Article

How Global Biodiversity Targets Risk Becoming Counterproductive: The Case of Papua New Guinea

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Abstract
Despite the Convention on Biological Diversity (CBD) defining 20 targets across 5 strategic goals, Target 11, which relates to protected areas, has received the most emphasis from donors, non-government organisations, and governments, as a performance standard for conservation in Melanesia. Protected area targets, however, may not be culturally or technically appropriate for Melanesian countries, such as Papua New Guinea (PNG), where resource extraction is central to development. In PNG, most protected areas are ineffective and generally lack government support. Despite this, donors continue to link conservation funding to protected areas and CBD coverage targets. We argue that pressure to establish protected areas and report against numerous multilateral environmental agreements not only fails to deliver conservation benefits, but also wastes scarce resources and retards the development of sustainable conservation approaches in Melanesia. Rather than aspiring to arbitrary spatial targets as set by the CBD, Melanesian governments need to develop appropriate conservation strategies which have incremental approaches that build capacity, improve data quality, and mainstream biodiversity priorities. Low governance capacity remains a major barrier to Melanesian conservation, so greater funding needs to be directed to administrative effectiveness because without a government-driven conservation agenda, biodiversity protection—and protected areas—will inevitably fail.

Keywords: biodiversity, CBD, conservation policy, Melanesia, Papua New Guinea, protected areas

INTRODUCTION

The Convention on Biological Diversity (CBD) was introduced to protect—or rather reduce the loss of—biodiversity globally; however, the CBD goals have been criticised for a lack of clarity and most Convention signatories have failed to deliver adequate protected area coverage or biodiversity monitoring (Walpole et al. 2009; Mace et al. 2010). The reality is that many nations in the tropical regions—the very regions in which strategic biodiversity conservation is most urgently required—simply lack the resources and capacity to properly delineate, let alone deliver, most of their CBD goals. Typically, these nations are developing countries like Papua New Guinea (PNG), in which poor governance and corruption is entrenched, and where the rural populace is keen to embrace modernity and participate more fully in a cash economy. These developing countries adopted protected area coverage targets as part of their CBD commitments despite the fact that set-aside protected areas are still perceived as an alien concept with little relevance for many cultures, particularly across Melanesia (Filer 2000, 2005; Novotny 2010).

In this paper, we argue that many of the high-level conservation goals set by multilateral environment agreements (MEAs), especially the protected area coverage targets, are not just unrealistic, but they may even retard conservation.
efforts by diverting scarce funding and resources from more promising conservation approaches. Our arguments are based on experiences working with and for the government, non-government organisations (NGOs), and other conservation actors in PNG, a Melanesian country that contains globally significant biodiversity, but also typifies many recurring conservation constraints across the Pacific. We contend that the significant donor resources devoted to new protected areas need to be redirected towards much more modest—but specific and achievable—goals relevant for the conservation priorities, technical resources, institutions, and capacities of Melanesia. This would help NGOs, researchers, and other conservation actors to work with governments rather than continue piecemeal efforts to set up token protected areas or unsustainable unilateral programmes. Resource-use decisions are political in nature—and unless there is political will to cope with biodiversity conservation, little impact will be achieved.

Background of the CBD protected area targets

The CBD indicators are based upon focal areas to identify status, trends, sustainable use, and threats to biodiversity (Walpole et al. 2009; Mace et al. 2010). In addition to these monitoring and analysis components, minimal protected area targets represent a core component of CBD commitments. In 2004, the Seventh Conference of Parties (COP7) set a target to conserve at least 10 per cent of each of the world’s ecological biomes (Coad et al. 2010). Protected areas coverage is also a key indicator for assessing the Millennium Development Goals at national levels (i.e., Indicator 7.6: Proportion of terrestrial and marine area protected).

Although the 10 per cent biome target was originally established as a global indicator, it has been widely adopted by individual nations to set protected area targets as part of their National Biodiversity Strategies and Action Plans (NBSAPs) (Coad et al. 2010). In many countries, protected areas coverage has become a predominant conservation measure, and many NGOs and their donors cite these targets in their fundraising and programme reports.

In the lead up to the 2010 Nagoya CBD meeting (COP10), it became clear that the 2010 terrestrial and marine biodiversity targets had not been reached, provoking discussion as to how to make the CBD more relevant and achievable (see for e.g., Walpole et al. 2009). Several problems with CBD goals have been identified: firstly, the overall goal is framed negatively, and discourages positive action; secondly, the operational implementation is extremely vague about timescale, baselines, acceptable rates, and measures, making it difficult to develop any real indicators or monitor progress or loss. Moreover, it has been noted that the CBD targets are hardest to achieve in places where the need for biodiversity conservation is greatest (i.e., developing countries like PNG) (Mace et al. 2010).

Despite these concerns, the outcomes from COP10 are worryingly familiar. There has not been any real questioning of high-level targets—in fact, the 10 per cent protected area cover targets were increased to at least 17 per cent of terrestrial and inland waters, and 10 per cent of coastal and marine areas by 2020 (IISD 2010). Instead of pragmatic strategies, COP10 proposes new expansive initiatives to improve terrestrial and marine conservation: the aspirational ‘Nagoya Protocol’ (the most recent attempt to grapple with the perennially thorny issue of benefits sharing); and, a declaration of 2011 to 2020 as the ‘UN-Decade on Biodiversity’ (UN Resolution 65/161) (UN 2011). Some commentators have noted the need to recognise national realities for more effective on-the-ground action (see for e.g., Scanlon 2010); however, the CBD is still dominated by high-level concept statements which are decoupled from any specified plans for realisation in the low-capacity and resource-limited environments of many developing countries. Moreover, new multilateral programmes such as the Coral Triangle Initiative seem set to repeat exactly the same unsuccessful strategies that have failed to engage in-country support in places like PNG, where suspicion lingers as to who is driving the conservation agenda and who will spend the money.

Papua New Guinea: A priority for biodiversity management

By any measure, PNG is a global priority for biodiversity conservation. The nation of PNG comprises the eastern half of the island of New Guinea, which is home to about 6 per cent of the world’s known land species, around half of which are endemic. About 4.5 per cent of the world’s mammal species are found in New Guinea, or a remarkable nine times the average global density of mammal species (Allison 2009); in fact, the biodiversity of New Guinea is considered to rival or exceed that of Borneo (WWF 2011). New Guinea also supports the third largest expanse of intact tropical forest in the world, and perhaps the most resilient. Coastal and marine resources are also highly significant, with extensive reef and marine ecosystems within the country’s 2.4 million sq. km Exclusive Economic Zone, particularly in inshore areas along the country’s 20,197 km coastline (ADB 2004).

Environmental NGOs in particular are quick to highlight the biodiversity value of PNG. Nine of the World Wide Fund for Nature’s (WWF) Global 200 Ecoregions are in PNG, as well as six Alliance for Zero Extinction sites. The entire country falls within two biodiversity hotspots (New Guinea and the East Melanesian Islands), and is classified as a ‘genuine’ wilderness by Conservation International. The forests and reefs of PNG are found on almost every global listing of priority conservation areas.

The population of PNG is currently around 6.7 million and is predominantly rural, with more than 80 per cent of households dependent on subsistence agriculture (Bourke and Harwood 2009). Communities organised in clan-based structures are the primary resource owners in PNG. Approximately 98 per cent of the land base and forest in PNG is owned by clans under customary law [although this may effectively be reduced to about 85 per cent due to the recent proliferation of government agricultural leases to private companies (Filer 2010)], and coastal and marine resources in some areas are also managed under community structures (Carrier 1987). Therefore, by
definition, any land-use or conservation activity in PNG must be undertaken in collaboration with the local community.

Conservation and protected areas in PNG

The notion of protected areas and a national conservation agenda is relatively recent for PNG. Until 1975, the country was under an Australian mandate, during which time the colonial administration established a few parks and reserves under the National Parks Act. But, these were small (seven parks totalling less than 30 sq. km), largely because the tribal laws and traditional land-ownership system was/is incompatible with state land control. As the country attained independence in 1975, there was a sudden spurt in the establishment of new protected areas (Figure 1), with the vast majority of these gazetted under the PNG Fauna (Protection and Control) Act as Wildlife Management Areas (WMA). Unlike the top-down approach of National Parks, WMAs are supposed to be initiated and supported by local communities. Although WMAs have been regarded as protected areas, they do not legislate for habitat conservation; in fact, the Act enables WMA committees to make rules for the “protection, propagation, encouragement, management, control, harvesting and destruction of fauna” (Author emphasis). Moreover, studies show that in accessible areas, the rate of forest change is just as high within many WMAs as in unprotected areas (Shearman and Bryan 2011), and in some cases (e.g., Guru WMA in New Britain), local communities have actively cleared parts of their WMA for oil palm, or investigated logging and mining concessions (e.g., Crater Mountain WMA in the Eastern Highlands).

Since PNG signed the CBD in 1993, there have been spasmodic additions to the national register of protected areas. The vast majority of these (over 70 per cent in coverage) were large WMAs established with the active support of international NGOs, often with communities cajoled into developing these WMAs with promises of rural enterprise opportunities. Attempts to develop large marine conservation areas in the Milne Bay Province failed using similar ‘carrots’ in the way of Conservation Incentive Agreements (CIAs) (Baines et al. 2006). More recently, the forest Conservation Area in the Yus area of western Morobe Province, gazetted in early 2009, has taken a more formalised CIA approach to garner community support, but its long-term sustainability is questionable, as it is again driven by a large international NGO.

The PNG Department of Environment and Conservation (DEC) currently lists 61 protected areas (of which over 90 per cent by area are WMAs) that cover about 18,000 sq. km or 4 per cent of the country by area, while the World Database on Protected Areas (WDPA) lists 54 protected areas in PNG, of which only two have been afforded International IUCN categorisation (a III and a VI) (WDPA 2011). Notwithstanding these conflicting figures, it is clear that the protected area coverage is well below CBD target figures and, moreover, the value of these protected areas is questionable. Even the modest WDPA figures are optimistic, because most protected areas are effectively dysfunctional, and none (not even the most recently established) have management plans, funding or sustainable financing (Chatterton et al. 2009). In addition to their doubtful legal value, the ecological viability of WMAs is dubious: most are small (over 50 per cent are less than 10 sq. km and only 13 per cent are greater than 500 sq. km in area), none cover full catchment areas or habitat ranges, and there is no strategic link with major biomes (Chatterton et al 2009; Lipsett-Moore et al. 2010; Shearman and Bryan 2011).

For these reasons, the DEC is keen to revamp protected areas policy and legislation, and has recently implemented a de-facto moratorium on declaring new WMAs. Apart from protected areas, PNG’s other conservation work under the CBD has been slow and patchy. A National Biodiversity Strategy and Action Plan (NBSAP) was published in 2007 (GPNG 2007), but it takes an academic approach, re-iterating high-level CBD commitments, identifying six national goals (including the unachievable 10 per cent protected area coverage target by 2010) and nine national programmes, comprising a list of idealised outcomes. The plan also encourages PNG to “take all necessary measures to fulfil the commitments of the agreements already signed under related International Conventions.” Notably, however, the NBSAP fails to articulate tangible ways to achieve these lofty aims: it provides no work plan or detailed activities, and no details of funding needs or sources (Wickham et al. 2010). The NBSAP also fails to address the underlying drivers of biodiversity loss or ways to mainstream changes, a common fault in many conservation approaches (Ferraro and Pattanayak 2006) and NBSAPs in particular (Prip et al. 2010). The country’s recent CBD report highlighted the unrealistic and premature nature of the NBSAP goals because PNG is yet to develop a database to determine the conservation status of species and ecosystems (GPNG 2010).

Despite the on-going issues with protected areas and the inadequacy of the NBSAP, a good deal of biological study has been done by NGOs (mostly the large international ones), researchers, and the government in PNG (see for e.g., Beehler and Alcorn 1993; Filer 2004; Allison 2009; Lipsett-Moore et al. 2010). Biological survey data have been collected (albeit...
scattered) and the DEC is trying to implement an on-going rationalisation of representative eco-regions to form the basis of an updated conservation needs assessment (GPNG 2010; Lipssett-Moore et al. 2010). However, this work is slow and ephemeral: inevitably, the spectre of CBD coverage targets haunts all conservation decisions, because protected areas remain a dominant indicator of conservation success for many environmental donors and NGOs. For example, the funding arm of the CBD, the Global Environment Facility (GEF), still insists that protected area coverage be integral to any national biodiversity funding for PNG. Consequently, related GEF conservation strengthening programmes, such as the Programme of Work on Protected Areas (PoWPA), are still predicated upon the central role of protected areas. Therefore, seminal strategic work has been constantly deferred as the government diverts much of its limited conservation resources in the DEC towards resolving the problems created by the declaration of ill-conceived protected areas.

**Motivations for protected areas**

Because a large backlog of WMAs await gazettal in PNG, it has been implied that the government is failing to support protected areas and conservation (Laurance et al. 2010; Shearman and Bryan 2011). However, this criticism needs perspective. Thus, it is crucial to analyse the motivations of stakeholders involved in the establishment of protected areas in PNG; namely, NGOs, communities, and government.

Environmental NGOs have been the foremost promoters of protected areas in PNG, despite the fact that their own assessments have long shown protected areas in this region to be ineffective and undermined by systematic governance and capacity issues (Swartzendruber 1993; Chatterton et al. 2009; Lipssett-Moore et al. 2010). Given these findings, it is hard to escape the conclusion that a major reason for the on-going promotion of protected areas by NGOs is the need to access donor funding, rather than the development of sustainable conservation approaches. Currently, all the major environmental donors [e.g., European Union, GEF, and UK Department for International Development (DFID)] refer to protected area coverage as a key conservation indicator (often linked to CBD goals). It is hard to see how an NGO could attract major funding for conservation without including protected area targets. Environmental NGOs in Melanesia are very susceptible to funding pressure because of the extremely high local costs and poor record of conservation delivery; this has led to a history of high staff turnover and short-term approaches (Filer 2005; Chatterton et al. 2009; Novotny 2009).

For village communities, the perspective of protected areas is centred on the identification and valuation of user rights. Melanesia is typified by unregistered customary land: most land is not under title, and when it does become registered, it is highly sought as having development potential (Power 2008). A WMA gazettal provides communities with a formally marked border. Similarly, conservation agreements are in the form of contracts on private land tied to the title of the land, so a protected area can help codify boundaries for resource rights or to assert dominance over rival tribes (Ellis 1997; Filer 2000). For village communities, conservation is seen as a business opportunity or bargaining tool like any other in which conservation imposes a restrictive covenant—essentially, conservation offers a choice of opportunity cost against economically productive use (McCallum and Sekhran 1997; Filer 2000, 2004; van Helden 2001; West 2006; Novotny 2009, 2010).

By contrast to NGOs and communities, there is little incentive for the government to gazette new WMAs. The DEC has no say in where protected areas are proposed (because they are often predicated by where environmental NGOs are located), and also has no dedicated funding for on-going management or support. Furthermore, the DEC has often been compromised as WMA boundary claims conflict with other more powerful resource management and development authorities. This has been exemplified by the compensation demands resulting from the contested resource use of the 2,280 sq. km Hunstein Range WMA in the Sepik Provinces (Filer and Wood 2011; Leggett and Lovell 2011).

**Broader barriers for Melanesian conservation**

The CBD targets illustrate a wider problem that developing countries often enter into MEAs which do not address local realities, but instead create conceptually vague goals (Chasek 2010). For instance, since attaining political independence in 1975, PNG has ratified and acceded to close to 50 MEAs; however, these are all non-binding and it is hard to identify tangible outcomes from many of them (Wickham et al. 2010). Despite agreeing to implement numerous high-level goals on species and habitat protection agreements, and proposing eight sites for the World Heritage list, PNG still lacks a formal conservation and protected areas policy. Consequently, many conservation practitioners in PNG are sceptical of the motivations and practicality of international commitments and donors (Filer 2005, 2010, 2011). Most recently, the gap between high-level aspirations and reality has been graphically demonstrated for Reduced Emission from Deforestation and Degradation (REDD) projects, in which PNG's international rhetoric has not been matched by any practical actions on the ground (Melick 2010; Leggett and Lovell 2011).

Given the lack of any follow through on MEA goals, the PNG government is open to criticisms of using MEAs to seek international prestige, rather than using them to stimulate genuine on-the-ground commitments. This style-over-substance approach is something to which PNG is very susceptible, because Melanesian politics remains, in some areas, an extension of leadership based around eloquence, wealth, power, travel, and other signs of strength and knowledge of the outside world (Filer 2000, 2004, 2005; West 2006; Novotny 2009; Chasek 2010).

Not only is the value of MEAs questionable for some developing countries such as PNG, but compliance requirements place added strain on limited national resources and capacities.
and can obfuscate conservation aims and needs (Chasek 2010; Wickham et al. 2010). Locke and Dearden (2005) noted this phenomenon and warned how global biodiversity funding is increasingly framed in terms of relationships to overarching poverty reduction and development goals; but, the links between biodiversity and poverty are complex and may be antagonistic (Sachs et al. 2009). The need to link conservation to poverty has certainly led to prescribed, unrealistic goals for some projects in PNG, with priorities aligned to donor expectations, rather than the conservation preferences of local communities (Baines et al. 2006; EC 2007; Benson 2012). Similarly, compliance reporting and strategy planning for biodiversity conservation often seems formulaic when linked to MEA funding. For example, Niue (with a population of 1,100 and an area of 259 sq. km) received the same amount from the CBD to produce an NBSAP as did PNG (with a population of 6.7 million and an area of 452,860 sq. km) (Carter 2007)—if a well-considered, researched result was desired, this hardy seems equitable.

Rethinking conservation approaches for Melanesia

There is no doubt that protected areas can play a valuable role in conservation globally, but all analyses agree that effective protected areas need governance support, local capacities, and sustainable financing (see for e.g., Ervin 2003; Rodrigues et al. 2004; Hayes 2006; Lele et al. 2010). Moreover, protected areas must be culturally relevant (Hayes and Ostrom 2005). There is also on-going debate as to what constitutes a protected area, with suggestions that IUCN Category V and VI protected areas would be better regarded as sustainable development areas (Locke and Dearden 2005). However, the most recent IUCN definitions state that conservation must be the primary objective for any protected area (Dudley et al. 2010), suggesting that nothing but state or private national parks would be designated as protected areas in Melanesia—given the strong relationship between people and their land, this raises obvious questions as to whether the IUCN notion of protected areas is at all relevant for Melanesia.

However, any debate regarding the status and feasibility of protected areas is still premature for PNG, about which four points are clear: 1) current protected areas are ineffective; 2) protected areas have limited government buy-in and begrudging support; 3) long-term conservation per se is rarely the prime community motivation for protected area establishment; and, 4) existing resource leases overlap with virtually all prospective, and many existing, protected areas (Table 1).

Despite these problems, Shearman and Bryan (2011) contend that the highest conservation priority for the PNG Government is to strengthen the WMA system and provide appropriate support for the many outstanding WMA applications, which they claim could be done “immediately, easily and at modest cost”. However, this is at odds with the evidence of failed and contested WMAs, and seemingly disregards the huge legal problems and possible compensation issues created by declaring WMAs over areas subject to resource exploration or development leases (see for e.g., Filer and Wood 2011), which cover enormous tracts of PNG and overlap with WMA claims (Table 1). We contend that strengthening WMAs, let alone creating more, could be done neither easily nor cheaply. Funds are required to operate WMA Committees, and moreover, adequate methods to monitor biological integrity have not been established for the country, let alone for rural villagers. Therefore, WMAs remain dependent on the support of environmental NGOs and this will continue to lead to multiple new resource conflicts, mixed agendas, and power politicking.

Some government managers within PNG are keen to reassess the current effectiveness of WMAs and de-list those that are compromised or degraded, but they are sensitive to the international donor reaction. De-listing protected areas may seem counter-productive, but in fact, such action could clear the ground for a realistic and robust approach to the establishment and management of viable protected areas. The warning of Ferraro and Pattanayak (2006) with regard to conservation programmes is extremely pertinent for PNG: “you cannot overcome poor quality with greater quantity.” Rather than press for new protected areas, real progress requires the development of minimum management standards and scientifically-based ecological and socioeconomic criteria for any future protected areas.

Appropriate conservation targets for Melanesia

The COP10 in Nagoya revised the strategic targets for the CBD and published these as the Aichi Targets (CBD 2010). There are 20 targets in five categories, covering virtually all strategic directions for conserving biodiversity, from species to landscape-scale conservation, to status of biodiversity knowledge. Only one of these targets, Target 11, is about protected area coverage. However, for Melanesia, other Aichi targets are much more relevant; namely, positive management incentives (Target 3), sustainable land-use (Target 7), integration of community practices (Target 18), and development of scientifically-based biodiversity criteria (Target 19). There is considerable overlap between these targets, but they could frame some specific conservation actions for PNG (Table 2).

Firstly, PNG must not only identify priority areas which have the greatest chance of sustained support, i.e., limited resource

Table 1

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<tr>
<th>Type of lease</th>
<th>Area (sq. km)</th>
<th>Coverage (%) of PNG</th>
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<tbody>
<tr>
<td>Mining exploration</td>
<td>102,000</td>
<td>22.0</td>
</tr>
<tr>
<td>Onshore oil and gas logging</td>
<td>118,600</td>
<td>25.6</td>
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<tr>
<td>Existing or potential concessions</td>
<td>58,000</td>
<td>12.5</td>
</tr>
<tr>
<td>Reserve logging forest</td>
<td>155,000</td>
<td>33.5</td>
</tr>
<tr>
<td>Re-entry or plantations</td>
<td>29,000</td>
<td>6.3</td>
</tr>
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Source: PNG Mineral Resources Authority, PNG Department of Petroleum and Energy, and PNG Forest Authority
conflicts, unified community support, and viable funding options; but must also invest in developing the necessary human capacity within its universities, research institutes, and public management agencies. Currently, it is highly probable that many claimed conservation outcomes are counterfactual [e.g., the apparent protection afforded by some WMAs is likely due to their inaccessibility (Filer 2005; Novotny 2010; Shearman and Bryan 2011)], and that many proposed conservation projects and protected areas have no economic viability in the absence of prolonged external support.

Although several biodiversity assessments have been made for PNG, there is still a lack of robust species and habitat data (Allison 2009; Filer et al. 2009; GPNG 2010; Lipsett-Moore et al. 2010; Shearman et al. 2010), so rather than measuring success against dubious coverage targets, tasking PNG with delivering biodiversity assessments of a few key areas, developing a centralised national biodiversity database, and a priority map could be an excellent—and achievable—10 year target for the CBD. Some concrete outcomes would bolster in-country confidence that PNG can produce and collate its own data and create its own biodiversity targets.

As far as the landowning groups are concerned in Melanesia, it is clear that the approach to conservation must be one of holistic resource management that includes development through resource extraction (Filer 2004; Hunt 2010; Novotny 2010; Shearman and Bryan 2011). Such activities could include funding to assess community management plans, centralised land-cover change mapping, development planning, and

<table>
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<th>CBD target</th>
<th>Possible activities within PNG</th>
<th>Outcomes</th>
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<tr>
<td>Target 3: By 2020, at the latest, incentives, including subsidies, harmful to biodiversity are eliminated, phased out or reformed in order to minimize or avoid negative impacts, and positive incentives for the conservation and sustainable use of biodiversity are developed and applied, consistent and in harmony with the Convention and other relevant international obligations, taking into account national socio economic conditions.</td>
<td>Oil Palm standards. Specific biodiversity contributions and offset responsibilities linked to National Development plans and project permit applications and renewals.</td>
<td>Current certified oil palm is mandatory—reduction of non-assessed forest clearing. Increased incentives for socially and environmentally responsible resource companies. Industry funding for biodiversity offsetting.</td>
</tr>
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<td>Target 7: By 2020 areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity.</td>
<td>Review of agricultural lease applications. Surveys of biodiversity values of logged-over and swidden-use forest areas. Development of national standards for oil palm development. Standardisation of forest type assessments [including high conservation value forest (HCVF) toolkit and identification of minimal protection habitat requirements]. Prioritisation of invasive species issues (including problems created by misguided Food and Agriculture Organization food fish programmes).</td>
<td>Improved transparency in land-use planning. Quantifiable metrics for biodiversity impacts of major land-uses. Industrial land-use is subject to national standards. Quantifiable benchmarks for environmental levies.</td>
</tr>
<tr>
<td>Target 18: By 2020, the traditional knowledge, innovations and practices of indigenous and local communities relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, are respected, subject to national legislation and relevant international obligations, and fully integrated and reflected in the implementation of the Convention with the full and effective participation of indigenous and local communities, at all relevant levels.</td>
<td>Review of existing community management plans and WMAs. Review of existing protected area legislation in terms of community rights and obligations. Development of minimal criteria for community land-use management plans. Clear identification of community priorities, including land development and conservation options.</td>
<td>Community values and priorities are captured as part of assessing the viability of conservation approaches. Potential conservation actions are aligned with community needs. Unrealistic and unsupported conservation programmes are identified and funding redirected. Development of appropriate multi-use conservation plans.</td>
</tr>
<tr>
<td>Target 19: By 2020, knowledge, the science base and technologies relating to biodiversity, its values, functioning, status and trends, and the consequences of its loss, are improved, widely shared and transferred, and applied.</td>
<td>Centralisation of biodiversity data with PNG Government. Creation of national biodiversity information system. Coordination of surveys to identified priority sites (e.g., Owen Stanley Ranges, New Britain). Development of national comprehensive, adequate and representative (CAR) criteria for protected area development.</td>
<td>The creation of a scientifically based and transparent set of national conservation criteria which is supported by the national Government. Enhanced alignment of NGO conservation projects (and donor funding) with national priorities. Resources focused on realistic conservation approaches. Empirical data to highlight counterfactual conservation outcomes.</td>
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centralised research coordination linked with existing and new spatial mapping. These resource management tools are also essential to deliver robust monitoring and evaluation for concepts such as payment for environmental services (PES), biodiversity offsets, or direct payment for conservation leases, which are likely to play a role in any sustainable PNG conservation strategy.

Opportunity costing is absolutely essential before any conservation project—let alone protected area—is even envisaged by the government (see for e.g., Lipsett-Moore et al. 2010). This would facilitate more meaningful and transparent interaction with communities, businesses, and donors. For this reason, it is important that measureable conservation goals be part of new mandatory national standards for resource development, such as oil palm, mining, and fisheries [Table 2; Aichi Targets 3 and 7 (CBD 2010)]. The codification of specific biodiversity targets, cost identification, and credibility of development proposals are critical to these standards, because the current vague notions of sustainability in PNG’s national development strategies (see GPNG 2009) are clearly ineffective. The DEC is now trying to initiate the development of specific industry standards with the hope that PES and environmental levies may eventually help finance protected areas. Importantly, the establishment of a protected area is the end result of this process, not the beginning, as is currently assumed under the NBSAP with an emphasis on CBD Target 11.

However, conservation practitioners need to test any and all practical alternative models for Melanesia which might align with CBD targets. For example, alternatives may emerge directly from multinationals engaged in resource exploitation, where corporate social/environmental sustainability is drawing a lot of attention; this may lead to a new paradigm of sustainable resource use and conservation planning in PNG.

Changes required by conservation stakeholders and donors

For greater conservation effectiveness in PNG, donor priorities and funding needs to focus more on investment in conservation capacity, rather than in pushing protected area establishment. Donor targets should also be aligned with realistic government priorities and initial funding should support the few existing projects that show promise, rather than starting afresh in new locations. There is also an onus on multilateral donors to try and remove overlaps and perverse outcomes [e.g., financing road expansion and forest conservation in the same places, funding of ill-conceived fish stock enhancement programme [e.g., Sepik-Ramu systems (Werry 1998)] that threaten biosecurity, or paying for business-as-usual or counterfactual outcomes (see for e.g., Filer 2010)]

Finally, there is an urgent need to break the vicious cycle that creates projects predicated upon unrealistic high-level international goals. Currently, the design and reporting formats for multilateral donor projects are so complex that only organisations with dedicated overseas government aid agency experts linked to donors are able to access them. This has resulted in the decoupling of project designs from the realities on the ground, leading to goals that are locally untenable or even disingenuous (e.g., short-term EU, DFID, and GEF projects, which demand rises in per capita incomes, concomitant with development of IUCN conservation areas).

Environmental NGOs are clearly central to conservation: they have a role in monitoring national standards and lobbying issues. However, NGOs should not try to drive national agendas—an approach which has been unsuccessful and confrontational for the past several decades in PNG [see for example the extreme polemic views of some conservation stakeholders cited in Filer (2005)]. In addition, large international NGOs are highly influential in framing donor approaches: they largely develop international conservation metrics and often help review large donor grants (e.g., the GEF, REDD programmes, and the Coral Triangle Initiative). To avoid becoming irrelevant and appearing self-serving, these NGOs must set aside their own funding pressures and address the need for a paradigm change on the usefulness of many of the CBD and MEA indicators (such as protected areas) for places like Melanesia. In essence, NGOs should become service agents for in-country agendas and programmes. Such a change requires a genuine effort to replace the current deductive approach (i.e., conservation theory informs local strategies) in favour of inductive approaches (i.e., practice informed by on-the-ground experience). Critically, these findings must resonate with the head offices and funding agencies in Europe, USA, and Australia, which all too often seem very far removed from the local conservation agenda.

To address overarching capacity issues, more conservation funding must be focused on public administration and financial management, with the provision of such basics as functioning communications, resource materials, and databases. Few outsiders appreciate the exorbitant costs of working in Melanesia and donor grants allow very low, or zero, management costs for government and NGOs. Past government conservation strengthening programmes in PNG have been largely unsuccessful, so new efforts must be more corporately focused to specifically link performance contracts with better-resourced positions, such as is being mooted in the transition of the DEC into a statutory authority. None of these funding needs are as ‘sexy’ as protected areas and field projects, but without adequate central capacities and government support, most field projects and many NGOs will continue to have no sustainability. Moreover, without greater government functionality, there will be no chance of developing local institutions or mainstreaming biodiversity within cross-sectoral activities at a national level—something that is supposed to be a key focus for the CBD (Prip et al. 2010).

CONCLUSIONS

In a damning critique of conservation approaches, Ferraro and Pattanayak (2006) challenge the credibility of monitoring and analyses used to justify most conservation programmes,
including the CBD and the Millennium Ecosystem Assessment. They assert that few—if any—projects have been properly assessed and speculate that much money has been wasted on protected areas and other counterfactual outcomes. Similar frustrations are evident from Cowling (2005) who called for natural scientists to “climb off their thrones and engage with real stakeholders”, including governments and communities. Most large-scale conservation projects in PNG have exemplified these criticisms. We argue that the last decades have been largely wasted chasing short-term notional coverage targets rather than trying to foster real behavioural change by developing a new generation of applied in-country practitioners.

Desperation to identify any measureable outcome from Melanesia’s environmental reporting blancmange is one understandable reason that donors cling to protected areas. However, until donors rethink their fixation with big-picture outcomes and encourage national governments to strip back rhetorical policy statements and address the underlying reasons for consistent failures, it is hard to see how a country such as PNG can ever develop a sustainable conservation strategy.

Commenting on the history of conservation failures in PNG, small local NGOs feel conservation is better facilitated through local social movements than by large NGO projects; their manifesto states that: “the real power to change this horrible mess in PNG doesn’t lie in the hands of the big boys of conservation but in the hands of the donors” (Filer 2005). But since donor approaches are strongly influenced by the metrics of large international conservation NGOs, it is highly doubtful whether donors have the courage to abandon the high-level, protected areas approach. Investing in long-term better management will probably be seen as high-risk, lacking measurability, and diluting hard conservation agendas. No one with any experience working in developing countries is naïve about the challenges, but given the amount of money and energy that has been spent (or wasted) already, surely this is a risk worth taking—in fact, a risk that must be taken. In the final analysis, sustainable conservation of some of the world’s most valuable biodiversity must rely on functional government institutions working collaboratively with—rather than against—civil society, NGOs, and researchers on pragmatic and deliverable outcomes.

Many conservation and social scientists are becoming cynical about the conservation industry surrounding the CBD (see for e.g., Adams 2010; Holmes 2011), and there are questions as to the relevance, and even perverse outcomes, of linking biodiversity funding to global markers (see for e.g., Barnes 2010; Chasek 2010). A refreshing start to this ‘UN Decade on Biodiversity’ could be for the next CBD goal-setting meeting to be limited only to those actively engaged in field conservation in developing countries. One suspects two major outcomes: 1) significantly lower attendance and costs; and 2) less grandiose, more specific goals. Currently, such a scenario seems likely to remain little more than wishful thinking.

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**REFERENCES**


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