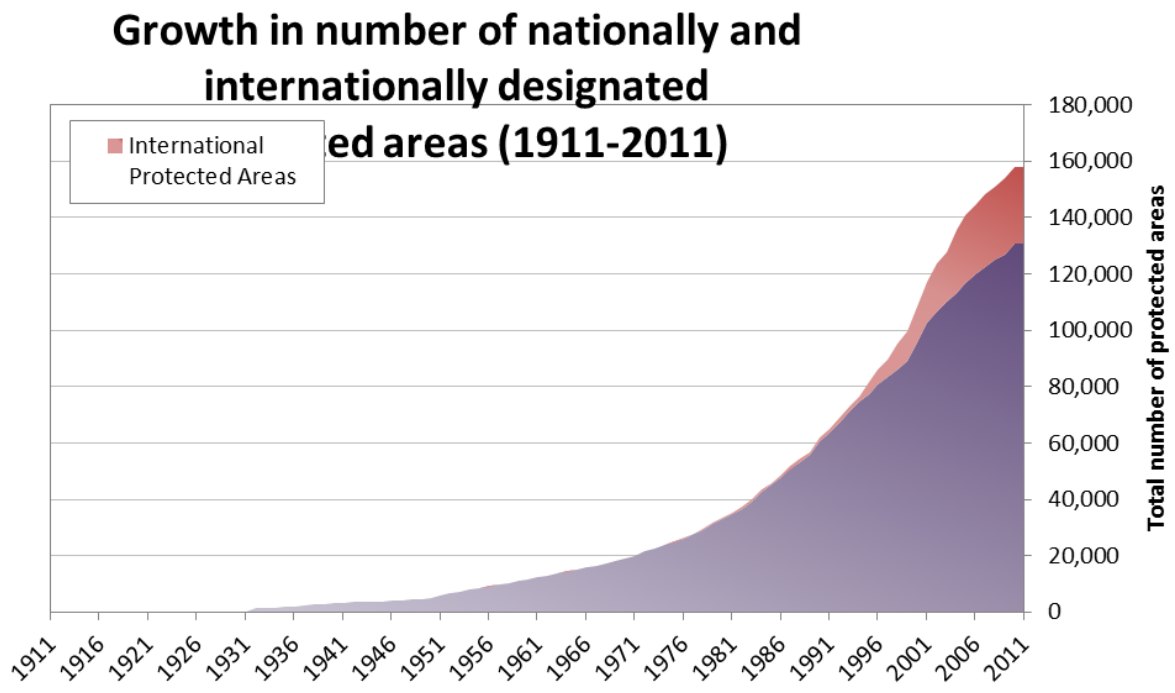
CBD/GEF-6 REPLENISHMENT VALUE ESTIMATION BASED ON AICHI TARGETS

Target 11: By 2020, at least 17 per cent of terrestrial and inland-water areas and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well-connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscape and seascape.

1. Technical Rationale

1. Currently, some 13 per cent of terrestrial areas and 5 per cent of coastal areas are protected, while very little of the open oceans are protected. Therefore reaching Aichi target 11 implies a modest increase in terrestrial protected areas globally, with an increased focus on representativity and management effectiveness, together with major efforts to expand marine protected areas. Protected areas should be integrated into the wider land- and seascape, bearing in mind the importance of complementarity and spatial configuration. In doing so, the ecosystem approach should be applied taking into account ecological connectivity and the concept of ecological networks, including connectivity for migratory species. Protected areas should also be established and managed in close collaboration with, and through participatory and equitable processes that recognize and respect the rights of indigenous and local communities, and vulnerable populations. Other effective area-based conservation measures may also include restrictions on activities that impact biodiversity, which would allow for the safeguarding of sites in areas beyond national jurisdiction in a manner consistent with the jurisdictional scope of the Convention as contained in Article 4.

Figure 1: Terrestrial and marine protected areas in the world.



Source: IUCN and UNEP-WCMC (2012) The World Database on Protected Areas (WDPA): February 2012. Cambridge, UK: UNEP-WCMC.

2. Reference to GEF Guidance and/or relevant COP Decisions

2. COP 10 decision X/24: Review of guidance to the financial mechanism, programme priorities 4.4: Conservation and protected areas (Article 8(A)-(F))

(a) Community-conserved areas;

(b) National and regional systems of protected areas;

(c) Country-driven early action activities of the programme of work on protected areas;

(d) Addressing the long-term financial sustainability of protected areas, including through different mechanisms and instruments;

(e) Further development of the portfolio on protected areas towards comprehensive, representative and effectively managed protected area systems addressing system wide needs;

(f) Projects that demonstrate the role-protected areas play in addressing climate change;

(g) Capacity-building activities for the implementation of the Global Strategy for Plant Conservation;

(h) Projects that promote the conservation and/or sustainable use of endemic species.

Programme priorities 4.19 Marine and coastal biological diversity

(c) Projects that promote the conservation and sustainable use of marine and coastal biodiversity under threat

3. COP 10 decision X/25: Additional guidance to the financial mechanism: Protected Areas

10. *Recalling* paragraph 1 of its decision IX/18 B, *further urges* Parties, in particular developed country Parties, and *invites* other Governments and international financial institutions including the Global Environment Facility, the regional development banks, and other multilateral financial institutions to provide the adequate, predictable and timely financial support, to eligible countries to enable the full implementation of the programme of work on protected areas;

11. *Urges* the Global Environment Facility and its Implementing Agencies to streamline their delivery for expeditious and proportionate disbursement and to align the projects to national action plans for the programme of work on protected areas for appropriate, focused, sufficient and harmonious interventions of projects;

4. COP 10 decisions X/ 31 on protected areas especially sections A (strategies for strengthening implementation) and B(issues that need greater attention) and X/29 on marine and coastal biodiversity, the marine protected areas component provides impetus for undertaking activities for achieving the target.

3. Activities

5. Establishment of comprehensive, ecologically representative, effectively managed and financially secured protected area networks is a critical strategy not only for biodiversity conservation, but for securing ecosystem goods and services, enabling climate change adaptation and mitigation, and helping countries achieve the Millennium Development Goals. Recognizing these critical roles of protected areas, the Parties to the Convention on Biological Diversity (CBD) in February 2004 committed to a comprehensive and specific set of actions known as the Programme of Work on Protected Areas (PoWPA). By emphasizing the equitable sharing of costs and benefits, recognizing various governance types and by giving prominence to ecological representation, management effectiveness and multiple benefits, the PoWPA is the most comprehensive global plan of action for effective implementation of protected areas and is considered as a defining framework or “blueprint” for protected areas for the next decades. As the elements of Target 11 incorporate the tenets of the PoWPA, its further effective implementation and implementation of marine protected areas component of decision X/29 on coastal and marine biological diversity holds the key for achieving Target 11. PoWPA implementation also helps toward achieving other Aichi Targets 1, 2, 5, 10, 12, 14, 15 and 18. The following activities which have already been agreed in decisions XI/18 and X/31 are required to be undertaken for achieving Target 11:

(1) Institutionalize management effectiveness assessment towards assessing 60% of the total areas by 2015 and ensure that the results of the assessments are implemented;

(2) Completion of ecological gap analysis for identifying "ecologically representative areas” (including unprotected IBAs, KBAs etc) and implement the results;

(3) Integration of protected areas into wider land and seascapes to showcase mainstreaming of biodiversity with other sectors and ecosystem based approaches to adaptation to climate change adaptation and leading to mitigation through carbon sequestration;

(4) Recognition of ICCAs including through acknowledgement in national legislation or other effective means, formal inclusion in the national systems, and practicing of various governance types;

(5) Development and implementation of sustainable finance plans for protected area systems;

(6) Valuation of PA goods and services.

6. In GEF-5 under the biodiversity focal area, strategic objective 1 "Improve the sustainability of protected area systems" the following activities are included[1]:

- Improve Sustainable Financing of Protected Area Systems
- Expand Marine and Terrestrial Ecosystem Representation
- Expand Threatened Species Representation
- Improve Management Effectiveness of Existing Protected

4. Cost estimates

7. The elements of protected area financing system addresses two key questions (i) what has to be financed ?; (ii) how much does it cost?

4.1 What has to be financed?

8. Bruner *et al* (2004[2]) described three categories of protected area expenses: (i) recurrent management costs for existing PAs; (ii) system wide expenses to support a network of protected areas, and (iii) costs of bringing new PAs and their effective management. An accurate and comprehensive assessment of management needs across a PA system enables informed decisions on funding needs, priorities and opportunities for savings. UNDP and TNC[3] reported the following six expenditure categories used in Latin American countries grouping hundreds of different items and resources needed for PA management:

Recurrent Costs (operational)

- Human resources: (salaries for park staff, scientist, community liaison officers, tourism and financial specialists etc.)
- Maintenance: office and vehicles, path maintenance, patrolling
- Utilities: water, electricity and communications
- Basic equipment: GPS devices, boots, uniforms etc.

Capital costs (investments)

- Infrastructure, capital equipment, and vehicles, visitor centre, ranger towers, demarcation posts, roads etc.
- Professional services for base level studies, ongoing training etc.

9. Bruner *et al* (2004) added system wide expenses which include national and regional administration, new site selection, budgeting, and securing financial allocation within political system to support the network. The establishment costs for new protected areas include designation costs (e.g., stakeholder consultations, biological inventories, boundary demarcation, land purchase, and compensation) and up front purchases, construction and planning.

4.2 How much does it cost?

10. Information on cost estimates for various PA management activities in Costa Rica, Peru and Ecuador taken from Flores *et al* (2008)[4] is given in Figure 2. Namibia has also estimated costs attributable to the parks system (Table 1)

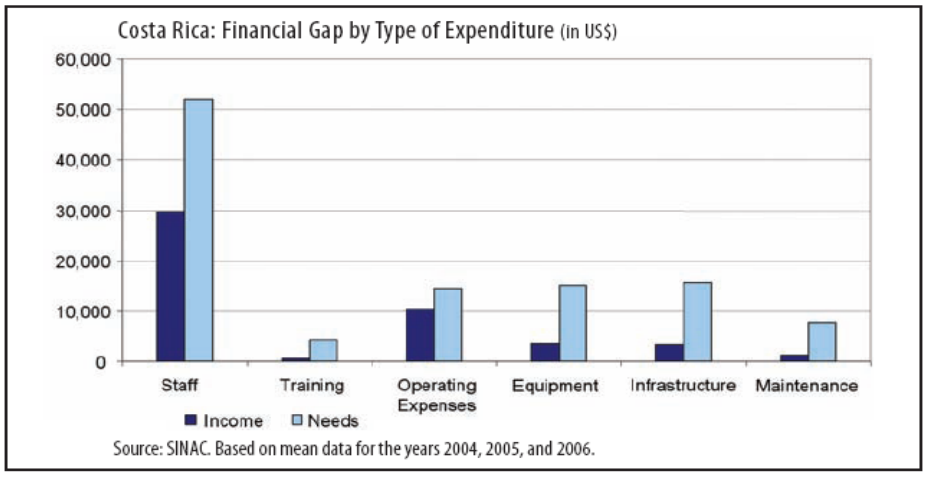
[1] Presentations on GEF focal area strategies in GEF Expanded Constituency Workshops: http://www.thegef.org/gef/node/4452

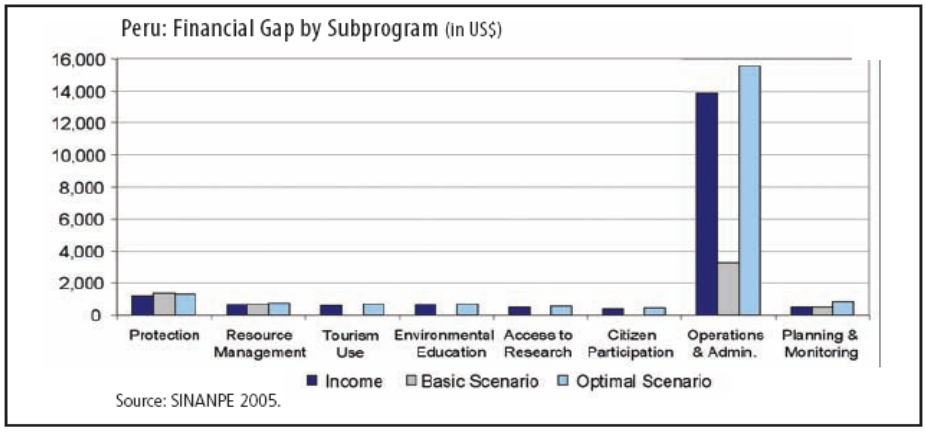
[2] Bruner, A., Gullison, R.E., and Balmford, A. 2004. Financial costs and shortfalls of managing and expanding protected area systems in developing countries. *Bioscience* 54 N0.12:1119-1126

[3] Bovarnick, A., J. Fernandez Baca, J. Galindo, and H. Negret, 2010. Financial Sustainability of Protected Areas in Latin America and the Caribbean: Investment Policy Guidance, United Nations Development Programme (UNDP) and The Nature Conservancy (TNC)..

[4] Flores, M., Rivero, G., León, F., Chan, G., *et al*., 2008. Financial Planning for National Systems of Protected Areas: Guidelines and Early Lessons. The Nature Conservancy, Arlington, Virginia, US.

Figure 2. Cost estimates for various categories in Costa Rica, Peru, and Ecuador





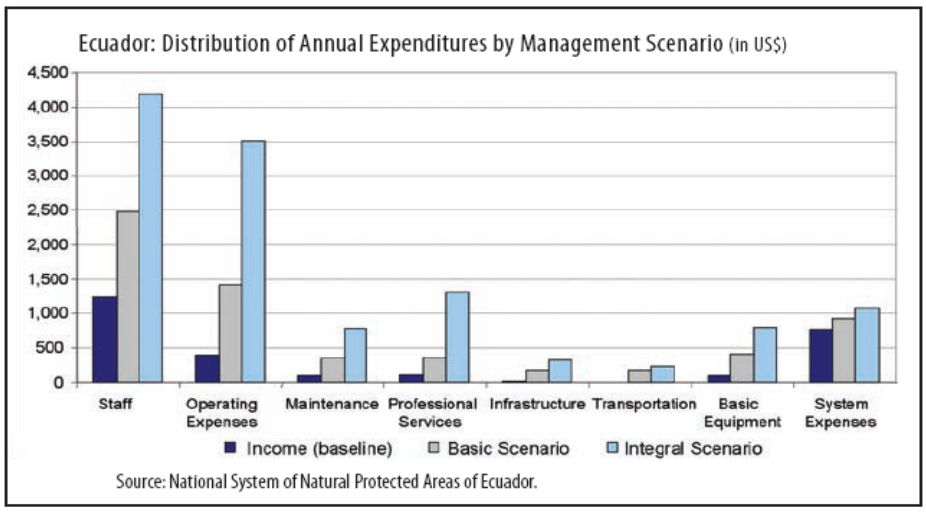


Table 1. Projected total public sector costs attributable to the parks system (excluding NWR) with implementation of the Parks vision in Namibia (N$ millions, 2008 constant values).

Measure of costs	Year 1 2007/8	Year 2	Year 3	Year 4	Year 5	Year 6-20*
Current costs						
Capital costs	6.2	6.2	6.2	6.2	6.2	6.2
Recurrent costs	84.4	84.4	84.4	84.4	84.4	84.4
Total	90.6	90.6	90.6	90.6	90.6	90.6
Additional costs to implement the vision						
Capital costs	72.7	99.9	173.9	119.6	43.9	20.8
Recurrent costs	73.0	73.2	73.6	73.9	74.2	74.4
Total	145.7	173.1	247.5	193.6	118.1	95.3
Total costs of implementing the parks vision						
Capital costs	78.9	106.1	180.1	125.9	50.1	27.1
Recurrent costs	157.4	157.6	158.0	158.3	158.6	158.8
Total	236.3	263.7	338.1	284.2	208.7	185.9
* Year 6 includes replacement capital costs prorated, in constant prices, to year 20						

4.3 Past GEF funding for protected areas

11. The Global Environment Facility[5] is the largest funding mechanism for protected areas worldwide. The GEF has invested in over 2302 protected areas, covering more than 634 million hectares, an area with at least 700 globally threatened species. The GEF has provided more than $1.89 billion to fund protected areas, leveraging an additional $5.95 billion in co-financing from project partners. In addition, the resources allocated to supporting PA system projects have increased during each successive GEF replenishment cycle. In GEF-4 (2007-2010) approximately $450 million out of the $1 billion biodiversity allocation is nominally directed for PA systems. Likewise in GEF-5(2010-2014) approximately $700 million of the $1.2 billion biodiversity allocation is nominally directed for PA systems. In addition other GEF initiatives such as the Small Grants Programme and the Critical Ecosystem Partnership Fund have also contributed significantly to protected areas. As per the guidance given by the COP in decision VII/28 the GEF launched a UNDP/GEF project to support implementation of the PoWPA.

12. In GEF-4, through the international waters and biodiversity focal area, $471 million was invested in marine and freshwater biodiversity conservation and sustainable use. Of this amount, GEF supported 25 marine biodiversity projects totaling $101 million which leveraged $411 million. The GEF has been a leader in helping establish sustainable financing mechanisms to support the operation of national protected area systems in developing countries through more than 90 projects that involve conservation trust funds, payment for ecosystem services schemes, revolving funds, private sector and village funds, and other innovative financial mechanisms to provide steady, reliable funding for protected area management and biodiversity conservation in developing countries. The GEF is recognized as a pioneer in supporting more than 40 conservation trust funds worldwide, investing more than $300 million in total.

13. GEF-4 support to catalyzing sustainable protected area systems is being channeled through three strategic programs: a) sustainable financing of protected area systems at the national level; b) increasing representation of effectively managed national marine protected area networks in protected area systems; and c) strengthening terrestrial protected area networks. Addressing the drivers of biodiversity loss and sustainable protected area systems was the centerpiece of the GEF protected area strategy for GEF-4 (2006-2010) and GEF-5 (2010-2014) as described below:

- The vast majority of GEF-4 PA projects are focused on system sustainability
- Sufficient and predictable resources available to support PA management costs
- Effective protection of ecologically viable samples of a country's ecosystems (marine focus with terrestrial coverage that supports filling global gaps, i.e., inland waters) provides adequate coverage of threatened species at sufficient scale to ensure long-term persistence (GEF-5)
- Individual and institutional management capacity

5. Needs estimates

[5] Financing the Stewardship of Global Biodiversity. 2010. Global Environment Facility. Presentation by Mark Zimsky in a side event on the margins of SBSTTA 14, Nairobi, Kenya, May 2010.

5.1 Available information on needs based on submissions from Parties

14. In the programme of work on protected areas, the Conference of the Parties to the Convention called for establishment and implementation of country-level sustainable financing plans by 2008 for ensuring financial sustainability of national systems of protected areas[6]. The assessment of financial needs and gaps for implementing the programme of work is one of the first steps in developing sustainable financing plans. To date, only a few countries are in the process of completing country-level sustainable financing plans. Information on financial needs assessment for implementing the programme of work is available for few least developed countries, small island developing states, other developing countries and countries with economies in transition (Table 2).

Table 2: Overview of financial needs estimates, available financial resources and funding gaps for implementing the programme of work on protected areas (million US$) in some countries

Country	Financial needs estimates	Available financial resources	Funding gaps
Least Developed Countries Liberia [7]	7.00	NA	NA
Small Island Developing States Bahamas [8]	30.20	2.11	28.09
Cuba [9]	32.00	3.00	29.00
Palau	2.50	NA	NA
Trinidad &Tobago	42.32	4.21	39.26
Other developing countries Brazil[10]	700 for structural investments & 450 per year for running costs. Additional investment of 500 for expansion of PAs (30% of Amazon and 10% each of other biomes, plus 150 annual running costs of expanded PAs)	NA	NA
China [11]	60.00	NA	NA
India [12]	840.00	NA	NA
Indonesia	40.50	5.50	35.00
Panama	36.00	NA	NA
Philippines	110.40	24.90	85.50
Countries with economies in transition Belarus	4.42	1.14	3.28
Russian Federation [13]	95.00	62.00	33.00

15. UNDP and TNC[14] described financing gaps in 18 Latin American countries estimated under both basic and optimal management scenarios (Table 3). The financing gap in Namibia under two expenditure scenarios is presented in Table 4.

Table 3. Financial gaps under basic and optimal management scenarios for 18 LAC countries (in US$)

Country	Available funds	financial needs basic needs	financial gap basic	financial needs optimal	financial gap optimal
Brazil	133415026	302573314	169158288	471731602	338316576
Mexico	80214239	120321358	40107119	160428478	80214239
Nicaragua	5314244.937	19546456	14232211	43321382	38007137

[6] Activity 3.4.2 of the programme of work on protected areas (decision VII/28).
[7] UNEP/CBD/COP/8/INF/26, per year
[8] UNEP/CBD/COP/8/INF/6
[9] UNEP/CBD/COP/8/INF/26, per year.
[10] Implementation of CBD in Brazil: Issues on the agenda of COP 9, Ministry of Environment, Government of Brazil 2008.
[11] Submission to the Secretariat on the review of implementation of the programme of work in 2007, per year up to 2010.
[12] Submission to the Secretariat on the review of implementation of the programme of work in 2007, per year up to 2012.
[13] UNEP/CBD/COP/8/INF/26, per year at federation level only.
[14] Bovarnick et al 2010: Financial sustainability of protected areas in Latin America and the Caribbean: Investment policy guidance, UNDP and TNC

Dominican Republic	10380071.45	22574294	12194223	27974294	17594223
Peru	13067099.82	25172664	12105564	41842414	28775314
Panama	9506948.08	19880360	10373412	33796612	24289664
Chile	9194339	17974193	8779854	26754046	17559707
Paraguay	1240665	9700000	8459335	19500000	18259335
Argentina	31309584	39512820	8203236	60366666	29057082
Guatemala	8339504	16118443	7778939	27401353	19061849
Colombia	20166261	25150153	4983892	42755260	22588999
Cuba	14587030	21639821	7052791	36787695	22200665
Ecuador	3977600	6730054	2752454	14040147	10062547
Uruguay	816000	3409002	2593002	4355947	3539947
Honduras	4122552	6618630	2496078	11251670	7129118
Costa Rica	29645948	31934374	2288426	44000000	14354052
El Salvador	3803223	4445738	642515	7557755	3754532
Bolivia	5102653	5374940	272287	9000000	3897347

Table 4. Estimation of the financing gap for the protected area system in Namibia under two expenditure scenarios (N$ millions, 2008 values).

	Minimum expenditure scenario to maintain the status quo			Optimal expenditure scenario to achieve the Vision		
(Constant 2008 prices, N$ millions)	**2008-2012**	**2013-2017**	**2017-2022**	**2008-2012**	**2013-2017**	**2017-2022**
(i) Estimated financing needs for management costs and investments to be covered	766.5	766.5	766.5	1331	929.5	929.5
(ii) Projected revenues (over 5 year period)						
Entrance fees (current estimate + 5% growth rate)	287	366	468	287	366	468
Concessions	10	10	10	99	214	296
Live sales & other	12	12	12	12	12	12
Total projected revenues	309	388	490	398	592	776
(iii) Amount of PA generated revenues retained in the PA system for re-investment	83.75	103.5	129	83.75	103.5	129
(iv) Total government budget (incl donor funds)	638.8	638.8	638.8	683.5	683.5	683.5
(v) Financing gap for 5-year period	44	24	-1	564	143	117
(vi) Estimated **average annual financing gap** (financial needs – *available* finances)	**8.8**	**4.9**	**-0.2**	**113**	**29**	**23**

5.2 Estimating needs using the cost estimates per hectare given in GEF-4 and GEF-5 allocations

16. Using data from the GEF council documents for GEF-4 and GEF-5 replenishments as a basis, the needs for GEF-6 and -7 can be estimated in order to achieve Target 11 of the Strategic Plan for Biodiversity 2011-2020. In the GEF council document GEF/C.37/3, in the summary of negotiations of the fifth replenishment of the GEF trust fund[15] dated May 17, 2010 paragraph 49 reads as follows:

"The achievements made by the global community with GEF support must be further consolidated through enhancing the sustainability of protected area systems such that they continue to deliver the global benefits of: (i) biodiversity (indirect use and option values, and existence values particularly with regards to threatened species); (ii) provision of ecosystem goods and services, including contributions to climate mitigation; and (iii) ecosystem-based adaptation. Therefore, an investment of $700 million will be made to improve the management effectiveness of protected areas covering an estimated 170 million hectares, thus continuing GEF's prioritization in helping countries implement their obligations under the CBD Programme of Work on Protected Areas. The additional investment in 170 million hectares of protected areas under effective management for biodiversity conservation would total

[15] http://www.thegef.org/gef/sites/thegef.org/files/documents/C.37.3%20Summary%20of%20Negotiations%20of%20the%20Fifth%20Replenishment%20of%20the%20GEF.pdf

about 14% of the area of existing terrestrial protected areas in GEF-eligible countries or about 23% of the area of existing marine protected areas in GEF-eligible countries"

17. In the GEF council document GEF/C.29/3, in Table 3 on expected outcomes and targets for GEF-4 biodiversity strategic objectives it was suggested to support at least 80 million hectares of protected areas based on FY91-04 of GEF support to protected areas. The average conservative estimate applied towards the target is: $5/ha per PA[16] for four years.

18. In GEF-5, 700 million US$ are programmed to improve effective management in 170 million hectares @ $4.1 per ha per four years. This additional 170 million hectares would cover 14% of the existing terrestrial PAs in GEF eligible countries or 23% of existing Marine PAs in GEF-eligible countries.

19. Given the two above estimates of the cost of management effectiveness ($5.1/ha and $4.1/ha per four years) an average between the two can be used ($4.55/ha per four years).

20. According to the MDG 2011 report, 13.3% of the terrestrial surface or 10 738 311.73 square km is currently protected in developing countries[17]. This is equivalent to 1 073 831 173 hectares. Out of this 86% or 923 494 809 hectares still needs investment for effective management for biodiversity conservation. This amounts to 923 494 809 ha X $4.55/ha = 4 201 901 381 US$ or simply 4 201 million or 4.2 billion US$ for four years.

21. Currently 13.3% of the terrestrial surface in developing countries is protected. To reach the global target of 17% terrestrial protection in developing countries, this number needs to increase to 17%. 1 073 831 173 ha=13.3%; Therefore how many hectares would equal 17% protection? 1 073 831 173 ha x 17/13.3 = 1 372 566 161 hectares would be 17% terrestrial protection in developing countries. 1 372 566 161 - 1 073 831 173 ha = 298 734 988 hectares are required to be added to reach 17%.

22. The cost of effective management of this additional 298 734 988 hectares is 298 734 988 X 4.55 US$ = 1 359 244 195 US $ or 1 359 million or 1.4 billion per four years.

23. The cost of expanding this 311 575 442 hectares is 2 billion US$ per year[18]

24. Thus the total requirement of funds for terrestrial areas to reach the 17% target:

- Effective management of existing protected areas = 4201 million or 4.2 billion US $ for four years
- Establishment costs of expanding to reach the 17% global target = 2000 million or 2 billion US$ per year= 8 000 million or 8 billion US$ for four years
- Effective management of the expanded protected areas = 1 359 million or 1.4 billion US$ per four years.
- Total = 4201 + 8000 + 1359 = 13 560 million or 13.6 billion per four years

25. Similarly calculating for Marine Protected Areas:

26. According to the MDG 2011 report, 4% of the marine surface in developing countries, or 461 564 sq. km (46 156 400 ha) is currently protected. Out of this, 77% (i.e. 100%-23%=77%) or 35 540 428 ha still needs investment for effective management. This amounts to 35 540 428 ha x $4.55/ha = 161 708 947 US$ or simply 162 million for four years.

27. Currently 4% of the terrestrial surface in developing countries is protected. To reach the global target of 10% marine protection this number needs to increase to 10%. 46 156 400 ha=4%; therefore how many hectares would equal 10% protection? 46 156 400 ha x 10/4 = 115 391 000 ha would be 10% marine protection in developing countries. 115 391 000 ha - 46 156 400 ha = 69 234 600 ha are required to be added to reach 10%.

28. The cost of effective management of this additional 69 234 600 hectares is 69 234 600 X 4.55 US$ = 315 017 430 US $ or 315 million per four years.

29. The establishment costs of expanding to reach the 10% global target[19] =1602 million or 1.6 billion US$ (one time cost).

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[16] http://www.thegef.org/gef/sites/thegef.org/files/documents/C.29.3%20Summary%20of%20Negotiations.pdf

[17] http://unstats.un.org/unsd/mdg/Data.aspx.

[18] Bruner, A., Gullison, R.E., and Balmford, A. (2004). Financial costs and shortfalls of managing and expanding protected area systems in developing countries. *Bioscience* 54 N0.12:1119-1126

30. Thus the total requirement of funds for developing countries to reach the 10% target of marine protected areas is:

- Effective management of existing protected areas = 162 million US$ per four years
- Establishment costs of expanding to reach the 10% global target = 1.6 billion US$ (one time in four years)
- Effective management of the expanded protected areas = 315 million per four years.
- Total = .162 + 1.6 + .315 = 2.1 billion US$ for four years

31. Thus the total estimate to reach Aichi Target 11 is 13.6 billion terrestrial + 2.1 billion marine = 15.7 billion US$ per four years total based on GEF-4 and GEF-5 cost estimates.

5.3 Estimating needs using the cost estimates from available studies on terrestrial and marine protected areas

Terrestrial protected areas

32. Based on several previous studies on financial needs of terrestrial protected area systems in the developing countries, analysis of management plans, information derived from questionnaire survey and multiple regression models of variation in annual protected area management cost, Bruner *et al* (2004)[20] presented terrestrial protected area management costs in developing countries. They reported that the total annual cost for effective management of the existing protected areas in developing countries ranges from US$ 1.1 billion to US$ 2.5 billion per year and the funding shortfall (total cost minus current funding) varies between US$ 1.0 and 1.7 billion per year. They concluded that as the lower estimate does not include system wide costs, the funding short fall should be greater than 1 billion and the midpoint of 1.3 billion should be a best estimate.

33. This paper was published in 2004 and the funding short fall of 1.3 billion corresponds to the terrestrial protected areas in developing countries in 2005, which was 10 546 051.77 sq km or 13% of the terrestrial surface of developing countries. In 2011, terrestrial protected areas cover 13.3% (10738311.73 sq km) therefore the funding short fall for effective management is 1.33 billion per year by extrapolating the 1.3 billion short fall reported by Bruner *et al* (2004).

34. Taking into account the cost of land acquisition, compensation payments, infrastructure and equipment etc, Bruner *et al* (2004) reported that the cost of expanding terrestrial protected areas to cover 30% of the terrestrial surface of developing countries could cost as much as 9 billion US$ per year for one decade. Since target 11 stipulates 17% terrestrial surface as a global target, the cost of expanding terrestrial protected areas from the current 13.3% to 17% amounts to 2 billion US $ per year.

35. Bruner *et al* (2004) also reported that the average per hectare management costs for new protected areas is likely to be greater than that for existing protected areas and the annual management costs for the expanded protected areas would be 1.8 billion US$ per year for a 30 % terrestrial surface expansion. So the effective management of 3.7% expanded terrestrial protected areas in developing countries costs 391 million per year.

36. Thus the total requirement of funds for effective management of existing terrestrial protected areas, expanding them to cover 17% of the terrestrial surface and their effective management in developing countries, as per Bruner *et al* (2004) can be estimated:

- Effective management of existing protected areas = 1330 million or 1.3 billion US $ per year
- Establishment costs of expansion to reach the 17% global target = 2000 million or 2 billion US $ per year
- Effective management of the expanded protected areas = 391 million or 0.4 billion US $ per year.
- Total = 1330 + 2000 + 391 = 3721 million or 3.7 billion per year
- Total requirement for four years of GEF-6 = 3.7 X 4 = 14.8 billion for four years

Marine Protected Areas

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[19] McCrea-Strub, A., Zeller, Sumaila, U.R., Nelson, J., Balmford, A., Pauly, D. 2011. Understanding the cost of establishing marine protected areas. Marine Policy 35: 1-9.

[20] IBID

37. Balmford *et al* (2004)[21] developed a model to predict total maintenance costs per unit area of marine protected areas based on a survey of 83 MPAs worldwide. Cullis–Suzuki and Pauly[22] applying the model of Balmford *et al* (2004) estimated the annual maintenance cost of the current global network of MPAs. Annual running costs per unit area were higher in MPAs that were smaller and closer to coasts. Using the models extrapolating the data, this study suggested that a global MPA network conserving 20-30% of world's seas might cost 5- 10 billion US$ annually to maintain.

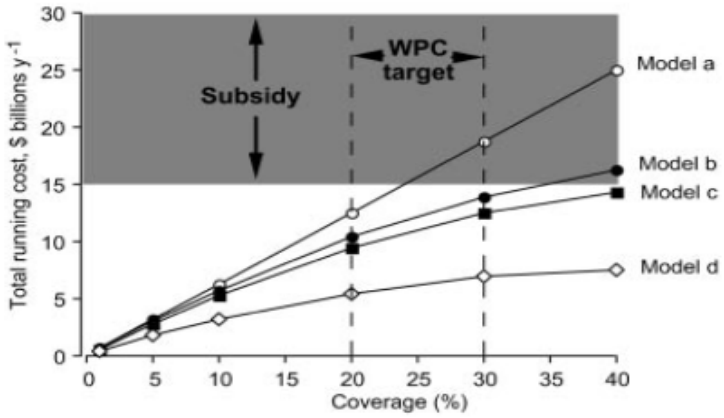

Fig. 3. Total estimated running costs of MPA systems covering 1–40% of the world's seas, according to four different models of system expansion. The shaded area denotes recent estimates of global subsidies to industrial fisheries (see text), whereas the vertical dashed lines show the MPA coverage recently recommended by the World Parks Congress. Model a, new MPAs randomly located, with no coalescence allowed; model b, new MPAs randomly located, but with all neighboring MPAs allowed to coalesce; model c, currently unprotected cells adjacent to already protected cells being 10% more likely than others to be picked for reservation, and with coalescence allowed; model d, as for model c, but with 50% greater likelihood of adjacent cells being picked.

38. McCrea-Strub *et al* (2011)[23] studied 13 MPAs from Asia, Africa, Latin America and North America and described the various components and establishment costs of MPAs. The variation in MPA start-up costs was most significantly related to both MPA size and the duration of the establishment phase. While the total establishment cost is expected to be higher for larger MPAs, when considered per unit of area smaller MPAs may be more expensive to establish than large MPAs, reflecting economies of scale. The estimated total establishment cost (EC) and annual maintenance cost for MPAs of 50 km^2 and 1,000,000 km^2 size, at US$ estimates in 2005, varied from 69 990 US$ per km^2 and 60 US$ per km^2 (EC) and 7723 US$ per km^2 per year and 3 US$ per km^2 per year (MC). EC and MC for 500 km^2 MPA are 2315 US per km^2 and 1253 US$ per km^2 per year respectively. These figures are taken as the basis to arrive on the cost estimates for MPAs for achieving target 11.

Table 5. Estimated total establishment cost (*EC*) and annual maintenance cost (*MC*) for MPAs of increasing size.

[21] Balmford, A., Gravestock, P., Hockley, N., McClean, C.J., Roberts, C. 2004. The worldwide costs of marine protected areas. PNAS 101:26: pp9694-9697.

[22] Cullis-Suzuki S., Pauly D. 2010. Marine protected areas costs as "beneficial" fisheries subsidies: a global evaluation. Costal Management 38:113-121.

[23] McCrea-Strub, A., Zeller, Sumaila, U.R., Nelson, J., Balmford, A., Pauly, D. 2011. Understanding the cost of establishing marine protected areas. Marine Policy 35: 1-9.

MPA size (km^2)	EC[a]		MC[b]	
	(2005 USD)	(2005 USD· km^{-2})	(2005 USD· $year^{-1}$)	(2005 USD· km^{-2}· $year^{-1}$)
0.5	31,876	63,752	146,819	293,639
5	105,551	21,110	238,113	47,623
50	349,514	6,990	386,175	7723
500	1,157,349	2,315	626,302	1,253
5000	3,832,343	766	1,015,743	203
50,000	12,690,081	254	1,647,342	33
500,000	42,020,808	84	2,671,675	5
1,000,000	60,255,959	60	3,090,295	3

[a] Estimated according to Eq. (2) or (4).
[b] Estimated according to Eq. (1) or (3).

39. According to the MDG 2011 report, 4.0% of territorial waters or 461 564 km² is currently protected in developing countries. The maintenance cost of these existing MPAs amounts to 578 million US$ per year (1253 US $ X 461564 km²).

40. For achieving target 11, the existing 4.0% has to be expanded to 10% of territorial waters i.e. 1,153,910 km² or addition of 692 346 km². The establishment cost for these additional 692 346 km² amounts to 1602 million or 1.6 billion US$. Maintenance cost of the expanded MAPs is 867 million US$ per year.

41. Thus the total requirement of funds for effective management of existing MPAs, expanding them to cover 10% territorial waters and their effective management in developing countries based on extrapolation of estimates by McCrea-Strub *et al*:

- Effective management of existing MPAs = 578 million US$ per year
- Establishment costs of expanding to reach the 10% global target =1602 million or 1.6 billion US$
- Effective management of the expanded MPAs = is 867 million US$ per year.
- Total = 578 + 1602 + 867 = 3047 million or 3.0 billion US$ per year
- Total requirement for four years of GEF-6 = 1.7 (578X4) + 1.6 +3.4 (867X4)= 6.7 billion US$

Total for terrestrial and marine = $ 21.5 billion US$

6. Incremental reasoning

42. Considering that protected areas contribute significant global benefits and as global benefits increase so does the GEF funding, the financial needs for GEF-6 are presented at three funding levels (covering 30%, 50% and 60% of the total costs) (Table 6).

Table 6. Protected Areas financial needs for the GEF-6 replenishment over three funding levels in US$.

Scenario	Total requirement	30% GEF funds	50% GEF funds	60% GEF funds
Based on GEF-4 and -5 cost estimates	$ 15.7 billion	$ 4.71 billion	$ 7.85 billion	$ 9.42 billion
Based on published models	$ 21.5 billion	$ 6.45 billion	$ 10.75 billion	$ 12.9 billion

7. Indicators and Milestones

43. Possible milestones include:

- By 2012, in the marine area, a global network of comprehensive, representative and effectively managed national and regional protected area systems is established;
- By 2014, all countries have completed ecological gap analysis and implemented results;
- By 2012, all protected areas have effective management;

- By 2015, management effectiveness in protected areas has been assessed and results implemented;
- By 2015, all protected areas and protected area systems are integrated into the wider land- and seascape, and relevant sectors; and
- By 2015 all countries develop and implement sustainable finance plans for protected area systems.

44. Possible indicators could include:

- Trends in coverage, condition, representativeness and effectiveness of protected areas and other area-based approaches;
- Trends in extent of marine protected areas, coverage of key biodiversity areas and management effectiveness;
- Trends in protected area condition and/or management effectiveness including more equitable management;
- Trends in representative coverage of protected areas and other area based approaches, including sites of particular importance for biodiversity, and of terrestrial, marine and inland water systems; and
- Trends in the connectivity of protected areas and other area based approaches integrated into landscapes and seascapes.

45. Outcomes and indicators suggested in the GEF council document GEF/C.37/3, in the summary of negotiations of the fifth replenishment of the GEF trust fund[24] dated May 17, 2010:

Outcome 1.1: Improved management effectiveness of existing and new protected areas.
Indicator 1.1: Protected area management effectiveness score as recorded by Management Effectiveness Tracking Tool.

Outcome 1.2: Increased revenue for protected area systems to meet total expenditures required for management.
Indicator1.2: Funding gap *for management of protected area systems as recorded by protected area financing scorecards*

[24]http://www.thegef.org/gef/sites/thegef.org/files/documents/C.37.3%20Summary%20of%20Negotiations%20of%20the%20Fifth%20Replenishment%20of%20the%20GEF.pdf