

Cover Note

Project Name: Community Based Coastal and Marine Conservation in Milne Bay Province

Date: 1 October, 2001

	Work Program Inclusion	Reference/Note
1. Country Ownership		
• Country Eligibility		Cover Page
• Country Drivenness	Clear description of project's fit within: <ul style="list-style-type: none"> • National reports/communications to Conventions • National or sector development plans 	Paragraph 9 Paragraph 10, 11, Annex A: IC Assessment
• Endorsement	• Endorsement by national operational focal point.	Attached
2. Program & Policy Conformity		
• Program Designation & Conformity	• Describe how project objectives are consistent with Operational Program objectives or operational criteria.	Paragraph 30
• Project Design	Describe: <ul style="list-style-type: none"> • sector issues, root causes, threats, barriers, etc., affecting global environment. • Project logical framework, including a consistent strategy, goals, objectives, outputs, inputs/activities, measurable performance indicators, risks and assumptions. • Detailed description of goals, objectives, outputs, and related assumptions, risks and performance indicators. • Brief description of proposed project activities, including an explanation how the activities would result in project outputs • Global environmental benefits of the project. • Incremental Cost Estimation based on the project logical framework. • Describe project outputs (and related activities and costs) that result in <i>global</i> environmental benefits • Describe project outputs (and related activities and costs) that result in joint <i>global and national</i> environmental benefits. • Describe project outputs (and related activities and costs) that result in <i>national</i> environmental benefits. • Describe the process used to jointly estimate incremental cost with in-country project 	Paragraphs 16 -19, Annex D (Threats, Root Causes and Management Solutions) Annex B (Log Frame Matrix) Paragraphs 20-28 (strategy, goals, Outputs) Paragraph 38: Risks Annex B: Assumptions and Performance Indicators Paragraphs 24-27 Paragraphs 1-3, Annex F (Overview of Biodiversity) Annex A (Incremental Cost Analysis) Annex A: Para 4.1 (a) (b) (c) NA Annex A Para 4.1 (d) Baseline estimates were collected by a staff member of the Department of National

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	<p>partner.</p> <ul style="list-style-type: none"> Present the incremental cost estimate. If presented as a range, then a brief explanation of challenges and constraints and how these would be addressed by the time of CEO endorsement. 	<p>member of the Department of National Planning and Monitoring, seconded to the project. The Milne Bay Provincial government assisted with the collection of baseline data, and elaboration of incremental costs. Project costs were partitioned, based on projected incremental costs with the full input of all the funding agencies involved.</p> <p>Annex A, Paragraph 35</p>
<ul style="list-style-type: none"> Sustainability (including financial sustainability) 	<ul style="list-style-type: none"> Describe proposed approach to address factors influencing sustainability, within and/or outside the project to deal with these factors. 	Section F, Paragraphs 38-40
<ul style="list-style-type: none"> Replicability 	<ul style="list-style-type: none"> Describe the proposed approach to replication (for e.g., dissemination of lessons, training workshops, information exchange, national and regional forum, etc) (could be within project description). 	Paragraph 39
<ul style="list-style-type: none"> Stakeholder Involvement 	<ul style="list-style-type: none"> Describe how stakeholders have been involved in project development. Describe the approach for stakeholder involvement in further project development and implementation. 	<p>Paragraph 22</p> <p>Annex E (Public Participation Plan)</p>
<ul style="list-style-type: none"> Monitoring & Evaluation 	<ul style="list-style-type: none"> Describe how the project design has incorporated lessons from similar projects in the past. Describe approach for project M&E system, based on the project logical framework, including the following elements: <ul style="list-style-type: none"> Specification of indicators for objectives and outputs, including intermediate benchmarks, and means of measurement. Outline organizational arrangement for implementing M&E. Indicative total cost of M&E. 	<p>Paragraph 47</p> <p>Paragraphs 41-46</p> <p>Annex B (Logical Framework)</p> <p>Paragraph 41- 43, Annex B (2), Annex D</p> <p>Estimated at 15% of the budget</p>
3. Financing		
<ul style="list-style-type: none"> Financing Plan 	<ul style="list-style-type: none"> Estimate total project cost. Estimate contribution by financing partners. Propose type of financing instrument. 	Paragraphs 35-36, Page 2 of Project Brief “ Grant
<ul style="list-style-type: none"> Implementing Agency Fees 	<ul style="list-style-type: none"> Propose IA fee. 	Basic Project Fee
<ul style="list-style-type: none"> Cost-effectiveness 	<ul style="list-style-type: none"> Estimate cost effectiveness, if feasible. Describe alternate project approaches considered and discarded. 	Paragraph 37

	Work Program Inclusion	Reference/Note
4. Institutional Coordination & Support		
IA Coordination and Support • Core commitments & Linkages	Describe how the proposed project is located within the IA's: • Country/regional/global/sector programs. • GEF activities with potential influence on the proposed project (design and implementation).	Paragraph 32 Paragraph 31
• Consultation, Coordination and Collaboration between IAs, and IAs and EAs, if appropriate.	• Describe how the proposed project relates to activities of other IAs (and 4 RDBs) in the country/region. • Describe planned/agreed coordination, collaboration between IAs in project implementation.	The Project builds on the substantive efforts of the Asian Development Bank (ADB) to strengthen management of the fisheries sector, including through institutional strengthening activities. The Proposal was discussed fully with Staff of the ADB project, and is fully compatible with that initiative, adding to the range of available management instruments in the country.
5. Response to Reviews		
Council	Respond to Council Comments at pipeline entry.	
Convention Secretariat	Respond to comments from Convention Secretariats.	
GEF Secretariat	Respond to comments from GEFSEC on draft project brief.	
Other IAs and 4 RDBs	Respond to comments from other IAs, 4RDBss on draft project brief.	
STAP	Respond to comments by STAP at work program inclusion	
Review by expert from STAP Roster	Respond to review by expert from STAP roster.	Annex C

PROJECT BRIEF

1. IDENTIFIERS

PROJECT NUMBER	PIMS 1068
PROJECT NAME:	Papua New Guinea: Community-based Coastal and Marine Conservation in Milne Bay Province
DURATION:	10 Years [Phase 1: 5 years; Phase 2: 5 Years]
IMPLEMENTING AGENCY:	United Nations Development Programme
EXECUTING AGENCY:	Conservation International
REQUESTING COUNTRY:	Papua New Guinea (PNG)
ELIGIBILITY:	PNG became Party to the CBD on 16 March 1993
GEF FOCAL AREA:	Biodiversity
GEF PROGRAMMING FRAMEWORK:	OP#2: Coastal, Marine, and Freshwater Ecosystems

2. SUMMARY:

Milne Bay Province is located on the eastern extremity of the island of New Guinea, at the edge of the biologically rich “coral triangle”. The area is a globally important storehouse of coastal and marine biodiversity, harbouring a range of tropical marine ecosystems. The species richness of these ecosystems is extraordinarily high, and besides displaying high levels of endemism, the area supports large populations of threatened species. While Milne Bay’s coastal and marine ecosystems remain in relatively pristine condition compared to those elsewhere in the Pacific Rim, pressures on the environment are escalating, and precautionary conservation interventions are needed to foreclose the loss of global conservation values. The project will support community-based conservation management demonstrations, working in three designated Zones that are representative of Milne Bay’s habitat diversity and the many different social settings in the Province. Interventions will seek to establish community-managed marine protected areas (MPAs), geared to securing conservation and sustainable use objectives.

With this objective, the project would support social mobilization, planning, awareness, advocacy, monitoring, evaluation and targeted capacity development. The Project is partitioned into two phases, to facilitate learning and condition GEF support progressively upon the attainment of conservation outcomes. This proposal seeks funding for the Phase 1, which will pilot the conservation approach in the first of the three target Zones, where social feasibility analyses undertaken during the course of project preparation have indicated that prospects for successfully mitigating threats to biodiversity are strong. Activities during this phase will test and adapt appropriate conservation models to reflect social, economic and ecological specificities in the area, while also establishing an enabling institutional and policy environment for conservation activities across the Province. Subject to independent verification that key milestones for Phase 1 have been met, a proposal will be submitted to the GEF for Phase 2 funding. Activities during Phase 2 would seek to adapt tested conservation approaches to the social and ecological landscapes of the other target Zones, while monitoring impacts in Zone 1.

3. COSTS AND FINANCING (MILLION US\$)

		Phase 1	Phase 2**
<u>GEF</u>	Project	3.200	~3
	PDF-B	0.349	
	Sub-Total	3.549	
CO-FINANCING	Government	0.570	~4
	CI	1.650	
	UNDP	0.500	
	Govt of Japan	0.350	
	ACIAR	0.140	
	ANU	0.108	
	PDF-B	0.260	
	Sub-Total	3.577	
Total Project Cost		7.127	~7

** Phase 2 funding estimates are indicative and will be confirmed during phase 1, following further site preparation.

4. ASSOCIATED FINANCING:

Baseline financing costed at US\$ 13.73 million over 5 years.

5. OPERATIONAL FOCAL POINT ENDORSEMENT:

Name: Dr Wari Iamo **Title:** Director
Organisation: Office for Environment and Conservation **Date:** 30-07-01

6. IA CONTACT:

Tim Clairs, Regional Co-ordinator, email <tim.clairs@undp.org>

LIST OF ACRONYMS

ACIAR	Australian Centre for International Agricultural Research
ADB	Asian Development Bank
ANU	Australian National University
APR	Annual Project Report
AusAID	Australian Aid
CBD	Convention on Biological Diversity
CBO	Community Based Organisation
CI	Conservation International
CNA	Conservation Needs Assessment
CPUE	Catch Per Unit Effort
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DOE	Department of Education
ENSO	El Niño Southern Oscillation
EU	European Union
FFA	Forum Fisheries Agency
GoPNG	Government of Papua New Guinea
GoJ	Government of Japan
GPS	Geographical Positioning System
HDI	Human Development Index
HSF	Japan Human Security Fund
ICLARM	International Centre for Living Aquatic Resource Management
LLG	Local Level Government
MBPG	Milne Bay Provincial Government
MPA	Marine Protected Area
NFA	National Fisheries Authority
NGO	Non-governmental Organisation
OEC	Office of Environment and Conservation
OP	GEF Operational Program
PIP	Public Investment Programme
PIR	Project Implementation Review
PPNA	Policy and Planning Needs Assessment
PRA	Participatory Rural Appraisal
RAP	Rapid Assessment Program
SES	Stakeholder Evaluation Study
SPP	Stakeholder Participation Plan
SPREP	South Pacific Regional Environmental Program
UPNG	University of Papua New Guinea
TAC	Total Allowable Catch
TPA	Tourism Promotion Authority
WDC	Ward Development Committee

A. PROJECT CONTEXT:

1. Environmental Context: Milne Bay is Papua New Guinea's (PNG's) largest maritime Province, with a sea area of approximately 110,000 km² that contains some 32% of the country's total reef area (Munro, 1989; Dazell & Wright, 1986). The Province embraces the mountainous south-eastern-most tip of mainland New Guinea, 10 relatively large islands and over 150 smaller islands of less than 10 km² (Mooney, 1997), and includes examples of all six types of Pacific islands—continental, volcanic, atoll, raised reef, coral cay and *makatea*¹. Lying within the coral triangle, the global epicenter of tropical marine biodiversity, Milne Bay's coastal and marine environments are amongst the world's most ecologically diverse and pristine. The chief habitats include an extensive and complex system of submerged and emergent coral reefs, including fringing reefs, platform/patch reefs, barrier reefs and atolls, as well as mangrove forests, seagrass beds, lagoons and mud, sand, rubble and rocky sea bottoms (Conservation International, 1998).

2. The project will focus its field activities within three Marine Conservation Zones, categorised based on their ecological and social characteristics. The three Zones encompass a sea area of approximately 46,800 sq. km (see map in annex F). Activities are warranted in all three Zones, to ensure that a representative sample of the Province's globally significant marine biodiversity is conserved, but also to ensure that conservation approaches are tailor made to suit the many different socio-cultural settings in the Province. Zone 1 encompasses the Nuakata region, East Cape, Sideia-Basilaki Islands, the Engineer and Conflict Groups, Long Reef and a portion of the Calvados Chain (Louisiade Archipelago). This Zone is most representative of mangrove forests, turtle nesting beaches, atolls, barrier reefs and lagoons. Zone 2 encompasses the rest of the Calvados Chain, Sudest Island and Rossel Island, and also has good examples of barrier type reefs and lagoons, but with the addition of extensive seagrass beds that are important habitats for the dugong and as spawning and nursery areas for various marine species. The third Zone covers the north coast mainland, the D'Entrecasteaux group and the Amphlett Islands and is most representative of mainland and island fringing reefs, patch/platform reefs, and mangroves.

3. Recent assessments of the biodiversity of the region, performed within the target Zones, have recorded over 429 species of reef coral, including over 20 new species (Fenner & Turak, 2000). This total is more than that for the entire Great Barrier Reef and equivalent to that found in the Philippines and Indonesia. The RAPs also recorded approximately 945 species of mollusks (Wells, 2000). In addition, there are 1,109 known reef and shore fish species, including 6 endemics. (Allen, 2000; Allen, 1998). The global significance of the area is amplified by the discovery of endemic species of coral and fish, and the area also contains many globally rare species, including endangered marine fauna such as the dugong, 4 species of marine turtles (2 nesting in the area), giant clams, seabirds, black corals and a diverse range of reef sharks. Further information on the biodiversity of the Province and of the target Zones is provided in Annex F.

¹ Raised coral limestone reef.

4. Socio-Economic Context: Milne Bay Province has a total population of 196,000, three quarters of which reside on the islands, although these make up only 42% of the total land area. The three Zones for project intervention have a combined population of approximately 64,000, with 14,000 in Zone 1, 9,000 in Zone 2 and 41,000 in Zone 3 (adjusted 1990 census figures). The annual population growth rate in the Province is stable at around 2.5%, giving a population doubling time of around 30 years. Although the population density for the Province as a whole is low, at 13 per square kilometre, the “physiological density” or number of people per unit of arable land is quite high, especially on the smaller islands. This results in a higher dependence on these islands on coastal and marine resources for subsistence and income generation. The Total Fertility Rate is decreasing slowly and the demographic profile is youthful, with 42% of the population under 15 years of age. As is the case elsewhere in Melanesia, there is great linguistic diversity in the Province, with 48 languages, correlating in high social and cultural heterogeneity.

5. Milne Bay is one of the more fortunate Provinces in PNG in terms of its level of human development. While PNG’s UN Human Development Index (HDI), at 0.36, is the lowest in the Pacific Region, the HDI for Milne Bay Province has been estimated at 0.42, placing it 5th out of the country’s 19 Provinces. The Real Domestic Factor Income per capita for the Province is estimated at US \$ 340 (in 2000 prices). Standards of education, in particular, are relatively high (the literacy rate is 77%, second highest in PNG). While in absolute terms other human development standards leave much to be desired (for example, health care coverage is poor) in PNG terms the human development fundamentals auger well for the successful attainment of conservation.

6. The production and marketing of copra and non-perishable marine resources constitute the main source of income on the small islands. Cash income from these sources is supplemented by remittances from community members in urban areas. Subsistence activities continue to provide the mainstay of the rural economy in the target Zones. The main crops in these areas are yam (*Dioscorea esculenta* and *D. alata*), sweet potato, cassava, banana and coconut, with a wide range of other crops including taro and sago being traded in from other more agriculturally rich areas. Reef fish and turtle products, megapode and seabird eggs, Pied Imperial Pigeons (*Ducula bicolor*) and Nicobar Pigeons (*Caloenas nicobarica*) are taken for consumption, and mangrove poles are harvested for the construction of shelters. Subsistence trading between communities promotes economic specialisation and impels the production of surpluses of garden produce, pigs, pots and ceremonial items. Food security is an issue facing several communities, who are increasingly relying on store purchased goods to make up for shortfalls during times of drought.

7. Outside of the project areas, logging, oil palm and mining constitute additional sources of livelihood. While a large gold mine on Misima Island is slated for closure in the next few years, prospecting for new mineral developments including alluvial gold mining and seabed extraction continues. Nature-based tourism offers potential, capitalising on the Province’s superb diving and numerous picturesque islands. Tourism development is modest at present, consisting of a few live-aboard dive boats and guesthouses. The Government of PNG (GoPNG) is, however, promoting the Province as a tourist destination, and the airport at Alotau, the Provincial capital, has been upgraded to accept jet aircraft. Scheduled flights to and from Australia are being inaugurated.

8. Communities in the project areas are matrilineal, so that clan membership, territorial rights, inheritance and succession to leadership are determined through the female line. The clan is the largest defined group with rights over land and natural resources. Generally, clans are politically autonomous, with separate hamlets and territories. Each has its own trading alliances with communities on other islands, often based on marriage or other clan relationships. Traditional ties forged through trading alliances and migration routes act also as information channels. Community decisions are generally made through an open form of democracy. Use rights over land resources may be inherited from either parent, those from the mother being theoretically inalienable, those from the father being granted only for the duration of the heirs' life. Customary rights over seaspace are usually enforced only when outsiders fish for a cash return. Customary rights are overlapping to a degree and at present lack clearly defined boundaries.

9. Policy Context: Papua New Guinea is a signatory to numerous international conventions pertaining to the protection of biological diversity. PNG ratified the Convention on Biodiversity (CBD) in 1993, having previously ratified the Convention on the International Trade in Endangered Species (CITES) in 1976. PNG is also party to the Ramsar Wetlands Convention, the London Convention on the Prevention of Marine Pollution by Dumping Wastes and Other Matter, and one regional treaty, the Apia Convention on the Conservation of Nature in the South Pacific. A fundamental guiding principal of PNG's Constitution is that the natural environment be used in such a manner as to benefit all present and future generations of Papua New Guineans.

10. In 1992, the GoPNG, in partnership with the Biodiversity Support Program, invited members of the NGO and academic communities to conduct a Conservation Needs Assessment (CNA). The resulting two-volume report and map defined priority areas for biodiversity conservation across the country. While PNG's marine ecosystems were less well documented than terrestrial environments at that time, Milne Bay Province's coral reefs were singled out as a top conservation priority. PNG has prepared a GEF-funded Biodiversity Country Study confirming these priorities, and articulating conservation strategies that have informed the design of this project. These strategies are being further elaborated in a National Biodiversity Strategy and Action Plan (also funded by GEF). A marine conservation strategy has been framed, with support from Conservation International, as an input to the national planning process. The strategy places priority on awareness building, advocacy, and institutional capacity building in support of community-based marine conservation. This project will help to address these needs.

11. PNG's legal framework explicitly recognizes the prevailing customary land tenure and resource usufruct systems, granting formal government control over only the open seas, minerals, Government-held land and legally protected fauna. While the Lands Act formally allows the government to alienate land holdings, the constitutional guarantee of customary tenure and deeply held spiritual and economic connections to land make such alienation politically and culturally untenable. Consequently, PNG's protected areas legislation focuses on the implementation of community-managed protection regimes on customary lands. Other pieces of legislation with a bearing on marine conservation focus on the regulation of trade in CITES-listed species, use of weapons or explosives, devolution of powers to the

Provincial and local-level governments, incorporation of land groups and powers vested in the village courts system.

(a) The Fauna (Protection and Control) Act of 1976 restricts the harvesting of protected wildlife, restricts the devices by which fauna may be taken, and facilitates the establishment of localized protection regimes on land and water (including marine ecosystems) under customary tenure. Fauna protected under this act automatically become State property. The Act's most often implemented feature is the Wildlife Management Area (WMA), which comprise customary-held lands that are gazetted by their traditional owners with the Office of Environment and Conservation. Landowners must create a wildlife management committee and formulate a management regime for the fauna (but not the flora) within the gazetted WMA. The Conservation Areas Act of 1978 also allows for the implementation of protected areas regimes on customary land, but focuses on the management of all natural resources including flora (which are omitted from the Fauna Act). The appeal of this act lies in its holistic management arrangements.

(b) The Fisheries Management Act of 1998 regulates the structure of the National Fisheries Authority (NFA), the supervision of pelagic fisheries and local and species-specific fisheries management plans. The Act promotes optimal and sustainable utilization of PNG's marine resources and explicitly mentions biodiversity and habitat preservation as objectives, thereby complementing the Fauna Act, which strongly emphasises the protection of terrestrial fauna. The provisions of the Act are defined in a separate Fisheries Management Regulation (2000), which outlines the NFA's various licensing, monitoring and surveillance responsibilities.

(c) The Organic Law on Provincial Governments and Local-level Governments of 1997 regulates the rights and obligations of the various levels of government, including in the arena of natural resource management. This law has devolved significant powers to Provincial and Local-level Governments (LLGs) under the assumption that they will be more responsive to local people's needs and aspirations and will be better able to deliver necessary services, especially to remote rural areas that are currently being underserved by government services.

12. Institutional Context: PNG has 19 Provinces. Under the 1997 Organic Law, each Province is divided into Districts, which in turn are divided into Local Level Governments (LLGs). The District Administration supports the LLGs in preparing five-year LLG Development Plans which together comprise the main body of five-year District Development Plans. LLGs have law-making authority and also have the right to create committees tasked with certain duties, such as monitoring conservation-related activities. The District Administration also facilitates the delivery of extension and support services. LLGs are divided further into Wards administered by Ward Development Committees (WDC) consisting of five members, two of whom are women representing different sectors of the community. This Committee draws up the development plans for the Ward, but has no authority to create laws. Village Courts comprise the local-level court system in PNG and are designed to address "prescribed" breaches of regulations and offences described under the Village Courts Act. In practice, however, village magistrates may address offences not covered by the Village Courts Act, within the realm of customary law.

13. Each Province has a Provincial Assembly comprised of elected members of Parliament, elected heads of Local Level Governments (LLGs) and a number of appointed citizens representing women's, youth and church groups. The Provincial Governor acts as the Regional Member of Parliament and serves as Chairman of the Provincial Assembly. A Deputy Governor is elected from among the heads of the LLGs. Assembly committees are created along thematic lines decided by the Members. A Provincial Executive Committee (PEC), consisting of the Governor, Deputy Governor, Provincial Treasurer and chairpersons of selected committees, functions as the executive branch of government, implementing laws and policies passed by the Provincial Assembly.

14. At a national level, the Office of Environment and Conservation (OEC) is charged with environmental policy making, and certain other tasks specified in the Fauna Protection and Conservation Areas Acts. These include regulating all exports of CITES listed species, and gazetting all WMAs and Conservation Areas. OEC also serves as the GEF Operational Focal Point. The National Fisheries Authority (NFA) regulates all fishing within Papua New Guinean waters, including licensing, trading, fee structures, reporting, transshipment, port calls, export requirements, marking and electronic monitoring. While this mandate applies primarily to the regulation of pelagic fisheries, the NFA is also responsible for approving all Provincial fisheries management plans such as for sea cucumber and other near-shore fisheries, conducts stock assessments of commercial species, and assists in the formalisation of marine protected areas.

15. Conservation International (CI) has worked in PNG for over ten years and currently maintains projects at four locations around the country. CI has focused on building partnerships and alliances with local NGOs, communities, private sector and governmental bodies in order to engender wider stakeholder participation in conservation projects. CI has established a strong presence in Milne Bay Province, where it has entered into partnerships with community-based organizations. In addition, CI co-managed the 1992 CNA and created the resulting map, and convened a stakeholder symposium in 1998 to devise the national marine conservation strategy.

B. BASELINE COURSE OF ACTION

16. Threats: The integrity of Milne Bay's near-shore marine environments remains mostly intact, largely owing to the low population density of the area and the Province's relative isolation. The recent biodiversity assessments in the Province found little manifestation of ecological impacts commonly tied with human-induced pressures elsewhere in the Indo-Pacific region, including crown of thorn starfish infestations, coral pathogens and coral bleaching and mortality. Large-scale land-based developments such as logging, plantation agriculture and mining, which cause sedimentation on near shore environments elsewhere in PNG, are confined to the mainland and the Province's large islands, outside the Project's focus areas. In addition, unlike in other parts of the coral triangle, there is no threat from wholesale conversions of coastal ecosystems such as coral mining for construction and mangrove clearance for aquaculture.

17. The principal extant threat to biodiversity within near-shore ecosystems in the project area stems from over-harvesting of some marine resources. Potential medium term threats include destructive

fishing. These pressures are expected to gradually build as socio-economic fundamentals change, meriting that precautionary steps be taken now to foreclose future degradation.

(a) Overharvesting of Marine Resources: Small island communities in Milne Bay generally meet their subsistence and cash income needs through a mix of smallholder gardening, copra production and fishing. Communities on more densely populated islands are less able to meet their food needs through gardening and depend more on marine resources for subsistence and income generation. The main resources at risk of over-collection include several species of sea cucumbers, harvested for the production of bêche-de-mer, trochus, and green snail, all of which are taken for sale to export markets. While little is known of the biology and ecology of these species, their selective removal from marine ecosystems is thought to have a number of inter-specific impacts². A further problem is that as high-value species are fished out, harvesting pressure intensifies on lower-value species, particularly non-perishable resources. As distribution facilities improve, pressures on perishable resources are likely to grow. The NFA has recently imposed a moratorium on industrial shark fishing, leaving such fishing to artisanal fishers. However, capacity needs to be built to manage this activity, which could pose a threat to the resource unless regulated. Finally, there is also the risk that subsistence pressures will eventually reduce the abundance of reef fish prized as food, as has already occurred elsewhere in the Pacific. It is also likely that harvesting pressures on sea turtles, and turtle eggs could reduce turtle numbers. While the scale of these pressures remains low, these trends are of concern given the importance of Milne Bay Province as a refugia for rare fauna that face extirpation elsewhere.

(b) Destructive and Illegal Fishing Practices: Coral reefs in neighbouring Indonesia and the Philippines have suffered tremendous losses of biodiversity as a result of destructive fishing practices. The lucrative live reef fish trade (LRFT) for Asian markets has amplified such pressures, given the predilection of some fishers to use cyanide to stun fish for harvest. PNG has imposed a moratorium on the LRFT, but several operations have applied for licenses to fish in Milne Bay, and the customary use of derris root to poison fish may facilitate a transition to cyanide once the moratorium is lifted. Other problems associated with the fishery include a propensity by fishers to target spawning aggregations of target species, such as grouper and coral trout, a method that has an initially high catch-per-unit effort, but quickly reduces the populations of species fished in the area. Dynamite fishing is also widely practiced in PNG, but is infrequently used in Milne Bay, and the recent biodiversity assessments found no evidence of its application.

(c) Land-based Activities: The disposal of household waste including plastic bags and other non-biodegradable wastes into the sea is a potential problem on some small islands that could threaten marine fauna.

² Sea cucumbers, for example, extract bacteria and organic matter from bottom sediments and are responsible for bioturbation and oxygenation of the sea floor. By feeding and defecation, sea cucumbers may reduce bacterial and micro-algal production in coral reef sediments and may increase the patchiness of the benthic environment. Consequently, intensive collection may cause adverse changes to the condition and nature of the sea floor sediments.

18. The root causes of the afore-mentioned threats are described in Annex D. At the present moment, there are no marine protected areas within the Province that could provide refugia from threats to biodiversity. The NFA and the Provincial authorities lack the institutional capacities to fully implement regulations governing artisanal and subsistence fishing activities in near-shore marine ecosystems, and local communities are not organised to execute conservation measures in these areas. Clearly, management objectives will not be realised without the full support and participation of these communities, not just because of long-established tenure systems, but also because of the difficulties in policing activities across far flung areas of the archipelago. There is a need to establish a co-management framework involving local communities, NGOs and government authorities in planning, implementing and monitoring conservation measures, with an accompanying intelligence gathering system to alert authorities to malfeasance by outside elements. However, as there has heretofore been little scarcity of most reef resources, barring some benthic species such as Giant Clams, the value of conservation has yet to be fully appreciated by communities. Awareness activities are needed to sensitise communities to the impacts of environmental degradation on their social and economic well being, and the benefits that conservation affords to their livelihood strategies need to be visibly demonstrated. Coral reefs fringing the most densely populated small islands are most threatened by over-harvesting of sedentary species to generate income to purchase food, partly because communities are unable to meet the food needs using traditional agricultural systems and practices. Farming systems on these islands will need to be adapted to provide for the food security of such communities.

19. **Baseline:** The course of events in a business-as-usual scenario, absent project intervention, is described below where relevant to conservation objectives. The costs of the baseline, estimated over five years, are summarised in the incremental cost assessment.

(a) **Strengthening Governance:** A number of efforts to reform the public sector and strengthen decentralised governance systems are underway to improve the accountability, delivery capacities and responsiveness of government departments to local needs. 4 Districts have been established in Milne Bay, each overlapping the proposed Conservation Zones to a greater or lesser extent. These are divided into 16 LLGs (8 within the Conservation Zones), which are in turn divided into 395 Wards, of which there are 13 in Zone 1, 17 in Zone 2 and 85 in Zone 3. The Government is creating and funding LLG Secretariats to provide assistance and administrative support to the LLGs and Ward Development Committees. A joint AusAID and ADB project is strengthening the provincial financial management system, and AusAID is providing funds to strengthen provincial planning. These activities are critical to good governance and administration of the development process and thus to conservation management. However, some capacity gaps remain. In particular, the capacity of the Ward Development Committees to support conservation specific planning, enforcement and monitoring functions remains inadequate. Moreover, conservation objectives need to be overlaid with development activities at the District level, and LLG activities programmed jointly with conservation interventions. The provincial government is establishing a bottom-up system for collecting, storing and analysing relevant social and economic data. However, gaps remain as the system does not capture vital environmental data, and the capacity of village recorders to collect/ interpret these data is weak.

(b) There is also an accompanying need to strengthen the capacities of NGOs to improve environmental governance within the marine resource sectors. NGOs play a valuable role in PNG by providing independent oversight of natural resource developments, demanding transparency in dealings between government and developers, and compliance by industries with national laws. Two national NGOs, the Centre for Environmental Law and Community Rights (CELCOR) and the Environmental Law Centre (ELC), provide legal and advocacy services to local communities, informing them of their rights and obligations under the Law, articulating sustainable use management objectives, and seeking to ensure that the benefits from resource extraction are equitably distributed. However, these organisations currently focus solely on the logging and mining industries and have little capacity to support marine conservation activities.

(c) **Marine Resource Management:** The Government has embarked on a far-reaching programme to improve management of fisheries by strengthening the policy making, management and regulatory enforcement capacities of the National Fisheries Authority (NFA). With funding from the ADB, the NFA is being completely restructured, with a focus on strengthening surveillance and enforcement functions. The NFA is now financially autonomous, funded from access fees paid by fishing vessels licensed to operate in PNG's Exclusive Economic Zone (EEZ). An on-board observer programme has been instituted, to ensure compliance with fisheries regulations, including gear restrictions, and size limit strictures. Management Plans have been prepared for sea cucumbers, shark and tuna, and will be prepared for sedentary resources, including trochus, green snail and oysters. The Plans provide for seasonal closures of certain fisheries, enforced at the point of export. Significantly, the industrial shark finning industry has been banned, and sharks may now only be taken by artisanal fishers.

(d) A gradual devolution of authorities and responsibilities for management of PNG's artisanal fisheries to provincial authorities is occurring, consistent with GoPNG's decentralisation policies. The NFA has retained specialists for tuna/shark fisheries, lobster and prawns and sedentary resources, responsible for advising Provincial fisheries departments on species management issues. These specialists are providing training to Provincial fisheries managers, and will assist in the establishment of monitoring systems and the development of pilot research (e.g., mariculture) programs. Management, surveillance and enforcement duties are progressively being turned over to Provincial fisheries departments, which will eventually be responsible for the following functions: providing extension services; enforcing regulations; developing fisheries policy; building awareness of fisheries laws and regulations; and assisting in the development of marine protected areas. Stock assessments, surveys and research functions will be outsourced. As part of NFA's restructuring process, a legislative overhaul of the Fisheries Management Act is in train, *inter alia*, in order to provide for the establishment of Provincial Fisheries Advisory Committees (PFAC)³ to elaborate and oversee implementation of Provincial marine resource management strategies. The GoPNG is developing a project to enhance the capacity of provincial fisheries authorities to perform their various responsibilities.

³ The PFACs will have multi-stakeholder membership, including representatives of Provincial and Local Level Governments, the commercial fisheries sector, resource owners, tourism operators and NGOs.

(e) The afore-mentioned activities provide an important baseline for fisheries management. However, there are limits to the effectiveness of conventional fisheries management methods (e.g., catch quotas and size limits) based on annual stock assessments and species specific management plans, in engendering the conservation and sustainable utilisation of fish stocks and marine ecosystems. These stem, amongst other things, from a lack of precision in even the most robust stock assessments, poor quality catch and effort data, and a failure to address the inter-specific impacts of removing certain species from the marine ecosystem (e.g., Cannon, 1997). A consensus has emerged among marine biologists that strategic networks of marine protected areas (MPAs) provide the best means of simultaneously satisfying conservation and sustainable use objectives (NFMS, 1995). When managed through ecosystem-based approaches, MPAs allow whole marine communities to be protected, allow depleted stocks to rebuild and abundant stocks to be maintained as fishing pressure increases, and contribute to nearby fisheries through a “spillover” effect and via larval dispersal (e.g., Russ and Alcala, in press). The establishment of MPAs in Milne Bay would enable global environmental benefits to be secured, while providing for continuance of local fisheries-based livelihoods and thus giving communities a firm stake in conservation. While clearly a ‘win-win’ strategy, a number of barriers exist to execution of this approach. These include: a dearth of good scientific information to underpin the shape and design of protected areas, a lack of understanding amongst resource owners of the benefits accruing to fisheries from conservation activities, the absence of a framework for planning and implementing management activities and monitoring outcomes, and insufficient know-how within communities to adapt management practices to maximise and sustain flows of both global and local benefits.

(g) The dive industry provides a potentially lucrative and conservation compatible enterprise in Milne Bay Province, that could, if managed carefully, provide durable incentives for local communities to protect the marine environment. While the number of divers vacationing in PNG is currently small, estimated at 5,000 per year with 1,000 of these visiting Milne Bay Province, the industry attracts wealthy clients willing to pay high prices to dive in remote areas, and drawn by PNG’s reputation as a premier diving destination. The industry is expected to grow over the next 5 years, with new air services being established between PNG and Japan to capitalise on the sizable Japanese tourism market, and Milne Bay and Australia. The Province is likely to corner a significant portion of the growing market. Presently, a total of 8 dive companies operate within Milne Bay, offering visitors a number of services, including PADI certification. These companies are all members of the PNG Divers Association (PNGDA), which serves as a conservation advocate, and lobbies against such potentially destructive activities as live reef fishing and shark finning. The Association has established strict environmental standards for its members and amongst other things, is promoting the installation of moorings at frequently visited dive sites around the country, to limit anchor damage to reefs. However, there are yet no mechanisms to transfer the economic benefits generated by the industry to coastal communities and resource custodians.

g) **Education and Awareness:** Milne Bay’s educational system is advanced for the country, with an active constituency of qualified educators. There are currently 181 elementary schools, 176 primary schools, 7 secondary schools and 8 vocational schools. The curricula for primary schools are currently undergoing structural reform. A new Environmental Studies syllabus for grades 3 to 5 is being trialed in Milne Bay and a new syllabus has been established for grades 6 to 8, which will also shortly be piloted.

The secondary school syllabus is also being restructured, a process likely to take several years. Appropriate syllabuses will also need to be developed for vocational schools. There is currently a lack of up-to-date and appropriate teaching materials for environmental education, which poses a serious problem at all levels, and there is a need to develop teaching aids and resources for educators concurrently with efforts to revise the curricula. As of yet, there is little formal conservation education within these curricula focused on fundamentals of marine biology and ecology and relevant socio-economic issues. Some activities have been initiated at an informal level, with conservation messages being promoted by several NGOs and church groups, including the Melanesian Environment Foundation and the PNG Council of Churches. While some awareness materials have been prepared for national-level campaigns, an awareness programme focused on issues specific to Milne Bay is needed.

(h) **Community Development:** There are presently 117 manned and functional aid posts across the Province that are responsible for providing support for child care and promoting family planning. The Total Fertility Rate of the Province, while still high at 5.1, is gradually declining. Insofar as education is a determinant of declining fertility rates, this trend is expected to continue. The healthcare sector constitutes a priority for the PNG government, and a number of investments are planned to strengthen health services, and provide access to contraception. The MBPG is responsible for providing farm extension services, with support from the National Agricultural Research Institute (NARI). However, many remote communities lack access to extension, and support packages are not equipped to deal with the special needs of small islanders. On several of these islands, the ability of gardening to meet subsistence needs has declined, as demographic growth has outpaced efforts by communities to adapt their farming systems. An alien species, the African Giant Snail (*Achatina fulica*) has ravaged gardens on several islands, resulting in a significant decline in crop yields. Given that declining garden production constitutes a stimulus for communities to over harvest some marine resources to generate income to purchase food, this problem will need to be addressed as part of conservation measures.

(i) At a larger level, there is an urgent need to assess the vulnerability of different communities to environmental change, including the frequency of droughts associated with ENSO events, which threaten their traditional livelihoods and which may cause them to exert unsustainable pressures on the marine environment. Such an assessment would provide the basis for informing development strategies, and adapting resource management practices, allowing communities to meet their basic needs in ways that are congruent with conservation objectives.

C. ALTERNATIVE COURSE OF ACTION

20. UNDP-GEF, GoPNG and Conservation International have invested in project preparation. In 1997 and 2000, CI conducted rapid marine biological assessments to determine the biological value of Milne Bay's coral reef systems and the highest priority sites for conservation. PDF B funds were secured to undertake a social feasibility analysis, fill critical gaps in data necessary for project design, and mobilise institutional commitments and resources for the project. Specific deliverables included a conservation needs assessment, a detailed threats assessment, a social evaluation study, a stakeholder participation plan, a sustainable use options plan, a policy needs assessment, and a monitoring and

evaluation plan. These outputs have helped shape the long- term conservation strategy, with stakeholder input, and served to ground-truth critical assumptions.

21. The project area has been sub-divided into three Marine Conservation Zones [see Annex F: Overview of Biodiversity] based on bio-geographic and socio-economic considerations⁴. Previous conservation initiatives in Melanesia have demonstrated that successful community-based conservation activities require long-term and sustained support to build capacities, and reach maturity. Accordingly, the project has been designed over a time frame of ten years, divided into two discrete phases, each with a duration of five years. Activities during Phase 1 will focus on Marine Conservation Zone 1, with ancillary support provided for institution building and awareness creation at the wider provincial and LLG level. After conservation approaches have been successfully piloted in this area, activities will be scaled up in Phase 2 to cover Zones 2 and 3, following independent verification of impacts in Phase 1. The processes of Zone/site selection, as well as the strategy of phasing the project's activities, have been conducted with an eye towards engendering sustainability and replicability. Primary interventions in Phase 1 will focus on those sites deemed to have the greatest potential for the successful establishment of a network of community-based marine protected areas. Further, project phasing will allow sufficient time to evaluate the actual conservation impacts of the proposed models, and adapt them if necessary.

22. A Social Evaluation Study (SES) was conducted as part of the process of preparing the project to ascertain whether communities in the proposed Zones have an interest in, and the ability to participate in conservation activities, and for the purposes of collecting economic and socio-cultural information needed to design the initiative. Local communities, NGOs, churches, and National and Provincial Government Departments were invited to a Province-wide assessment workshop, where they provided input on a wide range of biological, social and economic issues that led to a preliminary selection of sites and set the stage for initial community entry activities. Discussions with targeted communities and villagers were then initiated in the identified sites to assess their resource management needs and receptivity to conservation, and to gauge the likelihood of success in securing conservation outcomes. The community-based management activities advanced under this initiative were elaborated following these consultations.

23. The Project Goal is to conserve a representative sample of the globally significant marine biodiversity of Milne Bay Province. Project activities are organised into four thematic Outputs, collectively designed to deliver the project's Immediate Objective (Purpose) of operationalising a community-based conservation management framework in partnership with national and provincial government authorities, the private sector and non-government organizations. The Project will work at specific sites identified within the target Conservation Zones. Maps of Milne Bay showing the location of each of the Zones, and of Zone 1 is provided in Annex F. A system of community-managed marine

⁴ The following criteria were employed in selecting the Zones 1.] Coverage and conditions of near-shore marine habitat types; 2] Coverage of different social settings; 3] Social and economic landscape conducive to securing conservation outcomes; and 4] Proximate and secondary threats could be effectively countered by community-based management regimes.

protected areas (MPAs)⁵ will be established in each of the sites targeted, and a robust adaptive management cycle institutionalised, where continual feedback from monitoring and evaluation activities will inform conservation processes and allow for the timely revision of interventions to accommodate unforeseen changes in the operating environment.

Output 1: *An enabling environment for marine conservation and near-shore resource management is established at the Provincial, Local Level Government and Ward levels.*

[Budget Phase 1: GEF: US\$ 0.5 m/ Other US\$ 0.92 m]

24. The project will address policy and institutional capacity barriers to marine conservation at the local and provincial levels through a package of interventions designed to provide an enabling framework that legitimises and supports community-based conservation processes.

a) **Strengthen Local Conservation Governance Capacities:** Ward Development Committees will be delegated with major coordinating responsibilities for conservation planning and enforcement activities at the village level and thus for facilitating community-driven resource management. WDCs will play a particularly important role in facilitating the management of MPAs at the inter-community level. To fulfil these roles effectively, the capacity of WDC's to carry out applied conservation planning will be strengthened, as will their capacity to act as social facilitators, which will entail training in participatory planning and management approaches and social consensus-building techniques, as well as the use of conflict resolution mechanisms. The project will also train Village Recorders to compile relevant environmental data needed to inform local decision-making regarding conservation management, to maintain village file systems, and to analyse assembled information. Activities in Phase 1 will seek to strengthen conservation governance capacities within Zone 1. Capacity building within WDC's in Zones 2/ 3 would be undertaken in Phase 2. This component would be funded by the GEF.

b) **Provincial Policy Development and Institutional Strengthening:** CI will fund activities designed to strengthen the Provincial policy framework. During Phase 1, the project will back the establishment of a Provincial marine conservation policy framework, which legally recognizes community-level MPAs and provides an enabling environment for community-based marine resource management, in particular with respect to enforcement functions. Policies that enable communities to assess fees for environmental services will also be developed, notably a Province-wide policy to set and transfer payments from dive boat operators to communities with tenurial rights over diving sites. The project will also strengthen the capacity of the Provincial Administration to overlay marine conservation objectives into on-going development activities. This will include the installation of coordination mechanisms to integrate project activities into Provincial budgets and programme development interventions sponsored by other Government agencies, NGOs, and international organizations jointly with conservation activities. Second, the Provincial communications system will be strengthened. The GoPNG will provide funding in support of 1] the development of a Provincial high frequency radio

⁵ These MPAs would correspond to Manages Resource Protected Areas, or Category VI in the IUCN classification system. The objective of management is to protect areas containing predominantly unmodified natural systems to ensure the long-term protection of biodiversity, while providing for sustainable utilization of biological resources.

communications system on remote islands for surveillance, enforcement and reporting purposes; and 2] training provincial planners to use modern information technology and as communicators, while UNDP would provide funding to strengthen communications systems including by providing access to the web.

c) **NGO Advocacy Efforts and Legal Support Services:** With GEF funding, the project will support the efforts of CELCOR and ELC to integrate a marine resource management oversight component into their current operations, with a focus on building policy appraisal and regulatory negotiation capacities in marine and near-shore resource management issues. The project will then facilitate the transfer of legal and advocacy services from these organisations to local communities as needed, focusing on communities in Zone 1 in Phase 1 and Zones 2 and 3 in Phase 2. This may include informing community resource owners of their rights and obligations under Provincial and National Law, and training community-level paralegal advisors. Support will be provided to establish legal safeguards for MPAs, such as the use of legal compacts or other mechanisms to substantiate stakeholder agreements and collaborative arrangements.

Output 2: *A representative network of community-based marine conservation and sustainable near-shore resource management areas is established.*

[Budget Phase 1: GEF: US\$ 2.3 m/ Other US\$ 1.08 m]

25. The projects will operationalise a system of MPAs, providing resource-owning communities with the necessary information, training, equipment and organizational structures to manage reef systems. Activities in Phase 1 would develop MPAs within three sites within Zone 1, i] the islands off of East Cape, Nuakata and Yabam/Pahilele; ii] the Engineer Group – Tubetube, Skelton, Kwaraiwa, Tewatew and Anagusa-- and the Deboyne Islands – Paneati and Panapompom; and iii] Long Reef/Bramble Haven -- Brooker and Ware Islands. The focus of Phase 2 will be on establishing MPAs in 2 sites in Zone 2 (Rossel and Calvados chain) and Zone 3 (Cape Vogel and Dobu island). The Maps in Annex F indicate the location of each of the sites. ACIAR and CI would co-fund an initial sessile fisheries stock assessment and biogeographical survey that will inform the design and zoning of MPAs in Zone 1. GEF and CI would share costs for community-based MPA design, installation of adaptive management, monitoring and enforcement systems, gazettal of MPAs and all marine conservation alliance-building activities.

(a) **Community-based MPA Design:** The project will initiate an information-driven process of community-based MPA design, with special emphasis placed on applying lessons from other community-based conservation initiatives. Using results from targeted biological, social and economic assessments, the scientific and socio-economic rationale for MPA establishment will be communicated, employing a carefully managed process of community dialogue, appropriately paced and formatted for local circumstances. The project will assist communities to realistically assess the short-term costs and long-term benefits of MPAs. This will include use of household income and expenditure surveys that accurately convey the importance of marine resources to local livelihood strategies and generate data to help communities determine the optimal scale, location and types of MPAs to be established. A critical part of this package will be a participatory assessment of resource rights and access using PRA techniques, complemented by training in mapping of community-owned reefs and tenurial claims. Spatial

and economic data will be reconciled with biological data to provide a scientific basis for the management of MPAs.

b) **Adaptive Management Systems:** The project will pilot a community-based adaptive management process, whereby communities will gain ownership over conservation processes through a “learning-by-doing” approach that will allow for management activities to be modified in response to changes in the social, economic and ecological landscape. A long-term monitoring program will be installed in targeted sites, focused on building stakeholder capacity to monitor critical social and ecological indicators. The program would employ innovative methodologies specifically designed to provide non-scientists with the training and scientific background necessary for biodiversity assessments. These activities will be buttressed by an independent monitoring and evaluation program, which would include formal biennial biological and social assessments in order to ground-truth community-generated data. The Province will provide technical assistance in fisheries management to target communities at each site, helping them to develop and implement management, monitoring and enforcement mechanisms. This will be accompanied by a feedback mechanism whereby relevant data generated by Village Recorders is organized and communicated to the Fisheries Division for management planning purposes.

c) **Formalize the MPA System:** By providing appropriate organizational infrastructure and building technical capacities, the project will enable communities to develop and sustain long-term ownership of core MPA management processes, as well as formulate important co-management linkages with stakeholders with vested interests in marine conservation and resource use, vital for long-term management effectiveness. The project will convene community management forums of WDCs, village interest groups, churches, CBOs, etc. to communicate lessons learned and inform the management of MPAs by WDCs. These forums will be given logistical support and basic operational and communication infrastructure dependent on needs. Forum members will receive a mix of additional formal and informal training in MPA management methods, including threats identification, enforcement, reporting, and administration.

d) **Install Appropriate Enforcement Systems:** The project will support the design and establishment of the necessary surveillance and enforcement systems required to ensure the efficacy of the MPA system. Within established MPAs, appropriate, cost-effective enforcement systems will be designed and embedded in local institutions, such as using the village court system to arbitrate infractions. Communities will draft and formalize MPA regulations, and paralegal training will be provided to those charged with enforcing management rules. In such cases where MPAs could potentially extend over numerous community jurisdictions, the project will facilitate inter-community management meetings to coordinate conservation efforts and surveillance.

e) **Institute Alliances with the Tourism Sector:** The project will forge an innovative alliance with Milne Bay’s private dive operators, using the PNGDA as a platform for continued collaboration with the growing dive tourism industry. The project will work to transfer user fees to communities with

tenurial rights over dive sites used by the companies⁶. Specifically, the project will conduct an initial survey to determine the maximum willingness of divers to pay for community reef protection and enhanced diving facilities. This research will inform further dialogue with dive operators on instituting a financial transfer mechanism to help offset the immediate opportunity costs of conservation borne by local communities. Further, dive tourism operators act as natural awareness facilitators and will be encouraged to relay to divers the important community-based conservation and resource management efforts occurring in the region, potentially broadening the project's stakeholder support base. Private operators will also be requested to formally participate in the Provincial surveillance system by monitoring basic environmental indicators, reporting illegal activities in MPAs or boundary infringements by foreign vessels. The project will also enlist the services of the Milne Bay Visitors' Bureau in providing an oversight function for the established dive tourism fee system. The bureau will serve as the repository for all fee system records and data provided by dive company operators.

Output 3: *An environmental education program and conservation awareness campaign are imparting marine conservation values to students in formal and informal settings*

[Budget Phase 1: GEF: US\$ 0.4 m/ Other US\$ 0.3 m]

26. The project will develop an environmental education and awareness program aimed at building new conservation constituencies to facilitate the future conservation of marine ecosystems by Milne Bay people. The program will be aimed at target audiences on several different levels that will include local communities, school students, community leaders, provincial planners and decision-makers, church leaders, school teachers and other key actors.

a) Conservation Awareness Campaign: A broad based awareness campaign will be executed with financing from the GEF. Awareness materials will be designed specifically for different stakeholder groups to impart conservation values and emphasise the interconnections between human activities, development and the marine environment. Awareness messages will be communicated through the regular radio programs in local languages, local newspapers and the church. The project will invest in improving the services of Radio Milne Bay, strengthening the network as a channel for Province-wide awareness raising. The PNG Council of Churches will receive support through the project to organize training workshops, develop teaching materials and train religious scholars in conservation awareness raising methods. The project will also create links with youth groups and women's fellowship groups in order to promote their involvement in conservation, training members in conservation awareness raising techniques, and in the case of youth groups, involving them in monitoring. The campaign will continue through both Phases of implementation, and will be adapted as necessary to reflect changing circumstances.

b) Environmental Education Program: Phase 1 of the project would be devoted to curricula development and integration of environmental education curricula and resource materials into existing vocational and primary school programs throughout the Province; these activities would be expanded to

⁶ The agreement of the industry to these arrangements has been obtained during project preparation.

include Milne Bay's elementary and secondary schools in the project's second phase. The environmental education program will work in conjunction with the National Department of Education to develop appropriate curricula and resource materials, and teaching aids will be jointly developed for trial and use in schools. All products will be developed with input from teachers. Regular workshops will be organised to provide teachers with additional training as needed, and to provide a forum for them to share experiences and discuss future conservation education plans. Special emphasis will be placed on educating students (esp. vocational) in practical and applied marine resource conservation and management techniques, including environmental monitoring, generating opportunities for students to partake directly in community-based conservation management activities. CI will fund the development of new curricula for primary and vocational schools, focused on fisheries management and resource conservation. The GEF will support the development of teaching materials and teacher training.

Output 4 *Conservation objectives are overlaid into land use strategies on densely populated small islands*

[Budget Phase 1: GEF: Nil/ Other US\$ 1.02 m]

27. This component will focus on reconciling human food security issues on physiologically dense islands with sustainable management of near-shore marine resources. It will undertake a detailed assessment of the vulnerability of small island communities and ecosystems to environmental change, in order to inform planning, and will install a program of agricultural training and extension on highly populated islands where declining agricultural yields have occurred.

(a) Undertake a Comparative Vulnerability Analysis for Small Islands: UNDP and the Australian National University (ANU) would jointly provide funding during Phase 1 to undertake an assessment of the vulnerability of communities residing on small islands⁷ throughout Milne Bay to natural disasters and environmental change, including rising sea levels, storms and droughts, and the depletion of natural resources that underpin the subsistence economy. Activities include the establishment of a framework for collecting, analysing, and synthesising data needed to prepare vulnerability indices; performing local-level integrated assessments of the interplay between socio-economic and small island ecosystems, designed to increase the capacity of target small island communities to predict the potential environmental and economic consequences of their own resource consumption and resource management practices; providing a body of peer reviewed scientific information to inform development policies and programmes that may have an impact on ecosystem functions and services; assessing the cumulative impacts of segmented policy decisions and incentives in facilitating adaptation to environmental changes; and providing appropriate policy recommendations for improved ecosystem management and conservation⁸.

(b) Sustainable Land Use: Government of Japan and MBPG will fund efforts to encourage sustainable intensification of agricultural systems in Zone 1, focusing on the Islands of Panaeati (land

⁷ Focusing on 45 islands with less than 100 km² of cultivable land and a population density in excess of 100 per 100 km² of cultivable land, where the population is primarily dependent on local natural resources for its survival.

⁸ The study will provide inputs into the Millennium Ecosystem Assessment, and thus have global relevance.

area of 30.32 km²) and Panapompom (land area of 7.72 km²), Brooker (land area of 1.08 km²) and Ware (land area of 1.68 km²). These islands are all densely populated, and suffer from varying degrees of land degradation. Activities include the i] dissemination of extension materials and inputs to promote conservation compatible farming systems; 2] development of low-cost appropriate agricultural methods such as integrated pest management techniques (which amongst other things, will seek to control infestations by African Giant Snail) and rotational cropping; and 3] promotion of alternative subsistence and cash cropping schemes. In addition, the program will strengthen capacities of local institutions involved in addressing small island food security issues, such as women's agricultural centres. In Phase 2, these activities would be scaled up to include communities on other small islands (< 10 km²) in the other Zones, including the West Calvados islands, in Zone 2, and Dobu, Tewalla, the Amphaletts and Wagifa islands in Zone 3.

(c) Pilot Solid Waste Management Projects on Selected Islands: CI will provide funding to develop model solid waste management systems for the islands of Panaeti, Panapompom, Brooker and Ware. Planned activities include: i] preparation of solid waste management plans; and ii] provision of technical support to develop appropriate solid waste management systems. These interventions will be expanded in Phase 2 to include several other islands: the West Calvados chain in Zone 2 and Dobu, Tewalla, the Amphaletts and Wagifa islands in Zone 3.

28. Project Outcomes: A list of anticipated impacts and outputs at the end of Phase 1 is provided in the Log Frame Matrix (Annex B). At a provincial level, a marine conservation and resource management module will be a component of all primary and vocational school curricula, and students will exhibit increased comprehension of marine conservation issues. A broad-based awareness campaign will have been executed and its impact assessed. Within Zone 1, at least 3 MPAs will have been formally gazetted in the the East Cape Islands, the Engineers Group and the Deboyne Islands, under the stewardship of local communities and the WDCs. Marine conservation objectives will be fully integrated into LLG planning in this Zone. MPA monitoring will show either no change or improvements in all agreed indices. Increased benefits accruing to resource owners from the dive tourism industry and other alternative forms of economic development will reduce incentives to over-harvest sedentary resources. By the end of the Project, at least 4 additional MPAs will have been established within priority sites in Zones 2 and 3, with full capacitation of communities and government authorities responsible for their management. The domestic benefits from MPA establishment, including recruitment to fisheries, and other services will be visible, and providing communities with incentives to sustain management. There will be strong public support for conservation across the Province, and the development agenda will be guided by conservation objectives. The combined result of these impacts will be the conservation of a representative sample of Milne Bay's marine biodiversity.

29. Project Beneficiaries: Conservation and sustainable utilisation of critical marine ecosystems in Milne Bay will impart multiple benefits to a wide range of stakeholders. Global benefits would accrue from the conservation of one of the most pristine and biologically diverse marine eco-regions remaining in the Coral Triangle, including direct use, indirect use, existence and option values. Moreover, local island communities will directly benefit from the project's interventions. The establishment and effective management of community-based MPAs will result in a long-term, sustainable supply of important

marine resources used for cash and subsistence, and will facilitate the installation of compensation mechanisms that properly transfer user fees from dive tourism to local communities with tenurial rights over coral reef systems. Ward Development Committees and village institutions would benefit from the development of capacities in marine resource management, communications, and planning. Secondary beneficiaries include local dive operators that would benefit from the protection of ecosystem integrity.

30. Eligibility for GEF Funding: The precautionary approaches advanced under the project are congruent with the general aims of the Convention on Biological Diversity. The project meets the following provisions of the CBD: Article 6, General Measures for Conservation and Sustainable Use, by nesting conservation into fisheries management and agricultural sector activities on small island ecosystems; Article 8, In Situ Conservation, by establishing a representative network of community-managed marine protected areas; Article 7, Identification and Monitoring, through stock taking, impact monitoring and documenting lessons learned; Article 12, Capacity Building, by transferring know how, building institutional capacities for conservation, and enhancing individual capabilities; Articles 13 and 17, Awareness Raising and Information Sharing, through planned awareness and advocacy work; and Article 10, Sustainable Use Management, by removing barriers to the management of artisanal and subsistence fisheries management through conservation-enforcing approaches. Moreover, the project addresses a conservation priority identified by CBD- SBBSTA by controlling the spread and impact of an alien invasive species in small island environments: the African Giant Snail. The Project fulfils the requirements for funding under OP #2: Freshwater, Coastal and Marine Ecosystems, by spearheading execution of national conservation strategies, financing the agreed incremental costs of measures to protect globally significant biodiversity, and remove barriers to sustainable utilisation of threatened marine resources, demonstrating and fostering replication of sound integrated conservation approaches, and including a comprehensive monitoring and evaluation component. The Project also takes a considered and holistic approach to institutional capacity building, thus advancing the objectives of the Strategic Collaboration and Framework for GEF Action on Capacity Building for the Global Environment.

31. Linkages with other GEF Initiatives: The project comprises the first sizable GEF intervention in PNG under OP# 2. The design framework has been informed by lessons generated under the UNDP-GEF Biodiversity Conservation and Resource Management Programme, particularly with regard to social mobilisation strategies and activities, and approaches pioneered under the GEF Small Grants Programme in coastal communities. The project team will systematically share lessons with other GEF projects in the South-Western Pacific Ocean, including the UNDP-GEF IW project for Pacific SIDS, executed by SPREP and projects under development in Vanuatu, Solomon Islands and the Federated States of Micronesia.

32. Mainstreaming into IA Country Programme: The Environment Sector constitutes one of the three highest priorities for UNDP's activities in PNG. UNDP has identified Milne Bay as a priority area for the advancement of conservation as a vehicle for sustainable development, linked with efforts to improve systems of governance. UNDP is providing co-financing to support the integration of conservation and development policies in Milne Bay Province, including by assessing the vulnerability of small island communities to environmental change (depletion of resources, sea level rise and extreme

weather events) as a basis for framing adaptive measures and engendering the integration of conservation and development objectives into regional development strategies and programmes, promoting the adaptation of farming systems in densely populated small islands to abet food security and diminish pressures to over harvest marine resources, and strengthening the communications capacities of the provincial government and local government authorities. UNDP also coordinates efforts by the United Nations System in Milne Bay, including family planning activities. Finally, UNDP will play an active role as an advocate of sound marine resource stewardship as a cornerstone of sustainable development approaches.

D. PROJECT IMPLEMENTATION

33. Implementation and Execution Arrangements: Conservation International will execute the Project under UNDP's procedures for execution by non-government agencies. CI will be responsible to UNDP and the GoPNG for ensuring that project inputs are converted into the intended outputs, and for realising the Project Purpose, and will work closely with the MBPG, OEC and other entities in this endeavour. More specifically, CI will be responsible for the following specific tasks: 1] approving annual and quarterly work plans and financial plans; 2] certifying expenditures according to these plans; 3] letting sub contracts, recruiting personnel and procuring equipment and special services; 4] overseeing implementation of all project activities, and reporting on progress in implementation; and 5] maintaining project accounts and accountability for administration of funds. UNDP will closely monitor the use of funds, ensuring close adherence to UNDP's procedures and administrative practices. An internationally recognised firm of accountants will undertake an annual audit of project activities and expenditures. CI will establish a project office in Mile Bay to manage the project's activities. Activities would be implemented by the Milne Bay Provincial Government, Department of Education, NGOs, academic institutions and specialised agencies, as described in the log frame. The capacity of implementing agents to perform their functions will be strengthened systematically, through training, horizontal exchanges, field activities and secondments, with a view to transferring execution functions for Phase 2 activities to qualified national institutions.

34. A Project Steering Committee will be established, to be chaired by the Department of Planning and Monitoring, and including representatives of the following agencies: Milne Bay Provincial Government, Office of Environment and Conservation, National Fisheries Authority, UNDP and Conservation International. The Committee will be responsible for reviewing Annual Project Reports (APRs) and approving annual work plans, providing strategic guidance on policy matters and management direction, reviewing progress in implementation, and coordinating efforts to integrate project activities with on-going development programmes within Milne Bay Province. The Committee will meet bi-annually, including once to perform the Tripartite Review.

E. FINANCIAL ARRANGEMENTS

35. Incremental Costs: The total cost of the Alternative Strategy amounts to US\$ 20.25 million over Phase 1, including appropriations for the baseline and incremental conservation activities but excluding project preparation costs. The GEF contribution during this phase is estimated at 15.8 % of the Alternative. The GEF would provide funding amounting to US\$ 3.2 million over phase one to finance

the incremental costs of measures to conserve coral reefs and associated ecosystems and remove barriers to the sustainable utilisation of nearshore marine resources. Co-financing for the Project amounts to US\$ 3.32 million. The budget summary below provides a breakdown of costs for Phase 1, partitioned by funding source and project outputs:

OUTPUTS	PHASE 1 (US\$)		
	TOTAL	GEF	CO-FINANCING
Output 1	1,420,000	500,000	CI: 500,000 MBPG: 220,000 UNDP: 200,000 Total: 920,000
Output 2	3,380,000	2,300,000	CI: 750,000 MBPG: 120,000 TPA: 70,000 ACIAR: 140,000 Total: 1,080,000
Output 3	700,000	400,000	CI: 300,000 Total: 300,000
Output 4	1,018,000	-	UNDP: 300,000 GovJ: 350,000 ANU: 108,000 MBPG: 160,000 CI: 100,000 Total: 1,018,000
Total Phase 1	6,518,000	3,200,000	3,318,000
Project Preparation	605,851	349,300	UNDP: 76,000 CI: 171,726 MBPG: 12,000 Total: 259,726
Total incl Prep	7,123,851	3,549,300	3,577,726

36. An estimate of the proposed funding package for phase two is provided below. This will be confirmed during the life of phase one, based on the outcomes of planned interventions during that phase. A separate proposal would be made to the GEF for phase two funding appropriations.

	TOTAL	GEF	COFINANCING
Phase 2 funding: Indicative	7,000,000	3,000,000	4,000,000
Grand Total Phase 1 + Phase 2	14,123,000	6,546,000	7,577,726

37. Alternatives Considered: A number of other conservation strategies were considered during project preparation. These included the creation of a trust fund for conservation activities, discarded because the perceived returns from the fund were expected to be insufficient to cover the high initial one time costs of capacity building, and technical assistance needed to operationalise community-based protected areas and create an enabling institutional environment. Other options considered included the creation of large marine protected areas to protect pelagic and sessile species, considered unworkable owing to the costs of enforcing management restrictions in distant and far flung areas outside of the immediate jurisdiction of local communities.

F. SUSTAINABILITY OF PROJECT RESULTS:

38. Project Risks: Several risks to the project's intended impact have been recognized and corresponding abatement measures have been integrated into project design to optimise conservation outcomes. The principal risks and abatement measures are described below:

Risk	Rating	Abatement Measure
Community perception that MPAs do not support community development and household livelihood objectives diminishes their incentive to establish them.	M	Economic assessments undertaken during project preparation have identified communities where the opportunity costs of MPA establishment and management are low and may be compensated. Activities will initially be pursued in these communities, and only expanded to communities facing high costs once the benefits from the MPAs are visible. Rotational set asides will be tested in areas where the cost of permanent closure is unacceptably high.
Stocks of commercially valuable sedentary species (BDM, giant clam, trochus) in targeted MPAs have been over-exploited to the point of non-recovery over the project's duration.	M	Existing baseline assessments indicate that the stocks of most species remain healthy, although sea cucumber and sea shells face localised pressures. The project will promote MPA establishment initially in those areas where stocks have not been depleted to the point of non-recoverability. Selective restocking of over fished areas will be supported as part of the sustainable development baseline, where proven feasible.
MPAs and associated management regimes fail to optimise the recruitment, reproductive spillover and other environmental factors necessary to ensure stock recovery and regrowth.	L	Technical assistance will be provided to communities to enable them to make informed decisions regarding the location, size and shape of MPAs, and the impacts will be closely monitored to allow adaptive management so as to optimise benefits. Additionally, the regional stock assessment and biogeographical survey (SABS) will provide a baseline data set on the location, abundance and distribution of fisheries stocks and the number of spawning aggregations or populations of high-value sedentary species.
Established MPAs are perceived by non-owners to be resource rich, potentially resulting in increased incidence of infringements and territorial disputes.	L	This risk will be addressed by 1] assisting communities to clarify property and use rights over reefs; 2] strengthening their capacities to monitor malfeasance by outsiders within identified exclusion zones; and 3] providing communities with legal assistance to pursue recourse through the legal system.
The process of MPA establishment generates unrealistic expectations amongst resource users of potential and realized benefits, potentially resulting in community abandonment of the MPAs should they eventually fail to materialise.	M	The project will communicate to targeted communities the realistic benefits that can be expected of establishing a network of marine resource refuges, as well at the time frame for these benefits. An environmental education process will create awareness of the biological and economic parameters involved.
Socio-cultural control mechanisms and village-level judicial systems are inadequate to ensure MPA rules	L	The project will initially counteract this risk by ensuring that all resource management regulations are developed through participatory stakeholder decision-making processes, in

Risk	Rating	Abatement Measure
enforcement within communities		order to generate broad public support for enabling legislation. Secondly, the project will work to increase the awareness of the village magistrates (Village Courts) of the need for regulation. Thirdly, the project will employ independent monitoring techniques to ascertain that enforcement systems are functioning, and to recommend adjustment measures should compliance be unsatisfactory.
Inequitable distribution of conservation benefits yielded by the project results in social and economic stratification and diminishes local community support	L	Regular social assessments will monitor the distribution of benefits, allowing the adaptation of strategies where needed.
Political cycle – changes in Provincial and National administrations shift priorities and level of support for the project	M	Maintain political neutrality and open channels of communication with leaders.
Low capacity of provincial government threatens achievement of project outputs	M	UNDP has carried out a detailed assessment of capacity requirements to execute the project - as part of the project document preparation process. This "Capacity Assessment Report" was prepared by a UNDP team from the Regional Audit Service and the Operations Support Group, who undertook a mission to Port Moresby and Alotau. This is the most elaborate assessment UNDP has undertaken for a GEF project. The report includes a section "Building capacity for sustainability and replicability" which suggests indicators of capacity to be met by the end of Phase 1. UNDP is now developing these further for inclusion in the project document. The need to strengthen the Provincial Government's capacity was highlighted by the Capacity Assessment team. Recommendations were made as to how best to do this and the recommendations will be considered by UNDP, CI and GoPNG during the preparation of the project document. While highlighting the need to strengthen capacity of the Provincial Govt., the assessment team note that the CI team in Alotau is "suitably qualified" and "impressively committed" to this task. Two members of the CI team are on unpaid leave from the Provincial Govt., including the team's govt. liaison point who is from the Provincial environment office.
GEF funding is used by CI to support core programme	L	The Capacity Assessment Report, also addressed the risk of GEF funds being used to support CI's regular programme in a section "Use of project funded personnel for non-project activities". The assessment notes: "(the assessment mission) does not presently foresee the use of project funded resources supporting

Risk	Rating	Abatement Measure
		directly or indirectly, CI's Melanesia initiative" and "the mission understands that CI intends to use the core project team based in Alotau only for activities specified in the project document". The issue has also been discussed with CI and further clarified in CI's formal response to the Capacity Assessment Report, provided to UNDP. Nevertheless, the report's recommendations to clarify and specify the understanding in the project document will be adhered to.

Risk rating L=low; M=medium; H=high

39. Replicability: The unique socio-cultural landscape of Melanesia demands the development of tailor made approaches to marine conservation, for which there is an unmet need. The global conservation significance of the region and potential escalation of threats requires that this need be addressed. Within Milne Bay, the project will promote the replication of innovative conservation models by capitalising on social ties established through trade networks, customary exchange and marital alliances between communities. The prospects for replication are expected to be good once the local benefits from MPAs have been uncovered through demonstration activities. Zone 1, which is centrally located and lies at the heart of trade networks is ideally placed to assure replication through such means. In addition, replication will be promoted by supporting education, including by developing radio messages in local vernaculars, and utilising the networks of local churches and extension services. The project will employ low-cost management methods using locally appropriate technologies and simple management rules adapted to different ecological and socio-economic landscapes that can easily be adopted by communities, with minimal infusions of new capital. UNDP has established an electronic exchange system [known as MARINENET] to engineer knowledge networking within Papua New Guinea, Solomon Islands and Vanuatu. Lessons derived from the project will be shared with other conservation actors through the network, including with government authorities and donor bodies to inform the design of other initiatives. In addition, the project will impart know-how to conservation managers elsewhere in the country to facilitate the replication of approaches.

40. Sustainability: The project has been designed following a careful review of past lessons, and activities will be progressively adapted during implementation to optimise and sustain conservation outcomes. Conservation approaches will be moulded to reflect the special ecological, social and economic environment within the target communities, accommodating their livelihood strategies and explicitly recognising their overriding concern to ensure food security. In the long-term, the sustainability of biodiversity conservation hinges on the perception of these communities that management is to their benefit. The utility of MPAs to fisheries management has only recently been accepted by the scientific community, and a number of technical barriers need to be overcome before local benefits can be captured through this approach. The project has been designed to surmount these barriers, and thus nest efforts to generate global environmental benefits over the long-term within the sustainable development baseline. A ten-year implementation horizon has been adopted, recognising that the approach will take time to yield tangible dividends. In order to further shift the cost-benefit calculus of

communities in favor of conservation opportunities, the project seeks to ensure that communities capture a benefit from conservation compatible livelihoods, such as the growing dive industry. Incentive measures will be supplemented by capacity development activities, focused on the communities themselves, LLGs and the MBPG and aiming to strengthen abilities to plan, execute, and monitor conservation measures, and in particular, enforce regulations. The recent efforts by GoPNG to reform fisheries management have also improved prospects for sustainability.

G. MONITORING, EVALUATION, AND LESSONS LEARNED

41. Monitoring: The Project includes a strong monitoring component to assess its effectiveness in protecting biodiversity, the benefits accruing to communities and other primary beneficiaries, underlying causes of project outcomes (whether positive or negative), and level and quality of public participation in activities so as to guide site management interventions. A number of indicators to measure impact and processes have been selected (see log frame matrix in Annex B). Reef condition indices (RCI), consisting of three equally weighted components: fish diversity, coral diversity and relative damage from human and natural causes, will be used to assess biodiversity status on a larger geographical scale in sites where good baseline data is already available, to assess the degree to which the Project Goal is being realised. Monitoring at this level will be performed using standard biological survey methods, once every five years.

42. At the Purpose level, the effectiveness of the MPAs in achieving conservation objectives will be monitored using biennial BACI (Before/After Control Impact) investigations. This will include transect sampling of the environmental conditions of each site, species presence/absence (fish, coral and molluscs), habitat representation within each MPA, commercially exploited fish and sedentary marine species, stock/size levels in MPAs, identified spillover zones, and application of basic conservation functions, such as planning, surveillance, and enforcement. A regional stock assessment and biogeographical survey (SABS) will be conducted to provide a scientifically rigorous baseline data set on the location, abundance and distribution of fisheries stocks.

43. Finally, a number of process indicators have been identified for each Output to attribute causality to project outcomes. These indicators will provide the basis for annual reporting exercises. Impact and process monitoring activities will be carried out using participatory and independent monitoring techniques with the full involvement of local communities. Village Recorders will be trained to collect data and maintain data records and a network of community para biologists and informants will be established to perform biological surveys and undertake social assessments. During the first phase of implementation, the project will employ independent monitors to ascertain that communities are properly applying monitoring techniques.

44. The Project will share information with the international conservation community through the Global Coral Reef Monitoring Network (GCRMN) and the International Coral Reef Initiative (ICRI). Survey methodologies will be selected to facilitate data comparability at a global scale.

45. Evaluation: There will be three forums for evaluation: a monthly meeting of the project team, a quarterly consultation with project partners and stakeholders, and a yearly meeting of the Steering Committee. The purpose of these meetings would be to ascertain that project activities and tasks are occurring in the set time frame with the appropriate resource allocations, raise problems/issues faced in delivery, and adjust interventions as necessary. These meetings will also serve as a forum for discussing general issues/concerns regarding the project direction/approach, including new threats and/or opportunities that may affect the project. The Executing Agency will provide UNDP with quarterly and annual reports of project activities. The Annual Project Report (APR) will provide a rating and textual assessment of the progress of the project in achieving its objectives and present stakeholders' insights into issues affecting the implementation of a project and their proposals for addressing those issues. This will serve as a source of inputs to the Tripartite Review (TPR), by members of the Project Steering Committee. UNDP will report to the GEF on progress in implementation during the annual Project Implementation Review, drawing on the APR and quarterly reports, and independent evaluations.

46. Two independent evaluations are planned, one mid way through Phase 1, and one just prior to the conclusion of that Phase. The latter evaluation will assess the extent to which the Project has met its desired objectives in Phase 1, and recommend whether a further Phase is justified.

47. The project draws on lessons distilled under the UNDP-GEF supported PNG Biodiversity Programme, and ⁹South Pacific Biodiversity Conservation Programme as well as lessons defined following a comprehensive review of community-based conservation in Pacific SIDS. The most pertinent lessons are articulated below with a summary of features incorporated into project design to reflect the lessons and enhance prospects for securing stable conservation outcomes.

⁹ A major final evaluation of the SPBCP is currently being undertaken by UNDP, in collaboration with AusAID. The lessons learned from the evaluation will be incorporated into the Project Document.

Lesson	Design Feature
<p>- Social feasibility assessments should mediate the selection of conservation sites, complementing biological and ecological appraisals. Recipient communities should have a high degree of social cohesion and co-operative endeavour, which should be strengthened through social mobilisation activities.</p>	<p>A detailed Social Evaluation Study (SES) was conducted during project preparation, and has informed the selection of sites for conservation and the design of the Stakeholder Participation Plan (SPP). Social feasibility parameters in the intended sites have been defined as positive towards conservation outcomes. The project team will include an experienced sociologist who will play a major role in monitoring social responses and informing the focus of work.</p>
<p>- Conservation approaches should be founded on a careful process of social engagement, trust building and awareness raising within the target local communities.</p>	<p>Community entry activities commenced during project preparation as part of the SES. The work plan allows for social engagement and education to cultivate support and build absorptive capacities for conservation. Community engagement work will be closely monitored and adapted as necessary, to manage expectations and resolve conflicts.</p>
<p>- Significant time horizons are needed to successfully inculcate conservation values locally, strengthen community-based institutions, establish discipline in monitoring and enforcement operations, and demonstrate the utility of protected areas as conservation management tools, including by enhancing the productivity and sustainability of fisheries in adjacent areas as a long-term conservation incentive.</p>	<p>The project is designed as a two-phase intervention spanning a period of ten years, with modest annual funding infusions. Activities have been carefully sequenced to allow for the creation of absorptive capacities in participating communities and within provincial level institutions. Phase 2 activities will be designed based on progress in phase 1, allowing adequate flexibility to respond to socio-economic and ecological outcomes.</p>
<p>- An extensive education programme is required to lay the foundations of environmental awareness</p>	<p>Informal awareness activities orchestrated as part of social mobilisation will be complemented by a formal conservation education programme involving schools, churches and other institutions, and making use of radio for distance learning.</p>
<p>Simple management rules for MPAs work best. External players should play primarily an advisory role to communities.</p>	<p>Care will be taken to establish simple transparent rules, and monitoring systems that can be enforced/ implemented by villagers. The project will provide mentoring support to communities and seek to broker collaboration with other stakeholders.</p>
<p>- Communities are less able to deal with local threats in open access sites than restricted access.</p>	<p>Support will be provided to communities to clarify property rights and map reefs as a basis for restricting access to MPAs.</p>

Source: McCallum and Sekhran, 1997, Ellis, 1999, World Bank, 1999

H. LEGAL CONTEXT

48. This project document shall be the instrument referred to as such in Article 1 of the SBAA between the Government of Papua New Guinea and UNDP, signed on 7 April 1981.

49. The following types of revisions may be made to this Project Document with the signature of the UNDP Resident Representative, provided he or she is assured that the other signatories of the Document have no objections to the proposed changes:

- a) Revisions or additions to any of the annexes of the project document;
- b) Revisions which do not involve significant changes in the immediate objectives, outputs or activities of a project, but are caused by the rearrangement of inputs already agreed to or by cost increases due to inflation; and
- c) Mandatory annual revisions which rephrase the delivery of agreed project inputs or increased expert or other costs due to inflation or take into account agency expenditure flexibility.

I. PRIOR OBLIGATIONS

50. The project document will be co-signed by UNDP, the Department of National Planning and Monitoring and the Executing Agency, Conservation International. UNDP assistance to the project will be provided subject to UNDP being satisfied that the prerequisites listed below have been fulfilled or are likely to be fulfilled. When fulfilment of one or more prerequisites fails to materialize, UNDP may, at its discretion, either suspend or terminate its assistance.

General Prerequisites

- The provincial moratorium on live reef fish collection for the food fish trade is maintained until an enforceable and sound management framework to curtail destructive fishing is legislated.
- Co-financing commitments are confirmed for the first phase of the project.

Prerequisites for Phase 2

- An independent evaluation in year 5 documents good progress in realising the conservation outcomes projected in Phase 1, as documented in the logical framework matrix (Annex B).
- New financial mechanisms are in place to capture user fees from the dive industry, as a conservation incentive for local communities managing MPAs visited by dive boat operators.
- New financial mechanisms anticipated under the Fisheries Act are in place, to recover costs associated with monitoring and enforcing compliance with fishery management regulations.
- Co-financing commitments for phase 1 activities have been honoured
- Co-financing pledges are confirmed for the second phase of the project.

ANNEXES:

Required Annexes

ANNEX A:	Incremental Cost
ANNEX B (1):	Log Frame Matrix
Annex B (2):	Monitoring Objectives, methods and Tools
ANNEX C:	STAP Roster Technical Review and Response

OPTIONAL ANNEXES

ANNEX D:	Threats, Root Causes and Management Solutions
ANNEX E:	Public Involvement Plan Summary
ANNEX F:	Overview of Biodiversity
ANNEX H:	Letter of Endorsement
ANNEX I:	References

ANNEX A: INCREMENTAL COST

1. Broad Development Objectives:

1.1 The overriding development objective of the GoPNG is to improve social and economic development conditions. PNG has the lowest human development index (HDI) in the Pacific. While several social comparators in Milne Bay exceed the national mean, they compare poorly with other developing countries. The Milne Bay Provincial Government places a special emphasis on improving health services, food security and real domestic factor income, and is gearing its interventions accordingly. Also, PNG has embarked on a bold structural reform programme aimed at decentralising governance systems and strengthening the performance of the public sector with the objective of enhancing the accountability and responsiveness of government to communities. Given that the rural populace is highly dependent on natural resources for subsistence and productive use purposes, the long term sustainability of development activities hinges to a great extent on the good stewardship of the natural environment. The MBPG has recognised the vulnerability of coastal communities to degradation of marine ecosystems, and is seeking to advance a conservation programme concurrently with its development interventions. The Province has prepared a five-year rolling Development Plan (Public Investment Programme), which prioritises the activities to be undertaken by the project.

2. Global Environmental Objectives:

2.1 Milne Bay Province contains some of the most biologically diverse coral reefs, mangrove forests and seagrass beds left in the world (CI, 2000a; Conservation Needs Assessment). The significance of the area is amplified by the fact that these ecosystems remain some of the least impacted on the planet, especially important given that coral reefs are increasingly imperilled throughout the world. The global community stands to obtain a range of environmental benefits from the conservation of these environments, including existence values, option values, indirect service values and future recreational values. However, these values comprise public goods, accruing to the global community at large. The failure of local communities to capture these benefits means that they have inadequate incentive to provide an optimal quantity of conservation, and, as threats to the region's marine ecosystems are gradually increasing, there is a risk that global benefits might be forfeited absent intervention. The global environmental objective, therefore, is to overlay conservation goals into the sustainable development framework, and remove barriers to the sustainable utilisation of marine ecosystems at the local level. The project will uncover durable incentives for local communities to protect marine ecosystems and create conservation outcomes that simultaneously generate global and national benefits.

3. Baseline:

3.1 The current and emergent threats to marine biodiversity in MBP are summarized in Annex D. Current threats include over-harvesting of commercially valuable sedentary marine fauna, including sea cucumber, trochus, giant clam, and crayfish, with potential knock-on ecological impacts, that could diminish ecological integrity. Potential threats include destructive fishing, such as the use of cyanide and

blast fishing, and localised impacts from land-based activities on small islands, including clearance of mangrove forests. A number of activities are planned to address these problems in the baseline scenario, costed over five years, correlating with the first phase of project intervention:

(a) Policy Development and Institutional Capacity Building: The aggregate baseline is projected at US\$5.38 million. This includes expenditures of US\$4.0 million over five years by the Provincial Government for salaries, travel, utilities and operations associated with running district administrations, and local-level governments. LLG Secretariats are being created to support the activities of ward committees and the LLGs. An additional US\$0.7 million over five years is being allocated to the provincial judicial system, including to village courts, and to support land mediation and conflict resolution activities. AuSAID and ADB will contribute US\$0.38 million over five years to strengthen financial management in LLGs, and AuSAID will appropriate an additional US\$0.3 million to improve planning systems. While these activities create an enabling foundation for biodiversity conservation, there remains an unmet need to develop capacities to plan, support and monitor community based marine conservation and integrate conservation objectives into development activities. Further, there is a need to strengthen information management systems.

Non- government investment in Milne Bay's conservation sector is limited. The PNG Diving Association promotes conservation in marine ecosystems nationally, but has no programmes in Milne Bay. There is an unmet need to create partnerships bridging government, non-government and private entities for marine conservation, to increase the constituency for conservation, and promote transparency in the natural resource sectors.

(b) Marine Resources Management: The total baseline allocation for planning management and enforcement activities is US\$1.68 million over the first five years of the project. Efforts to strengthen the planning, management, surveillance and enforcement capacities of the NFA is costed at US\$1.3 million over five years. Accompanying activities to strengthen the capacities of the Milne Bay fisheries division will cost an estimated US\$0.18 million over five years. However, these investments are focused on management of both pelagic and near-shore fisheries and focus on traditional fishery management controls, including gear restrictions and seasonal closures based on estimates of sustainable yield. There is an urgent need to establish marine protected areas, as means of protecting biodiversity, and as a new sustainable use paradigm, that will remain unsatisfied in the default scenario. The OEC would allocate US\$0.2 million to process applications to gazette marine protected areas over the life of Phase 1.

(c) Environmental Education: The MBPG will allocate US\$1 million over five years to teach basic environmental science in elementary, primary, and secondary schools. An additional US\$0.06 over five years will be appropriated by Churches for formal environmental education. In addition, the MBPG is allocating US\$ 0.95 million from FY'02 – FY'05 to strengthen the services of Radio Milne Bay. The total allocation to these activities over 5 years amounts to US\$ 2.01 million. While primary and secondary school curricula are being adapted and the syllabus for environmental science in these schools is being improved, in the absence of this project there would be no specific investment in conservation education. There is also a need to develop specific curricula for environmental science and fisheries management in vocational schools. Finally, there is an outstanding need to develop targeted

awareness campaigns encouraging marine conservation.

(d) Sustainable Livelihoods: A number of baseline activities aimed at advancing sustainable development objectives have a bearing on conservation work. The total baseline allocation to these activities is conservatively costed at US\$4.66 million. As part of a national-level Skills Development Project for PNG, ADB and AusAID will be contributing US \$0.7m over 5 years to strengthen the informal sector and establish skills training units. Other activities aim at supporting economic livelihoods. The MBPG will allocate US\$0.7 million for farm extension services, and NARI, US\$0.41 million for farming systems research per annum. An additional US\$0.35 million will be expended by MBPG on livelihood support activities, including marketing and distribution. The Tourism Promotion Authority (TPA) will appropriate US\$0.5 million for five years to promote tourism in Milne Bay, including for networking with travel agents in potential tourism markets. As part of its Skills Development Project, ADB/AusAID will also be allocating US\$1 million over 5 years to aid in tourism development for Milne Bay, focused specifically on developing a tourism training program center for the Province. The EU would allocate US\$1 million to increase incomes derived from pelagic fisheries, and diminish artisanal harvesting pressures on nearshore environments. While this support is significant, gaps remain. In particular, there remains an unmet need to adapt gardening systems to meet subsistence demands for food on the more densely populated small islands. Also, there is a need to improving community waste management.

4. GEF Alternative

4.1 The GEF Alternative includes activities designed to mitigate threats to marine ecosystems and realize conservation objectives, over and above those spearheaded in the baseline. Activities have been bundled into four outputs, with sustainable development and incremental components, funding for which is partitioned between the GEF and other financiers:

(a) Environmental Governance: The capacities of Wards, LLGs and District Administrations to support community-based conservation policy making, planning, monitoring and management will be systematically enhanced, strengthening the ability of government authorities to impart technical assistance, and provide guidance to communities, and integrate conservation and development. Additional support will be provided to the NGO community, to build capacities to provide legal advocacy services and monitor implementation of laws and regulations by stakeholders. The incremental costs of this component amount to US\$ 1.420 million. Of this amount, the GEF would provide funding of US\$ 0.5 million, CI would provide additional funding, amounting to US\$0.5 million to strengthen the Provincial policy framework, where pertaining to marine conservation. UNDP will provide US\$0.2 million to strengthen provincial information management systems. Finally, the MBPG will provide US\$ 0.22 million to strengthen the Provincial communications system.

(b) MPA Management: The incremental costs of this component amount to US\$ 3.38 million, including the costs of removing barriers to the sustainable utilisation of marine resources, through spatial ecosystem management means. Activities would set up a representative network of community based marine protected areas. GEF would provide US\$ 2.3 million for community organisation, participatory

conservation planning, institution building, instituting financial mechanisms to collect user fees for dive tourism and other activities, and establishing a surveillance and enforcement system, in conjunction with the MBPG. CI will provide funding amounting to US\$ 0.75 million for social, biological and ecological monitoring, including for fish stock assessments, reef condition evaluations, and social appraisal, and to assist communities to clarify property and usufruct rights. ACIAR will provide US\$ 0.14 million for stock assessments. Local communities will provide a significant contribution to this project, through the dedication of sweat equity, though this is not imputed into the cost of the GEF Alternative. The MBPG will provide US\$ 0.12 million in funding to strengthen regulatory capacities. The TPA will provide US\$0.07 million in funding to promote dive tourism in Milne Bay.

(c) Environmental Education and Awareness: Incremental conservation awareness and advocacy activities will supplement the baseline. This component has been costed at US\$0.7 million. GEF will provide US\$ 0.4 million in funding to 1] develop teaching materials for conservation education, 2] train teachers as conservation educators; 3] sensitise school administrators to conservation needs; 4] undertake a conservation awareness program, using multiple media; and 5] document and disseminate the lessons learned from conservation activities to practitioners. CI would provide US\$ 0.3 million in funding to develop new curricula for vocational schools, focused on fisheries management and resource conservation.

(d) Human Security: Government of Japan, through the Human Resources Development Trust Fund will provide US\$0.35 million to promote sustainable farming systems intensification on the most densely populated small islands in Zone 1, and control infestations by the African Giant Snail, to increase the productivity of gardening, and reduce the impetus for local communities to over-harvest marine resources to generate income. The MBPG will invest US\$0.16 million in this activity. UNDP and the ANU will appropriate US\$ 0.408 million to assess the vulnerability of small island communities to environmental change, and to develop policy recommendations. CI will appropriate funding of US\$ 0.1 million to improve community waste management on densely populated small islands, to reduce pollution in sensitive near shore environments. The net investment in this component totals US\$ 1.02 million.

5. Scope of Analysis:

5.1 The scope of analysis have been defined temporally, as the life of the project's first phase (five years), and thematically, by activities required to achieve conservation objectives in Milne Bay Province: the geographic locus of intervention. While the focus is on activities occurring within Milne Bay, a number of national activities have been included in the analysis where relevant to the task of protecting the Province's marine ecosystems.

6. Incremental Costs and Benefits:

6.1 The baseline, comprising activities that would be pursued irrespective of project investment, has been conservatively estimated at US\$ 13.73 million. Additional activities, justified in the national interest and required to secure a sustainable development baseline have been costed at US\$ 1.02 million. These activities will be funded entirely by non-GEF sources. The incremental costs amount to US\$ 5.5 million,

of which 58% will be funded by GEF, and the remainder by co-financing. The incremental costs to be funded by GEF amount to 15.8 % of the total cost of the alternative, which amounts to US\$20.25 million. Baseline data have been collected by the MBPG, and incremental costs have been determined based on an analysis of domestic and global benefits accruing from specific activities. A summary of these benefits is provided below:

INCREMENTAL COST MATRIX

Component	Cost Category	Cost (in millions)	Domestic Benefit	Global Benefit
Environmental Governance	Baseline	MBPG: 4.700 AuSAID:0.300 AusAID&ADB: 0.380 Total: 5.380	Policy and planning functions advance development objectives without reflecting conservation values underpinning sustainability	Limited institutional capacities to support community based conservation management threatens sustainability of MPAs
	Increment	GEF: 0.500 GoPNG: 0.220 CI: 0.500 UNDP: 0.20 Total: 1.420		
	GEF Alternative	Total: 6.800	Strengthened capacities to integrate conservation and development objectives	Capacities created in decentralised governance systems to plan, monitor and guide biodiversity conservation

Component	Cost Category	Cost (in millions)	Domestic Benefit	Global Benefit
MPA Management	Baseline	NFA: 1.300 MBPG: 0.180 OEC: 0.200 Total: 1.680	Focus on “traditional” fisheries management approaches, including fish stock assessment, gear restrictions and seasonal closures.	Lack of protected areas to provide refugia for fauna and flora and protect ecological processes
	Increment	GEF: 2.300 CI: 0.750 MBPG: 0.120 ACIAR: 0.140 TPA: 0.070 Total: 3.380		
	GEF Alternative	5.060	Set asides provide additional fisheries management tool, enhancing stock recruitment	Marine Protected Areas protect biodiversity in situ, and overlay allows conservation objectives to be pursued as part of sustainable development
Environmental Education	Baseline	MBPG: 1.950 Churches: 0.060 Total: 2.010	New curricula for elementary, primary and secondary schools includes environmental sciences	Conservation-specific education and awareness is limited, meaning that conservation values are poorly articulated within society
	Increment	GEF: 0.400 CI: 0.300 Total: 0.700		
	GEF Alternative	Total: 2.710	New curricula for fisheries management and conservation in vocational schools	New conservation constituencies created, and provide the foundation for sustaining planned conservation interventions

Component	Cost Category	Cost (in millions)	Domestic Benefit	Global Benefit
Sustainable Development	Baseline	MBPG: 1.050 TPA: 0.500 NARI: 0.410 ADB/AusAID: 1.700 EU: 1.000 Total: 4.660	Investments in healthcare and livelihood creation	Gaps in baseline imply that several determinants of threats to biodiversity remain unchecked
	SD Baseline	UNDP: 0.650 CI: 0.100 MBPG: 0.160 ANU: 0.108 Total: 1.018		
	GEF Alternative	Total: 5.680	Improved waste management improves community health, and enhanced food security on small islands	Waste dumping in sensitive environments curtailed and improved food security reduces pressures by local communities to over-harvest marine resources to earn income to purchase food items
Total	Baseline	13.730	Enhancement of use values	Protection of existence, option, and indirect service values.
	GEF Alternative	20.250		
	Incremental Cost	5.500		
	SD Baseline	1.020		
	Full Project			
	GEF	3.200		
	Non-GEF	3.320		
	Total	6.520		
	Preparation			
	GEF	0.349		
	Non-GEF	0.260		
	Total	0.606		
	Grand Total	7.127		

ANNEX B (1): LOG FRAME MATRIX

OBJECTIVES	INDICATORS	MOV	RISKS AND ASSUMPTIONS																																												
<p>Goal: A representative sample of the globally significant marine biodiversity of Milne Bay Province is conserved</p>	<p>Reef Condition Index Reef condition (measured by fish diversity, coral diversity and relative damage from human and natural causes) in MPA does not degrade over established baseline.</p> <p>Table 1. Mean RCI values¹⁰ recorded for major geographical areas within Milne Bay Province (2000 survey).</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th rowspan="2" style="text-align: left;">Major Area</th> <th colspan="2">2000</th> <th colspan="2">2005</th> </tr> <tr> <th>No. sites</th> <th>Mean RCI</th> <th>No. sites</th> <th></th> </tr> </thead> <tbody> <tr> <td style="text-align: left;">Basilaki-Sideia Islands</td> <td>2</td> <td>239.55</td> <td></td> <td></td> </tr> <tr> <td style="text-align: left;">Conflict -Louiside Group</td> <td>26</td> <td>206.58</td> <td></td> <td></td> </tr> <tr> <td style="text-align: left;">Cape Vogel area</td> <td>6</td> <td>203.07</td> <td></td> <td></td> </tr> <tr> <td style="text-align: left;">D'Entrecasteaux Islands</td> <td>5</td> <td>194.68</td> <td></td> <td></td> </tr> <tr> <td style="text-align: left;">Amphlett Islands</td> <td>7</td> <td>187.98</td> <td></td> <td></td> </tr> <tr> <td style="text-align: left;">South Collingwood Bay</td> <td>3</td> <td>187.07</td> <td></td> <td></td> </tr> <tr> <td style="text-align: left;">Goodenough Bay and E. Cape region</td> <td>7</td> <td>171.12</td> <td></td> <td></td> </tr> </tbody> </table>	Major Area	2000		2005		No. sites	Mean RCI	No. sites		Basilaki-Sideia Islands	2	239.55			Conflict -Louiside Group	26	206.58			Cape Vogel area	6	203.07			D'Entrecasteaux Islands	5	194.68			Amphlett Islands	7	187.98			South Collingwood Bay	3	187.07			Goodenough Bay and E. Cape region	7	171.12			<p>Biological Assessment Reports Every 58 years</p>	<p>No increase in natural environmental perturbation beyond background level (i.e., storm intensity, drought, ENSO events).</p> <p>Social relations between villages provides a spontaneous vehicle for replicating conservation strategies across the bio-regional landscape</p> <p>Baseline and family planning endeavours stabilize population</p>
Major Area	2000		2005																																												
	No. sites	Mean RCI	No. sites																																												
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<p>Purpose: A community-based marine conservation framework is operationalised in partnership with national and provincial government, the</p>	<p>Marine Protected Areas Established At least 6 MPAs within Marine conservation Zone 1 established by the end of Phase 1.</p> <p>Threat Indicators There is no increase in destructive fishing practices (blast fishing, use of cyanide) within Marine Conservation Zone 1 beyond the established baseline.</p>	<p>Gazettal</p> <p>Habitat & MPA map overlays</p>	<p>Scarcity of species utilised for consumptive and productive purposes drives efforts by communities to establish and manage MPAs.</p> <p>Socio-political environment in Milne Bay remains supportive of project objectives</p> <p>Inter and intra-village conflicts pertaining to conservation management can be</p>																																												

¹⁰ Reef Condition Index (RCI) consists of three equally weighted components: fish diversity, coral diversity and relative damage from human and natural causes. The latter category also incorporates the percentage of live coral cover. The hypothetical maximum RCI for a pristine reef is 300; RCI values are useful tools for interpreting reef condition and comparing sites. Depending on their RCI, sites can be classified as extraordinary, excellent, good, moderate, poor and very poor (see Allen & Seeto, 2000 for more details)..

OBJECTIVES	INDICATORS	MOV	RISKS AND ASSUMPTIONS
private sector and NGOs	Biennial biological surveys confirm that reef condition (measured by fish diversity, coral diversity and relative damage from human and natural causes) in MPAs does not degrade beyond established baseline	Community monitoring reports, surveillance network records Assessment Reports	successfully mediated. No significant new threats beyond baseline anticipated in Yr. 2000 Industry actors set and abide by sustainable practices Co-financing commitments for Phase 1 are honoured
Output 1: An enabling environment for marine conservation and near-shore resource management is established at the Provincial, Local Level Government and Ward levels	<p>WDC trained as community facilitators in each of the targeted wards</p> <p><u>Yrs: 2 4</u> <u>No: 8 12</u></p> <p>At least 4 WDCs are engaging target communities in marine resource management activities by the end of year 1</p> <p>All Zone 1 MPA management plans are integrated into LLG (Lousiade, Bwanabwana and Maramatana) Development Plans by Year 5</p> <p>District-level annual program budgeting explicitly recognizes LLG and Ward level marine conservation programs and Ward rules are incorporated into LLG/ Provincial laws by Year 5</p> <p>Province-wide dive tourism policy developed and instituted by Year 2.</p> <p>Mobile High Frequency radio communications network is facilitating surveillance reporting across Zone 1 by Year 2.</p> <p>An environmental advocacy/watchdog alliance is exchanging monitoring data on reef-related trends and threats to Provincial law enforcement by Year 4</p>	<p>Ward reports, LLG Annual reports</p> <p>Ward reports, LLG Annual reports</p> <p>Meeting minutes, list of participants, articles of agreement/operation</p> <p>LLG Development Plans</p> <p>Annual program plans, LLG and Provincial law books</p> <p>MBP Government approved policy document.</p> <p>Audio records,</p>	<p>LLG and WDCs have sufficient absorptive capacity to assume responsibilities proposed under the project.</p> <p>Cadre of motivated WDC officials is in place to provide drivers for conservation outreach.</p> <p>Rising awareness of resource management problems provides a durable trigger for community driven conservation action.</p> <p>Political will can be maintained over subsequent provincial/district-level political cycles</p>

OBJECTIVES	INDICATORS	MOV	RISKS AND ASSUMPTIONS
		<p>surveillance records</p> <p>Legal compact(s), independent reviews, court records on file</p>	
<p>Output 2: A representative network of community-based marine conservation and sustainable near-shore resource management areas is established</p>	<p>Resource user rights and access issues in Zone 1 identified and documented by Year 2.</p> <p>Initial MPA design in Zone 1 targeted sites established and processed for formal recognition by Year 4</p> <p>Species-specific (BDM, turtle, shark, clam) management plans developed for 5 community clusters by Year 3.</p> <p>A total of 40 WDC members, VIG members and village recorders trained in data collection and analysis by Year 2.</p> <p>At least 3 inter-community management forums in Zone 1 convened by Year 4</p> <p>Independent monitoring confirms that, by Year 3, community-based monitoring systems in targeted sites have high participation and that collected data is feeding into management decision-making</p> <p>At least 6 WCAs in Zone 1 gazetted by Year 5.</p> <p>Independent monitoring confirms that MPA zones are being adhered to and infractions are being reported and penalized by Year 6.</p> <p>All PNGDA affiliated dive operators are in full compliance with the dive fee system and are engaged in fee adjustment negotiations by Year 2</p>	<p>Socio-economic reports</p> <p>Annual reports</p> <p>Meeting minutes, member lists, evaluation report</p> <p>Management plan copies</p> <p>Workshop attendees list, Annual Project Report</p> <p>Meeting minutes, member lists</p> <p>Annual Project Report</p> <p>Gazettal proposals and announcements</p> <p>M&E Documents, Court records</p>	<p>There is a discernible impact on spillover and/or recruitment to target wild resources from the creation of MPAs, which provides sufficient social and economic incentives for community-based conservation</p> <p>Village court systems have the institutional authority and capacity to adjudicate MPA rules and regulations</p> <p>Stakeholder commitment is sufficiently high to ensure participation in management structures and adaptive management processes (including enforcement activities)</p> <p>Current institutional and/or policy barriers to protected area gazettal at the provincial and national levels can be overcome during the project duration</p>

OBJECTIVES	INDICATORS	MOV	RISKS AND ASSUMPTIONS
		MBVB records, payments summary report	
<p>Output 3: An environmental education program and conservation awareness activities are imparting marine conservation values and resource management skills to students in formal and informal settings (elementary, primary and secondary schools, vocational schools, church schools)</p>	<p>Conservation curricula developed and integrated into existing school curricula by Years 4 & 6.</p> <ol style="list-style-type: none"> 1. Elementary (G 0-2): 180 schools 2. Primary (G 3-8): 175 schools 3. Secondary (G 9-12): 7 schools 4. Vocational: (G 9-12) 8 schools <p>Conservation education materials are developed and distributed to educators in targeted sites (all Zones) by Years 4 & 6:</p> <ol style="list-style-type: none"> 5. Elementary: 60 educators in 20 schools 6. Primary: 150 educators in 25 schools 7. Secondary: 50 educators in 6 schools 8. Vocational: 20 educators in 7 schools <p>20 Vocational students are engaged in community-level adaptive management and monitoring activities in target communities by Year 4.</p> <p>10 church groups in targeted sites are utilizing developed teaching aides and resource materials by Year 4.</p> <p>A communications strategy for the Province is designed and being implemented by Year 2.</p> <p>Communication/Awareness networks instituted by Year 2:</p> <ul style="list-style-type: none"> ● Weekly radio program ● Regular newspaper coverage ● Program newsletter 	<p>Conservation Curricula</p> <p>Copy of materials</p> <p>Copy of materials, distribution list</p> <p>List of students, student files, community reports</p> <p>Synod/church council meeting minutes</p> <p>Developed communications materials and operational plan for each targeted site</p> <p>Audio recordings of weekly program</p> <p>Lessons documents,</p>	<p>Children are communicating knowledge gained to their elders and peers.</p> <p>Education officials will effectively disseminate knowledge and resource materials to teachers</p> <p>Vocational education programs can absorb the participatory adaptive management and monitoring into current curricula</p> <p>The project enjoys continued access to established communication media (printed press, radio airwaves, public forums, etc.)</p> <p>Traditional knowledge systems are accessible to project and communities support their use in the design and implementation of informal educational activities</p>

OBJECTIVES	INDICATORS	MOV	RISKS AND ASSUMPTIONS
	Lessons are documented on an annual basis and are communicated and exchanged in all forums (Community Networks, MARINENET, and regional and international conferences) by end of Year 2	conference proceedings	
<p>Output 4: Conservation objectives are overlaid into land use strategies on densely populated small islands</p>	<p>At least 30 farming families on 15 islands are engaged in technical extension activities such as integrated pest management, alternative cash and/or subsistence cropping by Year 3</p> <p>Food security-marine resource awareness materials are produced and disseminated to 45 islands by Year 2.</p> <p>By Year 3, relevant Provincial level policies reflect the findings and recommendations of the comparative vulnerability analysis for small islands</p> <p>Small island vulnerability indices are entered into the PNG Resource Information system by Year 3</p> <p>5 islands are piloting alternative solid waste management programs by Year 2</p>	<p>Village profiles, Annual Project Report</p> <p>Copies of materials produced</p> <p>Copies of policy documents/approvals</p> <p>PNGRIS Database.</p> <p>Village Profiles, Annual Project Report</p>	<p>Farming families are receptive to efforts to improve their long-term food security</p> <p>Provincial government receptive towards policy development initiatives</p>

Output 1	Implementing Agent(s) and Focus Area
1.1 Provide training and extension to Ward Development Committees	
1.1.1 Assemble a team of experienced trainers to train Ward Development Committees	
1.1.2 Train trainers in participatory learning and action methods	Village training teams; WDCs. This activity will occur in Zone 1 targeted sites
1.1.3 Develop training materials in vernacular languages.	
1.1.4 Develop and implement a training work plan in each targeted LLG ward.	
1.1.5 Monitor field activities of WDCs for the purposes of assuring quality control	
1.2 Establish a conflict resolution mechanism at the Ward level	
1.2.1 Provide training to Village Court Officials and WDCs in conflict resolution at the inter-community level	
1.2.2 Provide ongoing technical support to Village Court Officials and WDCs in conflict management activities	Village training teams with LLG Admin staff. This activity will occur in Zone 1 targeted sites
1.3 Engage Local Level Government in conservation efforts	
1.3.1 Sensitise LLG to conservation needs and requisite monitoring approaches	
1.3.2 Integrate MPA management plans into LLG development programming and budgeting	Project staff with LLG Admin staff.
1.3.3 Establish channels to continuously update Local-Level Government on relevant project developments	
1.4 Strengthen the Provincial policy and institutional framework for marine conservation activities	
1.4.1 Provide capacity building in information technology and interpretation to appropriate sectors of Provincial Administration	
1.4.2 Develop a Provincial dive tourism policy that institutes financial incentive structure for dive fee system	Project staff, Legal entity; NGOs, public and private sectors
1.4.3 Develop Provincial high frequency radio communications system for project activities (inc. surveillance and reporting)	
1.4.4 Develop a provincial protected areas policy	
1.4.5 Integrate MPA management plans into Provincial development programming and budgeting	
1.4.6 Undertake Provincial fisheries policy review and development	
1.4.7 Establish channels to continuously update Provincial Government on relevant project developments	
1.4.8 Continually assess and communicate potential impacts of changes in policies pertaining to conservation objectives	
1.4.9 Develop joint programming with other government, NGO, and international donor marine resource management initiatives as they relate to Provincial level marine conservation objectives	

<p>2.3 Institutionalise a simple and locally appropriate community-based monitoring and adaptive management program</p> <p>2.3.1 Develop appropriate social, economic and biological indicators for community-level monitoring activities</p> <p>2.3.2 Train WDCs in monitoring methods and basic interpretation</p> <p>2.3.3 Provide training for village recorders to compile and manage village files on conservation activities</p> <p>2.3.4 Provide ongoing technical support to assist communities in evaluating data collected and modifying management strategies</p> <p>2.4 Establish long-term surveillance and enforcement systems for MPAs</p> <p>2.4.1 Define zoning regimen and management regulations for established MPAs.</p> <p>2.4.2 Build capacity of local village court officials to enforce conservation regulations</p> <p>2.4.3 Establish surveillance procedures within each community</p> <p>2.4.4 Provide training to village rangers in surveillance mechanisms and enforcement procedures</p> <p>2.5 Establish an independent monitoring and evaluation mechanism to ensure MPA effectiveness</p> <p>2.5.1 Conduct biennial socio-economic assessments in MPA communities to evaluate incentive structures, accrual and distribution of benefits from MPAs</p> <p>2.5.2 Conduct biennial biological assessments in MPAs to evaluate species and habitat conservation impacts</p> <p>2.5.3 Conduct intelligence gathering to evaluate rules compliance</p> <p>2.5.4 Conduct biennial evaluation of court adjudication effectiveness</p>	<p>Project staff, Village training teams, MB Admin staff; Village court officials, WDCs, village surveillance designees</p> <p>Project staff, AIMS, CI, communities</p> <p>Village training teams, Project staff, OEC/NFA, Lands Office; MPA initiating villages</p>
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<p>2.6 Develop a tourist/diver marine conservation partnership</p> <p>2.6.1 Establish project alliance with PNG Divers Association to promote the application of diving best practices</p> <p>2.6.2 Co-monitor adherence to dive fee system within MBP and effectiveness of benefit distribution mechanisms</p> <p>2.6.3 Encourage dive tourism industry to support and promote marine conservation awareness and generate stakeholder support</p> <p>2.6.4 Engage dive tourism operators in collection and supply of relevant data (e.g., tourism trends, community behaviours, environmental observations) to inform project activities</p> <p>2.6.5 Formulate a tourism alliance with the Milne Bay Visitors Bureau Board to monitor dive tourism trend data and investigate other tourism opportunities and markets</p> <p>2.7 Formalize Marine Protected Areas system</p> <p>2.7.1 Prepare long-term management plan at the site cluster level</p> <p>2.7.2 Determine appropriate policy and institutional avenues for gazettal of MPAs</p> <p>2.7.3 Submit established MPAs for gazettal and complete planning and policy work required to formally gazette MPAs</p> <p>Output 3</p> <p>3.1 Integrate marine conservation and resources management module into primary and vocational school curricula</p> <p>3.1.1 Work jointly with NDOE, VTAT and IEA curriculum officers to determine current curricula gaps in schools.</p> <p>3.1.2 Attend curriculum-writing workshops to insert conservation overlays into curricula development</p> <p>3.2 Develop, produce and disseminate environmental resource materials for use in primary and vocational schools</p> <p>3.2.1 Conduct education materials gaps assessment</p> <p>3.2.2 Develop resource materials with input from teaching establishment and other relevant organisations.</p> <p>3.2.3 Establish a linguistic translation alliance with SIL in the production of materials in local vernacular</p> <p>3.2.4 Evaluate effectiveness of resource materials through surveying techniques</p>	<p>Project staff, MBVB, dive industry, PNGDA; communities where diving occurs</p> <p>Project staff, NDOE, VTAT, IEA, :</p> <p>Project staff, Standards NDOE, PDOE; inspectors, superintendents, within the Zones, senior teachers</p> <p>Project staff, NDOE: educators within the Zones.</p>
<p>3.3 Sensitise school inspectors, superintendents and senior teachers to marine conservation and resource management issues</p> <p>3.3.1 Conduct workshops for education officials to introduce marine conservation and resources management issues.</p> <p>3.3.2 Develop and disseminate marine conservation teaching aides to education officials to distribute to teachers.</p> <p>3.4 Collaborate with local churches to impart conservation values to interest groups</p> <p>3.4.1 Work with the PNG Council of Churches, MEF and interested congregations to develop teaching aides and</p>	<p>Project staff, NDOE: superintendents educators within the Zones</p> <p>Project staff; PNGC of C, MEF;</p>

<p>resource materials</p> <p>3.4.2 Train instructors in use of developed materials</p> <p>3.4.3 Monitor progress and effectiveness of program</p> <p>3.5 Train educators at all levels to utilize teaching materials</p> <p>3.5.1 Conduct workshops for educators to introduce new materials and train them in their application</p> <p>3.5.2 Provide short-term technical assistance in classrooms for use of new materials</p> <p>3.5.3 Design surveying techniques to determine teacher use of materials and student receptiveness</p> <p>3.5.4 Use survey results to evaluate program success and make necessary modifications.</p> <p>3.6 Design and implement a marine conservation awareness campaign for Milne Bay Province</p> <p>3.6.1 Perform a participatory awareness needs assessment for Milne Bay Province</p> <p>3.6.2 Conduct preliminary public awareness activities throughout the Province (e.g., posters, pamphlets, theatre groups)</p> <p>3.6.3 Initiate Province-wide awareness raising program using radio and local newspapers</p> <p>3.6.4 Design and continuously update awareness program messages</p> <p>3.6.5 Mobilise youth and women’s forums to participate in conservation awareness raising efforts</p> <p>3.7 Develop and participate in lessons exchange mechanisms</p> <p>3.7.1 Establish Community-based Marine Management and Conservation Network to inform and exchange lessons learned between communities throughout the Province</p> <p>3.7.2 Share project lessons with other conservation actors within PNG, Solomon Islands and Vanuatu through use of MARINENET</p> <p>3.7.3 Participate in appropriate regional and international forums to exchange project lessons and inform the design of other initiatives</p>	<p>Church interest groups</p> <p>Project staff; superintendents and educators in the Zones</p> <p>Project staff, CI, theatre groups, Radio MB, Eastern Star; provincial community</p> <p>Project staff, independent evaluator; environmental NGO community</p>
<p>Output 4</p>	
<p>4.1 Provide agricultural research, training and extension to targeted small island communities</p> <p>4.1.1 Research the interrelationship between agricultural productivity/security and on marine resource use on targeted islands</p> <p>4.1.2 Conduct land use surveys in catchment-coastal interface of targeted islands</p> <p>4.1.3 Engage farmers in technical extension activities in use of low-input sustainable agriculture systems</p> <p>4.1.4 Provide extension on integrated pest management systems for the recent African snail infestations</p> <p>4.1.5 Research and identify potential alternative cash and subsistence cropping methods (inc. alternative crop production)</p> <p>4.1.6 Provide capacity building and training to Women’s agricultural centre</p> <p>4.1.7 Develop awareness materials that elucidate the important connections between food security and</p>	<p>DAL, SMART; communities in Zones with non assured food security</p>

<p>sustainable marine resource harvesting</p> <p>4.1.8 Form a food security alliance with the SMART demonstration and experiment centre jointly conduct research and extension activities</p>	
<p>4.2 Undertake comparative vulnerability analysis for small islands in Milne Bay Province based on demographic change and external environmental perturbations</p> <p>4.2.1 Integrate marine conservation objectives into small island vulnerability community assessments</p> <p>4.2.2 Organise participatory workshops to discuss the design, implementation and findings of community assessments</p> <p>4.2.3 Facilitate the introduction of scientists/extensionists to small island communities to collect relevant data and provide technical assistance</p> <p>4.2.4 Integrate findings of community assessments into Provincial policy development, planning and decision-making</p> <p>4.2.5 Secure international scientific expertise to conduct land-use mapping, database development and coursework/training programs</p>	<p>Project staff, MB Admin, International expertise; communities in Zones with non assured food security</p>
<p>4.3 Employ island waste control and sanitation systems</p> <p>4.3.1 Assess waste management practices of targeted island communities</p> <p>4.3.2 Provide technical support in developing solid waste management and sanitation techniques</p>	<p>Project staff, DOH, LLG Admin; village communities in Zones with non assured food security</p>

ANNEX B (2) MONITORING OBJECTIVES, METHODS AND TOOLS

Monitoring Objectives, Methods and Tools

Biodiversity and Fisheries Monitoring Program

Objectives:

1. Assess the ongoing status of marine resources
2. Compare biodiversity spatially and temporally against an established baseline assessment
3. Determine any threats or improvements to the resource status of species

Purpose:

1. Show that MPAs have met the desired conservation outcomes (producing global environmental benefits)
2. Demonstrate to the communities that MPAs have produced local benefits (social, economic or environmental)

Methods:

A two tier system for monitoring and evaluation is planned, matching frequent/ low intensity community based monitoring activities with less frequent/ high intensity scientific monitoring, to gauge the effectiveness of the community based monitoring system.

Sampling will involve reference sites, replicates and nesting of variables to ensure that comparative spatial and temporal assessments (before, during and after MPA establishment) have statistically demonstrable confidence levels. The evaluation of the success or failure MPAs will depend upon the establishment of a reasonable baseline from which to assess the conservation of biodiversity and habitats as well as the spatial and temporal distribution and abundance of indicator species.

A testable model and hypothesis will be established during implementation addressing each of the monitoring objectives listed above.

e.g Hypothesis 1: MPAs are responsible for conserving marine biodiversity in MBP.

Hypothesis 2: There will be an increase in the abundance and size of certain commercially exploited species within established MPAs, relative to fished areas.

1. Reef Check Methodology

Aim: to determine if the establishment of MPAs directly or indirectly results in the conservation of marine biodiversity in MBP.

The project will employ the Reef Check methodology to ensure that survey results are useful at regional and global scales. Reef Check is the largest international coral reef monitoring program involving local communities, recreational divers and marine scientists. Reef Check has been designated as the “community-based” survey program for the United Nation’s Global Coral Reef Monitoring Network (GCRMN), and is therefore a full partner in the International Coral Reef Initiative (ICRI).

The Reef Check methodology will be utilized at two levels:

- Reef Check Community: A community-based, relatively simple monitoring program carried by community members (including vocational and high school students) will monitor biodiversity and certain relevant fisheries species both inside and outside the MPAs. Reef Check Community will occur annually, if not more frequently.
- Reef Check Science: The second level will be a more detailed, higher taxonomic, higher resolution methodology, involving groups of scientists (including students from the University of PNG) in biodiversity and reef health monitoring. These surveys will be done biennially both inside and outside MPAs, involving replicates and nesting variables and allowing for statistically testable hypotheses.

2. Fisheries Monitoring

Aim: To determine if the number and size of commercially important invertebrates increase (relative to fished areas) as a result of the established MPAs.

It is a common assumption in fisheries research that the rate at which fish are caught will be dictated by the number of fish present in the area being fished ie. Catch per unit effort (CPUE) will relate to stock densities and can therefore be used as an index of stock abundance. If CPUE is used as an indicator, then the relationship between catch rates and stock abundance will need to be studied over a range of estimates. While there are strong theoretical arguments supporting the benefits of marine reserves for the management of fisheries, strong quantitative evidence from field investigations in PNG is lacking. Monitoring efforts will seek to correlate effects on productivity with management measures:

- Community Based: Catch rates and stock abundance will be monitored by villagers through time as a fishery changes from being lightly fished to heavily fished. Three methods will be used to collect data about artisanal and subsistence fisheries:
 - (a) Questionnaire Survey- interviews of a sub-sample of rural populations concerning their fishing activities.

- (b) Creel Survey- Observations of fishing activities and monitoring the catches of fishers.
- (c) Fish Consumption Survey- Recording the daily consumption of marine products from selected households.

- Independent: Community based monitoring will be ground truthed through biennial scientific monitoring, that will help explain any trends recorded in the community survey. The project will utilize UVC methodologies tested in the Amarnon Islands in the Solomons archipelago, producing quantitative results that will allow for statistical temporal and spatial comparisons (see Lincoln Smith et al (2000)).

Summary Matrix

	Monitoring Program	Indicators	How (method)	Where	When	Who
<u>Biodiversity and Reef Health</u>						
Community Based	Reef Check Community (Annual)	Fish Invertebrate Substrate	-Belt & line Transects -UVC -Point counts	Inside/ outside MPAs	Before, During & After MPA establishment	Villagers Students
Independent	Reef Check Science (Biennial)	Fish Invertebrate Substrate	- Belt & line Transects -UVC -Point counts -Timed swims	Inside/ outside MPAs	Before, During & After MPA establishment	Scientists Students
<u>Fisheries</u>						
Sustainable Use						
Community Based	Community-based (Continual)	Commercially important species	-Questionnaire Survey -Creel Survey -Fish Consumption Survey	In target communities	Before, During & After MPA establishment	Villagers Students Trained monitors
Independent	Scientific (Annual)	Invertebrates Eg. BDM Trochus Giant Clams	-Belt Transects -UVC	Inside/ outside MPAs	Before, During & After MPA establishment	Scientists Students

ANNEX C: STAP ROSTER TECHNICAL REVIEW AND RESPONSE

Introduction

This is generally a well designed project. It is ambitious but has a reasonably staged approach and a timeline which is appropriate to developing the social and economic framework for longer term sustainability. It has the potential to contribute to and learn from an increasing pool of experience in design and application of projects for ecologically sustainable development and the conservation of biological diversity and maintenance of ecological processes at the ecosystem scale. The issues of conservation and sustainable use are particularly acute in the developing economies of countries in tropical seas. This project is important because it addresses a mega diverse area, part of the “coral triangle” - a region of the highest global biodiversity significance in which most countries face complex development and social pressures. There is a level of risk in such projects but it is critically important that projects such as this are implemented. The design of the project, the strong element of community education and involvement, and the nature of the partnership of government, non-government and local groupings address and minimise the risks to an acceptable level.

Scientific and technical soundness

The scientific basis of the project is sound. It builds upon the foundation of work in relation to fisheries marine resource protection and area management in a number of tropical coral reef and coastal environments around the world.

The project is technically sound and the proposal recognises the importance of community and decision maker education, acceptance and commitment to identifying and operating within the constraints of the natural resources and the ecological systems which produce them.

A core element of the project is the establishment of Marine Protected Areas. In the literature there is a range of meanings covered by the term Marine Protected Area. In this project proposal it seems to refer only to highly protected, restricted access sites. It would clarify the proposal if there were reference to the IUCN Guidelines on Marine Protected Areas and if the various area and resource management elements of the proposal were related to IUCN categories so that the scope for mutual misunderstanding of the meaning, purpose and performance criteria for Marine protected Areas is minimised.

Table 1: IUCN Protected Area Categories

Category	Title	Main Protected Area Management Objective
I	Strict Nature Reserve	Science or wilderness protection
II	National Park	Ecosystem protection and recreation
III	Natural Monument	Conservation of specific natural features
IV	Habitat/Species Management Area	Conservation through managed intervention
V	Protected Landscape/Seascape	Landscape/seascape conservation and recreation
VI	Managed resource Protection Area	Sustainable use of natural ecosystems

My interpretation is that the whole scheme relates to IUCN Category VI Managed Resource Protection Area which has the objective of Sustainable use of natural ecosystems. Within that there are clearly proposals which are consistent with either IUCN Category I (Strict Nature Reserve with the primary objectives of Science or wilderness protection) or IUCN Category II (National Park with the primary objectives of Ecosystem protection and recreation.) Some of the other approaches suggest that there may also be roles for other categories. The concept of a large, preferably ecosystem scale, managed resource protection area within which are more highly protected sites is a sound approach to integrated management and for conservation and sustainable development. It is strongly supported by the International Coral Reef Initiative in its Framework for Action.

It would also be helpful to clarify the elements and the contents of monitoring. The term is used in reference to program or financial compliance, environmental condition, resource use, socioeconomic condition, scientific and biological factors, and compliance with the new management regime. There is rightly an emphasis on community monitoring with village recorders and reference to independent monitors to “audit” community monitoring.

At an early stage in implementation it will be important to list the indices that community people are to monitor and the methods, training and quality control programs. For data collection to contribute to monitoring there will need to be a clear linkage to performance criteria and preferably a prior definition of base state and of departures from base state which may be accepted as clearly indicating good performance or improvement on the one hand and deterioration on the other. Further, for at least the environmental parameters there will be a need to link high frequency low precision local monitoring of a limited number of parameters with less frequent higher precision monitoring. This will, at least initially, probably require higher levels of expertise and technical and equipment support than are routinely available on site. It would be sensible for the monitoring of this program to be linked with and contribute to the broader global context of coral reef monitoring.

Global environment benefits and costs

If it achieves its objectives the project will have clear global environmental benefits in securing sustainable development and conservation of the biological diversity of a significant part of the mega-diverse “coral triangle”. The lessons learned in implementing this project will be of considerable interest and importance to those involved in similar projects in other coral reef areas. There are no apparent global costs beyond the investments sought in this proposal.

The context of GEF goals and guidelines

The project clearly addresses the coastal and marine components of the Biological Diversity focal area and the integrated land and water components of the International Waters focal Area. It addresses the objectives of providing a basis for achieving sustainability and it applies the guidelines with respect to incremental costs and the log-frame.

Regional Context

Discussed above. The project is important in the biodiversity and regional technical cooperative networks for the Pacific and South East Asia. The biodiversity significance of the Milne Bay Area is of high regional and global significance.

Replicability

There are now several projects in the tropical regions of the world addressing the issues of achieving sustainability of coastal and marine biological diversity, natural resource management and economic development. The circumstances of each is unique so it would be naïve to expect a simply replicable “turn-key” model. Nevertheless the collective lessons learned through this project which will contribute to the global sum of experience and knowledge and certainly provide guidance in replication of such activities regionally and globally through programs such as the International Coral Reef Action Network.

Sustainability

This is the core of the project. The design makes provision with an appropriate time frame for planning, implementation, institutional strengthening and capacity building in national, provincial and local government. Through education it provides for consolidation in the next generation of the concepts of ecologically sustainable use and conservation and the importance of viable highly marine protected areas. This is a critical element because in common with virtually all human coastal communities there is a deep cultural view of the resources of the sea as limitless and self replenishing. It is no easy matter to challenge such a deep cultural perception and develop an acceptance that through numbers and technology humans now have the capacity to destroy marine systems and the consequent self interest in making sure this does not happen.

Contribution to future strategies and policies

The information gathering tasks, project monitoring and the documented experience of project implementation will contribute to the development of concepts and capacity for international technical cooperation, effective assistance and sound sustainable investment projects.

Secondary Issues

The proposal refers to current capacity building projects by ADB and AusAID. Are there any other significant government or externally funded projects currently being, or likely to be, undertaken in the Milne Bay Area which are relevant to the scope of the proposal or could compete with it for human or other resources?

Involvement of stakeholders

The project identifies this as a critical issue and stakeholder commitment and involvement are key

elements in management of the project through all stages of planning, implementation and monitoring of conservation and sustainable use of coastal and marine natural resources in Milne Bay Province. In the course of implementation it will be important to ensure that the workload and time demands on key local people are comfortably manageable alongside their other roles in the community.

Conclusion

This is a well designed project tackling critical issues in ways appropriate to the situation of the Milne Bay Area.

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RESPONSE TO STAP COMMENTS

COMMENT	RESPONSE
<p>There is a need to clarify the objectives of the intended Marine Protected Areas. The meaning, purpose and performance criteria for management would be better understood if the relevant IUCN management category for these areas were defined within the proposal.</p>	<p>The MPAs would meet the requirements of IUCN Category VI: Managed Resource Protection Area. This has been clarified in paragraph 23, footnote # 5.</p>
<p>It would be helpful to clarify the elements and content of monitoring.</p> <p>At an early stage in implementation, it will be important to list the indices that community people are to monitor and the methods, training, and quality control programs.</p> <p>It would be sensible for the monitoring effort to be linked with broader global coral reef monitoring programs.</p>	<p>The elements and context of monitoring are further elaborated in Annex B.2. The project will establish a two tier monitoring system, coupling low intensity/ high frequency community-based monitoring with more precise low frequency / high intensity monitoring by scientists. The latter is necessary to ground truth information collected by communities and verify the assumptions underpinning management efforts as well as impacts.</p> <p>The project would be linked to the Global Coral Reef Monitoring Network (GCRMN), and will in consequence, be a full partner in the International Coral Reef Initiative (ICRI) . This is now clarified in paragraph 44.</p>
<p>Are there any other significant government or externally funded projects that are currently being, or likely to be undertaken in Milne Bay which are relevant to the scope of the project.</p>	<p>The baseline analysis provided in the incremental cost assessment provides a comprehensive listing of government and externally funded projects that are relevant to the scope of the proposed project.</p>

ANNEX D: THREATS, ROOT CAUSES AND MANAGEMENT SOLUTIONS

1. While Milne Bay Province's 13,000 km² of coral reefs are perhaps the most pristine remaining in the Coral Triangle, several threats are emerging. These have decimated reef systems elsewhere in the region and warrant specific management attention to foreclose environmental degradation.

Over Harvesting of Marine Resources

2. Over-harvesting of commercial marine species is the clearest, most urgent threat to Milne Bay's marine biodiversity. Populations of the highest value species of sea cucumber, processed for bêche-de-mer, are being depleted, and lower-value species are increasingly being targeted for exploitation. The commercial harvest of giant clam species is illegal¹¹, and temporary moratoria have been declared on the live reef fish trade and shark fishing, while the National Fisheries Authority draws up management plans. There is a tremendous need for data collection on commercial species and ecosystem integrity in order to inform resource management actions.

2. The urgency of addressing over-harvesting is underscored by the dearth of knowledge of its long-term ecological impacts. Little is known of the biology and ecology of sea cucumbers in PNG other than that they extract bacteria and organic matter from sea bottom sediments, and some species are responsible for bioturbation and oxygenation of the sea floor (Uthicke, 1994b). By feeding and defecating, holothurians may reduce bacterial and microalgal production in coral reef sediments (Moriarty et al., 1985) and may increase the patchiness of the benthic environment (Uthicke, unpublished). Consequently, intensive collection may cause changes to the condition and nature of the sea floor sediments. Trochus, among the most commonly harvested species in Milne Bay, feed on a variety of algae, as well as epilithic algal turf which grows on bare coral or coralline algal surfaces (Wright and Hill, 1993). They have also been shown to consume large quantities of sand and sediment. The total removal of trochus from the ecosystem may have a bottom-up effect on ecological balance, resulting from the direct increase in algal biomass and growth. The results of their removal from the ecosystem are largely unknown.

Destructive Fishing Practices

3. A moratorium currently exists on the live reef fish trade (LRFT) in PNG. However, this measure is temporary, and several companies have applied for licenses to run LRFT operations. The LRFT relies heavily on destructive fishing methods in neighbouring Indonesia and the Philippines, and the project must closely monitor development of this fisheries sector to ensure that it does not lead to the use of cyanide, dynamite fishing or unsustainable harvesting of certain targeted species, including by targeted spawning aggregations. The LRFT has direct and indirect impacts on reef fish populations. The removal of piscivorous and herbivorous species that are targeted for the live reef fish trade may have

¹¹ Seven species of giant clam inhabit the waters of Milne Bay Province. Of these seven, two are listed as vulnerable by the IUCN, four are listed as conservation dependent, and one has been delisted.

repercussions throughout the ecosystem. Piscivorous fishes are probably the most significant consumers of fish biomass (Grigg et al., 1984), and it is predicted that the removal of predatory species should result in the proliferation of their prey (Jennings et al., 1995). Herbivorous species such as parrotfish may have a bottom-up effect, with decreases in herbivore biomass leading to increases in algal growth and abundance, impacting the ecosystem.

4. The removal of apex species such as sharks from the ecosystem may also result in ecological imbalance. However, the direct and indirect results of their removal are still largely unknown and should be monitored closely. Similarly, while harvested solely for subsistence or cultural purposes, the ecological ramifications of over-harvesting of marine turtles and dugong are difficult to predict. Anecdotal evidence suggests that turtles and dugong are experiencing localized over-harvesting, which should be monitored in order to measure its impacts on marine ecosystems.

Land based Threats

5. The introduction of exotic species is a burgeoning threat throughout the Pacific, and the African snail *Achatina fulica* is having a discernible local impact on subsistence gardening in parts of Milne Bay Province given its appetite for the young shoots of newly planted food crops. By minimizing their impact, especially on those islands where communities are gardening on marginal lands and relying more heavily on marine resources for cash income and subsistence, the project can work to reduce threats to marine resources that are currently being over-fished to compensate for poor returns from gardening.

6. Greater pressure on sea cucumber stocks is also leading to increased use of mangrove and other sources of fuel used during the processing of bêche-de-mer. The resulting degradation of terrestrial habitats can threaten off-shore coral reefs through increased sedimentation. Alluvial gold-mining activities, may also lead to sedimentation and downstream pollution from toxic chemicals used to extract gold from ore. Disposal of human waste from coastal communities may result in localized pollution or eutrophication and algal blooms in coastal environments.

Shipping

7. Four vessels have run aground or struck reefs in Milne Bay Province over the past year. Some were illegally within the three-mile economic exclusion zone, while others simply ran aground due to acts of nature or faulty navigation. The threat of damage to marine ecosystems and marine life from fuel spills or large-scale reef destruction from ship impacts is difficult to predict, but could be enormous under certain circumstances.

ENVIRONMENTAL EFFECTS	ROOT CAUSES AND MANAGEMENT ISSUES	ALTERNATIVE STRATEGY
Conjunction of Threats to Biological Diversity		
<p>Degradation of Milne Bay's diverse marine ecosystems and loss of globally significant biodiversity</p>	<p>1. Lack of conservation areas to serve as refugia against threats to biodiversity. Marine resource management focuses on the management of a few select fisheries, and ecosystem-based approaches are lacking. Large geographical focal area and weak institutional capacities hamper enforcement and surveillance by fisheries authorities.</p> <p>2. Stakeholders lack an understanding of the economic effects of environmental degradation and consequently fail to perceive the benefits of conservation management.</p> <p>3. Insufficient scientific assessments preclude accurate decision-making and informed adaptive management; baseline information is inadequate to monitor ecological change. Scientific knowledge is not disseminated to local communities or resource owners in a meaningful or useable form; linkages with traditional knowledge and contemporary resource management methods are not made.</p>	<p>- Establish community-based conservation management regimes, adopting ecosystem approaches centred on the creation and management of marine protected areas (purpose). Empower communities to enforce conservation regulations, and establish co-management system that involves communities in surveillance activities, to inform regulators of malfeasance by fishing companies in communal waters (outputs 1, 2 and 3). Advocate the development of community driven management plans and regulations [Output 1], and build capacity of local communities in conservation planning, management and monitoring [Output 2]. Strengthen capacities of legal advocacy groups to support marine conservation and promote transparency in decision-making [Output 1].</p> <p>- Strengthen the connection between local livelihoods and conservation through targeted awareness and education campaigns [Output 3] and encourage local investment in conservation by uncovering subsistence and productive benefits [Output 2]. Study trade of marine species along the market chain to improve community understanding of market values of marine resources as a basis for improving benefit capture [Output 2].</p> <p>- Conduct baseline biological assessments and long-term monitoring of ecological and biological parameters; impart data collection and interpretation skills to conservation managers and planners [Output 2].</p>
Over-harvesting of Sedentary Marine Resources		
<p>Alteration in the distribution and abundance of species, eg. bêche-de-mer, trochus, other shells and corals; reduction in biodiversity and disruption of ecosystems</p> <p>Danger of extirpation of endangered species, eg. Tridacnidae (giant clams)</p>	<p>1. Absence of no-take areas insulated from artisanal fishing pressure. General lack of understanding of fishery management benefits provided by set-asides [i.e. recruitment effects; protection of spawning biomass, insurance against ecological perturbation]; Critical natural habitats (spawning areas, juvenile nursery areas) have not been identified, foreclosing efforts to protect them.</p>	<p>- Create a network of fishery set asides within protected areas [Output 2]; raise awareness of the benefits of set-asides to fisheries management [Outputs 2/3]; establish control plots where exploitation is unregulated as a means of demonstrating the local benefits of conservation [Output 2]. Identify critical natural habitats (sources of larvae) [Output 2]; raise local awareness of the importance of protecting these sites, and ensure sites are included in core Zones [Output 2].</p>

ENVIRONMENTAL EFFECTS	ROOT CAUSES AND MANAGEMENT ISSUES	ALTERNATIVE STRATEGY
	<p>2. Government regulatory regimes may be inappropriate or based on inadequate information (eg. bêche-de-mer), and communities often lack awareness of regulations and the rationale behind them.</p> <p>3. Lack of capacity, within government institutions to conduct assessments of the populations of high-value species and adapt management.</p> <p>4. Subsistence and trade do not fulfill community needs and income requirements, and a lack of alternative cash earning opportunities leads to dependence on income from sedentary marine resources which are readily accessible and available to most people, given a tradition of open access to marine resources.</p>	<p>- Raise stakeholder awareness of national and provincial regulations and their rationale (ecol/econ model to demonstrate benefits) [Output 3]. Facilitate and support design and implementation of village-based resource management plans including regulations, monitoring, enforcement, and reporting. Revise current regulations for local management (e.g., TAC to be island or area specific) [Output 2].</p> <p>- Facilitate stock assessments for the purpose of developing objective resource management plans [Output 2 SD Baseline].</p> <p>- Reduce pressure on marine resources by facilitating alternative income generation (dive tourism/fees, introduction of low-volume/high value agricultural products, eg. vanilla) and investigating village-based re-seeding and farming programs for higher-value bêche-de-mer and giant clams and improving quality and efficiency of village-processing of marine resources [Outputs 4 SD Baseline] . Work with dive industry to create incentives for conservation of charismatic species that attract divers, eg. giant clams, and communities awareness raising [Output 2].</p>
Over-harvesting of Marine Turtles and Dugongs		
Depletion or loss of marine turtle species and dugong <i>Dugong dugon</i> and subsequent ecosystem disruption.	<p>1. Hunting and harvesting for subsistence, trade, and customary use in feasts and exchanges</p> <p>2. Unrestricted access for resource owners to turtle egg laying beaches and ease of harvest.</p>	- Raise awareness of the consequences of over-harvesting [Outputs 2/ 3] and develop simple community-based management measures, including no-take zones that protect egg-laying beaches for marine turtles, regulate harvests and protect breeding and feeding grounds for dugong [Output 2].
Reef Sharks		
Disruption of marine ecosystems from depletion or loss of apex predators and reduction of biodiversity.	1. Illegal commercial harvest of sharks (erroneously depicted as by-catch) for lucrative cash sales to satisfy a burgeoning global market for sharkfin.	- Increased surveillance and interdiction by provincial and national fisheries authorities and effective prosecution of illegal commercial harvest of sharks [baseline]. Raise stakeholder awareness on the importance of sharks to a healthy ecosystem and the direct benefits to communities from divers who come to see whole reef assemblages, particularly those with healthy shark

ENVIRONMENTAL EFFECTS	ROOT CAUSES AND MANAGEMENT ISSUES	ALTERNATIVE STRATEGY
		populations[Outputs 2 & 4].
Destructive Fishing Practices		
Degradation of benthic habitats, reduction of biodiversity and disruption of ecosystems.	1. The national moratorium is lifted and Milne Bay artisanal fishermen turn to lucrative live reef fish trade (LRFT) for cash income. LRFT introduces the use of destructive and unselective fishing practices. Insufficient education and awareness exist on the importance of gear restrictions and dangers of using hookah gear, cyanide or dynamite.	- Raise community awareness of the importance of gear restrictions and ecological, human health and economic ramifications of destructive fishing [Output 3]; discourage environmentally harmful harvest techniques including the use of cyanide, and targeting of fish spawning aggregations (Output 2); conduct demonstrations to improve revenue-per-unit catch and reduce mortality (so enabling communities to satisfy target incomes with smaller catches (Output 2);
Diving		
Damage to reefs.	1. Diving code of practice is not adhered to by all operators.	- Install mooring buoys at over-nighting and dive spots to reduce anchor damage to reefs [Baseline]. Implement a uniform divers code of conduct to reduce damage to reefs by dive boat operations [Output 2].
Land-based Threats		
<p>Alteration of the distribution and abundance of marine species and reduction in biodiversity and disruption of ecosystems.</p> <p>Loss of coastal habitat and degradation of adjacent or downstream marine ecosystems with subsequent loss or reduction of marine biodiversity.</p> <p>Pollution of coastal waters and degradation of habitats with potential declines in ecosystem health.</p>	<p>1. Direct and indirect impact of introduced species. African snails predate gardens leading to increased pressure on marine resources for subsistence and livelihood.</p> <p>2. Overharvesting of mangroves for fuel wood, copra and sea cucumber processing/drying and subsistence leads to siltation and degradation of marine habitats.</p> <p>3. Increased alluvial mining and exploration encouraged by provincial government but largely unregulated.</p> <p>4. Community disposal of wastes into coastal marine waters due to cultural acceptance, a lack of infrastructure, and lack of community awareness raising on health and hygiene concerns.</p>	<p>- Small targeted campaigns at eradication or control of exotic species in designated areas or on small islands in order to increase garden production [Output 4].</p> <p>- Introduce techniques that improve the efficiency of bêche-de-mer processing, thereby increasing quality and income and reducing pressure on other marine resources and mangrove wood for fires [Output 4]. Launch community awareness campaigns on the advantages of selective use of mangroves and importance of restoration of degraded mangrove habitats [Output 2].</p> <p>- Monitor the impacts of alluvial mining and exploration in or near project sites to inform future strategies of alleviation [Output 5].</p> <p>- Raise awareness of health and environmental concerns due to waste disposal in coastal waters [Output 2]; introduce simple alternative technologies and utilize extension health workers to spread information on health and hygiene concerns [Output 5].</p>
SHIPPING		

ENVIRONMENTAL EFFECTS	ROOT CAUSES AND MANAGEMENT ISSUES	ALTERNATIVE STRATEGY
<p>Potential large-scale reef destruction and direct impacts on species from loss of habitat or fuel spills.</p>	<p>1. Possible grounding of fuel vessels on major shipping routes, e.g. Jomard Entrance—main Australia-Japan route; Raven Channel—Moresby-Lae route.</p>	<ul style="list-style-type: none"> - Well maintained shipping routes (buoys with beacons or lights) steering ships away from reefs and other hazards [Phase 2 Baseline activities]. - Effective prosecution of companies with vessels found within restricted areas such as the three-mile fishing exclusion zone [Baseline].

ANNEX E: PUBLIC INVOLVEMENT PLAN SUMMARY

1. Introduction

- 1.1 The Stakeholder Participation Plan has been prepared in consultation with various stakeholders to guide the choice of conservation activities, design of interventions, and implementation processes. As local communities have usufruct rights over marine environments within claimed territories, they largely will determine the long-term success of conservation. As such they constitute the principal target group for project interventions, and the SPP has been especially designed to deal with their needs and expectations.
- 1.2 The SPP has been developed through an iterative process with stakeholders from local communities and NGOs, churches, Provincial and National Government Departments, the United Nations Development Programme (UNDP) and Conservation International (CI). Most of these stakeholders participated in a Province-wide assessment of conservation needs that culminated in presentations to stakeholder groups at a Site Selection Workshop that identified the Conservation Zones that will constitute the geographic focus of activities, encompassing a representative sample of globally significant biodiversity. Prospective Marine Protected Areas (MPAs) were then identified in each Zone. This then set the stage for initial community entry and the social feasibility assessment. Discussions with targeted communities and villagers were initiated in the identified sites to assess their resource management needs and receptivity to conservation, and also to gauge the likelihood of success in securing conservation outcomes. The SPP was subsequently prepared by an anthropologist with extensive experience working with the target communities, who collated stakeholder inputs and elaborated participatory processes. These will be monitored and modified during project implementation to maximise their impacts. The SPP covers activities scheduled in Phase one.

2. Stakeholder Identification

- 2.1 Stakeholders generally include any individual, group or organisation with a direct interest in the use and management of the natural resource base at any particular place and who perceive themselves to be affected by, or can effect conservation and management activities. The research conducted as part of the Social Feasibility Study identified several groups of stakeholders or beneficiaries. These have been broken down into three categories:
- a) **Primary Stakeholders** are people who directly depend on the reef for a living and who make direct use of its constituent resources. Communities in the MCZs are all culturally similar, despite linguistic diversity. Most are predominantly matrilineal, so that clan membership, territorial rights, inheritance and succession to leadership are determined through the female line. Generally, clans are politically autonomous, with separate hamlets and territories. Each has its own trading alliances, often based on marriage or clan relationships, with communities on other islands. They are mostly subsistence and artisanal fishers selling bêche-de-mer and shells to secondary stakeholders and rely mainly on fishing and subsistence agriculture for their food

supply and livelihoods.

- b) **Secondary Stakeholders** are people who do not use the reef and its resources directly, but make use of products or services from the reef or whose actions may affect the reef indirectly. This includes the main marine resource buyers and exporters. Other groups may include hoteliers, developers, dive operators and shop owners.
- c) **Relevant Organisations** are organisations with direct responsibility for managing activities affecting reefs and reef resources or with an interest in the primary or secondary stakeholders, including churches, government, NGOs, local users, universities and researchers. Some of these organisations have participated or assisted in project formulation and planning missions, and will contribute towards implementation of activities.

2.2 The primary stakeholders are the main targeted beneficiaries of the project. As such they will be affected most strongly by project interventions and will be the priority targets for project activities. The total population of Milne Bay is 196,044¹² covering the Alotau, Esa'ala, Kiriwina-Goodenough and the Samarai-Murua Districts and encompassing 16 Local Level Governments (LLGs) and 395 wards. The total population of the three Zones is 63,659 and accounts for 32.5% of the total population of Milne Bay, whilst the actual population targeted by the project is 11,641 and represents 5.9% of the Provincial total.

2.3 The roles and responsibilities of stakeholder participants are provided in the tables below.

	Description	Role in Project
Primary Stakeholders		
Zone 1	Zone 1's total population is 13,778 people incorporating a total of 34 wards within the Maramatana, Bwanabwana and Louisiade LLGs. The three Marine Protected Areas incorporate the communities of East Cape, Iabam/Pahilele, Nuakata, Kwaraiwa, Tubetube, Skelton, Anagusa, Tewatewa, Ware, Panaeati, Panapompom and Brooker, which represent 12 wards and a population of 4,655 people.	The local community will be represented through the Ward Development Committee (WDC), which comprises representatives of the village community. The WDC will directly contact community members as required on particular issues. They will be instrumental in awareness raising, community assessments, conflict mediations, regulatory enforcement and development issues. Members of the community will play a significant role in biological monitoring, surveillance and general planning of resource management and conservation activities.
Zone 2	Zone 2's total population is 9,079 people incorporating 17 wards within the Yeleyamba LLG. The one MPA incorporates the communities of Sabra, Nimoa, Western Point,	Field activities will focus on Zone 1 during phase 1. However detailed site preparation for Phase 2 will be undertaken in Zones 2 and 3 in the course of Phase 1. The

¹² This and all subsequent population figures are derived from the PNG 2000 Census.

	Description	Role in Project
	Damanu, and Morpa, which represent 5 wards and a population of 3,107 people.	populations in Zone 2 and 3 will also benefit during phase 1 from the intensive awareness and education campaign that will be sponsored under the project.
Zone 3	Zone 3's total population is 40,802 people incorporating 85 wards within the Makamaka, Goodenough, West Fergusson and Dobu LLGs. The one MPA incorporates the communities of Yo'o, Taulu, Kenaia, Buduwagula, Sawa'edi, East and West Waluma, Sebutuia, Gumawana, and Sanaroa, which represent 10 wards and a population of 3,879 people.	
Secondary Stakeholders		
Provincial, District and Local Level Governments including: <ul style="list-style-type: none"> • Milne Bay Visitors Bureau • Planning and Co-ordination Division • Department of Agriculture and Livestock • Division of Fisheries and Marine Resources • Environment Section • Education Division and • Health Division 	<p>The Milne Bay Provincial Government is headed by the Governor who serves as chairman of the Provincial Assembly. Project related issues concerning conservation, fisheries and tourism are administered under the Assembly. The Provincial Executive Committee (PEC) is the executive arm of the Provincial Assembly, which consists of sector chairpersons. The PEC is responsible for the implementation of laws and policies handed down by the Provincial Assembly and the National Parliament. The Provincial Administrator is responsible for enacting these policies and laws.</p> <p>District Administrations constitute the governmental bodies in which bottom-up planning processes within the LLGs are linked to the Provincial Administration. The Districts serve as the conduit for funding to implement policies and plans of the various LLGs. The District provides health services and extension and support services in the fields of agriculture, fisheries, commerce and industry, environmental management and women and youth. LLGs are made up of a president, all ward councillors plus two women's representatives. Each LLG is</p>	<p>The Milne Bay Visitors Bureau will take the lead role in dive tourism sector management, policy, regulation and development. They are responsible for overseeing the dive fee schedule.</p> <p>The Planning and Co-ordination Division will be responsible for overall planning and coordination of the Public Investment Plan and all LLG 5-year Development Plans. Provincial Policy development of new or revised conservation and management policies. They are also key in the Provincial Data System and will be a major focal point between the project and the Provincial administration, and will be represented on the Project Steering Committee.</p> <p>The Department of Agriculture and Livestock (DAL) will be responsible for certain activities under output 4. They will play a role in cash crop development and plantation redevelopment throughout the Province.</p> <p>The Division of Fisheries and Marine Resources is to be a main partner in the Project providing extension, enforcement and regulatory and fisheries policy development. They will be active in implementing strategies for enforcement, awareness, and policy and will be instrumental in assisting the development of Protected Areas through the Fisheries Law.</p> <p>The (Provincial) Environment Unit will also act as a major focal point for the project playing</p>

	Description	Role in Project
	divided into a number of wards, which have their own Ward Development Committees (WDCs) to help define and solve problems.	<p>an executive role for the Project Steering Committee. The PEU will play a complimentary role to the OEC on conservation matters, mainly to ensure that appropriate procedures for establishing Wildlife Management Areas (WMAs) or other conservation areas are undertaken. The unit will assume shared responsibilities for implementing strategies for community waste management on small islands, and will co-ordinate environmental awareness activities.</p> <p>The Education Division will be instrumental in developing and implementing a new marine environment curriculum and associated teaching materials. They will also play a major role in raising conservation and management awareness through the education system.</p>
Dive Operators	Live aboard dive operators are the dominant sector in the industry currently and are carriers of most divers, usually on weeklong voyages. Shore-based operators from Alotau are a developing sector offering short dive excursions.	Dive operators will be responsible for raising community awareness of the value of the reef. As potential users of the marine environment, they offer financial returns for their activities, which provide an incentive for marine resource management. They will also play a significant role in surveillance, reporting and incidental environmental monitoring, and have importance as global disseminators of project aims and achievements.
Marine produce buyers and exporters	Several marine exporters and buyers benefit from the extraction of marine resources by primary stakeholders.	Exporters and buyers will have some responsibility for raising awareness on the value of primary stakeholders' resources and resultant management incentives. They will also be a source of marine resource extraction data, which will assist the National Fisheries Authority and the project in fisheries management activities.
United and Catholic Churches	The forerunners of the United Church began work in 1891 in Milne Bay, whilst the Catholic Church only began work in the Province in 1932. All people are nominally Christian, with 65 % of the population belonging to the United Church, 13.4% to the Catholic Church, with the remainder claiming affiliation to Anglican, Seventh Day Adventist and other Pentecostal denominations.	The Churches will be involved in identifying needs, resources management planning and implementing local activities. They will provide a potent and innovative vehicle for reaching large constituencies on conservation resource management issues.
Summer Institute of	The Summer Institute of Linguistics	SIL will be involved in the translation of

	Description	Role in Project
Linguistics	is involved in Bible translation around the globe. It has been instrumental in developing orthographies and literacy materials for 31 of the estimated 48 languages in use in and around Milne Bay which covers approximately 92% of the population.	education and awareness materials and, therefore, will be instrumental in the implementation of ongoing communications strategies.
National Government including: <ul style="list-style-type: none"> • Office of Environment and Conservation • Department of Education • The National Maritime Surveillance Co-ordination Centre • PNG Defence Force • Department of National Planning and Monitoring • National Fisheries Authority 	National Government Departments are responsible for policy formulation and providing advice to ensure policies are implemented in the Provinces and LLG areas. They are also responsible for capacity building so the Province can carry out Public Investment Programs.	<p>The Office of Environment and Conservation (OEC) will play a government cooperating agency role. Their main duty as the lead agency for conservation, will be to encourage collaboration and support from other relevant Government agencies. They will also oversee the process of MPA formalisation. OEC will be a major focal point between the project, the Milne Bay Provincial Government and the National Administration and will be represented on the Project Steering Committee.</p> <p>The Department of Education will oversee the new curriculum development and monitor its implementation.</p> <p>The National Maritime Surveillance Co-ordination Centre and PNG Defence Force are responsible for monitoring and apprehension of illegal fishing vessels, which will act as a disincentive to poaching.</p> <p>The Department of National Planning and Monitoring will chair the Project Steering Committee and ensure that GoPNG financial and other commitments are honoured. The Department will be responsible for donor coordination.</p> <p>The National Fisheries Authority will provide technical advice to the Provincial Fisheries Department to facilitate fisheries management in the project Zones. The NFA is currently collaborating with the project in a joint exercise to ascertain bio-habitat and stock assessments of valuable nearshore marine resources.</p>

2.4 The project is geared towards facilitating strong stakeholder involvement in planning, implementing and monitoring activities, and various strategies have been devised to encourage active stakeholder participation, as described below:

3. Information Dissemination and Awareness Raising

- 3.1 Stakeholder consultations performed during project preparation uncovered an unmet need for conservation education, awareness and advocacy amongst primary and secondary beneficiary groups. Stable conservation outcomes are unlikely to be achieved unless stakeholders perceive a nexus between conservation objectives and their local livelihoods and welfare. The project will promote a critical understanding of the need for, the objectives and the process of community-based management of coastal and marine resources, which imparts conservation values and emphasises the interconnection between the environment and development. Education and awareness campaigns will be orchestrated at several levels and moulded to account for the perspectives of different stakeholder groups within the community. These campaigns will be differentiated between the Zones to reflect different ecological conditions and resource use practices. The project would be amended as necessary following social assessments, to ensure that the content of messages and delivery tools is appropriate to need.
- (a) Ward Development Committees will be provided with training in conservation advocacy methods as a means of facilitating discussion of conservation issues in village meetings. The project will provide the Committees with a range of tools for imparting conservation awareness, including posters, leaflets and information sheets in local languages. These will provide factual information on reef ecology, degradation and management.
 - (b) The Project will create special links with youth and women's fellowship groups in order to promote their involvement in conservation, and utilise them as disseminators of conservation awareness within communities. Activities include: training members in conservation awareness raising techniques; and, in the case of youth groups, actively involving them in biological monitoring and resource assessments and social assessments.
 - (c) The Project will foster inter-community exchanges to enable communities to share and learn from respective experiences and create a learning environment within each of the three Zones.
 - (d) With the support of relevant Church bodies, church leaders and lay pastors will be sensitised to conservation needs and trained in conservation education methods. Activities include: organising training workshops; developing teaching materials; and training religious scholars in awareness raising methods focusing on the conservation related teachings of Christianity (this will be adapted to the needs of different denominations).
 - (e) The project will sponsor regular radio broadcasts in local languages to disseminate information on conservation activities and stimulate discussion and debate amongst concerned stakeholders. Programs will sensitise communities to ecological relationships and the negative impacts of over-harvesting of marine resources, the role these resources play within the reef ecosystems and a number of options to reduce harvesting levels and engender sustainable resource use. The target audience will comprise primary stakeholders, particularly the most isolated communities.

Detailed annual communications strategies will be developed with stakeholder input, identifying the content of awareness messages to be disseminated by radio to the various participating communities. In addition, news broadcasters will be sensitised to conservation issues, and a regular fact sheet will be prepared for distribution to radio announcers as a means of disseminating information on conservation and sustainable use of marine resources.

- (f) The project will also support an environmental education program. Teachers will be provided with training in instructional methodologies to spearhead conservation education and to sensitise them to conservation issues. In consultation with education authorities, conservation education modules, adult education curricula and resource materials will be developed using input from the teaching establishment and teaching aids will be developed for use in Milne Bay schools. Regular workshops will be organised to provide teachers with an opportunity to share experiences and discuss future conservation education plans.
- (g) Secondary stakeholders will be targeted primarily through the local newspaper, *The Eastern Star*, PNG's only provincial newspaper. The project will train and provide close contact with journalists to disseminate information.

4. Social Mobilisation and Planning

- 4.1 The Project will recruit a team of Village Training Teams (VTTs) under the co-ordination of a Community Trainer. These VTTs will be responsible for mediating primary stakeholder participation through the WDCs. The VTTs will impart and develop capacities of the WDCs and the general community for conservation and resource management goals, including planning, conflict mediation, and enforcement and monitoring functions. The VTTs will be provided with extensive training in basic participatory research and analysis and community engagement methods.
 - a) VTTs will patrol initially, for the first two years or so, until adequate WDC, and community capacity is in place. Gradually, the community and WDCs will take on increasing responsibility as their capacity increases. The VTT's efforts in the community will then start to wind down. A system of reporting will be initially installed to ensure a two-way flow of information between project management and the WDCs via the VTTs. Later WDC records will be monitored to ensure project objectives are being met.
 - b) At the end of each patrol the VTTs will be briefed and debriefed in order to ensure quality control in the application of field activities. These briefing forums will provide a constant two-way flow of information between the project and stakeholders to guide decision-making.
 - c) Specific training will be provided to WDCs and community members in conservation planning methods in order to prepare Marine Resource Management and Conservation Plans (MRMCPs). Community members will be provided orientation, training and exposure to conservation management methods to enable them to take part in the planning, implementation, enforcement and monitoring of their MRMCPs via their WDCs with initial assistance from the VTTs. The focus of training will be adapted to suit the needs of communities, following

community needs assessments. Training packages would be adapted to improve their efficacy, following routine monitoring and evaluation activities.

- d) MRMCPs will provide a navigational chart for effecting biodiversity conservation and will provide a framework for assessing ecological, social and economic issues. The MRMCPs are to be dynamic instruments, and will be assessed periodically through information gathered by biological and socio-economic monitoring, and will be updated and changed as required.
- e) WDCs will take primary responsibility for co-ordinating management planning and enforcement processes in the MPAs. Regular community forums will be arranged by the WDCs to explain management rules to community members and communicate decisions and address local grievances. These will be forums for idea sharing and will also foster a sense of local empowerment and stewardship.
- f) Full participation of women and youth will be encouraged as women have a relatively prominent role in public life and in village affairs. Gender analyses will be conducted where needed.
- g) The project will assist stakeholders to clarify property and use rights over reefs through pragmatic and understandable zoning and management rules.

Enforcement

- 5.1 Effective enforcement of conservation efforts will require partnerships among Provincial and National authorities and local communities. Primary stakeholders will be responsible for assuring compliance with conservation regulations amongst community members. Mechanisms for reporting infringements, outside community jurisdiction, to the WDCs and higher levels of authority will be developed, to provide intelligence on malfeasance to the National Maritime Surveillance Co-ordination Centre and PNG Defence Force.
- 5.2 Conservation and resource management regulations at the community level will be developed throughout the initial phase and will include a mix of community sanctions and legal penalties. This activity will build capacity for compliance monitoring and reporting, ensuring that protected areas management and sustainable harvest limits are met, and adhered to. Such monitoring will cover a wide swathe of resource use activities. The Project will sensitise local village court officials to their power to enforce natural resource-related regulations and establishing an enforcement mechanism within each community. Training will be provided to village monitors and rangers in surveillance mechanisms and enforcement procedures. These people will be responsible for monitoring resource use, maintaining records of wild resource harvests, and reporting infringements.

6. Monitoring and Evaluation

- 6.1 The project makes provision for on-going data collection and assessment to monitor the status of biodiversity. Monitoring of stakeholder involvement will help to identify avenues for cooperation as well as further training and capacity building needs. The results of monitoring will be integrated into a community decision-making process that allows stakeholders to weigh evidence and propose new or altered courses of action.

- 6.2 Biennial Social Assessments (SAs) will ensure adequate understanding of key social issues and risks, expected costs and benefits, design appropriate institutional arrangements and monitor achievements and evaluate the social impacts on different stakeholders.
- 6.3 Primary stakeholders will be directly involved in developing baseline data and in monitoring the project's biological and socio-economic impacts. This will encompass a broad range of subjects to be monitored, including seascape or species dynamics, socio-economic factors and community involvement and institutional and regulatory factors. This will enable the detection of changes in the status, security and utilisation of biological diversity for the purpose of improving the effectiveness of management of that biodiversity.
- 6.2 In general, monitoring internal threats amongst primary stakeholders will involve seeing if the project is providing incentives and/or sanctions that would cause their behaviour to change in line with project goals and activities. Monitoring external threats will involve seeing if the project is enabling primary stakeholders to defend their resources against incursion from outside elements. Again, frequency will depend on the type and severity of the threat, but these data should be formally collected at least once a year.

7. Social and Participation Issues

7.1 Conflict Resolution

- 7.1.1 One possible negative side effect of project activities may be the inequities (perceived or real) in the distribution of conservation benefits amongst stakeholders. Therefore, distribution of benefits will be assessed carefully as part of the process of social assessment. The project will counteract potential conflicts by ensuring that regular forums are conducted within which resource management regulations are developed through participatory stakeholder decision-making processes. Secondly, the project will work to increase the awareness of the all stakeholder groups of the need for regulatory measures. Thirdly, the project will employ independent monitoring techniques to ascertain that enforcement systems are functioning and to recommend adjustment measures should compliance be unsatisfactory.

7.2 Creation of Incentives

- 7.2.1 Stable conservation is unlikely to be achieved unless consistent with stakeholder priorities. The Project will have to link conservation to issues which local stakeholders find important and which move them to think about resource management, planning and conservation. The education and awareness campaign outlined above will sensitise stakeholders to the need for ecosystem management to sustain their livelihood base. The project will uncover incentives for resource management by explaining and demonstrating the benefits accruing at the community level from the proposed management strategies [increased fishery productivity, advancement of tourism, improved food security]. The project will communicate to targeted communities the realistic benefits that can be expected from establishing MPAs, as well as the timeframe for

realization of these benefits.

7.2.2 Assessments undertaken during project preparation identified several communities where the opportunity costs of MPA establishment and management. Activities will initially be pursued in these communities and upon successful demonstration, replicated in other communities. Participating communities will not receive any financial remuneration for activities performed or for participation in the project, because the value received from set-asides and protected areas are expected to provide sufficient long-term benefits as to offset the short-term costs of undertaking conservation management. Non-payment for participation will also ensure long-term sustainability after the project is finished, rather than promoting community dependence on the project for income generation and subsistence.

7.3 Role of External Actors

7.3.1 Various government authorities will support collaborative management with communities in the enactment and effective enforcement of fisheries management rules. They will assist in developing a framework to facilitate the adoption and enforcement of local rules, and offer assistance on demand to communities on technical aspects of resource management.

7.3.2 The project will invite open participation with the private sector, including the fishery and tourism industries in setting conservation goals, designing field interventions and providing technical assistance to local communities.

7.3.3 Donor assistance will be tied to encouraging a long-term government commitment to community assistance.

7.3.3 Independent national NGOs will monitor the compliance of stakeholders and perform a watchdog and advocacy function in monitoring and to improve governance and transparency in public and private sectors operations. There will be increased Province-wide coverage of marine management and conservation issues in local media and a Community-Based Marine Management and Conservation Network operational across the Province to inform and exchange lessons learned between communities' Province-wide.

ANNEX F: OVERVIEW OF BIODIVERSITY

1. Introduction

1.1 Papua New Guinea (PNG) comprises the eastern half of the island of New Guinea (the world's largest tropical island) and over 600 offshore islands. It has an extensive coastline, stretching over 17,110 km and an immense area of sea encompassing some 3,120,000 sq. km. The country and its surrounding waters lie within the “coral triangle”, the global epicenter of marine biodiversity. In contrast to neighbouring Indonesia and the Philippines, also within the coral triangle, PNG's marine ecosystems are generally in excellent condition. The country has some of the best remaining examples of coral reefs in the world. In addition to over 40,000 sq. km of coral reefs, PNG has extensive seagrass beds, mudflats, estuaries, mangroves and other coastal ecosystems. PNG therefore clearly constitutes an area of global conservation priority.

1.2 Milne Bay is PNG's largest maritime Province with a sea area of approximately 110,000 sq. km containing 32% of PNG's total reef area (Munro, 1989; Dazell & Wright, 1986). The Province comprises the mountainous south-eastern most tip of mainland PNG, 10 relatively large islands and over 150 smaller islands (Mooney, 1997). All types of Pacific islands- continental, volcanic, atoll, raised reef, coral cay and *makatea*¹³ – are represented. Major islands or island groups include the D'Entrecasteaux Islands, Trobriand Islands, Louisiade Archipelago, Woodlark Island and Basilaki Island. The tropical marine environment in the area is among the world's most diverse and pristine, including an extensive and complex system of submerged and emergent coral reefs, as well as mangrove forests, seagrass beds, bays, lagoons and mud, sand, rubble and rocky sea bottoms. The Province consists of four major types of reef structure: fringing reefs, platform/patch reefs, barrier reefs and atolls (Conservation International, 1998).

2. Marine Biodiversity of Milne Bay Province

2.1 Rapid Assessment Programs (RAPs), sponsored by Conservation International, were performed in Milne Bay Province in 1997 and 2000. These surveys recorded over 429 species of reef coral, more than are found on the entire Great Barrier Reef (Fenner & Turak, 2000). The RAPs also recorded approximately 945 species of mollusks (Wells, 2000); there are 1,109 known reef and shore fish species (Allen, 2000; Allen, 1998). Inventory work continues to uncover new species of coral, fish and other fauna, and the area contains many globally rare species, including endangered marine fauna such as dugong, marine turtles, giant clams, seabirds, black corals and sharks.

- **Reef and Shore Fish:** Milne Bay Province has one of the world's richest reef and shore fish faunas consisting of approximately 1,109 species and a predicted total of at least 1,300 species (Allen, 2000). The fish diversity of this Province greatly surpasses that of other areas that have been surveyed in the Coral Triangle and includes six endemic species and a rare Black Velvet Angelfish. The Milne Bay fish fauna is similar to that found in other reef areas in the Indo-Pacific region,

¹³ Raised coral limestone reef.

although species composition varies greatly according to locality. The Nuakata region and Conflict Group are the richest areas for reef fishes, followed by Cape Vogel area and the W. Louisiades-Bramble Haven area.

- **Corals:** Over 429 species of corals were recorded during the RAP surveys (including 20 newly discovered species), and coral diversity equals that in the Philippines and Indonesia, which are known to be the most species-rich in the world (Fenner & Turak, 2000). In Milne Bay, the Louisiade/Conflict Group of reefs had the greatest number of species of coral, followed in order by the mainland coastal areas, Amphlett Islands and the D'Entrecasteaux Islands. The coral fauna of Milne Bay Province, and PNG in general, is typical of Indo-Pacific reefs. A few species span the entire range of the Indo-Pacific, but most do not.
- **Molluscs:** The molluscan fauna of Milne Bay is quite diverse with a total of 945 species of molluscs recorded during the RAPs (Wells, 2000). This total compares favourably with previous RAPs in the Philippines and Indonesia. The majority of mollusc species in Milne Bay belong to the Indo-West Pacific fauna, with a smaller portion of West Pacific species. In Milne Bay, the richest area for molluscs was the Amphlett Islands, followed closely by the D'Entrecasteaux Islands and then the mainland (the Louisiades was not surveyed for molluscs).
- **Other marine animals:** The four main species of turtles found in Milne Bay waters are the green turtle (*Chelonia mydas*), hawksbill (*Eretmochelys imbricata*), leatherback (*Dermochelys coriacea*) and loggerhead (*Caretta caretta*): the hawksbill is considered Critically Endangered under the IUCN Red List of Threatened Animals and green turtles, loggerheads and leatherbacks are listed as Endangered (Baillie & Groombridge, 1996). The numbers of green, hawksbill and leatherback turtles are decreasing in many areas of PNG (Pritchard, 1979; Spring, 1982a, b). The dugong (*Dugong dugon*), listed in the IUCN Red List as Vulnerable is also found in the Province. Killer whales (*Orcinus orca*) also travel through Milne Bay waters and have been sighted in pairs or small schools around the Louisiades, between East Cape and Normanby Island, and between East Cape and Cape Vogel. These marine mammals are considered to be Conservation Dependent under the IUCN Red List. Other mammals such as spinner dolphins, sperm whales, minke whales and various small toothed whales are also present; however their numbers are not known. Milne Bay waters also harbour a diverse and abundant range of elasmobranchs, most common of which are the oceanic whitetip, mako, blue, bronzewhaler, tiger shark, blacktip, whitetip and silvertip sharks, grey reef sharks, lemon sharks (all Carcharhinidae), hammerhead species (*Sphyrna spp.*) and other sand and reef sharks (ANZDEC, 1995). Shark numbers are declining globally, accentuating the importance of conserving Milne Bay's abundant populations.

2.2 In general, Milne Bay Province showed little or no effects from destructive fishing practices such as explosives and the use of cyanide, and had minimal coral pathogens or crown-of-thorn infestations (Allen & Seeto, 2000). There was however some evidence of recent stress at most sites in the northern part of the Province, with newly bleached or bleaching corals (minimal only). The reef condition of Milne Bay surpasses that of previously surveyed areas in Indonesia and the Philippines. The best reef conditions were found around the Basilaki-Sideia islands, followed by the Louisiades/Conflict Group, the Cape Vogel area and the D'Entrecasteaux Islands.

2.3 The coral reefs of Milne Bay Province are fished relatively lightly on a commercial and artisanal scale. However, over-harvesting of several sedentary commercial species such as bêche-de-mer (*Holothuridae*) and giant clams (*Tridacnidae*) is occurring throughout the whole Province (Allen *et al.*, 2000; Kinch, 1999). Biomass estimates for target fish were found to be considerably higher in Milne Bay than in other locations in the Philippines and Indonesia (sampled by previous CI RAPs). Milne Bay may be a source area for fish larval recruitment to other reef communities in the Western Pacific, though further research on larval sources and sinks is needed to confirm this. The location of fish spawning aggregations also needs to be determined.

3. Proposed Marine Conservation Zones in Milne Bay

3.1 Three large Marine Conservation Zones (MCZs) have been selected as the focus of conservation interventions. The location of these areas is shown in Map 1. 4.3 As shown below, the three MCZs appear to capture different species and habitats within Milne Bay Province and hence together, provide good representation of the biological diversity of the Province.

- Zone 1: This Zone encompasses the Nuakata region, East Cape, Sideia-Basilaki Islands, the Engineer and Conflict Group, Long Reef and a portion of the Calvados Chain (Louisiade Archipelago). This large Zone encompasses a sea and land area of 22,850 sq. km and 250 sq. km, respectively, and is representative of a diverse range of habitats and biodiversity. Zone 1 is most representative of mangrove forests, turtle nesting beaches, atolls (the Conflict Atoll is possibly the best atoll-type environment in the Province), barrier type reefs and lagoons. The Conflicts and small barrier islands of the western most portion of the Calvados Chain are also the most important nesting areas in the Province for green and hawksbill turtles and are important rookeries for the Nicobar pigeon *Caloenas nicobarica* which is on the IUCN Red List as a Conservation Dependent species. Bird nesting and roosting areas for the uniform swiftlet *Collocalia vanikorensis*, glossy swiftlet *Collocalia esculenta*, black and brown noddy terns, *Anous minutus* and *A. stolidus*, are also present. This Zone comprises areas of pristine reefs, such as the Sideia-Basilaki region, which had the highest RCI value for the whole Province. The Sideia-Basilaki region also has extensive mangrove and seagrass areas that are regularly frequented by the globally vulnerable dugong *Dugong dugon* and are home to the estuarine crocodile *Crocodylus porosus*. The rare black velvet angelfish *Chaetodontoplus melanosoma* has a restricted range in the cold upwelling areas from Samarai east to Basilaki.
- Zone 2: The second Zone (to be established in Phase 2) encompasses the Louisiade Archipelago, which includes the Calvados Chain, Sudest Island and Rossel Island. This Zone has a sea and land area of 10,700 sq. km and 1000 sq. km, respectively. The Louisiades have the Province's most extensive and best-developed barrier reef, great examples of lagoons, and also extensive seagrass beds (which are important foraging areas for the dugong and spawning areas for the sardine). The area has pristine coral reefs, which include spectacular outer reef drop-offs and passages that have a high diversity of fishes and corals. Giant clams were found to be relatively abundant in this Zone compared to the rest of the Province, and Nicobar pigeons also nest within this area. This Zone is very important to the local communities who intensively harvest commercially valuable species such

as bêche-de-mer and trochus. Approximately 50% of the total amount of bêche-de-mer processed in Alotau (provincial capital of Milne Bay Province) has been harvested from the reefs of the Calvados Chain (Kolkolo, 1998).

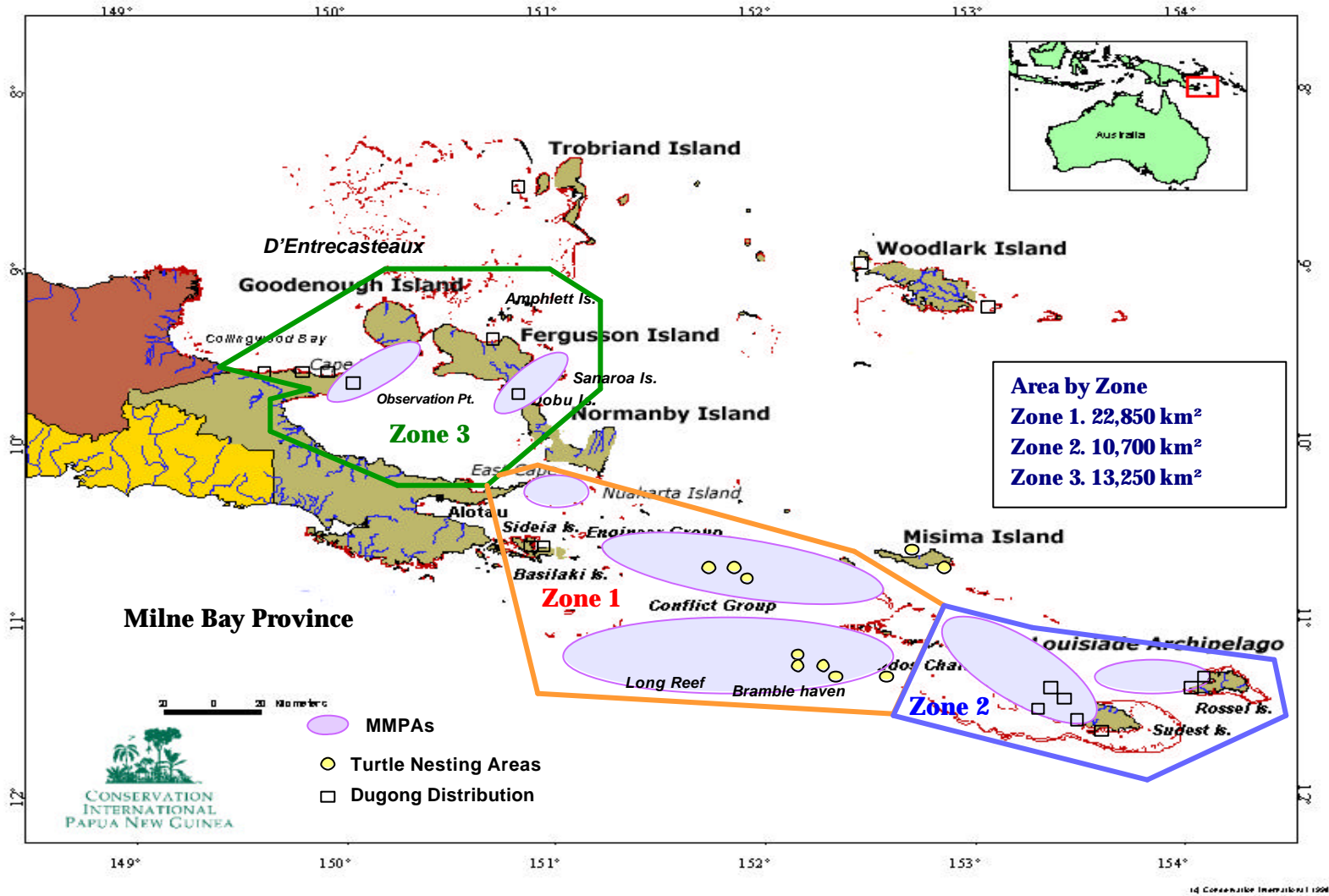
- Zone 3: This last Zone will also be established during the second phase of the project. It encompasses the north coast mainland, the D'Entrecasteaux group and the Amphlett Islands. This Zone has a sea and land area of approximately 13,250 sq. km and 2750 sq. km, respectively, and is most representative of mainland and island fringing reefs, patch/platform reefs, a deltaic floodplain, seagrass beds and mangrove forests. Nesting and roosting areas for the white-bellied sea eagle *Haliaeetus leucogaster*, pied imperial pigeon *Ducula bicolor* and uniform swiftlets *Collocalia vanikorensis* are also present. The Cape Vogel area, which marks the boundary between Collingwood and Goodenough Bays, contains remarkable fish, coral and mollusc diversity and is one of the richest areas in the Province for reef and shore fish. This area also has an extraordinary range of marine habitats and the estuarine crocodile and the dugong are also present. Observation Point is a critical area for the Sand-diver *Trichonotus halstead*, which is so far only known from the steep sand slope at this location and is represented by less than 100 individuals (Conservation International, 1998).

4. Species Composition Patterns Across the Region

4.1 The total number of fish and mollusc species recorded in Milne Bay on the 1997 Marine RAP was 868 species and 637 species, respectively, of which only 443 species of fish and 238 species of molluscs were shared with Indonesia and the Philippines. A total of 199 fish species and 251 mollusc species were found in PNG only. While PNG and Philippines shared only 6% and 8% of their total number of fish and mollusc species, respectively, the percentage of shared species between PNG and Indonesia was 12% for fish and 5% for molluscs. The total number of fish species recorded in Milne Bay on the 2000 Marine RAP was 831 species (out of over 1000 known reef and shore fish species in Milne Bay Province), of which only 440 were shared by all three Zones. While Zone 1, with 636 total species, and Zone 2, with 592 total species, shared 67% of their total number of species, Zone 2 and Zone 3, with 670 total species, shared only 65%, and Zone 1 and Zone 3 shared 66%. The total number of coral species recorded in Milne Bay was 429 species, of which 216 were found in all of the Zones. While Zone 1, with 304 total species, and Zone 2, with 233 total species, shared 70% of their total number of species, Zone 2 and Zone 3, with 416 total species, shared only 55%, and Zone 1 and Zone 3 shared 69%.

4.2 The Conflict Group, NE Cape/Nuakata/Basilaki Island, and D'Entrecasteaux Islands are in the centre of Zone 1, the northwest corner of Zone 1, and the eastern edge of Zone 3 respectively. The total number of mollusc species recorded in Milne Bay on the 1997 Marine RAP was 637 species (out of 945 known mollusc species in Milne Bay Province), of which 190 were shared by all areas. While the D'Entrecasteaux with 89 total species and NE Cape/Nuakata/Basilaki Island with 140 total species, shared 52% of their total number of species, the Conflict Group, with 32 total species, and the D'Entrecasteaux, shared only 40%, and the Conflicts and NE Cape/Nuakata/Basilaki, shared 45%.

MAP OF THE PROJECT AREA



MAP OF ZONE 1





OFFICE OF ENVIRONMENT AND CONSERVATION

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30 August 2001

Mr. Harumi Sakaguchi,
UNDP Resident Representative,
PO Box 1041,
Port Moresby, NCD
Papua New Guinea

SUBJECT: SUMISSION OF A PROPOSAL TO THE GLOBAL ENVIRONMENT FACILITY FOR A COMMUNITY-BASED COASTAL AND MARINE CONSERVATION PROJECT IN MILNE BAY PROVINCE

Dear Mr. Sakaguchi,

In reference to the proposal to the Global Environment Facility (GEF) for a Community-Based Coastal and Marine Conservation Project in Milne Bay Province, the Office of Environment and Conservation is pleased to endorse the current project document as submitted for our review. Furthermore, we fully support the submission of this project document to the Global Environment Facility by the United Nations Development Programme and Conservation International.

We look forward to a continued fruitful process of consultation with UNDP and CI in the implementation of this project and to a further strengthening of the working relationship in our collaborative efforts for conservation and sustainable development in Papua New Guinea .

Yours faithfully,

Dr. Wari Iamo
Director
Office of Environment and Conservation

ANNEX G: REFERENCES

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