental example, we present the case of Jamaica's coral reefs, which have been under stress for decades. Both the causes of reef degradation and the solutions to these problems can be clearly outlined. Many well-intentioned organisations and individuals have been involved in the attempt to stem or reverse the damage, and significant funding has been channelled through these agencies. In spite of this, there has been no documented improvement in the condition of the reefs, apart from some natural regeneration that owed nothing whatever to any human activity.

The problem is that the known solutions have not been implemented. This has happened for several reasons. First, government organisations have actively encouraged NGOs to undertake the responsibility of protecting sections of the coastline, but without any proper assessment of the capacity of those organisations to do so, and in some cases actively preventing them from acquiring that capacity. Second, the proliferation of NGOs (in part a response to the availability of funding) has been counter-effective, resulting in duplication of effort, competition for limited funds, and conscious or unconscious misrepresentation of results. Third, the utilisation of NGOs to solve environmental problems often results in an increase in the number of levels of management, resulting in inefficient utilisation of funds.

The known solutions to the degradation in the Jamaican marine environment principally involve (a) reducing fishing pressures at a national level and (b) the reduction of pollution by local municipalities. The effective role of NGOs in bringing about these two solutions therefore differs: where national changes are necessary, government centralisation and effective enforcement are necessary, although NGOs could still play a useful auxiliary or augmenting role. With local problems like municipal pollution, NGOs may be better able to lead in catalysing and implementing change, although the government could usefully provide co-ordination and support.

These differences illustrate the fallacy in the simplistic assumption that rising public concern, increased levels of funding and a growing number of people and/or organisations involved in conservation will lead to environmental improvement. Effective hierarchical organisation is still a prerequisite for bringing about effective solutions, although the mode of organisation adopted should be a function of the particular solution necessary.

Finally, since many NGOs have effectively functioned as parasitical organisations that have consumed public funding without any discernible public benefit, NGOs should be subject to the same scrutiny and assessment as any private sector organisation contracted to the government and/or donor agencies, and those who fail to perform should be barred from further receipt of public funds.

KEY WORDS

non-governmental organisations, civil society, Jamaica, coral reefs, reef degradation

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NGOS: PART OF THE SOLUTION, OR PART OF THE PROBLEM?

There is a commonly-held view that NGOs can provide an effective route to deliver environmental and social projects, and NGOs are now routinely designated as preferred applicants in major international funding programmes. The NGOs built themselves into the core of policy and resource decision-making during the 1990's, to the extent that the importance of the NGOs has become almost an article of faith. Micklethwait and Wooldridge (2000) note that there are now some 1,700 NGOs clustered around the United Nations (UN) centre in Geneva, that more than half of the World Bank's projects in 1998 involved NGOs, and that the agendas of these institutions are being increasingly written by the NGOs that satellite around them.

The NGOs achieved this new prominence partly as a result of their perceived (and in some cases real) successes in delivering projects, partly because of their effective lobbying of the international institutions, partly as a response to the perceived failure on the part of many governments to deliver worthwhile, durable projects, and partly in order to develop an alternative delivery route that would be less subject to embezzlement and political manipulation.

This development has resulted in a remarkable increase in the number of NGOs. As Micklethwait and Wooldridge also note, the 1990 *Yearbook of International Organisations* listed some six thousand international NGOs; by the end of that decade the number had risen to twenty-six thousand. There has been an even greater increase in the number of local NGOs. The World Watch Institute has estimated that there are now two million NGOs in the US, for example, and a million in India.

The rise to prominence and the proliferation of the NGOs also reflects, however, a significant change in the underlying philosophy of development. Van Rooy (1998) has noted that various NGOs and donor governments are now convinced that the strengthening of *civil society* will foster a wider and more durable process of development, and thus enable many more people in developing countries to escape the poverty trap. The concept of civil society ultimately encompasses most of the institutions that are intermediate between the individual and the state, including NGOs. The idea is, therefore, that donor funding should be channelled through this web of organisations and agencies, delivering projects while simultaneously increasing the capacity of the network to sustain and deliver larger projects in future.

This is in turn part of a wider process of change in political philosophy; the failure of centralised state planning, progressive disillusionment with the repeated failures of state initiatives and the decline of Marxism, dependency theory and related beliefs and theories created a vacuum (or new intellectual space) in the political spectrum in the early 1990s. A number of concurrent developments,

including the spread of democracy, free markets and civil liberties, fostered a growing awareness of the limits to effective state action and a better public understanding of the respective roles of the state and the private sector. These profoundly important changes and developments shifted the centre ground of politics decisively towards a greater emphasis on the role of the private sector and the individual, but many people did not accept the more extreme monetarist-libertarian view that peoples' choices, freely expressed through the market place, can adequately express the majority of necessary public decisions. This then led to the new emphasis on the role of civil society.

The concept of civil society is complex, amorphous and elusive, however, as it is difficult to deploy a single definition to cover a range of organisations broad enough to include the church, tribal structures, major international agencies, single issue campaign groups, semi-independent public sector agencies, business fora, and small local/national NGOs, while still retaining operational usefulness. In addition, the body of associated political theory is still relatively immature, although it draws on contributions from Jefferson, from theoreticians of communitarianism such as Etzioni (1993), and Third Way theorists such as Giddens (1998).²

In effect, therefore, the international development/aid system is trying to turn an important but still relatively contested and complex political theory simultaneously into a *justification* and *tool* for a particular model of development. The theory is now being used as the basis for both policy and practice, and evolved to accommodate the very diverse individual conditions and historical trajectories of a range of disparate developing nations. It is also, of course, used in order to justify the expenditure of donor funds and the choice of particular channels to disburse and control those funds.

There is a latent conflict of interest in this situation, however, in that some of the agencies currently lobbying most effectively for this particular model of development (NGOs) are themselves members/representatives of the civil society sector. In some cases the NGOs concerned are donors, but in other cases the overlap is complete; NGOs arguing for this particular model of development are also, in effect, lobbying to take over control of the funding.

A range of other problems have been highlighted by various authors. Micklethwait and Wooldridge (2000), for example, have noted the shift in the balance of power between governments and NGOs, with some (such as the Soros Foundation, Amnesty International, Médecins sans Frontières and so on) now having significantly greater financial resources, stronger human and technical capacity and better political connections than many of the states in which they operate. This is not necessarily a problem, but it does serve to highlight the mismatch between the common perception of NGOs as intermediate in size between the individual and the state, and the current reality, in which a few NGOs have become multinational organisations with a global reach and substantially more power and resources than some states.

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Other authors, such as Chabal and Daloz (1999), Wrong (2000), Fatton (1992), Hancock (1989), Klitgaard (1990) and Maren (1997) have exposed various aspects of the moral ambiguity in the context in which some NGOs must operate. In states with little or no effective governance, there can be little oversight of the work of NGOs. This can, at a minimum, result in little co-operation on the ground, and consequent duplication of effort and wastage of resources. In more serious cases, NGO-run programmes effectively compete, not only for public donations and government or development agency contracts to deliver programmes, but also to deliver projects, and some have thereby exacerbated problems (by, for example, setting competing feeding stations at different ends of famine areas, thereby undermining any prospect of a coherent movement and resettlement programme). Maren (1997), in particular, presents a profound indictment of the way in which some aid/development NGOs acquire a vested interest in exaggerating problems and then overstating their role in solving them. In the worst cases documented by Maren, some NGOs were even implicated in (perhaps unconsciously) sabotaging solutions and perpetuating problems in order to justify their continuing involvement, and continuing role as a conduit for major funding programmes. In even more morally ambiguous cases in places like Somalia, some aid programmes were effectively hijacked by war lords and ethnic faction leaders whose control over the distribution of aid allowed them to reward their followers, build a power base and supply their militias, thus triggering and perpetuating civil wars. Once the situation had become clear, of course, the subsequent failure of the international NGOs involved in these programmes to withdraw made them complicit in this outcome.

The NGOs involved in these cases appeared to be motivated, in large part, by their need to secure their role in the development/aid process, and thereby their supply of funding. Part of their motivation lay in the need to avoid donor fatigue. People will, in general, support relief efforts in response to *acute* crises (such as earthquakes), or crises that become acute and/or can be presented as acute (such as famine or droughts). It is much harder to attract and retain public attention for issues that represent long-running, *chronic* crises, that don't have neat endings, get solved or go away. In the case of some of the large NGOs involved in Somalia, for example, it seems to have been more important to be seen to be addressing the acute crisis (the famine), even at the expense of prolonging the chronic crisis (the civil war). This then creates a nightmarish dilemma for the more ethical and responsible NGOs and agencies; whether to cut off the flows of aid, and thus become partly responsible for a number of deaths by famine, in order to stem the supplies prolonging the war.

Environmental NGOs (ENGOS) have a broadly similar incentive to misrepresent complex problems. As Clayton and Radcliffe (1997) pointed out, people are generally more willing to donate to save pandas, rather than beetles, and to identify with one species, rather than an entire ecology. Unfortunately, these anthropomorphic tendencies do not necessarily reflect ecological priorities. This

can oblige an ENGO to adopt fundamentally unhelpful positions. In the US, for example, the Sierra Club resisted forest thinning, which would have mimicked the effect of naturally occurring fires. This meant that the forests in the National Parks became particularly dense, which then made the eventual naturally occurring fires significantly more damaging than would otherwise have been the case. Friends of the Earth and Greenpeace have resisted the construction of waste incinerators, even in cases where their own experts privately agreed that these were the best available technical solution to particular waste problems, presumably in order not to risk losing public support and donations (R. Clift, personal communication). Other ENGOs have resisted elephant culling in Africa's game parks, which, given that the elephants were no longer able to roam, but still reproducing, eventually meant that some of the elephants starved instead. As Clayton and Radcliffe (1997) also point out, there is a similar case for culling the red deer in Scotland, given that their natural predators (wolves and bear) have been exterminated and their forest cover reduced, resulting in excessive numbers and consequently poor condition. Some of the senior staff of the influential ENGOs involved agree that culling would be in the best interests of the species, but arguing this in public risks alienating many of their supporters – and, in a situation where a majority of staff, donors and other supporters have to be educated and won over before there can be any significant change in policy, change is usually slow.

A less extreme, but probably more common failing, particularly in the developing nations, is the subtle erosion of focus and effectiveness as the original purpose of the NGO becomes gradually subordinated to the need to ensure continued supplies of funding. This 'learned dependency' is an insidious but profoundly damaging consequence of financial support. It is hard to avoid, however; as NGOs respond to the availability of funding by scaling up their work, they acquire staff, an expanding payroll and overheads, and thereby incur Weber's law of bureaucracy.³ As the needs of the organisation *per se* expand, other priorities can gradually be displaced, resulting in a reprioritisation around the availability of particular funding programmes. As donor priorities also change over time, sometimes quite erratically, recipients can end up constantly repackaging themselves, expanding and contracting their commitments and staffing levels, and reshuffling their priorities, in a way that is not particularly conducive to effective delivery.

The availability of funding *per se* can have another unintended and clearly undesirable consequence; a counterproductive proliferation of NGOs. In the later years of the UK's urban regeneration programmes, for example, one funding element was usually reserved for 'community groups'.⁴ These were not well-defined, however, which meant in practice that anyone could set up a community group, and any community group could apply for funding. This rapidly led to a situation where areas which had previously been represented by one (usually poorly attended) community group became over-represented by a

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large number of competing community groups, most too small to be effective, with some representing just individual streets.⁵

Donors and other funders can compound these problems in a number of ways. One, referred to above, is lack of consistency in both approach and priorities. This partly reflects, of course, changes of government in donor countries, or changes in the senior management of funding agencies, as well as the implementation of lessons learned from previous successes and failures. Lack of co-ordination between funding agencies is another common problem. Although multilateral and bilateral donor agencies operating in a given country do usually liaise, priorities are usually determined at head office. Each agency field office also has to produce results and justify its existence to its own head office. This usually means, in practice, that there is relatively little scope to adopt common programmes, which creates fragmentation, overlap, and opportunities for the more entrepreneurial and less scrupulous NGOs to get double or triple funding for the same project.

A more insidious problem is that the donor's own field operatives and agencies can become complicit in misreporting. The careers of aid agency staff are frequently tied to performance criteria that may actually be quite unhelpful. One common criterion, for example, is the number of large grants successfully disbursed, and projects duly completed. This helps to ensure that the local office can expend its entire budget for the year. If it fails to do so, of course, it may lose part of its budget (and possibly staffing complement) for the following year. This can lead to a situation where aid agency staff have an incentive to massage reports and otherwise ensure that projects are routinely reported to head office as being successful.

We've been involved in this country for decades. In that time, we've handed out millions of dollars for environmental projects. We've reported every one of these projects as a great success. But the environment has continued to deteriorate.

[Former USAID worker, previously stationed in Jamaica]

This relates to another subtle but damaging effect, the redirection of funding under 'soft' headings (such as meetings, travel and *per diems*) that can easily expand to absorb any funding surplus. Many recipients are willing to accept funding for airfares and hotel accommodation, especially when the *per diems* are set at a margin above the actual cost of the room, or when reciprocal arrangements allow participants to stay in each other's houses and thereby retain the accommodation component as a supplement to income.

One EU-funded programme for the Caribbean region, for example, was aimed at fostering a more effective network of environmental NGOs. This required that a number of NGOs from across the region should meet, agree upon a set of priorities and apply for the funding. Nearly a decade later, and after many meetings, there was still only partial agreement on the common priorities. By this time, unfortunately, a large part of the funding in the programme had been used

to cover the cost of the meetings. The Delegation of the European Commission therefore demanded that there be one final meeting to resolve any remaining issues, agree to the priorities and draft the funding proposal.⁶ This meeting was duly held and facilitated, but little emerged by way of a coherent set of priorities – apart from one point of agreement; that the funding remaining in the programme be used to cover the cost of further travel and *per diems*, so that the NGO staff could keep on having meetings (and claiming expenses). This is not, arguably, the best (or intended) use of donor funding, given originally for the protection of the local environment.

Finally, donors and other funders have compounded these problems by their failure to address the issues indicated in this section.

The authors would like to make it clear, at this stage, that we are not arguing against the concept of civil society, which we agree has an important role to play in the analysis and development of societies in transition. We are, however, concerned to highlight some of the relatively little examined latent conflicts of interest and the associated incentive to conceal mission-failures entailed in some of the applications of this model. Some NGOs have undoubtedly become very effective and professional organisations, with a high percentage of strongly motivated, dedicated and professional staff. In other cases, however, NGOs have consistently failed to deliver, or have acquired many of the same failings (and in some cases the same personnel) as the governments whose functions they have partially replaced. There is therefore a clear need for a more objective debate, more honesty, transparency and objectivity about the role of the NGOs, and a more rigorous assessment of the effectiveness of NGOs as a delivery route for projects.

Jamaica offers a good case study of the role and failings of the NGOs in this regard. It is clear that a dramatic increase in the number of environmental NGOs in Jamaica and the drawing-down of major external funding programmes has done virtually nothing to redress Jamaica's most pressing environmental problem – the decline of the coral reefs – and that the NGOs have therefore been almost entirely ineffective as a means of addressing this problem.

In the sections below, we discuss the reasons why we believe this to be the case, and what policy adjustments would be, in our opinion, most likely to reverse the decline. It is important to go into a single instance of this kind in detail, because the reasons for the failure are complex, and involve several points at which the deployment of known solutions to particular environmental problems is effectively precluded by a number of interlocking political and social problems, while at the same time illustrating incorrect assumptions about the nature of such problems and the availability of solutions. Many of these issues are common to other transitional/developing nations, so that the solutions that apply to Jamaica are therefore likely to be applicable to many other countries as well.

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MANAGING THE REEFS

Marine environments around the globe are under threat from anthropogenic factors. There is particular concern about coral reefs, which are under pressure from multiple sources (reviewed in Brown 1997). In many cases, the coastal waters around reefs are being polluted by nutrient inflow and toxic wastes, with associated nutrient eutrophication,⁷ overfishing has already removed many of the species involved in the predator-prey dynamics of the reef, and the greenhouse effect is associated with rising carbon levels (resulting in decreased coral growth rates), increasing sea temperatures (associated with bleaching⁸), and increased incidence of severe weather conditions (such as hurricanes and typhoons) which can badly damage reefs. The periodic changes in weather patterns called 'El Niño' and 'La Niña', for example, often result in increases in water temperatures and subsequent coral reef bleaching, and further global warming may have implications for these weather patterns (Buddemeier 2001). Human activity may affect the emergence and frequency of a wide variety of pathogens and diseases of coral, including black band disease, white band disease, red band disease, white pox disease, rapid wasting disease, and coral plague (possibly by transfer of pathogens via the discharge of ballast waters).

Many of these relationships are still not well understood. The general consensus, however, is that coral reefs are under severe pressure, many are dead, dying or in poor health, and the fundamental causes of this world-wide degradation of coral reefs are probably anthropogenic. It is equally clear, that many of the attempts to date by environmentalists and/or governments to prevent the degradation of coral reefs have been largely ineffective, usually because they were partial, misconceived, or inadequately enforced.

Jamaica offers a paradigm of the pattern and reasons for failure in marine environmental policies in the developing nations. Jamaica is a good exemplar, because the country has some of the worst cases in the world of some of the factors known to cause marine environmental degradation; particularly overfishing (see Russ 1991 and references therein). There have been a number of significant Jamaican governmental and agency initiatives, and a proliferation of non-governmental organisations (NGOs) concerned with the marine environment, but the situation has continued to deteriorate.

Jamaica's coral reefs have degraded over the last three decades from a pristine, high diversity coral-dominated environment, to a low diversity algae-dominated environment (ranging from damaged to dead reefs). The major factors have been:

- Overfishing.
- Pollution (primarily excess nutrient inflow).
- Severe storms and hurricanes.

- A disease (probably viral) that wiped out a keystone species in the mid-1980s, the sea urchin *Diadema antillarum* (see references below).

It is important to note that only the first two of the factors listed above are anthropogenic. The other two are natural, and at least one (storm damage) occurs frequently in the Caribbean, and is in fact part of the natural dynamic processes of coral reef ecology. This highlights the probable importance of multiple ‘hits’; coral reefs are probably capable of dealing with one or two of these factors at a time, but not with all of them simultaneously.

The effect of the combined negative factors on Jamaican reefs can be seen in the historical record. Up until the end of the 1970’s, Jamaican reefs were generally healthy, at least in terms of coral cover, although artisanal fishing had by then reduced the presence and abundance of reef fish. In 1980, however, Hurricane Allen caused major damage to Jamaican north coast reefs (Woodley et al. 1981). This storm essentially reduced many reefs to something resembling a moonscape, as the highly three-dimensional rugose nature of the reefs was changed to a more two-dimensional flat aspect. One of the most important changes was the destruction of the branching corals *Acropora cervicornis* and *A. palmata*, which had previously dominated some of the shallow water zones (Knowlton et al. 1990). This destruction immediately reduced the presence of many of the species that are either directly associated with the branching corals or use crevices and holes as refugia (Aronson and Precht 1997). In the normal course of events, of course, the corals would eventually have recovered from the hurricane damage, as they have elsewhere in the Caribbean (e.g. Stoddart 1969, 1974). In time, the branching corals would have re-established themselves, the three-dimensional nature of the reef would have been restored, and species numbers and abundance would have recovered.

A series of linked events, however, prevented a normal recovery:

- The discharge of nutrients (in the form of human wastes, agricultural runoff and so on) had already resulted in the increased presence and growth of algal species (Lapointe 1997).
- This surge in algal growth would normally have been matched by an increase in the herbivorous fish and other organisms that eat algae, but growing fishing pressure prevented the herbivorous fish populations from increasing. This left the sea urchin *Diadema antillarum* as the main organism controlling the algae.
- This species of sea urchin was then nearly wiped out in 1983/4 by an unknown pathogen.
- As a result, algal species spread unchecked, and rapidly overgrew large sections of the reef. This algal cover prevented coral growth and settlement, and in some cases caused coral death by cutting off access to oxygen and sunlight (Liddell and Ohlhorst 1986; see also Brown 1997).

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This last event in a series of inter-linked problems finally precipitated what Hughes (1994) characterised as a 'phase shift' in the Jamaican coral reef environment, from a high diversity coral dominated ecosystem to a low diversity algal dominated habitat. This was a catastrophic collapse. Measurements of live coral cover fell from approximately 40% to 20% of the reef after Hurricane Allen, but plummeted from 20% to just 2–3% after the sea urchin epidemic (Liddell and Ohlhorst 1986, D. Liddell, personal communication).

Although there has been general agreement as to the nature and sequential, cumulative impact of the various negative factors, there has been considerable debate on the relative importance of the two major anthropogenic agents. Lapointe (1997; Lapointe et al. 1997) has argued that the primary cause of algal overgrowth is a 'bottom-up' process, that is, caused by nutrient inflow. Others, including Hughes (1984; Hughes et al. 1999), Aronson and Precht (2000), and Edmunds and Carpenter (2001), feel that the major factor is 'top-down', that is, the absence of herbivores which can control the algae. More recent information, including the fact that nutrient levels at many inshore locations are only slightly above those of the open ocean (Greenaway and Morrison, unpublished), and that the recovery of *Diadema* populations in shallow water reef areas has resulted in the removal of algae and an increase in coral recruitment (Edmunds and Carpenter 2001), indicates that 'top-down' processes are probably more important, which means that steps to control fishing pressures are more likely to result in reef improvement than steps to reduce pollution levels.

It is important to note that the situation in Jamaica is not unusual, as it now appears that overfishing has had a more significant impact on reefs and other marine ecosystems than any other anthropogenic factor (Jackson et al. 2001). Thus the degradation of the reefs due to overfishing is not simply a characteristic of the Jamaica marine ecosystem, but an instance of a global pattern. This at least suggests a straightforward policy goal, as the more fishing can be controlled and reduced, the more we can reasonably expect reefs to improve and recover.

This may, however, be an oversimplification. Reef health varies considerably around the Jamaican coastline, both in terms of geographic variation and in terms of variations along depth profiles, at least partly because of variations in the relative strengths of the factors listed above:

- Pollution is clearly a problem in particular locales, especially along the coastlines adjacent to urban areas. Kingston Harbour and Hunts Bay, for example, have very elevated nutrient levels (Webber 1997; Webber and Webber 1998), and other cities like Montego Bay and Ocho Rios probably have similar problems. In more remote areas, however, pollution is a significantly less serious problem.
- Reefs along the south and western Jamaican coastline were not as badly affected by Hurricane Allen and observations indicate that these reefs were somewhat more resistant to the negative effects of the sea urchin die-off.

- Fishermen are present around the entire coastline, but are more numerous at certain locations; areas far from population centres and far from main roads tend to have fewer fishermen, while spear-fishermen in particular are found in areas adjacent to their beach access points.

These geographical variations in the relative strengths of these factors are significant but it does not, unfortunately, alter the general pattern of degradation; it simply means that degradation is more marked in some areas compared to others.

SOLUTIONS

There are now some grounds, however, for cautious, limited optimism, as the populations of *Diadema antillarum* now seem to be showing signs of recovery (Woodley 1999, Woodley et al 1999, Edmunds and Carpenter 2001, Haley and Solandt 2001).

This gradual recovery has resulted in reefs that, on the north coast of Jamaica at least, can often be stratified into three zones along depth profiles. In Discovery Bay, for example, healthy populations of urchins occur down to 7 metres, and here the substrate is bare, with no algal cover, and with increasing numbers of young coral recruits (Edmunds and Carpenter 2001). Between 7 and 30 metres, the reef is still a low diversity algal dominated environment, with very few urchins, almost no live coral, and extensive algal coverage (Haley and Solandt 2001). Below 30 metres, however, and down to the reef limits at approximately 130 metres, the coral appears healthy, with far less algae (probably in part due to light attenuation at depth) and extensive coral cover of flat, platelike species like *Agaricia agaracites* (Haley, unpublished data).

Thus the reef can now be characterised as having three zones; a previously damaged, but now recovering, shallow water zone, a damaged mid water zone that is not recovering, and a deep water zone that is still relatively pristine (but note that this characterisation only applies to corals and other benthic invertebrates; fish populations are low for all zones).

It is known, however, that *Diadema* prefers shallow water, as historically this is where they were found in greatest densities (Solandt 1998, and references therein) and *Diadema* moved to deeper water will migrate back to shallow water (J.-L. Solandt, personal communication), so it is not clear that their current recovery in shallow water will necessarily extend much deeper.

More fundamentally, even if *Diadema* spreads into deeper water, removes some of the excess algae and thereby causes further reef recovery, that will in itself only result in the partial restoration of an earlier, unstable situation, where the health of the reef will again depend on a single species. Another sea urchin disease, for example, would then immediately cause another catastrophic

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collapse in live coral cover. A truly stable situation will only be restored if the various anthropogenic factors that have caused the degradation are properly controlled.

The nature and distribution of the problems are, of course, the key determinants of the management strategy. Pollution and nutrient inflow are essentially localised problems, whereas overfishing is a problem that occurs over the entire Jamaican coastline. This suggests that the pollution issues could be most appropriately addressed by the local municipalities that are (a) the prime causes and (b) the most severely affected, while overfishing, as a national problem, has to be addressed at a national level. Consider each of these in turn:

Controlling pollution

There are both point sources (specific) and non-point sources (non-specific or diffuse) of nutrients and other forms of pollution (Webber 1997). The latter are, in part, a consequence of Jamaica's geology; much of the island consists of porous limestone and is therefore like a gigantic sponge, with dissolved or suspended terrestrial material seeping into the marine environment over the entire coastline. Controlling non-point sources is always extremely difficult. There is currently a consensus, however, that point sources (i.e. urban areas) represent a much more serious problem, so there is no need for non-point sources to attract any policy or resource focus at present.

The point sources would require various measures, but probably the most important would be to upgrade sewage outputs to the tertiary level in order to prevent any increase in the ambient nutrient levels in the recipient coastal waters. Some improvements have been made, for areas such as Kingston Harbour (D. Webber, personal communication), but progress over the years has been desultory and slow.

Controlling overfishing

The most direct route to improving Jamaica's national marine environment would be to reduce fishing pressures, which would allow the diversity and numbers of the fish on the reef to increase. There is a range of possible policy tools (such as size restrictions, catch restrictions, fishing seasons, species limits and so on) but all depend on two factors:

- Putting some parts of the Jamaican coastline off-limits for unlimited fishing.
- Proper enforcement of the delineated limits.

This may seem straightforward, but there are some serious practical and political problems with implementation.

POLICY PROBLEMS

Current Jamaican political culture has been shaped by various key events, including the adoption of a broadly Marxist orientation by a former Prime Minister, Michael Manley, in the early 1970's and the consequent deterioration in relations with the United States. This era was also marked by the polarisation of politics, the importation of guns and the arming of various factions, and a descent into violence. These factors precipitated a wave of skill and capital flight that undermined the long-term growth potential of the economy. As in a number of developing/transitional nations, a Marx-influenced emphasis in the years after independence on the need to control the development, direction and orientation of the economy inhibited the development of a robust private sector and left a legacy of distrust between the private and public sectors.

Periods of growth subsequently alternated with prolonged recessions, which diluted or erased their impact. Several local entrepreneurs were notably successful in building up tourism and entertainment operations, but various Government-led attempts to foster new areas of economic activity were largely unsuccessful, as foreign investors remained ready to divest and depart in search of a cheaper and less militant workforce. As late as 1996, for example, the National Industrial Policy listed garment manufacture as one of the five key strategic clusters in the economy, but this then lost ground rapidly in the face of lower-cost competition from Mexico and Central American states. More recently, the steady erosion of competitiveness in traditional exports of bauxite/alumina, sugar and bananas have left the country dependent on tourism for some 56% of all foreign exchange, an increasingly precarious position, and this vulnerability was highlighted recently by the slow-down in the sector after September 11th 2001.

This long-term, deep-rooted pattern of economic underperformance has left a widespread disillusionment with politics and political solutions. Many of the politicians compromised by these conflicts and failures are still important actors in politics today, which reinforces a perception of a lack of accountability and a consequent disconnect from public life. The current administration is committed to a programme of local government reform, but power still rests largely with the government. Other organisations sometimes appear to have a voice in decisions; but their involvement is typically superficial. More generally, Jamaican politics have been characterised as clientelist (Payne, 1988), reflecting the pressures on Jamaican politicians to ensure the flow of public funds and contracts to key party supporters. Partly as a result, Jamaica was rated at 3.8 in Transparency International's 1998 Corruption Perception Index.⁹

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IMPLEMENTATION AND ENFORCEMENT

Various governmental bodies have published a series of environmental policy papers with respect to both the terrestrial and marine environment (see Addendum), but enforcement of the policies recommended has been noticeably lacking. With respect to the marine environment, one of the most important policy papers was a Country Environmental Profile published by the National Resources Conservation Division in 1978, which recommended that several sections of the Jamaican coastline be put aside as Marine Reserves or Parks. No money was set aside to follow these suggestions and, at first, nothing was done. Increasing international awareness of environmental issues, however, led to the formation of the Montego Bay Marine Park in 1989/1990. Initially, this was funded by the United States Agency for International Development (USAID); since 1996 it has been run by the Montego Bay Marine Park Trust, a local NGO. The management of this Park has been problematic, as the Jamaican government authorities have attempted to retain decision-making power while delegating much of the responsibility for dealing with problems and raising money to run the Park to the local management team, (J. Williams,¹⁰ personal communication, see also Byfield 2000). Periodic difficulties in raising money have resulted in an inconsistent record of environmental protection within the Park; at times Rangers have actively patrolled the Park and kept out fishermen, while at other times financial problems have led to an inability to repair broken equipment and pay Rangers with the result that patrolling is inadequate or non-existent, and fishermen once more start to take fish within the Park's boundaries. Some of the other marine parks (Negril, Port Antonio, and the Portland Bight) that were recommended are now being set up, but are, at the time of writing, not yet legal entities.¹¹

The last decade has seen a proliferation of non-government organisations. In the marine environment alone, the numbers are remarkable – over 30 non-government and government organisations now have the marine environment as part of their mandate (see Table 1). In general, the government has been quite willing to let these NGOs assume the lead (public) role on environmental issues, partly because they can then shed some responsibilities (and associated financial commitments), and partly because the NGOs may be able to access additional external funding (which, in one case, was then used by the government representative on the NGO board to cover areas of government expenditure). Ministers and civil servants will occasionally turn up at a forum or workshop to make supportive speeches, but this rarely translates into tangible domestic support in terms of infrastructural development and/or funds.

Unfortunately, it is difficult to identify any tangible, positive change in the status of the Jamaican reefs as a result of the activities of any of the organisations in Table 1. Many of these groups can be legitimately criticised for spending most of their time in offices, but even when organisations like PARC, USAID and

TABLE 1. Organisations involved with marine conservation in Jamaica.

| | | |
|-----|----------|--|
| 1. | WWF | World Wildlife Foundation |
| 2. | IUCN | International Union Conservation Network ^a |
| 3. | UNEP | United Nations Environmental Programme |
| 4. | USAID | United States Agency for International Development |
| 5. | CIDA | Canadian International Development Agency |
| 6. | DFID | The (British) Department for International Development |
| 7. | TNC | The Nature Conservancy |
| 8. | IRF | Island Resources Foundation |
| 9. | CPACC | Caribbean Planning for Adaptation to Global Climate Change |
| 10. | MLE | The (Jamaican) Ministry of Land and Environment |
| 11. | FD | The (Jamaican) Fisheries Division |
| 12. | TDPCo | Tourism Product Development Company |
| 13. | NEPA | National Environment Planning Agency ^b |
| 14. | JCDT | Jamaica Conservation and Development Trust |
| 15. | PIOJ-PMU | Planning Institute of Jamaica – Project Management Unit |
| 16. | PARC | Protected Areas Resource Conservation project ^c |
| 17. | CMS-UWI | Centre for Marine Sciences of the University of the West Indies |
| 18. | CDC-UWI | Conservation Data Centre of the University of the West Indies ^d |
| 19. | JNPI | Jamaica National Parks Institute |
| 20. | SITE | Strategic Intervention in the Environment |
| 21. | EFJ | Environmental Foundation of Jamaica |
| 22. | JET | Jamaica Environment Trust |
| 23. | NEST | National Environmental Societies Trust |
| 24. | CE Ltd | Caribbean Ecosystems Ltd |
| 25. | ESL | Environmental Solutions Ltd |
| 26. | SCCF | South Coast Conservation Foundation |
| 27. | CCAM | Caribbean Coastal Area Management Foundation |
| 28. | J-PAN | Jamaica Protected Area Network |
| 29. | FOTS | Friends of the Sea |
| 30. | MBMPT | Montego Bay Marine Park Trust |
| 31. | MBMP | Montego Bay Marine Park |
| 32. | NRCPS | Negril Coral Reef Protection Society |
| 33. | NEPT | Negril Environmental Protection Trust |
| 34. | PEPA | Portland Environmental Protection Association |
| 35. | STAEP A | St. Anns Environmental Protection Association |
| 36. | STEPA | St. Thomas Environmental Protection Association |
| 37. | RWEKET | Rockfort Wareika East Kingston Environmental Trust |

Organisations are presented roughly in order of size and scope, with the largest, international organisations at the top, Jamaican government agencies in the middle, national NGOs next, and the smallest, regional NGOs at the bottom. Note that this list is not necessarily exhaustive, which itself is indicative of the profusion of entities involved.

^a Now the World Conservation Union. ^b Formerly the NRCA (National Resources Conservation Authority) and prior to that the NRCDA (National Resources Conservation Division). ^c Set up to administer the creation of the first national parks in Jamaica, but now essentially defunct. ^d The functions of this unit have now been subsumed into other departments of the University of the West Indies.

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MBMP (see Table 1) have been involved in active conservation fieldwork there is virtually no evidence for tangible improvement (Byfield 2000). The recent improvements noted in the first section of this paper result from purely non-anthropogenic factors; they are entirely (as far as can be determined) a consequence of the natural recovery of *Diadema* populations, for which no-one can claim any credit.

There are several difficulties with the current reliance on NGOs to manage the marine environment. First, many of these NGOs are small and lack the infrastructural capacity to take on major managerial tasks or to enforce regulations or agreements. Thus in Discovery Bay, for example, the task for managing a small fish reserve was initially placed in the hands an advisory committee that consisted primarily of members of a local fisherman's co-operative. Progress toward proper legalisation of the reserve was considerably delayed (and therefore the provision of proper protection for the fish in the reserve) because such fishermen lacked the necessary education and training to prepare either proper management plans or funding proposals. Sharing decision-making capabilities with local stakeholders is completely appropriate, but expecting these stakeholders to make all decisions and to be fully responsible for the management of protected areas is not.

Second, having several different organisations compete for essentially the same pool of funds is a wasteful duplication of effort and can also foster conflict. The competition for money, especially given the decline in levels of external support, has on occasion led some NGOs to denigrate the achievements of others, and there have been several unpleasant 'turf wars'.

There is a related issue with regard to duplicated overheads. Many of the organisations listed in Table 1, for example, have rented offices (some in the business district in New Kingston, one of the most expensive rental areas), paid office support staff, including secretaries and accountants, and the usual computers, copiers, fax machines and so on. Some have purchased four-wheel drive vehicles that are rarely seen out of the city, and some of the more senior executives have extensive international travel schedules. We do not mean to imply that spending money in this way is never appropriate; but there is an important question as to whether it might be more effective to channel the funding more selectively, while ensuring that more actually gets spent on practical measures.

Third, the integration of NGOs into any form of funding pipeline usually involves an increase in the number of levels of hierarchical organisation, with the concomitant reduction in efficiency that this usually implies. Both of the authors of this paper have been involved with environmental projects in Jamaica that include (a) an international funding agency, (b) a local government agency awarding the contract, (c) a First World NGO that is the primary contractor (often, and perhaps not surprisingly, from the same nation as the funding agency), (d) a local Jamaican NGO or organisation subcontracted to perform

specific tasks, and (e) individual consultants and/or students themselves subcontracted by the local NGO to go out in the field and collect actual data or perform any project implementation necessary. With the number of people, organisations, fees and overheads involved, the amount of money paid to the people performing the actual fieldwork can be a minute fraction (less than 5% of the total budget in one project involving the first author, for example) of the total funding awarded. With up to 95% of project funding absorbed by management, administration, report-writing and overheads, this at least partly explains why the amount of work done in the field is typically very limited. This in turn indicates why many studies consist primarily of secondary research, trawling and re-trawling the same small primary data set. This may also partly account for the lack of tangible results despite the millions of dollars spent.

Fourth, the current situation places these organisations under pressure to massage their results, as funding renewals are usually contingent on the success of previous efforts. It is not entirely surprising, therefore, that most ENGOs regularly report that their activities have been successful, even though, as indicated earlier, there is actually no evidence that the Jamaican marine environment has been substantially improved by any ENGO activity. It is important to note the subtlety of this effect; many of the people working for these ENGOs are clearly well-meaning committed individuals. Some may be involved in active deception, but, in the majority of cases, it is more likely to be the simple human desire to believe that one's efforts are not in vain. This, in conjunction with the need to secure further funding, lends itself to a rather selective report.

The ENGOs cannot be entirely blamed for the lack of progress in Jamaica's marine environment, however, as their role has been fostered partly because of the government's readiness to shed responsibility, and reluctance to enforce policy recommendations.

Some of the government's reluctance results from internal conflicts of interest. Until April 2000, for example, the Ministry responsible for the Environment was simultaneously responsible for Housing. This combination generated a serious conflict of interests, for both marine and terrestrial environments (the pressure to develop new housing schemes led to the clearing of forests known to house endangered species, for example). The combination of Housing and Environment was particularly problematic because of the distribution of potential voters between housing and the environment. The provision of cheap housing has been traditionally used by successive administrations to reward followers, and thereby secure party loyalty and votes, whereas environmentalists are perceived as a relatively small group who can afford the luxury of worrying about esoteric issues. This meant that the Ministry of Housing and the Environment was primarily concerned, in practice, with housing, and allocated few resources to addressing environmental degradation. The portfolios have been reshuffled since then, but the environment is still part of a combined portfolio; at present it is part of the Ministry of Land and the Environment.

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These political factors are implicated in other contradictions and the general lack of progress. Fines levelled at fishermen found fishing in the Montego Bay Marine Park, for example, were initially so low that they were not a deterrent, and Park personnel had to devote considerable effort to get local judicial officials to increase the fines to reasonable levels (L. Walling,¹² personal communication). In part, this difficulty illustrates the common perception that fishermen are simply 'poor men struggling to make a living', and that any effort to curtail their activities is simply oppression of the working man. Fishermen themselves are quick to use this kind of rhetoric in any debate.

Perhaps the major environmental policy problem in Jamaica, therefore, is the combination of political factors that effectively sabotages the prospect of any real change, rather than a lack of resources. It would clearly be possible, for example, to institute strict fishing controls over large areas in order to restore the coral reefs along the Jamaican coastline. Such controls are already in place in other sites around the Caribbean, generally where such controls are perceived to be in the best economic interests of the nation. In Mexico, for example, about 85% of the coral reefs around Cozumel are in the Cozumel Reefs National Marine Park; routine maintenance costs are covered by charging diving tourists \$2.00 per day per person, and since the park is under the ordinance of a Federal Management Program, park regulations and no-fishing ordinances can be enforced by any Federal agency, including the Mexican Navy.¹³ It would, similarly, be possible for Jamaica to use the existing Coast Guard, Police and Defense Force to enforce no-fishing zones, without necessarily increasing the funding levels of these organisations. In islands with substantial revenue from diving related tourism, like the Cayman Islands and the Netherlands Antilles, diving and hotel staff report environmental violations, as it is in their economic interest to do so; in Bonaire, for example, the volunteers that help to run the Bonaire Marine Park include personnel from several diving operations.¹⁴ If Jamaica also had substantial revenues from diving-related tourism (which could accrue if the corals were restored), then it would be reasonable to expect similar co-operation from diving enterprises in policing parks and enforcing regulations.

POLICY SOLUTIONS

There are a large number of ENGOs in Jamaica, which is a small, middle-income country. This represents an unnecessary duplication of effort and expense. A more fundamental problem, however, is that the ENGOs have been demonstrably ineffective with regard to the marine environment (amongst others). This is partly because of a basic issue of scale and structure; environmental solutions that can only be applied nationally, such as fishing controls, can only be delivered by a government organisation.

NGOs do, however, play an important role at the local level. They provide an important voice for community members, and as such should be involved in the implementation of national policy directives in their local area. It is important not to place too much managerial responsibility in the hands of individuals and organisations that are clearly not equipped or prepared for these tasks, but this still leaves room for viable co-operative arrangements. For a given section of coastline, for example, a local NGO could usefully serve as advisor to the government body responsible for implementing national policy. This would only work, of course, if there was a proper framework for national environmental policy in Jamaica, and, until recently, this has been undermined by the various problems with implementation.

We make both a traditional and a non-traditional recommendation here. First, it has become increasingly clear that there is no substitute for active government involvement and enforcement in the protection of the marine environment.¹⁵ These policies could be usefully directed toward the creation and protection of more marine 'no-fishing' zones. This element is reflected in draft policy papers, but is currently just one element of a suite of policy recommendations, so its central importance has been lost. The traditional argument that the establishment of more parks or reserves is not possible because of a lack of resources is no longer entirely convincing, as the Jamaican government currently employs over 50,000 people,¹⁶ including more than 10,000 in the police and military, and 150 in the Coast Guard (with 18 boats of various sizes). It is difficult to see how reassigning the 100 or so employees required, and/or utilising the Coast Guard and Police in policing the no-fishing zones would place an undue burden on the financial or logistical resources of the State.

To a certain extent, of course, the cry of poverty is genuine; while it is true that the Jamaican government could re-prioritise and expend more time and money on the creation of protected areas, it is unlikely that they could do so for more than a limited number of areas. There is a solution to this problem too; to create a small number of relatively large zones. This, superficially, is current policy, and reflected in the establishment of Marine Parks at Montego Bay, Negril, Port Antonio, and the Portland Bight. In practice, however, these parks are to be run by NGOs (the MBMPT, NEPT, PEPA and CCAM, respectively; see Table 1) with all the implied disadvantages reviewed earlier.

The creation of a few large reserves, however, will not represent a complete solution. Organisms within the reserves will benefit from the protection, of course, and areas adjacent to the reserves will also benefit, as fish and other organisms will move out of the reserves into these areas. Research has shown, however, that recruitment (for fish in particular) can be astonishingly local, and it is often fairly unidirectional, following the direction of the prevailing currents (Munro 1983, 1999). In other words, even if the Montego Bay Marine Park, for example, is well protected, most of the fish spawned there will stay there. A few may end up as far away as Negril to the west, but virtually none will migrate east (as currents along the Jamaican coastline are primarily in a westerly direction).

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There is still a need, therefore, to fill the 'gaps' with small marine reserves in order to spread the benefits of protection more widely. This could be fairly readily accomplished, as many of Jamaica's tourist hotels have the motivation and resources to establish and maintain small marine reserves off their beaches. Some of them would already have done more in this regard, but have been handicapped by various legal impediments restricting the ownership rights associated with beaches and land below the high tide mark.

It would be possible, however, to alter the legal status of the nearshore zone in order to permit private ownership and/or management of nearshore marine property, including coral reefs. This would give the hotels, for example, the right to maintain the property for the exclusive use of their guests and staff. The advantage, of course, would be that the hotels (unlike NGOs or even the government) actually have the financial resources and economic motivation to succeed. The motivation is simple; to increase the quality of the product and thereby increase revenues. Many of the guests at beachfront hotels want to look at the coral reefs (by snorkelling, scuba-diving, or via glass-bottom boat), and it is therefore important to maintain healthy reefs. A second reason relates to the problem of harassment; many hotels would like to have more control over their immediate environs so that they can protect their guests from aggressive vendors.

The hotels would also, of course, have an incentive to take a proactive role in restoring 'their' reefs, and there are now a number of techniques (Haley, in preparation) that can accelerate reef recovery towards the ideal or pristine state. The exclusion of fishermen alone would assist in regeneration, and the increase in fish and coral numbers would allow these private areas to seed others, thereby generating a widening pattern of benefits.

The two largest chains of hotels in Jamaica – Sandals and Superclubs – operate 11 and 7 hotels respectively (as of June 2001). If these two chains were to assume control of their proximate littoral zones, this would immediately add 18 small, well-managed reserves to the larger reserves already present; a very worthwhile addition.

Modification of the benthic environment should still require official permission, as it does now. It would be justifiable, for example, for government to sell or give management contracts for sections of the coastline only to those who are both willing and able to maintain protected zones, and to disallow purchase for any other purpose.

CONCLUSION

As indicated in the body of the paper, there are (potential) solutions to all of the problems with Jamaica's marine environment. However, the two main anthropogenic factors negatively affecting Jamaican reefs; pollution and overfishing, will only be solved if they are addressed systematically, and solutions will only

be deployed if donors review their current commitment to channelling funding through NGOs and adopt a more pragmatic approach to the management and delivery of projects. Pollution is primarily a local problem, and can therefore be addressed by local NGOs in co-operation with the government. Overfishing, however, is a national problem, and must therefore be addressed at national level, although there is still a role for local NGOs as local experts who can guide the detailed decision making.

Although the issues addressed in this paper relate specifically to the mismanagement of one environmental issue in one transitional/developing country, variants of these problems can be found in other developing countries and in advanced economies with economically depressed areas and disadvantaged communities. Incorporating environmental management in the development of local communities, or entire countries, is a complex process, and a preference for just one mode of project delivery may inhibit proper consideration of other options. A search for real, workable solutions will typically require case-by-case consideration to determine the most effective combination of people, funds, NGOs, Ministries and other agencies. A more responsive, flexible, pragmatic, evidence-based and results-oriented approach would assist in this regard.

NOTES

¹ Michael Haley is currently Research Fellow in the Centre for Marine Sciences at the University of the West Indies. Anthony Clayton is currently the Alcan Professor of Caribbean Sustainable Development in the Sir Arthur Lewis Institute for Social and Economic Studies at the University of the West Indies. We would like to acknowledge the advice and comments of friends and colleagues at the University of the West Indies, the Discovery Bay Marine Laboratory (DBML) and in a number of NGOs, particularly Simon Pepper of the World Wide Fund for Nature. Some of our friends and colleagues do not agree with all of our conclusions, however, so we would also like to note that the final form and content of the paper (including any errors) are the sole responsibility of the authors. This is DBML publication number 656.

² Thomas Jefferson, the third President of the United States, believed that the strength of the republic lay in what he called the '100's', referring to the small town communities, each made up of roughly 100 families or so, that formed the backbone of the social network in parts of New England. Etzioni (1993) emphasised the central importance of the community, as intermediate between the individual and the state, and Giddens (1998) has extended this into a more general theory of political change and development.

³ Weber (1922) pointed out that bureaucracies will seek to perpetuate themselves, if necessary by re-inventing their role and function.

⁴ The second author was a member of the board of one of the UK's urban regeneration organisations.

⁵ One community activist commented that if the funding programmes had remained in place, there would eventually have been one community group per household.

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⁶The second author was a member of the EC advisory group asked to evaluate the funding proposal.

⁷Coral reef water adjacent to oceanic islands is typically oligotrophic (i.e. very low nutrient levels; see Birkeland 1997), so corals are typically stressed by nutrient run-off and the associated algal bloom.

⁸Bleaching describes the condition in which corals expel their symbiotic algae, and thereby become pale or white in appearance, and is associated with an increase in coral mortality.

⁹The Transparency International Corruption Perception Index is a poll of polls. The information is derived from a standardised range of sources and surveys. The primary polling involves business people, investors, risk analysts and – to a limited extent – the general public. The figures represent the subjective evaluation of the degree of corruption in a country by these groups. The index is a 10-point scale. In broad terms, countries with scores between 0–3 are regarded as completely/very corrupt; scores between 3–5 indicate extensive corruption; countries with scores between 5–7 are somewhat corrupt; those with scores between 7–9 are relatively clean; and those with scores between 9–10 are virtually devoid of any corruption. The 1998 Corruption Perception Index listed 85 nations. Denmark scored a perfect 10, the only country to do so. The UK scored 8.7, and placed 11th. The US scored 7.5, and placed 17th. Jamaica, with 3.8, placed 49th. The most corrupt country in the 1998 index was Cameroon, which scored 1.4, and placed 85th. See <http://www.transparency.org/>

¹⁰Current Executive Director, Montego Bay Marine Park.

¹¹National Environmental Protection Agency (10 Caledonia Avenue, Kingston 5, Jamaica).

¹²Manager, Montego Bay Marine Park, 1990–1994.

¹³Source: www.aquasafari.com/marinepk.html

¹⁴Source: www.bmp.org

¹⁵The green paper 'Towards a National Policy on Ocean and Coastal Zone Management in Jamaica', under review when this paper was written, became a white paper in July 2002, and is now official policy. Given past events, however, we remain sceptical that the nominal adoption of a national policy will result in any tangible environmental improvement.

¹⁶40,107 civil servants (Civil Service Association of Jamaica), 7,057 police (Jamaica Constabulary Force Establishment Unit), and 3500–4000 military personnel (Jamaica Defence Force were unwilling to release the exact number), as of June 1st 2001.

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