Note:

The Report entitled "***National Level Assessment of Funding Needs to Implement the Aichi Biodiversity Targets in Ecuador – Report to the CBD Secretariat***" is a case-study work commissioned to Conservation International by the Secretariat of the Convention on Biological Diversity as part of the full assessment of the amount of funds needed for the implementation of the Convention during the sixth replenishment period of the Trust Fund of the Global Environment Facility (GEF). This is in line with the terms of reference of the Expert Team who undertook the GEF-6 Funding Needs Assessment as provided in Decision X/26. The Report is a revised version updated as of October 2013. It is not a report by the Government of Ecuador.

National Level Assessment of Funding Needs to Implement the Aichi Biodiversity Targets in Ecuador

Report to the CBD Secretariat

January 31, 2013

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This assessment was carried out during September 2012 – January 2013 in collaboration with the Directory for National Biodiversity of the Ecuador Ministry of Environment. We updated the information in August 2013 based on further inputs from the Ministry of Environment and the new national goals of the Government of Ecuador.

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NATIONAL LEVEL ASSESSMENT OF FUNDING NEEDS TO IMPLEMENT THE AICHI BIODIVERSITY TARGETS
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ACRONYMS

CBD	Convention on Biological Diversity
CI	Conservation International
COP	Conference of the Parties
CPPS	Permanent Commission for the South Pacific (Comision Permanente del Pacifico Sur)
ENBD	National Biodiversity Strategy (Estrategia Nacional de Biodiversidad)
FEIG	Galapagos Invasive Species Fund (Fondo para el control de especies invasoras de Galápagos)
GEF	Global Environment Facility
GISD	Global Invasive Species Database
MAE	Ecuador Ministry of Environment (Ministerio del Ambiente Ecuador)
MICIP	Ecuador Ministry of Industry, Competitiveness and Production
PAN	National Environmental Policy
PANE	National Natural Heritage Areas (Patrimonio de Áreas Naturales del Estado)
PSB	SocioBosque Program (Programa Socio Bosque)
SENESCYT	National Secretary of Higher Education, Science and Technology
SNAP	System of National Protected Areas **(**Sistema Nacional de Áreas Protegidas)
SRP	Vice ministry of Aquaculture and Fisheries (Viceminsiterio de Acuacultura y Pesca)

1. INTRODUCTION

Relevant Decisions of the Tenth Conference of the Parties: Strategic Plan, and Aichi Goals and Targets.

The Tenth Conference of the Parties (COP) of the Convention on Biological Diversity (CBD) took place in October of 2010 in Nagoya, Japan. One of the 47 approved decisions from this meeting was Decision X/2 on the Strategic Plan for Biodiversity 2011-2020 and the Aichi Biodiversity Targets. This decision reflects the Parties' basic instrument for structural and effective application of the Convention. Additionally, it recognizes the urgent need for action to conserve biodiversity at a global level.

The Strategic Plan for Biodiversity 2011-2020 includes, among others, a shared vision, a mission, and 20 Targets organized into five strategic goals, known as the Aichi Biodiversity Goals and Targets. Annex 1 lists the 5 goals and the 20 Targets of the Strategic Plan.

The Strategic Plan aims to provide a flexible framework for the Parties to establish national and regional targets for greater consistency in the application of the provisions of the Convention and the decisions of the previous COPs, including the various work programs such as The Global Strategy for Plant Conservation, Access to Genetic Resources and Benefit-sharing, and Inland Waters Biodiversity. The text of the Convention, and in particular its three objectives, namely the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources, form the foundation for the Strategic Plan.

Additionally, the Strategic Plan serves as a foundation for the development of communications tools that can attract attention from diverse sectors, actors, and stakeholders and engage them to facilitate the integration of biodiversity into national and regional programs. In broad terms, the vision of the Strategic Plan is "Living in harmony with nature" where "By 2050, biodiversity is valued, conserved, restored, and wisely used, maintaining ecosystem services, sustaining a healthy planet and delivering benefits essential for all people."

The mission of the Strategic Plan is to "Take effective and urgent action to halt the loss of biodiversity in order to ensure that by 2020 ecosystems are resilient and continue to provide essential services, thereby securing the planet's variety of life, and contributing to human well-being, and poverty eradication. To ensure this, pressures on biodiversity are reduced, ecosystems are restored, biological resources are sustainably used and benefits arising out of utilization of genetic resources are shared in a fair and equitable

manner; adequate financial resources are provided, capacities are enhanced, biodiversity issues and values mainstreamed, appropriate policies are effectively implemented, and decision-making is based on sound science and the precautionary approach."

Application of the Convention on Biological Diversity in Ecuador

Ecuador ratified the CBD in 1993 and since then the country has been committed to the development of actions for its implementation. In Ecuador, the management of environmental issues is the responsibility of the Ministry of Environment (MAE by its Spanish acronym) and the National Environmental Authority.

The first National Biodiversity Policy and Strategy for Ecuador 2001-2010 was designed in 2001. This document was formalized through publication in the Official Registry 011 of January 30, 2007. Unfortunately, the National Biodiversity Strategy (ENBD by its Spanish acronym) did not have an action plan to facilitate the execution of the objectives and proposed programs.

Currently, the MAE is in the process of updating the ENBD. This was brought about by a Global Environment Facility (GEF) project in which priority will be given to developing an action plan and incorporating the approved decisions of the most recent COPs, especially as proposed in the Strategic Plan for Biodiversity 2011-2020 and the Aichi Targets (W. Rojas, pers. Com., 2012).

What the Aichi Targets Represent for Ecuador

In Ecuador, the provisions of the CBD, especially the programmes of work and the Aichi Targets for biodiversity, have generated the adoption and implementation of policies, programs, and projects at various levels. As in many countries in the region, Ecuador's natural resources constitute the basis of its economy, and so there is constant pressure on biodiversity and the measures designed to conserve it. In all ways, it is necessary to increase efforts to significantly reduce the underlying causes of biodiversity loss.

In terms of environment and biodiversity in the last decade, there have been significant advances, including the 2008 adoption of the Constitution, which contains various items related to the conservation of biodiversity, the rights of nature, the formation of a national system of protected areas, and, most significantly, the national environmental objectives outlined in the National Plan for Good Living and the definition of National Environmental Policy (PAN). However, there is still a need for greater understanding

and integration of biodiversity issues into other sectors in the country and in its policies, strategies, programs, and broader actions.

Although there is a growing understanding of the links between biodiversity, ecosystem services, and human well-being, incentive structures and macroeconomic policies still do not properly articulate the value of the great biodiversity of Ecuador. According to the PAN, “Nature will transform into a strategic sector, with a context that favors a different view of environmental issues and their management, specifically biodiversity. This dynamic must be assumed as a key to sustainable development of the country and the well-being of its citizens” (MAE, 2010).

Now, in light of the new Strategic Plan and Aichi Targets, the National Biodiversity Strategy (ENBD) should be updated and an appropriate action plan created. This will enable the National Policy and Strategy to be an effective instrument for the integration of the biodiversity targets into national policies and strategies for development and poverty reduction. This is also a method for incorporating biodiversity into national accounts and, where appropriate, to form an integral part of the guidelines of the economic sectors. This will constitute the basis for spatial planning process of the State, private sector, and civil society at all levels.

Conservation International’s Proposal to the CBD Secretariat

During COP-11, Parties adopted a preliminary baseline and financial target, specifically to achieve the three objectives of the Convention (decision XI/4). Correct estimates of financing needed at the national level will provide information to support the negotiations on financing targets.

In response to Decision X/2 of the tenth meeting of the Conference of the Parties to adopt targets for resource mobilization at the next COP, based on an assessment of costs, and Decision X/26 to make a specific assessment of the funding required for the sixth replenishment of the GEF-6 and subsequent calls for expressions of interest to provide national-level assessment of financial needs, Conservation International (CI) submitted a proposal to the CBD Secretariat to carry out an assessment of the cost of implementation of the Strategic Plan in Ecuador.

The methodology used for this analysis is based on the *Draft Guidance for estimating cost of achieving the Convention on Biological Diversity Targets for 2020* presented by Conservation International as a step-by-step guide for estimating the cost of implementing the Aichi Targets at the national level. As the title implies, the Draft Guidance is not in final form and is presented for field testing and peer review.

The primary objective of this exercise was to assess the financial investment needed to achieve the Aichi Targets in Ecuador. With the direct support of the authorities of the MAE, CI Ecuador has made this national estimate of the amount of funding required for the implementation of a subset of the Aichi Targets. This analysis was conducted during a five-month period and is based on secondary information from published literature and financial reports, and interviews with key stakeholders. The preliminary results were discussed with MAE in April 2013 and their comments incorporated into this report.

It is worth mentioning that the Government of Ecuador carried out an initial exercise to cost out the Aichi Targets in response to the request of the CBD Secretariat for the data to inform the GEF-6 funding needs assessment process. This information has been taken into account in the preparation of this report.

The other objective of this analysis is to support the Environmental Authority of Ecuador with updated information on the costing of the Aichi Targets, so that the results of this analysis can be incorporated in the updated version of the ENBD.

2. METHODOLOGICAL ASPECTS – APPLYING THE GUIDE FOR ESTIMATING THE COSTS OF THE AICHI TARGETS

We estimated the costs of achieving the Aichi Targets in Ecuador using the methodology developed in the document *Draft Guidance for Estimating Cost of Achieving the Convention on Biological Diversity Targets for 2020* (Conservation International, 2012).

This guide provides several, generic, steps:

1. Define Target (who/what area is to be influenced, by how much, etc);
2. Select actions for meeting the Target and determine the cost of those actions;
3. Select monitoring strategy and determine the cost of that strategy;
4. Determine total cost.

The Draft Guidance provides instructions for carrying out each of these steps and assessing the cost of each activity at three different levels of complexity for estimating the costs of implementation:

Simple: Estimates at this level rely primarily on published literature extrapolated to the country context, and bypass the identification of specific actions to be implemented.

Middle of the Road: Estimates at this level typically rely on existing information either from within the country itself or information from other places that is suitable for extrapolation, and identify specific issues within the broader target to focus on.

Detailed/Complex: Estimates at this level rely on expert analysis to establish a specific target within the broader Target and a workplan to achieve that Target and then to estimate the cost of implementing the workplan in that country context. At the most rigorous, costs would be parameterized by studies of on the ground impact from actual spending as an input to expert opinion

In this analysis we used the "simple" and "middle of the road" approaches, relying on published information about costs in Ecuador or similar countries and on data provided by in-country experts.

Identifying the Aichi Targets for Ecuador

Ideally the Targets for Ecuador would be identified through a thorough dialogue involving civil society. Due to limited time and resources, the identification of Targets in our rapid assessment relied instead drawing on goals and targets that have already been articulated in public policy documents and adjusting these based on inputs from - relevant government staff and key experts.

Once the Targets were defined we classified them into three categories according to the level of existing information available. "Green" Targets are defined as those with extensive financial information and a definition of criteria and indicators in national policy documents (such as the National Plan of Good Living 2008-2013 or the National Environmental Plan). The estimates for these Targets are, understandably, the most robust of the analysis. For example Target 11 on protected areas was relatively straight forward to cost because Ecuador has already made significant efforts to define the costs of managing their state protected areas (MAE, 2005) and because the conservation of these areas has received increased attention from international conventions and treaties.

"Yellow" Targets include those that lack adequate definition or data to prepare a robust estimate; although they are advanced enough that perhaps a very generic estimate could be made. Some Targets, such as Target 3 with incentive reform or 14 on the restoration and safeguarding of ecosystems that provide essential ecological services have greater availability of economic information than biological. Conversely, other Targets (such as 12 on endangered species) have predominately more biological or ecological information rather than economic. For these we drafted Target language,

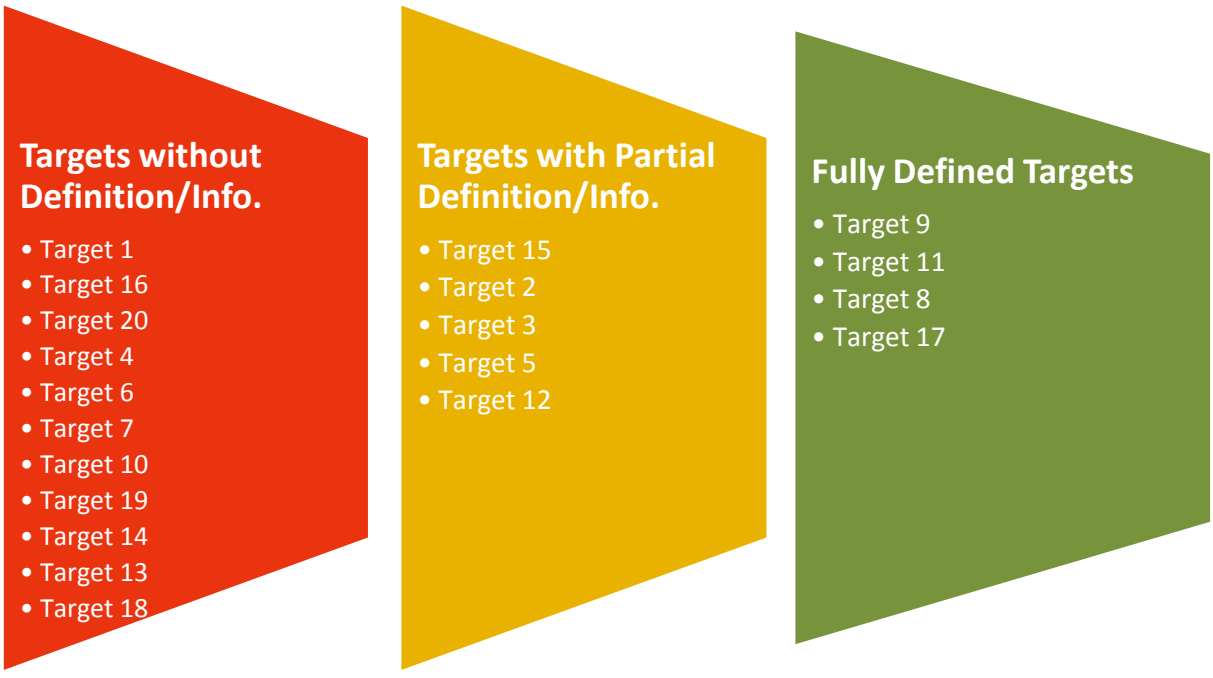
vetted it with the MAE, and used this as a basis for producing an estimate of implementation costs.

A third set of "Red" Targets are those for which there is minimal policy guidance available to define the Target and financial information is also difficult to identify. For example, Target 14 on restoring and safeguarding ecosystems that offer essential ecosystem services and Target 16 on implementing the Nagoya Protocol have no concrete or measurable indicators, and therefore require more attention and work. For some of these targets we were able to develop a specific target through interviews and then carry out an estimate of the cost of implementation.

Beyond the Green/Yellow/Red categories, there is an additional set of challenges associated with Targets that are closely linked with other Targets and therefore run the risk of being over-estimated by double counting of costs.

For the final document we were able to produce estimates for 18 Targets (the exceptions are Targets 13 and 18).

Table 1: Categories of Aichi Targets for Ecuador



In subsequent interactions with MAE these targets were identified but there is still need for discussion of the details of the targets. Additionally, this document and all of the Targets identified herein should be consulted with a broader set of actors, which can perhaps be done as part of the ongoing NBSAP update process.

Five main policy documents and sources of information were consulted for contribution to the definition of Targets:

- Plan Nacional del Buen Vivir 2008-2013 (SENPLADES, 2008), a national planning document that establishes policies, specific targets, and indicators for reporting levels of compliance.
- Draft version of the Plan Nacional del Buen Vivir 2014-2018 (SENPLADES, 2013)
- Política y Estrategia Nacional de Biodiversidad 2001 – 2010 (MAE, 2001).
- Políticas y Plan Estratégico del Sistema Nacional de Áreas Protegidas 2007 - 2016 (MAE, 2007).
- Sectoral policies in agricultural, fishing, and energy.

3. RESULTS: COSTING THE TARGETS

We present costs of achieving the Aichi Targets in Ecuador considering the best currently-available information.

Keeping to the methodology proposed by Conservation International (Bruner and Barrera, 2012), we approached the costing exercise by sorting the Targets into causal order, such that costing can begin with the set of targets that are most clearly defined as actions and then progressively costing towards those that imply a broader set of actions, such that additional actions/costs can be identified. This is to avoid double counting since many of the same actions may contribute to multiple targets and indeed some targets themselves contribute to achieving others[1].

CBD Targets in Causal Order

[1] Various peer-reviewed frameworks for disaggregating conservation work into such causal chains have been developed. For the purposes here, we have ordered the targets into a suggested causal order, adapting the framework described by Salafsky et al (2008). Others would be equally valid to use – the more fully the causal framework is developed, the more useful it will be in both guiding the selection of actions and sorting out potential double counts.

ACTIONS	CONTRIBUTING FACTORS	DIRECT THREATS	STRESSES	EFFECT
1. Awareness 9. Alien species	2. Biodiversity into planning and accounting	4. Sustainable production and consumption	5. Reduce habitat loss	12. Prevention of extinctions 13. Agricultural genetic diversity
11. PA creation and management	3. Incentive reform	6. Sustainable fisheries (species focus)		14. Ecosystems delivering ES restored and safeguarded
16. ABS operational	18. Traditional knowledge respected and integrated	7. Sustainable ag/ aquaculture/ Forestry (area focus)		
17. Participatory NBSAP	20. Substantial increase of funds	8. Control pollution		
19. Improved knowledge base		10. Reduce pressure on coral reefs and other vulnerable ecosystems		Conservation and restoration (for carbon/ climate change)

Goals related to Actions

Target 1: By 2020, at the latest, people are aware of the values of biodiversity and the steps they can take to conserve it and use it sustainably.

Target 1 Ecuador: By 2020, Ecuador has put strategies in place to raise awareness of the value of biodiversity on four levels: the education system, national level decision makers, local governments and consumers to induce reponsible practices (principally in relation to protected areas, sustainable use of biodiversity, and conservation of coastal and marine ecosystems).

This Target will require at least US$ 33 million for a biodiversity communiations and outreach program on three levels (education system and national and local decision makers). The cost, including the strategic plannin g process, material production, salaries and monitoring is US$3 Million per year. Media advertising will require at least US$ 2 million per year, depending on the type of campaign.

Methodolgical note: We performed a direct costing, through interviews with experts, of generic activities that would go towards acheiving this Target. Costing will need to be adjusted once specific activities are identified in the communications and outreach program. (Annex 2)

Target 9: By 2020, invasive alien species and pathways are identified and prioritized, priority species are controlled or eradicated, and measures are in place to manage pathways to prevent their introduction and establishment.

Target 9 Ecuador (Mainland): By 2020, eradicate and control the populations of 5 species of plants and animals. Eradicate the giant African snail (Achatina Fulica) and control populations of Polylepis racemosa, bullfrogs (Lithobates catesbeianus), rice snails (Pomacea sp) and Common Water Hyacinth (Eichhornia crassipes).

Target 9 Ecuador (Galapagos): Implement the invasive species control plan for Galápagos.

For mainland Ecuador at least US$ 5,108,000 is needed to establish 3 programs for the control of invasive species (Achatina Fulica, Lithobates catesbeianus and Eichhornia crassipes).

Annex 2B shows that Galapagos requires about US$ 38,800,000 to achieve the goal, equivalent to US$ 4,800,000 million per year. The Islands are currently receiving around US$ 900 thousand per year through FEIG.

Methodological note: In 2012, the Ministry of Environment prioritized five invasive species to develop an eradication strategy for mainland Ecuador but accurate information on the population status of these species or their eradication costs is nonexistent. Scientific information on the distribution of the species in question and successful eradication strategies is still pending. We have adapted costs from other countries that have successfully eradicated and controlled species like African snail (Achatina fulica), bullfrogs (Lithobates catesbeianus), and Common Water Hyacinth (Eichhornia crassipes). Experiences from Florida (USA) and Germany were applied given that they provide good information on activities and costs.

For the Galápagos case we used secondary information for three specific programs (eradication of small mammals, invertebrates and introduced plants) from an estimate developed for a work plan covering the years 2006 -2008 and extrapolated it to the 2012-2020 period. For a fourth program, large mammals, we adapted the costs from the Mexican program for the control of introduced species and extrapolated and applied to the scale of Galápagos. (Annex 3)

Target 11: By 2020, at least 17 per cent of terrestrial and inland water, 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 seascapes.

Target 11 Ecuador: By 2017, Ecuador will increase up to 35.9% the terrestrial and inland waters area under conservation and environmental management and will increase coastal and marine protection to reach a total of 8,170 km^2 protected areas.

Protecting an additional 3,770 km^2 of coastal marine areas requires an additional US$ 1,232,000 to create at least 7 additional areas . Protecting an additional 2,337km^2 of terrestrial areas requires US$ 623,134.

Target 11 Ecuador: By 2020, Ecuador will manage 20% of the country's land area within the (PANE).

Comprehensive management of existing and additional protected areas of PANE in mainland Ecuador and the Galápagos requiries US$ 81.2 millon a year, or US$ 525 millon by 2020.

Methodological note: As shown in the Annex, the analysis for the costing of this target was performed in 2013 using a direct cost method based on the general political framework for the 50 protected areas that are currently in the PANE (system of national protected areas). For the estimate until 2020 we use a 5% discount rate.

Additionally, in the financial requirements, we performed a direct costing of the average requirements for the establishment of 3,770 km^2 marine protected areas and for the 2,337 km^2 of inland areas that still need to be declared to reach the Target for Ecuador. For this process we received support from a marine expert so a direct costing exercise was developed considering the involvement of local communities, developing specific agreements on non-take zones and multiple use areas, developing baseline information and designing the control and monitoring of seven proposed marine protected areas (Annex 4).

Target 16: By 2015, the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization is in force and operational, consistent with national legislation.

Target 16 Ecuador: By 2015, the Nagoya Protocol is adopted, operational, and a monitoring mechanism for its implementation is in place.

Ecuador requires US$ 2.5 million-to enforce the adopted Nagoya Protocol and monitor the implementation at a national level.

Methodolgical note: We performed a direct costing of activities requried to implement and monitor the Nagoya Protocol (Annex 5). We base the costing on the activities international defined to implement the Protocol.

Target 17: By 2015, each Party has developed, adopted as a policy instrument, and has commenced implementing an effective, participatory and updated national biodiversity strategy and action plan.

Target 17 Ecuador: By 2015, Ecuador will have an updated National Biodiversity Strategy (ENBD) and operational action plan that was designed in a participatory manner.

Ecuador requires US$ 760 thousand for the updating of the ENBD and establishment of a participatory process and validation at a national level.

Methodolgical note: We performed a direct costing of activities requried for updating the ENBD , its action plan and an annual monitoring process (Annex 6).

Target 19: By 2020, knowledge, the science base and technologies relating to biodiversity, its values, functioning, status and trends, and the consequences of its loss, are improved, widely shared and transferred, and applied.

Target 19 Ecuador: By 2020, Ecuador has a strategy for the generation of, and public access to, biodiversity knowledge that includes sustainable use, traditional and ancestral knowledge, marine and aquatic biodiversity where indigenous people, universities and other specialized centers participate, with emphasis on the development of human capacity necessary to allow for succesful participatory processes.

Ecuador requires US$ 310.4 million for the establishment and implementation of a strategy to strenghten national capacities for research and dissemination of information.

Methodolgical note: We utilized secondary information generated in the design of capacity building programs and a national program to promote research on the use of biodiversity. We also included current government investments in research and scolarships. A more detailed analysis is needed, especially of the cost of designing afund to promote research. (Annex 7)

Goals related to Contributing Factors

Target 2: By 2020, at the latest, biodiversity values have been integrated into national and local development and poverty reduction strategies and planning processes and are being incorporated into national accounting, as appropriate, and reporting systems.

Target 2 Ecuador: By 2020, Ecuador has a national accounting system that incorporates the contribution of biodiversity to the economy and a national level land use planning process that incorporates national biodiveristy and inidgenous territories as a crosscutting consideration. Strenghten the chemical, pharmaceutical and food industries that use biodiversity in sustainable way.

Ecuador requires US$ 72.2 million to incorporate information on the contribution of biodiveristy, water and natural ecosystems into national accounts and improve capicityfor land use planning that considers biodiversity at the local level.

Methodological note: The costing exercise was performed with information on current investments in state priority programs on Green GDP and reduction in ecological footprint (implemented through the MAE). Additonally, direct costing was performed with information from interviews about issues related to land use planning. (Annex 8). A more detailed costing excersice will be needed to define a more specifc capacity building process for local governments.

Target 3: By 2020, at the latest, incentives, including subsidies, harmful to biodiversity are eliminated, phased out or reformed in order to minimize or avoid negative impacts, and positive incentives for the conservation and sustainable use of biodiversity are developed and applied, consistent and in harmony with the Convention and other relevant international obligations, taking into account national socio economic conditions.

Target 3 Ecuador: By 2020 Ecuador has incorporated 3 million hectares into the Socio Bosque program (PSB).

Target 3 Ecuador: By 2020 perverse incentives are clearly identified for possible removal or reform and those changes are implemented in key sectors (as energy).

Meeting the goals of the PSB requires US$ 228.4 million by 2020, ranging between 13 and 46 millon per year.

An estimated US$ 17.6 million is required for the analysis of perverse incentives and implementation of a strategy for the removal or reform of these perverse incentives.

Methodological note: For this estimate, we used direct costing methodologies to define both the amounts of incentives, operation and administrative costs and monitoring and control costs. We worked with PSB data, using data on the costs of annual growth in hectares covered by the program. It's important to highlight that 70% of the financial requirements will be invested in the incentives, 22% in the monitoring and 8% in administrative costs. We used a 5% discount rate for the analysis. (Annex 9)

We also use the direct costing approach to estimate the cost of identifying perverse incentives, taking into account the economic, social and environmental analysis that the topic requires.

Target 18: By 2020, the traditional knowledge, innovations and practices of indigenous and local communities relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, are respected, subject to national legislation and relevant international obligations, and fully integrated and reflected in the implementation of the Convention with the full and effective participation of indigenous and local communities, at all relevant levels.

Target 18 Ecuador: By 2020, Ecuador protects traditional knowledge, creates mechanisms for the prevention and punishment of biopiracy, and generates the living conditions and alternative production activities for populations in protected areas, that ensurie strict respect for ecosystems, women, and other vulnerable groups.

Meeting the goals requieres at least US$ 8.4 million to implement mechanism to promote and protect the traditional knowledge.

Methodological note: For this estimate, we used direct costing methodologies based on activities defined in the new Development Plan for Ecuador. This target still needs more discussion on what is needed to achieve it. (Annex 10)

Target 20: By 2020, at the latest, the mobilization of financial resources for effectively implementing the Strategic Plan for Biodiversity 2011-2020 from all sources, and in accordance with the consolidated and agreed process in the Strategy for Resource Mobilization, should increase substantially from the current levels. This target will be subject to changes contingent to resource needs assessments to be developed and reported by Parties.

Target 20 Ecuador: By 2020 Ecuador has generated the resources necessary to change the intersectoral investments to acheive the Aichi Targets.

The results of this study show that a total of US$ 2,626,887,901 is needed to acheive all of the Aichi Targets in Ecuador.

Mobilizing the additional funds needed to fully implement the Aichi Targets will cost approximately US$ 800 thousand annually, or a total of US$ 5.6 million until 2020.

Methodological note: We performed a direct costing in relation to historical investment in resource mobilization and past strategies for generating funds for biodiveristy from various sources, not all of which have been implemented (Annex 11). This may need to be updated once a more detailed design of the intervention strategy is completed.

Goals related to Direct Threats

Target 4: By 2020, at the latest, Governments, business and stakeholders at all levels have taken steps to achieve or have implemented plans for sustainable production and consumption and have kept the impacts of use of natural resources well within safe ecological limits.

Target 4 Ecuador: By 2020, Ecuador will promote initiatives for the sustainable production and consumption of goods and services that consider nature's regenerative capacity to maintain the integrity and resliience of ecosystems. Especially by: increasing the share of alternative energy to 6%, protection of the Yasuni in place of oil exploitation, provide incentives for responsible consumption and generate tax incentives for innovation of ecosystem-friendly products.

Ecuador requires US$ 1.295 billion to implement strategies to reduce the impacts of production and consumption on biodiversity.

Methodological note: To cost out this target, information from existing national programs to convert to renewable energy sources was used (note that due to the negative impacts of hydropower dams on biodiveristy they are not considered in Ecuador's strategy for alternative energy) the protection of Yasuni in place of oil explotation. Additionally, costs of creating incentives for responsible consumption in other countries in the region were used for the other portions of the Target (Annex 12).

Target 6: By 2020 all fish and invertebrate stocks and aquatic plants are managed and harvested sustainably, legally and applying ecosystem based approaches, so that overfishing is avoided, recovery plans and measures are in place for all depleted species, fisheries have no significant adverse impacts on threatened species and vulnerable ecosystems and the impacts of fisheries on stocks, species and ecosystems are within safe ecological limits.

Target 6 Ecuador: By 2020, bottom trawling will be eliminated as a fishing method and artesinal fishing will be encouraged through association programs and technical support; artesinal fishing practices will be improved, increasing the quality and value of the fish, fish stocks will be protected and the sea bed in coastal areas will be cleaned of debris.

The promotion of responsible small-scale fisheries requires an estimated US$ 19 million. This would be used to generate programs for fisheries management, conservation, research, pollution control strateiges, and eliminate trawling fisheries. This target is complementary to Target 7 and 15. It is important to consider that the creation of marine protected areas is closely related to this target, but those costs are included in the estimate for Target 11.

Methodological note: To estimate the cost of all other aspects related to this Target we used the information presented by the Ministry of Finance on past and current investmetns in the control and conservation of fishing areas and promotion of responsible fishing practices and data from the initiatives enforced by the Comision Permanete del Pacifico (CPPS). (Annex 13)

Target 7: By 2020 areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity.

Target 7 Ecuador: By 2020, at least 25% of agricultural , aquaculture and forestry areas and 30% of degraded mangrove areas are under a management system that encourages biodiverstiy conservation.

Ecuador will require an estimated US$ 127.9 milion to implement a strategy to strengthen agricultural and aquacultural practices (approximately US$ 18 million per year).

Methodological note: We used secondary information from past proposals for how to improve agricultural practices and direct interviews for information on the cost of improving aquaculture practices (Annex 14). A more detailed costing excerse will be needed once a specific strategy has been developed.

Target 8: By 2020, pollution, including from excess nutrients, has been brought to levels that are not detrimental to ecosystem function and biodiversity

Target 8 Ecuador: By 2020, water sources and flows, air, and soils will be protected from pollution and the harmful environmental consequences generated by extractive, productive, and other activities, with particular emphasis on industires that utilize persistent organic pollutants, mining and the management of solid waste at the municipal level.

Ecuador will require US$ 453 million in order to combat pollution on three main fronts: persistent organic pollutants , mining and the management of solid waste at the municipal level.

Methodological note: Secondary information from national plans and the Ministry of Finance on historic investemnt levels were used to cost this Target. Additionally, we used information on the real average costs of solid waste management (Annex 15).

Target 10: By 2015, the multiple anthropogenic pressures on coral reefs, and other vulnerable ecosystems impacted by climate change or ocean acidification are minimized, so as to maintain their integrity and functioning.

Target 10 Ecuador: By 2015, coral reefs have been assessed to identify those that are most at risk and exposure to anthropogenic stress, and vulnerable to climate change have been identified.

The risk assessment of coral reefs, including the acquisiton and production of the necessary data, and the implementation of a monitoring system will cost approximately US$ 1.13 million.

Methodological note: Given the lack of available information on coral reefs in the country, this target was costed based on expert inverviews (Annex 16).

Goals related to Stresses

Target 5: By 2020, the rate of loss of all natural habitats, including forests, is at least halved and where feasible brought close to zero, and degradation and fragmentation is significantly reduced.

Target 5 Ecuador: By 2020, the rate of deforestation will be reduced by 30%.

To control deforestation and generate forest information US$ 45.3 million is required until 2020, which would be US$ 6.4 millon per year.

Methodological note: This target presented the greatest risk of overestimate. For this reason, we included in the estimate for this target items related to forest control. The other components of forest governance, such as incentives, policy design and participation, are considered in other targest. The costing exercise relied on information on current investments in these programs by the Government of Ecuador. (Annex 17)

Goals related to Effect

Target 12: By 2020 the extinction of known threatened species has been prevented and their conservation status, particularly of those most in decline, has been improved and sustained.

Target 12 Ecuador: By 2020, Ecuador will have eliminated the pressure on endangered species of sharks, tapirs and condors, and will have implemented a strategy to combat the extinction of endagered species.

Plans for the conservation of all three species groups exist, however, they are not being implemented and they do not include information on budgetary needs. The conservation of endangered sharks will cost a total US$ 7 million.

Note: The targeted endangered species in the Ecuadorian plan are:

Sharks: Alopia pelagicus, Alopia supersiliosus, Isurus oxirinchus, Prionace glauca, Carcharhrinus leucas, MuAstellus dorsalis, Sphyrna lewini, Sphyrna mokarran, Sphyrna media, Rhinchodon typus, Carcharadon carcareas, Carcharadon albus.

Tapirs: Apirus terrestris and Tapirus pinchaque.

Condors: Vultur griphus.

Methodological note: We conducted an expert interview in order to identify the cost of the national shark conservation strategy but were unable to obtain information to estimate the cost of the other species conservation plans (Annex 18). This target will require updating once specific strategies are developed regarding threatened species.

Target 13: By 2020, the genetic diversity of cultivated plants and farmed and domesticated animals and of wild relatives, including other socio-economically as well as culturally valuable species, is maintained, and strategies have been developed and implemented for minimizing genetic erosion and safeguarding their genetic diversity.

Target 13 Ecuador: By 2020, programs for conservation, use, access and recovery of traditional seeds and products will be developed and the production of healthy and culturally appropriate foods for domestic consumption will be promoted, with consideration for small, medium, urban and rural producers and peasant, indigenous, montubias and afroecuatorian communitities, to ensure the conservation of natural ecosystems.

To implement a national program to conserve tradicitional seeds and promote its production we need US$109.2 million until 2020.

Methodological note: We use a direct costing excersise developed by the national authority updated to current costs. (Annex 19)

Target 14: By 2020, ecosystems that provide essential services, including services related to water, and contribute to health, livelihoods and well-being, are restored and safeguarded, taking into account the needs of women, indigenous and local communities, and the poor and vulnerable.

Target 14 Ecuador: By 2020, Ecuador has restored 100,000 hectares of ecosystems in active restoration and 80,000 hectares in pasive restaoration that provide ecosystem service through the Socio Bosque Program (PSB) considering the needs of women, indigenous and local communities, and the poor and vulnerable

To implement the management of a PBS plan in 180,000 hectares that provide ecosystem services, an investment of US$ 48.5 millon is required until 2020.

Methodological note: This estimate was obtained in an interview with the Director of the PSB. (Annex 20)

Target 15: By 2020, ecosystem resilience and the contribution of biodiversity to carbon stocks has been enhanced, through conservation and restoration, including restoration of at least 15 per cent of degraded ecosystems, thereby contributing to climate change mitigation and adaptation and to combating desertification.

Target 15 Ecuador: By 2020, Ecuador has restored 378,955 hectares of critical areas for water and soil carbon, representing 15% of degraded areas.

Restoration of 15% of the currently degraded critical areas, such as bodies of water and paramos, which are key for providing water and capturing carbon in the soil, will require an investment of US$ 1.331 billion.

Ecuador's primary activity to build carbon stocks is captured in Target 3 on the expansion of the PSB.

Methodological note: The 15% of land used to estimate the cost of restoration was selected using information on areas of particularly steep grade (>50°), which are at high risk of erosion, proximity to a source of water (50m riparian zone) and thse that have lost original cover. To estimate the cost we used secondary information from studies carried out in Ecuador that identified the cost of restoring key ecosystems. (Annex 21)

4. SUMMARY OF RESULTS

The costing exercise yielded a total estimate of US$ 4.6 billion, which translates into US$ 669.8 million per year in total cost for Ecuador to achieve the Aichi Targets. The largest component of this cost is related to Target 4 on sustainable consumption and production (28%) and to Target 15 related to the cost of restoring degraded ecosystems identified in Target 7 (28%), followed by Target 8, reduction of pollution (10%).

It is important to note that this amount represents 19% of the Ecuadorian national government budget for the year 2013. The current budget for the entire environment sector of the Government for the year 2012 is US$ 163.4 million and the MAE budget for year 2013 is US$ 110.6 million. This figure is not sufficient for calculating a gap in financing needs since not all of the MAE budget contributes specifically to the Aichi Targets and since budgets from other sectors are obviously implicated in the achievement of the Targets. If the budget from MAE remains it will cover only 17% of the financial need of achieving the Aichi Targets. However, even considering the budgets for agriculture and alternative energy matters, financing the achievement of these Targets will require a significant effort to raise adequate funds and gain broad political support in the national government. In short, this is sufficient to understand the scale of financing and the scale of the gap, but not to identify a precise gap in financing needs.

Table 2: Summary of Results by Target

Target	Aichi Target	Ecuador Target	Source	Financial needs (US$)
Target 1	By 2020, at the latest, people are aware of the values of biodiversity and the steps they can take to conserve and use it sustainably	By 2020, Ecuador has put strategies in place to raise awareness of the value of biodiversity at three levels: the education system, national level decision makers, and local governments (principally in relation to protected areas, sustainable use of biodiversity, and conservation of costal and marine ecosystems).	MAE 2006 SENPLADES 2008	33,000,000
Target 2	By 2020, at the latest, biodiversity values have been integrated into national and local development and poverty reduction strategies and planning processes and are being incorporated into national accounting, as appropriate, and reporting systems.	By 2020, Ecuador has a national accounting system that incorporates the contribution of biodiversity to the economy and a national level land use planning process that incorporates national biodiversity and indigenous territories as a crosscutting consideration.	Interview DNB	72,292,000
Target 3	By 2020, at the latest, incentives, including subsidies, harmful to biodiversity are eliminated, phased out or reformed in order to minimize or avoid negative impacts, and positive incentives for the conservation and sustainable use of biodiversity are developed and applied, consistent and in harmony with the Convention and other relevant international obligations, taking into account national socio	By 2020, Ecuador has incorporated 3 million hectares into the Socio Bosque program (PSB). By 2020, perverse incentives are clearly identified for possible removal or reform	MAE 2012	246,112,135,15

	economic conditions.			
Target 4	By 2020, at the latest, Governments, business and stakeholders at all levels have taken steps to achieve or have implemented plans for sustainable production and consumption and have kept the impacts of use of natural resources well within safe ecological limits.	By 2020, Ecuador will promote initiatives for the sustainable production and consumption of goods and services that consider nature's regenerative capacity to maintain the integrity and resilience of ecosystems. Especially by: increasing the share of alternative energy to 6%, implementing the Yasuni ITT initiative to keep oil in the ground, provide incentives for responsible consumption and generate tax incentives for innovation of ecosystem-friendly products.	Plan Nacional del Buen Vivir. Ecuador	1,295,960,000
Target 5	By 2020, the rate of loss of all natural habitats, including forests, is at least halved and where feasible brought close to zero, and degradation and fragmentation is significantly reduced.	By 2020, the rate of deforestation will be reduced by 30%.	Plan Nacional del Buen Vivir. Ecuador	45,318,000
Target 6	By 2020 all fish and invertebrate stocks and aquatic plants are managed and harvested sustainably, legally and applying ecosystem based approaches, so that overfishing is avoided, recovery plans and measures are in place for all depleted species, fisheries have no significant adverse impacts on threatened species and vulnerable ecosystems and the impacts of fisheries on stocks, species and ecosystems are within safe ecological limits.	By 2020, bottom trawling will be eliminated as a fishing method and artisanal fishing will be encouraged through association programs and technical support; artisanal fishing practices will be improved, increasing the quality and value of the fish, fish stocks will be protected and the sea bed in coastal areas will be cleaned of debris.	Plan Nacional del Buen Vivir. Ecuador	19,004,000
Target 7	By 2020 areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity.	By 2020, at least 25% of agricultural, aquaculture and forestry areas and 30% of degraded mangrove areas are under a management system that encourages biodiversity conservation.	CDB 2012 Executive Decree 903, 2012.	127,919,867
Target 8	By 2020, pollution, including from excess nutrients, has been brought to levels that are not detrimental to ecosystem function and biodiversity.	By 2020, water sources and flows, air, and soil will be protected from pollution and the harmful environmental consequences generated by extractive, productive, and other activities will be mitigated or eliminated.	SENPLADES 2008	453,016,993

Target 9	By 2020, invasive alien species and pathways are identified and prioritized, priority species are controlled or eradicated, and measures are in place to manage pathways to prevent their introduction and establishment.	GALÁPAGOS Target 9: Establish and implement an invasive species control plan for Galápagos.	Especies Invasivas en Galápagos/Plan de Control Total de Especies Introducidas de Galápagos; Programa FEIG	43,960,294
		MAINLAND ECUADOR Target 9: By 2020, Ecuador has eradicated and controlled the populations of 5 species of plants and animals. Eradicate the giant African snail (Achatina Fulica) and control populations of Polylepis racemosa, bullfrogs (Lithobates catesbeianus), rice snails (Pomacea sp) and water hyacinth (Eichhornia crassipes).	MAE 2012	
Target 10	By 2015, the multiple anthropogenic pressures on coral reefs, and other vulnerable ecosystems impacted by climate change or ocean acidification are minimized, so as to maintain their integrity and functioning.	By 2015, coral reefs have been assessed to identify those that are most at risk and exposure to anthropogenic stress, and vulnerable to climate change have been identified.	CBD 2012	1,130,000
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 landscapes and seascapes.	By 2015, Ecuador will increase by 5% the terrestrial and inland waters area under conservation (2,337 km^2) in order to reach a total by 51,028 km^2 and will increase coastal and marine protection by 1,500 km^2 in order to reach a total of 2,521 km^2 protected areas.	SENPLADES 2008 MAE 2006	526,945,152
		TARGET 11 ECUADOR: By 2020, Ecuador will manage 20% of the country's land area within the (PANE).	SENPLADES 2008 MAE 2006	
Target 12	By 2020 the extinction of known threatened species has been prevented and their conservation status, particularly of those most in decline, has been improved and sustained	By 2020, Ecuador will have eliminated the pressure on endangered species of sharks, tapirs and condors implemented a strategy to combat the extinction of endangered species.	**Plan de Acción Nacional de Tiburones**/INP **Estrategia Nacional para la Conservación de los Tapires** en el Ecuador/Grupo de Especialistas de Tapires UICN con el MAE **Estrategia de Conservación del Cóndor Andino** Vultur griphus en Ecuador/MAE and other institutions	7,000,000

Target 13	By 2020, the genetic diversity of cultivated plants and farmed and domesticated animals and of wild relatives, including other socio-economically as well as culturally valuable species, is maintained, and strategies have been developed and implemented for minimizing genetic erosion and safeguarding their genetic diversity.	By 2020, programs for conservation and recovery of traditional seeds and products will be developed and the production of healthy and culturally appropriate foods for domestic consumption will be promoted, with consideration for small, medium, urban and rural producers and peasant, indigenous, montubias and afroecuatorian communi-ties, to ensure the conservation of natural ecosystems.	SENPLADES 2008	109,299,155
Target 14	By 2020, ecosystems that provide essential services, including services related to water, and contribute to health, livelihoods and well-being, are restored and safeguarded, taking into account the needs of women, indigenous and local communities, and the poor and vulnerable.	By 2020, Ecuador has restored 20,000 hectares of ecosystems that that provide ecosystem service through the Socio Bosque Program (PSB)	PSB Interview	48,535,459
Target 15	By 2020, ecosystem resilience and the contribution of biodiversity to carbon stocks has been enhanced, through conservation and restoration, including restoration of at least 15 per cent of degraded ecosystems, thereby contributing to climate change mitigation and adaptation and to combating desertification.	By 2020, Ecuador has restored 378,955 hectares of critical areas for water and soil carbon, representing 15% of degraded areas.	SENPLADES 2008	1,331,541,486
Target 16	By 2015, the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization is in force and operational, consistent with national legislation.	By 2015 The Nagoya protocol is adopted, operational, and a monitoring mechanism for its implementation is in place.	DNB Interview	2,504,000,00
Target 17	By 2015 each Party has developed, adopted as a policy instrument, and has commenced implementing an effective, participatory and updated national biodiversity strategy and action plan.	By 2015 Ecuador will have an updated National Biodiversity Strategy (ENBD) and operational action plan that was designed in a participatory manner.	DNB Interview	760,000

Target 18	By 2020, the traditional knowledge, innovations and practices of indigenous and local communities relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, are respected, subject to national legislation and relevant international obligations, and fully integrated and reflected in the implementation of the Convention with the full and effective participation of indigenous and local communities, at all relevant levels.	By 2020, Ecuador protects traditional knowledge, creates mechanisms for the prevention and punishment of biopiracy, and generates the living conditions and alternative production activities for populations in protected areas, that ensure strict respect for ecosystems , women, and other vulnerable groups.	SENPLADES 2008	8,400,000
Target 19	By 2020, knowledge, the science base and technologies relating to biodiversity, its values, functioning, status and trends, and the consequences of its loss, are improved, widely shared and transferred, and applied.	By 2020, Ecuador has a strategy for the generation of, and public access to, biodiversity knowledge that includes universities and other specialized centers, with emphasis on the development of human capacity necessary to allow for successful participatory processes.	CBD 2012 Senescyt 2012	310,480,000
Target 20	By 2020, at the latest, the mobilization of financial resources for effectively implementing the Strategic Plan for Biodiversity 2011-2020 from all sources, and in accordance with the consolidated and agreed process in the Strategy for Resource Mobilization, should increase substantially from the current levels. This target will be subject to changes contingent to resource needs assessments to be developed and reported by Parties.	Ecuador: By 2020 Ecuador has generated the resources necessary to achieve the Aichi Targets.	CBD 2012	5,600,000
			TOTAL	4,668,778,541

5. CONCLUSIONS and RECOMMENDATIONS

Based on an assessment focused on review of available public documents, interviews with experts, and institutional and personal meetings with MAE, we can draw the following conclusions and recommendations:

- The results of this analysis are that it would cost Ecuador approximately US$ 4.6 billion to implement the 20 Targets between 2013 and 2020.

- There is a general lack of awareness among the environmental community, including the public, key stakeholders, environmental policymakers of the significance and opportunities of the Aichi Targets and the potential existing options to integrate biodiversity targets into national policies and strategies for development and poverty reduction. It is necessary to disseminate the approach and scope of the Strategic Plan for Biodiversity 2011-2020 and the Aichi Biodiversity Targets in different sectors including the environmental sector and throughout the governmental sector, which is currently updating the National Development Plan and should integrate the Aichi Targets in the process.

- Ideally, the costing of the Targets would be done with sufficient time and resources to undertake a participatory, multidisciplinary and inter-agency exercise. Participatory exercises to define national targets and indicators would not only help incorporate biodiversity issues into sectoral policies, but would also bring higher levels of awareness and capacity building practices for costing and subsequent funding of biodiversity, especially for decision makers who participate in the process. The next update of Ecuador's National Biodiversity Strategy and definition of an Action Plan is an extraordinary opportunity to integrate the Aichi Targets into policies and national development strategies, poverty reduction strategies, and to build and agree on participatory national indicators to assess compliance to these goals.

- There are various limitations to this study. The first is that the government of Ecuador is only in the early stages of updating the National Biodiversity Strategy, so the national level targets that correspond with the Aichi Targets have not been finalized. Although we have used the best possible sources to establish national level targets for this assessment, the cost implications of the finalized ENB may be different. A second limitation is the availability of data to inform the analysis. Ideally all estimates would be based on detailed financial data but in the case of some Targets there was no data available other than what we could acquire through personal interviews with key stakeholders. These data gaps suggest areas where more data collection would be useful in Ecuador, and possibly in other countries as well.

- The next step is to identify the current levels of funding from all sectors going into the specific activities needed to achieve the Aichi Targets in Ecuador. With this information in hand it will be possible to clearly identify the gap between current funding and the level of financing needed, as estimated in this study. Although we don't have detailed figures, it is clear that the current level of investment is insufficient to achieve the Aichi targets. Once the gap is identified it will be necessary to develop a strategy for accessing the necessary funds.

- The biggest methodological challenge in this study was the issue of determining causality in order to avoid double counting. The methodology calls for approaching the costing exercise in causal order of the Targets so that Targets that are most clearly defined actions are costed first and their contributions to other targets can be identified and specifically not counted. This is a reasonable guide to the issue but still requires the subjective decision of the researcher to determine exactly which costs to include in which Targets, a task that is made immensely more difficult in the absence of clearly defined Targets and action plans and sufficient data.

- An additionally important note is that the total estimate changed significantly between the first and final version because of a change in the government of Ecuador's environmental goals, specifically theose related to the Yasuní-ITT Initiative. This change caused a reduction of US$ 2.1 billion in the estimated costs. This is an important example of how this effort in costing the Aichi Targets has to be followed by an exercise of valuing the biodiversity and its goods and services.

References

- Aguirre, A., et al. 2009. Especies exóticas invasoras: impactos sobre las poblaciones de flora y fauna, los procesos ecológicos y la economía. En: Capital natural de México, Vol. 2. Estado de conservación y tendencias de cambio. CONABIO, México. Pp. 277-318.

- Aguilar, F., Chalén, X., & Villón, C. 2005. Plan de Acción Nacional de Tiburones. Manta: Instituto Nacional de Pesca.

- Álvarez, P., Carrillo, G., de la Cadena, G., Ortega, S., & Páez, T. 2005. Restauración, Rehabilitación y Reafectación de un Paisaje de Bosque de Neblina en el Bosque Protector Mindo - Nambillo (Chocó Andino, Ecuador). Quito: Máster en Biodiversidad de Áreas Tropicales y su Conservación, Universidad Central del Ecuador.

- Arriaga, L y Martínez, J. 2003. Plan de ordenamiento de la pesca y acuicultura del Ecuador. Subsecretaria de Recursos Pesqueros SRP, Ministerio de Industrias, Competitividad y Producción MICIP.

- Avilés, D. 2010. Análisis de los subsidios a los combustibles en el Ecuador con sus posibles alternativas de focalización y control, en el período 2004-2009. Tesis de economista. PUCE. Quito

- CCE – Comisión de las Comunidades Europeas. 2008. Comunicación de la Comisión al Consejo, al Parlamento Europeo, al Comité económico y social europeo y la Comité de las Regiones: hacia una estrategia de la UE sobre especies invasoras. Bruselas.

- Cabera, J., Perron-Welch, F., & Rukindo, O. 2012. Overview of national and regional measures on access to genetic resources and benefit sharing. Challenges and opportunities in implementing the Nagoya Protocol. Centre for International sustainable Development Law.

- CEPAL. SF. Producción y consumo sostenible. Resultados, tendencias y desafíos para el desarrollo sostenible de América Latina y el Caribe. Informe Preliminar.

- Conferencia plurinacional e intercultural de soberanía alimentaria. 2012. un nuevo modelo agrario para el Ecuador. Quito

- Consejo Sectorial de la Producción. 2010. Agenda para la transformación productiva. Ministerio Coordinador de la Producción, Empleo y Competitividad. Quito.

- Conservación y Desarrollo. 2003. Cotización para Reforestación de 12 hectáreas de Manglar en la Provincia de Esmeraldas. Quito.
- Conservation International. Bruner, A and Barrera, L. 2012. Draft Guidance for Estimating Cost of Achieving the Convention on Biological Diversity Targets for 2020 (Aichi Biodiversity Targets), Conservation International: Arlington, VA, USA
- CPPS. 2010. Informe de la XVI reunión del grupo consultivo del plan de acción para la protección del ambiente marino y áreas costeras del pacífico sudeste. Guayaquil, Comisión permanente del pacífico sur.
- Curbelo Alonso, A. 2011. Informe de Evaluación Final: "Proyecto de Energía Eólica San Cristóbal, Galápagos". San Cristóbal: PNUD/MEER.
- Díaz, C. 2008. Costos incrementales: alternativas de análisis. Proyecto ECU/00G31. Especies invasoras de las Galápagos. Ministerio del Ambiente, GEF, INGALA, UNDP.
- FEIG. 2012. Fondo para el control de especies invasoras de galápagos. Unidad operativa FEIG. Quito, Ecuador.
- GISD - Global Invasive Species Database. 2012. Achatina fulica: management information. http://www.issg.org/database/species/management_info.asp?si=64&fr=1&sts=sss&lang=EN. Acceso el 26 de septiembre del 2012
- Gobierno Nacional de la República del Ecuador. 2012.Yasuní-ITT: Crea un nuevo mundo. Página web: http://yasuni-itt.gob.ec/inicio.aspx.
- Grupo de Especialistas de Tapires Ecuador. 2011. Estrategia Nacional para la Conservación de los Tapires en el Ecuador. Quito: UICN/Especialistas Tapires Ecuador, Ministerio del Ambiente del Ecuador.
- Guerrero, E. 2009. Implicación de la minería en los páramos de Colombia, Ecuador y Perú. Proyecto Páramo Andino. INIAP 2008. Programa de Fortalecimiento Institucional . INSTITUTO NACIONAL AUTONOMO DE INVESTIGACIONES AGROPECUARIAS. Quito
- Key, G. 2004. Estrategia de Control de Especies Invasivas en las Islas Galápagos, Ecuador. . Quito: Fundación Charles Darwin.
- Kinderman, G., Obersteiner, M., Sohngen, B., Sathaye, J., Andrasko, K., Rametsteiner, E., y otros. 2008. Global Cost Estimates of Reducing Carbon Emissions Through avoided deforestation. PNAS , 105 (30):10302-10307.

- Ministerio del Ambiente del Ecuador. 2001. Política y estrategia nacional de biodiversidad del Ecuador (2001-2010). Ministerio del Ambiente. Quito.
- Ministerio del Ambiente del Ecuador. 2005. Análisis de las necesidades de financiamiento del Sistema Nacional de Áreas Protegidas del Ecuador, Quito, Ecuador.
- Ministerio del Ambiente Ecuador y Fundación GEMA. 2002. Estrategia de Conservación del Cóndor Adino Vultur gryphus en Ecuador. Quito: Ministerio del Ambiente.
- MAE, PNUMA Y GEF, 2006, Plan nacional de implementación para la gestión de los contaminantes orgánicos persistentes en el Ecuador.
- Ministerio del Ambiente Ecuador. 2007. Plan estratégico del Sistema Nacional de Áreas Protegidas del Ecuador (2007-2016). Proyecto GEF. Ministerio del Ambiente. Quito.
- Ministerio del Ambiente del Ecuador. 2010. Plan Nacional de la calidad del aire. COSUDE, MAE. Quito.
- Ministerio del Ambiente Ecuador. 2010. SocioBosque, Programa de Protección de Bosques. Recuperado el 01 de 11 de 2012, de http://sociobosque.ambiente.gob.ec/
- Ministerio del Ambiente del Ecuador. 2012. Página web. www.ambiente.gob.ec.
- Ministerio del Ambiente del Ecuador. 2012. Plan de acción para la implementación del programa de trabajo sobre áreas protegidas de la Convención sobre la Diversidad Biológica. Quito.
- Ministerio del Ambiente del Ecuador. 2013. Actualización del Estudio de Necesidades y el Análisis de la Brecha de Financiamiento del Sistema Nacional de Áreas Protegidas. MAE. Quito.
- Martínez, M. sf. Progress on water hyacinth (*Eichhornia crassipes*) management. In: Weed management for developing countries (Addendum 1). FAO Corporate Document Repository. http://www.fao.org/docrep/006/Y5031E/y5031e0c.htm. Acceso el 30 de septiembre del 2012.
- Martínez, E. 2012. Análisis de las áreas de importancia hídrica en procesos de erosión. Conservación Internacional.
- Ministerio de Finanzas. 2012. Ejecución de presupuestos en proyectos de inversión. Quito.

- Medina C. 2007. Economic valuation of the conservation in the Galapagos Islands.
- Ordóñez, V. 2009. Restauración Ecológica del Capital Natural de la vegetación de rivera de la cuenca alta del río Carihuaycu. Paluguillo- Ecuador. Quito: USFQ/ Tesis Maestría en Ecología.
- Radical Energy Inc. 2012. CóndorSolarEcuador. Recuperado el 01 de 11 de 2012, de http://www.condorsolarecuador.com/
- República del Ecuador. 2009. Plan Nacional de Buen Vivir. Quito: República del Ecuador.
- República del Ecuador. 2010. Código de la Producción. Registro Oficial 351.
- Salafsky, N. et al. 2008. A Standard Lexicon for Biodiversity Conservation: Unified Classifications of Threats and Actions. Conservation Biology22(4):897-911; Kapos, V. et al. 2008. Calibrating conservation: new tools for measuring success. Conservation Letters 1: 155–164.
- SENPLADES. 2008. Plan nacional del Buen Vivir (2008-2013). Secretaría Nacional de Planificación. Quito.
- SENESCYT. 2012. Plan nacional de ciencia, tecnología, innovación y saberes para el Buen Vivir. Secretaría Nacional de Educación Superior Ciencia y Tecnología SENESCYT. Quito.
- SENESCYT. 2012. Matriz de objetivos y metas de las unidades administrativas. Coordinación general de planificación.
- Siete Iglesias. 2012. Siete Iglesias Área Ecológica de Conservación Municipal. http://www.sieteiglesiasec.com/SieteIglesias/AcercadeSieteIglesias.aspx
- Tapir specialist group - Ecuador. 2011. Estrategia nacional para la conservación de los tapires en el Ecuador. Grupo de especialistas de tapires de la UICN. Primera edición. Quito, Ecuador.
- UNDP. 2012. Ecuador Yasuní ITT Trust Fund. Página web: http://mptf.undp.org/yasuni .

Interviews

Chalén, X. (2012, October 15). Manejo de recursos pesqueros y áreas marinas protegidas. (M. Albán, Interviewer)

García, M. (2013, January 8). Expert on Environmental Communication. (M. Albán, Interviewer)

Lascano, M. (2012, October 14). Inversiones del Programa Socio Bosque. Gerente del Programa Socio Bosque (M. Albán, Interviewer)

Martínez, C. E. (2012, December 18). Planificación territorial para la conservación de biodiversidad. (M. Albán, Interviewer)

Moreno, M. (2012, November 19). Las metas Aichi y la actualización de la ENBD. Coordinadora de la ENBD. (M. Albán, &, Interviewers)

Moreno, M. (2013, April 22). Retroalimentación a las metas Aichi y a al proceso de costeo. Coordinadora de la ENBD. (M. Albán, Interviewers)

Quirola, D. (2012, October 9). Revisión de las metas AICHI a partir de la visión de la Secretaría de Planificación, SENPLADES. (M. Albán, Interviewer)

Rojas, W. (2012, October 16). Protocolo de Nagoya y ENBD. Punto focal técnico del CBD en el Ecuador (M. Albán, Interviewer)

Annexes and Appendices

Annex 1: AICHI TARGETS

Strategic goal A. Address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society

Target 1: By 2020, at the latest, people are aware of the values of biodiversity and the steps they can take to conserve and use it sustainably.

Target 2: By 2020, at the latest, biodiversity values have been integrated into national and local development and poverty reduction strategies and planning processes and are being incorporated into national accounting, as appropriate, and reporting systems.

Target 3: By 2020, at the latest, incentives, including subsidies, harmful to biodiversity are eliminated, phased out or reformed in order to minimize or avoid negative impacts, and positive incentives for the conservation and sustainable use of biodiversity are developed and applied, consistent and in harmony with the Convention and other relevant international obligations, taking into account national socio economic conditions.

Target 4: By 2020, at the latest, Governments, business and stakeholders at all levels have taken steps to achieve or have implemented plans for sustainable production and consumption and have kept the impacts of use of natural resources well within safe ecological limits.

Strategic goal B. Reduce the direct pressures on biodiversity and promote sustainable use

Target 5: By 2020, the rate of loss of all natural habitats, including forests, is at least halved and where feasible brought close to zero, and degradation and fragmentation is significantly reduced.

Target 6: By 2020 all fish and invertebrate stocks and aquatic plants are managed and harvested sustainably, legally and applying ecosystem based approaches, so that overfishing is avoided, recovery plans and measures are in place for all depleted species, fisheries have no significant adverse impacts on threatened species and vulnerable ecosystems and the impacts of fisheries on stocks, species and ecosystems are within safe ecological limits.

Target 7: By 2020 areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity.

Target 8: By 2020, pollution, including from excess nutrients, has been brought to levels that are not detrimental to ecosystem function and biodiversity.

Target 9: By 2020, invasive alien species and pathways are identified and prioritized, priority species are controlled or eradicated, and measures are in place to manage pathways to prevent their introduction and establishment.

Target 10: By 2015, the multiple anthropogenic pressures on coral reefs, and other vulnerable ecosystems impacted by climate change or ocean acidification are minimized, so as to maintain their integrity and functioning.

Strategic goal C: To improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity

Target 11: By 2020, at least 17 per cent of terrestrial and inland water, 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 seascapes.

Target 12: By 2020 the extinction of known threatened species has been prevented and their conservation status, particularly of those most in decline, has been improved and sustained.

Target 13: By 2020, the genetic diversity of cultivated plants and farmed and domesticated animals and of wild relatives, including other socio-economically as well as culturally valuable species, is maintained, and strategies have been developed and implemented for minimizing genetic erosion and safeguarding their genetic diversity.

Strategic goal D: Enhance the benefits to all from biodiversity and ecosystem services.

Target 14: By 2020, ecosystems that provide essential services, including services related to water, and contribute to health, livelihoods and well-being, are restored and safeguarded, taking into account the needs of women, indigenous and local communities, and the poor and vulnerable.

Target 15: By 2020, ecosystem resilience and the contribution of biodiversity to carbon stocks has been enhanced, through conservation and restoration, including restoration of at least 15 per cent of degraded ecosystems, thereby contributing to climate change mitigation and adaptation and to combating desertification.

Target 16: By 2015, the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization is in force and operational, consistent with national legislation.

Strategic goal E. Enhance implementation through participatory planning, knowledge management and capacity building

Target 17: By 2015 each Party has developed, adopted as a policy instrument, and has commenced implementing an effective, participatory and updated national biodiversity strategy and action plan.

Target 18: By 2020, the traditional knowledge, innovations and practices of indigenous and local communities relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, are respected, subject to national legislation and relevant international obligations, and fully integrated and reflected in the implementation of the Convention with the full and effective participation of indigenous and local communities, at all relevant levels.

Target 19: By 2020, knowledge, the science base and technologies relating to biodiversity, its values, functioning, status and trends, and the consequences of its loss, are improved, widely shared and transferred, and applied.

Target 20: By 2020, at the latest, the mobilization of financial resources for effectively implementing the Strategic Plan 2011-2020 from all sources and in accordance with the consolidated and agreed process in the Strategy for Resource Mobilization should increase substantially from the current levels. This target will be subject to changes contingent to resources needs assessments to be developed and reported by Parties.

Annex 2: Cost of Target 1

Item	US$
Communications and outreach program on three levels: the education system, national level decision makers, and local governments. Costs include strategic planning, material production, wages, and monitoring.	21,000,000
Media Advertising Costs (beginning in year 2).	12,000,000
Total	**33,000,000**

Source: Interview with Mario García, 8 January 2013

Annex 3: Cost of Target 9

A. Costs for introduced species priorities on mainland Ecuador

Action	US$	Source
Eradication of the giant African snail	700,000	GISD 2012
Control of the Common Water Hyacinth population (Eichhornia crassipes)	1,600,000	Martinez (nd)
Rice snail (Pomacea sp)	No data	
Polylepis racemosa	No data	
Erradication of the Bullfrog (Lithobates catesbeianus)	2,808,000	GISD 2012
Total	**5,108,000**	

B. Cost for the introduced species program in the Galápagos

Program	2006-2008 US$	2012-2014 US$	Actual financial resources US$ for 2012	Financial Gap US$
Large mammals	4,341,090	5,817,476	0	
Small mammals	3,075,000	4,120,794	0	
Invertebrates	3,090,000	4,140,896	611,000	
Introduced plants	3,990,000	5,346,982	297,200	
Total	14,496,090	19,426,147	908,200	
Total for 2020	28,992,180	38,852,294	6,357,400	32,494,894*
Annual cost	**3,624,023**	**4,856,537**		

Source: Diaz, 2008; Aguirre et al., 2009. FEIG 2012.

*The financial gap can only be calculated as a total because the Fund determines programmatic priorities on a yearly basis.

Annex 4: Cost of Target 11

A. Costs for the management of Protected Areas*

Natural area	Total ha	Inland hectares	Marine hectares	Total Funding needed US$/year
REFUGIO DE VIDA SILVESTRE ISLA SANTA CLARA	5	5	-	552,584
REFUGIO DE VIDA SILVESTRE MANGLARES ESTUARIO RIO ESMERALDAS	242	242	-	1,400,228
ÁREA NAC.DE RECREACIÓN SAMANES**	380	380	-	190,000
AREA NAC.DE RECREACION EL BOLICHE	400	400	-	1,300,497
REFUGIO DE VIDA SILVESTRE PASOCHOA	500	500	-	647,723
REFUGIO DE VIDA SILVESTRE ISLA CORAZON	700	700	-	1,743,955
REFUGIO DE VIDA SILVESTRE LA CHIQUITA	809	809	-	259,190
ÁREA NAC.DE RECREACIÓN ISLA SANTAY	2,214	2,214	-	746,055
ÀREA NAC. DE RECREACION PARQUE-LAGO	2,283	2,283	-	385,736
RESERVA BIOLÓGICA EL CONDOR	2,440	2,440	-	343,967
REFUGIO DE VIDA SILVESTRE EL PAMBILAR	3,123	3,123	-	320,220
REFUGIO DE VIDA SILVESTRE MANGLARES ESTUARIO RIO MUISNE	3,173	3,173	-	504,127
RESERVA GEOBOTANICA. PULULAHUA	3,383	3,383	-	2,017,469
REFUGIO DE VIDA SILVESTRE EL ZARZA	3,643	3,643	-	273,312
RESERVA BIOLOGICA LIMONCOCHA	4,613	4,613	-	1,420,241
RESERVA DE PRODUCCION DE FAUNA MANGLARES EL SALADO	5,217	5,217	-	1,489,068
RESERVA BIOLÓGICA EL QUIMI	9,071	9,071	-	304,682
REFUGIO DE VIDA SILVESTRE MANGLARES EL MORRO	10,030	10,030	-	1,928,214
REFUGIO DE VIDA SILVESTRE MARINO COSTERO PACOCHE	13,630	5,044	8.586	756,315

RESERVA ECOLOGICA EL ANGEL	15,715	15,715	-	1,884,297
RESERVA ECOLOGICA ARENILLAS	17,082	17,082	-	589,127
RESERVA BIOLOGICA CERRO PLATEADO	26,115	26,115	-	368,503
PARQUE NACIONAL CAJAS	28,808	28,808	-	1,249,573
PARQUE NACIONAL COTOPAXI	33,393	33,393	-	1,946,223
PARQUE NACIONAL YACURI	43,091	43,091	-	1,493,745
RESERVA DE PRODUCCION FAUNISTICA MARINO COSTERA PUNTILLA STA. ELENA	47,455	177	47.278	2,093,013
RESERVA ECOL. MANGLAREAS CHURUTE	50,068	50,068	-	2,149,790
RESERVA ECOL. CAYAPAS MATAJE	51,300	51,300	-	843,997
RESERVA MARINA GALERA SAN FRANCISCO	54,604		54.604	1,993,325
RESERVA ECOLOGICA COFAN BERMEJO	55,451	55,451	-	618,625
PARQUE NACIONAL MACHALILLA	56,184	56,184		1,922,214
RESERVA FAUNISTICA CHIMBORAZO	58,560	58,560	-	1,099,620
RESERVA ECOL. MACHE CHINDUL	119,172	119,172	-	1,748,359
RESERVA ECOLOGICA ANTISANA	120,000	120,000	-	2,246,454
PARQUE NACIONAL PODOCARPUS	146,280	146,280	-	2.030.591
RESERVA ECOL. LOS ILINIZAS	149,900	149,900	-	2.377.702
PARQUE NACIONAL SUMACO	205,249	205,249	-	2,011,279
PARQUE NACIONAL LLANGANATES	219,707	219,707	-	2,231,371
RESERVA ECOL. COTACACHI CAYAPAS	243,638	243,638	-	1,755,014
PARQUE NACIONAL CAYAMBE COCA	403,103	403,103	-	2,389,053
PARQUE NACIONAL SANGAY	517,765	517,765	-	2,464,572
RESERVA FAUNISTICA CUYABENO	603,380	603,380	-	2,436,432
PARQUE NACIONAL GALAPAGOS**	693,700	693,700	-	693,700
PARQUE NACIONAL YASUNI	982,000	982,000	-	3,038,000
RESERVA BIOLOGICA MARINA DE GALAPAGOS**	14,110,000		14,110,000	14,110,000
ÁREA NACIONAL DE RECREACIÓN QUIMSACOCHA	3,200	3,200		225,000
ÁREA NACIONAL DE RECREACIÓN PLAYAS DE VILLAMIL	14			256,115
REFUGIO VIDA SILVESTRE ISLA CORAZÓN Y FRAGATAS	800	800		1,743,955
RESERVA MARINA EL PELADO		13,101		280,780
ÁREA ECOLÓGICA DE CONSERVACIÓN MUNICIPAL SIETE IGLESIAS	16,224	16,224		147,116
GAP PARA CUMPLIR AREA MARINA	377,000			1,885,000
GAP PARA CUMPLIR AREAS TERRESTRES 5%	233,675			2,336,752
TOTAL	**19,748,489**			81,242,880

** This is the only area that was not coasted in the analysis. The estimation was based on historical data

Source: MAE, 2013

B. **Costs for the establishment of marine and coastal protected areas**

Item	US$
Creating marine areas: establishing local agreements, base document design and other minimum requirements	148,000
Development of Joint management plan with local communities	10,000
Development of monitoring and evaluation plan	18,000
Total	176,000
Total investment costs for marine protected areas (7)	1,232,000

Source: Interview Xavier Chalén, expert in the costs of the conservation of costal and marine areas. 27 September 2012.

C. Cost for the establishment of terrestrial/ protected areas

Item	US$
Analysis for the creation of the protected area: definition of categories, biophysical and socioeconomic information. Development of basic cartography.	15,000
Negotiation process with local communities and governments	5,000
Development of the management plan	60,000
Total for one area	80,000
Total for 8 protected areas	**623,134**

Source: Ulloa, R. 2013; interview

Annex 5: Cost of Target 16

Item	US$
Decision making process	
Follow-up meetings for approval	1,000
Coordination meetings with related Ministries	2,500
Design of monitoring system	3,000
Monitoring Implementation of the Nagoya Protocol	14,000
Trips and workshops	10,500
Dissemination of results (Spanish and English)	28,000
Implementation of the Protocol	
Create legal certainty, clarity and transparency	
Develop domestic ABS legislation to implement the Nagoya Protocol	10,000
Provide fair and non-arbitrary rules and procedures	10,000
Establish clear rules and procedures for prior informed consent and mutually agreed terms	30,000
Conditions of transfer of accessed material to third parties	5,000
Promote participation of local people in research activities;	300,000
Develop in-country research capability and institutions	
Transfer of environmentally-friendly technology and knowledge (including biotechnology);	
Supplying information about antecedents, state of the science about resources and products;	480,000
Capacity-building measures based on a country's self-assessment of national needs and priorities	360,000
Country assessment	20,000
	1,200,000
Raise awareness	
Total	**$ 2,504,000,00**

Source: Wilson Rojas, National Biodiversity Directorate, Cabrera et al. 2012.

Annex 6: Cost of Target 17

Item	US$
Update the ENBD	200,000
Consultation and participation meetings	80,000

Construction of the Action Plan	60,000
Validation of the Action Plan	80,000
Desarrollo de actividades de comunicación	250,000
Monitoreo anual de la ENBD	90,000
Total	760,000

Source: Interview with Wilson Rojas, National Biodiversity Directorate and Moreno M.

Annex 7: Cost of Target 19

Item	US$ annual	US$ for 2020
Institute for Genomic Biology	3,000,000	21,000,000
Promotion of the initiative with universities		30,000
Scholarships to build national capacity	1,350,000	9,450,000
Research fund	40,000,000	280,000,000
Protect and restore traditional knowledge	2,000,000	14,000,000
Total		**310,480,000**

Source: MAE 2010. SENACYT 2012

Annex 8: Cost of Target 2

Item	US$ / YEAR	US$ TO 2020
Design of national accounting system	600,000	4,200,000
Calculation of the ecological footprint of the public and productive sectors	525,000	3,675,000
Generating annual reports	3,000	21,000
Design of elements for land use planning	20,000	20,000
Training – 24 provinces	50,000	1,200,000
Planning process follow-up	3,000	21,000
Generar un marco normativo para incentivar el acceso y aprovechamiento a los recursos biológicos	50,000	50,000
Desarrollar estudios de preinversión	15,000	105,000

Fortalecer la inversión públia	2,000,000	14,000,000
Mantener bancos de germoplasma	5,000,000	35,000,000
Impulsar el cultivo de plantas frutales y medicinales como parte de la cadena de valor del uso sustentable de los recursos de la biodiversidad	2,000,000	14,000,000
Total		**72,292,000**

Source: Ministry of Finance. 2012, interview with Emkio Martínez. December 2012

Annex 9: Cost of Target 3

A. Financing needs for Socio Bosque Program (PSB)

Year	2013	2014	2015	2016	2017	2018	2019	2020
Hectares	1,580,508	1,940,508	2,320,508	2,700,508	3,080,508	3,460,508	3,460,508	3,460,508
Incentive payment US$	9,524,249	13,668,821	16,716,421	19,883,721	25,658,093	29,319,393	29,319,393	32,240,999
Operations costs US$	1,632,728	2,343,226	2,865,672	3,408,638	4,398,530	5,026,182	5,026,182	2,302,928
Monitoring costs US$	2040,910	2,929,033	3'582,090	4,260,797	5,498,163	6,282,727	6,282,727	10,132,885
Admin costs US$	408,182	585,807	716,418	852,159	1,099,633	1,256,545	1,256,545	1,381,757
Total US$	13,606,069	19,526,887	23,880,601	28,405,315	36,654,418	41,884,847	41,884,847	46,058,570
Total Net Present Value	12,341,105	17,711,462	21,660,409	25,764,458	33,246,637	37,990,790	37,990,790	41,776,480
Total for all categories and years				**US$ 228,482,135**				

Source: Lascano 2012, interview, MAE 2012

B. Costs for the analysis of perverse incentives

Item	US$
Analysis of the perverse incentives for conservation	50,000
Establishment of impact strategy for decision makers	80,000
Implementar una campaña de comunicación sobre la eliminación de incentivos perversos	3,500,000
Aumentar los incentivos a las actividades con beneficio ambiental (reciclaje, eficiencia energética, agricultura orgánica)	14,000,000
Total	**17,630,000**

Annex 10: Cost of Target 18

Item	US$
Fomentar el díalogo de saberes entre la comunidad y la academia, en la investigación y documentación de la memoria social, el patrimonio cultural y los conocimientos diversos	3,500,000
Mejorar la calidad de los mecanismos para la protección, la revitalización, la conservación y el manejo del patrimonio cultural tangible e intangible con apropiación de la comunidad y para su disfrute colectivo.	3,150,000
Establecer mecanismos que incentiven el uso de las TIC para el fomento de la participación ciudadana, la interculturalidad, la valoración de nuestra diversidad y el fortalecimiento de la identidad plurinacional	1,750,000
total	**8,400,000**

Annex 11: Cost of Target 20

Item	US$
Strategy to increase National Budget for implementation	1,050,000
Strategy to access bilateral and multilateral assistance	1,750,000
Strategy to increase access to resources from the private sector	2,450,000
Establecer mecanismos para transparentar las inversiones	350,000
Total	**$ 5,600,000**

Source: Rojas, W, 2012. Ulloa R. 2012 interviews.

Annex 12: Cost of Target 4

Item	US$	
Cost to reach 6% renewable energy	847,250,000	65%
Incentives for responsible consumption	25,210,000	2%
Incentives for cleaner production (tax benefits and) trading system for pollutants)	2,100,000	0%
Yasuní Protection	421,400,000	33%
Total	**1,295,960,000**	

Source: CEPAL, SF; Consejo Sectorial de la Producción. 2010. Curbelo Alonso, A. 2011; Gobierno del Ecuador 2012. El Comercio, 2013.

Annex 13: Cost of Target 6

Item	annual cost US$	total cost US$
Elimination of trawling	7,000	980,000
Fisheries Management	500,000	3,500,000
Marine biodiversity conservation	1,032,000	7,224,000
Strengthen costal marine research	250,000	1,750,000
Strengthen pollution prevention and control and the protection of threatened species	300,000	2,100,000
Patrolling, laboratory operation, materials, staff, FRA visit, European Control Agency	350,000	2,450,000
Program to clean sea bed in coastal areas	10,000	1,000,000
TOTAL		**19,004,000**

Source: Ministry of Finance, 2012. CPPS. 2010.

Annex 14: Cost of Target 7

	Cost per Unit US$	Total Cost US$
Conservation of agricultural biodiveristy, seeds and associated knowledge	16,300,000	114,100,000
Incentives for agroecology		-
Participatory research, education and technical Support	500,000	3,500,000
Regulation of production and certification of industrial sites	300,000	2,100,000
Strengthen public participation	350,000	2,450,000
Implement plan for aquaculture control	500,000	3,500,000
Restoration of 400 ha of mangrove (30% of degraded mangrove areas)	5,675	2,269,867
		127,919,867

Source: Conferencia plurinacional e intercultural de soberanía alimentaria. 2012. un nuevo modelo agrario para el Ecuador. Quito; Chalén, 2012, Ministerio de Finanzas 2012.

Annex 15: Cost of Target 8

	Total US$
Management of persistent organic pollutants	90,933,043
Management of pollution form mining activities	43,920,000
Management of solid waste at municipal level	318,163,950
Total	**453,016,993**

Source: Ministerio de Finanzas 2012

Annex 16: Cost of Target 10

	Hectares	US$/ha	Total US$
Research to identify distribution of coral reef species	100	10,000	1,000,000
Distribution of results			30,000
Periodic sampling for monitoring	10	10,000	100,000
Total			**1,130,000**

Source: Chalén 2012, interview

Annex 17: Cost of Target 5

Item	US$/year	US$ until 2020
National forest statistics system	531,000	3,717,000
Decentralize national system for control of the extraction, transport and sale of timber	5,400,000	37,800,000
National forest assessment	543,000	3,801,000
Total		**45,318,000**

Source: Ministry of Finance, 2012.

Annex 18: Cost of Target 12

	Annual Cost US$	Total Cost US$
Shark action plan	1,000,000	7,000,000
Tapir management plan	ND	
Condor conservation plan	ND	
Total		7,000,000

Source: Chalén 2012

Annex 19: Cost of Target 14

Item	Until 2020
Goal for active restoration (hectares)	100,000
Average annual payment (100% of actual payment) US$	60
Goal for passive restoration (hectares)	80,000
Average payment for passive restoration (70% of actual payment) US$	42
Payments until 2020 (US$)	**$ 48,535,459**

Source: MAE 2013, Lascano (January 7, 2012 and September 18, 2013)

Annex 20: Cost of Target 13

Year	US$	US$ in 2013 currency
2013	14,504,000	18,511,188
2014	16,155,000	19,636,503
2015	13,352,000	15,456,609
2016	11,112,500	12,251,531
2017		11,668,125
2018		11,112,500
2019		10,583,333
2020		10,079,365
Total	55,123,500	109,299,155

Source: INIAP 2008

Annex 21: Cost of Target 15

General vegetation type	Total hectares under degradation (ha)	Hectares 2020 Goal (15% of total area)	Restoration cost US$ per hectare?	Total US$ to 2020 by ecosystem
Montane cloud forest	410,895	61,634.25	300	55,470,825
Deciduous and semi-deciduous forest	390,288	58,543.20	1,500	263,444,400
Floodplain forest	4,966	744.9		0
Montane evergreen forest	464,800	69,720	1,500	313,740,000
Lowland evergreen forest	959,804	143,970.60	1,500	647,867,700
Grassland	540	81		0
Wet scrubland	70,116	10,517.40		0
Dry scrub	139,780	20,967		0
Paramo	85,180	12,777	1,331	51,018,561
Total	**2,528,454**	**378,955**		**1,331,541,486**

Source: Martínez 2012. Conservation International; Alvarez et al 2008; Conservación y Desarrollo 2003

Note: The restoration of mangrove is under Target 7.