



# National Blue Carbon Policy Assessment Ecuador



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## Layout

Charles El-Zeind, GRID-Arendal

## About the Blue Forests Project

The Global Environment Facility's (GEF) Blue Forests Project is a global initiative focused on harnessing the values associated with coastal marine carbon and ecosystem services to achieve improved ecosystem management and climate resilient communities. The project is implemented by the United Nations Environment Programme (UNEP) with partners worldwide. Project sites include locations in Ecuador, Kenya, Madagascar, Mozambique, Indonesia, the United Arab Emirates, Thailand, and the United States of America. The project also addresses key 'blue forests' knowledge gaps, as well as providing experience and tools to support greater global replication and application of the blue forests methodologies and approaches.

Project website: [www.gefbblueforests.org](http://www.gefbblueforests.org)

## Preface

This report traces the policy, legal, and regulatory context for coastal “blue carbon” ecosystems – namely mangroves, salt marshes, and seagrasses – in ECUADOR and is one in a series of five country reports to be undertaken as part of the UNEP/GEF Blue Forests Project. Other countries included are Indonesia, Madagascar, Mozambique and the United Arab Emirates (UAE).

The goal of these National Policy Assessments (NPAs) is to bring together the key policy, legal and regulatory frameworks and incentives that have an implication for the management of blue carbon ecosystems including items from a perspective of national development, climate change, forestry, and biodiversity, as well as marine resource management.

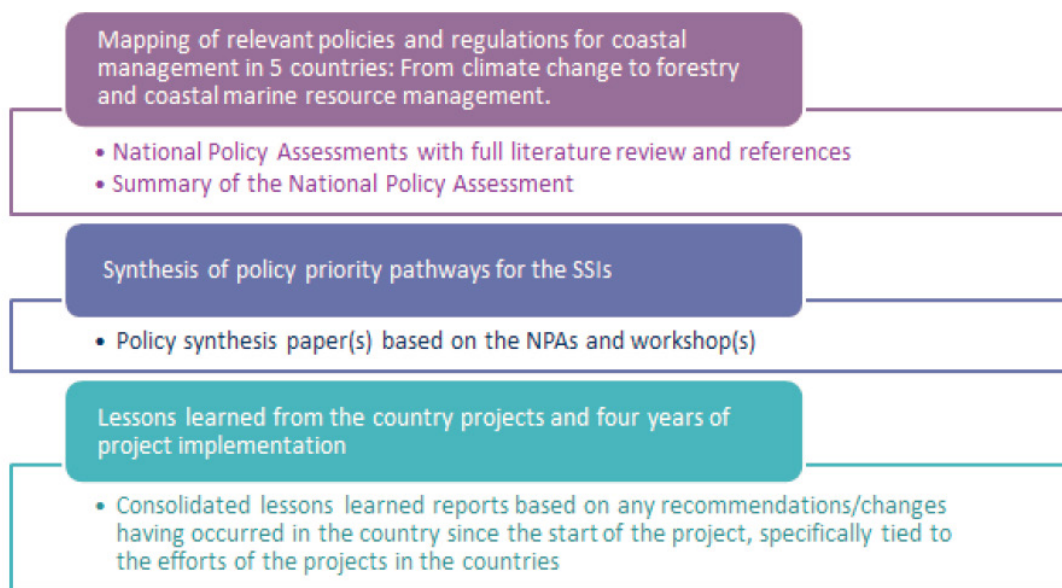
The report will also undertake a first order analysis of the gaps and opportunities for more comprehensive and coordinated coastal management that can use a variety of existing legal and financial incentive schemes. The report is accompanied by a summary document.

The NPAs are a first step in a series of consecutive documents (see Figure 1). After the completion of the five NPA reports, the aim is to extrapolate common trends and barriers, best practices and opportunities for the management of coastal carbon ecosystems across the five studies. These synchronized NPAs – for Ecuador, Indonesia, Madagascar, Mozambique, and the UAE – will serve as the basis for targeted advice on policy approaches for the Blue Forests Project’s Small-Scale

Interventions (SSIs) and, more broadly, for scaling up blue forest efforts at the international level. A document on lessons learned from the SSIs will be available towards the end of the Blue Forests Project in 2018.

The NPAs are one of the deliverables of the GEF-funded project Standardized Methodologies for Carbon Accounting and Ecosystem Services Valuation of Blue Forests (Blue Forests Project). Specifically, they contribute to Component 1, Development of guidance for carbon accounting and ecosystem services valuation for blue forests ecosystems (i.e. blue carbon ecosystems). The focus of Component 1 of the Blue Forests Project is the development of guidance for the implementation of methodologies and approaches for carbon accounting and ecosystem services valuation for blue forest ecosystems, specifically through project level support to the small-scale interventions. Component 1 will facilitate better management practices based on an improved understanding of carbon and other ecosystem services for blue forest ecosystems.

Overall the UNEP/GEF Blue Forests Project aims to improve and share knowledge about coastal and marine ecosystem with managers and stakeholders in selected regions on carbon sequestration, storage, possible greenhouse gas emissions as well as ecosystem services in blue forests ecosystems and on possible policy and economic instruments that may be applied to sustainable coastal habitat management.



**Figure 1.** Overview of UNEP/ GEF Blue Forests Project related policy assessment reports and products

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## Glossary

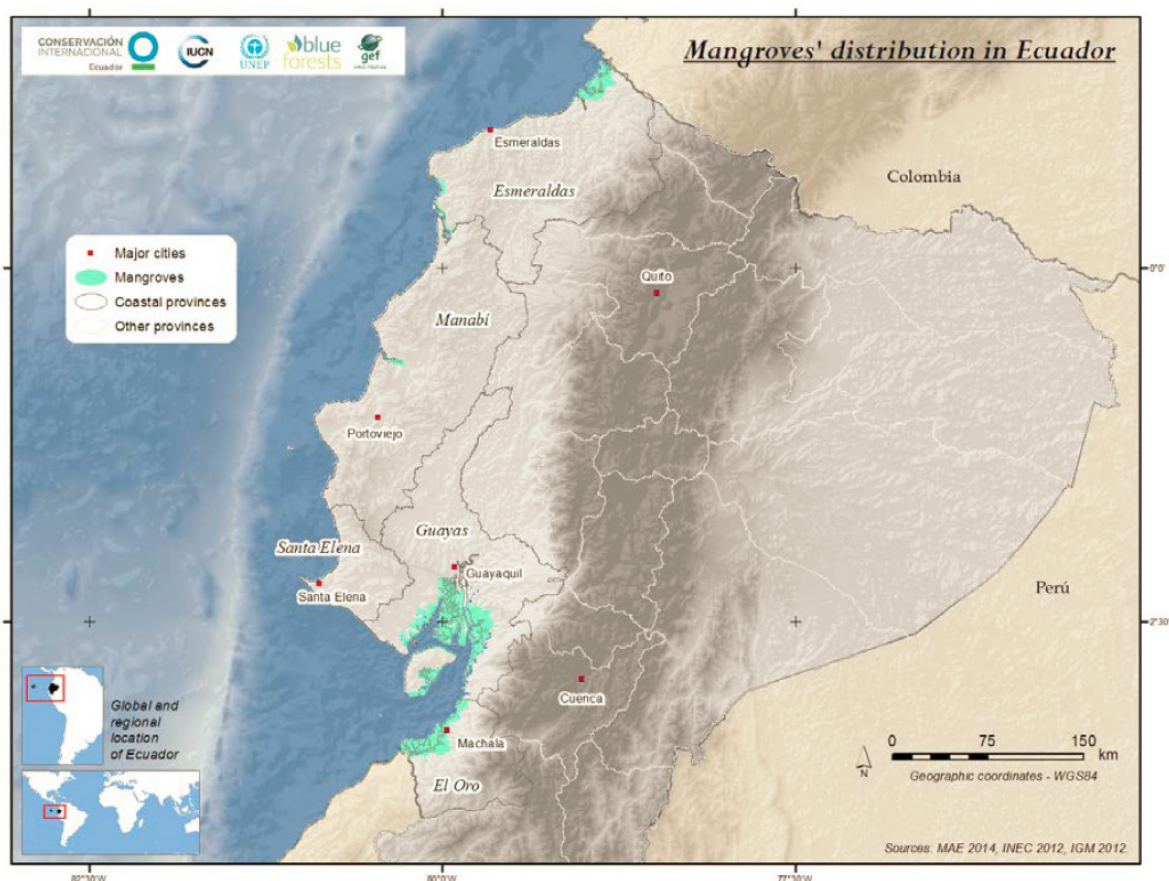
ASC	Aquaculture Stewardship Council
CBD	Convention on Biological Diversity
DIGMER	Merchant Marine and Coastal Directorate – Dirección General de la Marina Mercante y del Litoral
FCPF	Forest Carbon Partnership Facility
GEF	Global Environment Facility
ICZM	Integrated Coastal Zone Management
INEFAN	Ecuadorian Institute of Forestry, Natural Areas and Wildlife - Instituto Ecuatoriano Forestal y de Áreas Naturales y de Vida Silvestre
MAE	Ministry of Environment – Ministerio del Ambiente de Ecuador
MRV	Measurement, reporting and verification
NAMA	Nationally Appropriate Mitigation Action
NAP	National Adaptation Plan
NBPAS	National Biodiversity Policy and Strategy
PANE	State Natural Heritage Areas - Patrimonio de Áreas Naturales de Estado
PMRC	Coastal Resource Management Programme - Programa de Manejo de Recursos Costeros
PNFR	National Forest and Reforestation Plan - Plan Nacional de Restauración Forestal
REDD +	Reducing Emissions from Deforestation and Forest Degradation and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries
SAM	Special Area Management
SNAP	National System of Protected Areas – Sistema Nacional de Áreas Protegidas
SSI	Small-Scale Interventions
TULSMA	Unified Text of Secondary Environmental Legislation - Texto Unificado de Legislación Ambiental Secundaria
UNFCCC	United Nations Framework Convention on Climate Change
VCS	Verified Carbon Standard

# 1. Blue carbon ecosystems in Ecuador

With seagrasses and tidal marshlands largely absent, Ecuador's blue carbon portfolio is focused on the country's extensive mangrove forests which represent major ecological and economic assets. Despite considerable losses in the second half of the 20th century and the first decade of this century, the mangrove forest stock remains rich. Robust and up-to-date mapping details are hard to come by, however. According to the Ministry of Environment (MAE) figures, the current area of mangroves totals just over 157,000 hectares (MAE mapa interactivo).<sup>1</sup> In 2006 – the last year for which seemingly uncontested figures exist – the total mangrove area stood at around 147,000 hectares (CLIRSEN 2006). Using this data, the main locations are the estuaries of Cayapas Mataje (21,400 ha), the Muisne River (1,558 ha), the Cojimíes River (2,742 ha) and the Chone River (933 ha) in the north of the country, and the Gulf of Guayaquil (105,130 ha), as well as the Jambelí Archipelago (15,208 ha) in the south. Map 1 provides an overview of the geographical location of these areas along the Ecuadorian coast.

The drivers of mangrove destruction have been mostly human. The expansion of coastal developments (housing, transport, industry, fisheries), agricultural encroachment, and unsustainable timber harvesting and fishing practices have all left their toll. Most damaging, however, has been the introduction of aquaculture, mainly shrimp farms, in the late 1960s and its steep rise since the late 1980s. Ecuador is among the world's leading shrimp producers, exporting about 250,000 tonnes a year with a total value exceeding over 2 billion USD (FAO 2015).

As comprehensive mangrove mapping was not undertaken before the 1990s, absolute deforestation rates can only be estimated. According to a 2007 calculation, Ecuador lost 27.6% of its mangroves during the period 1969-2006 (Bravo 2013). The figure may be an underestimation, as it does not compare with a government calculation of undertaken in 1986 (when cartographic capacity, however, was still limited), which put the total figure of mangroves at 362,802 hectares



**Map 1.** Location of main mangrove areas in the continental territory of Ecuador.



(MAE 1986). Additionally, it does not compare with the figure on potential forest types used by the government in its forest reference level submission earlier this year (326,000 hectares, MAE 2015b). If only 150,000 hectares were left in 2006, the rate of gross deforestation would be closer to 55% or 60%. At any rate, these figures are subject to of debate, and it is hard to draw firm conclusions.

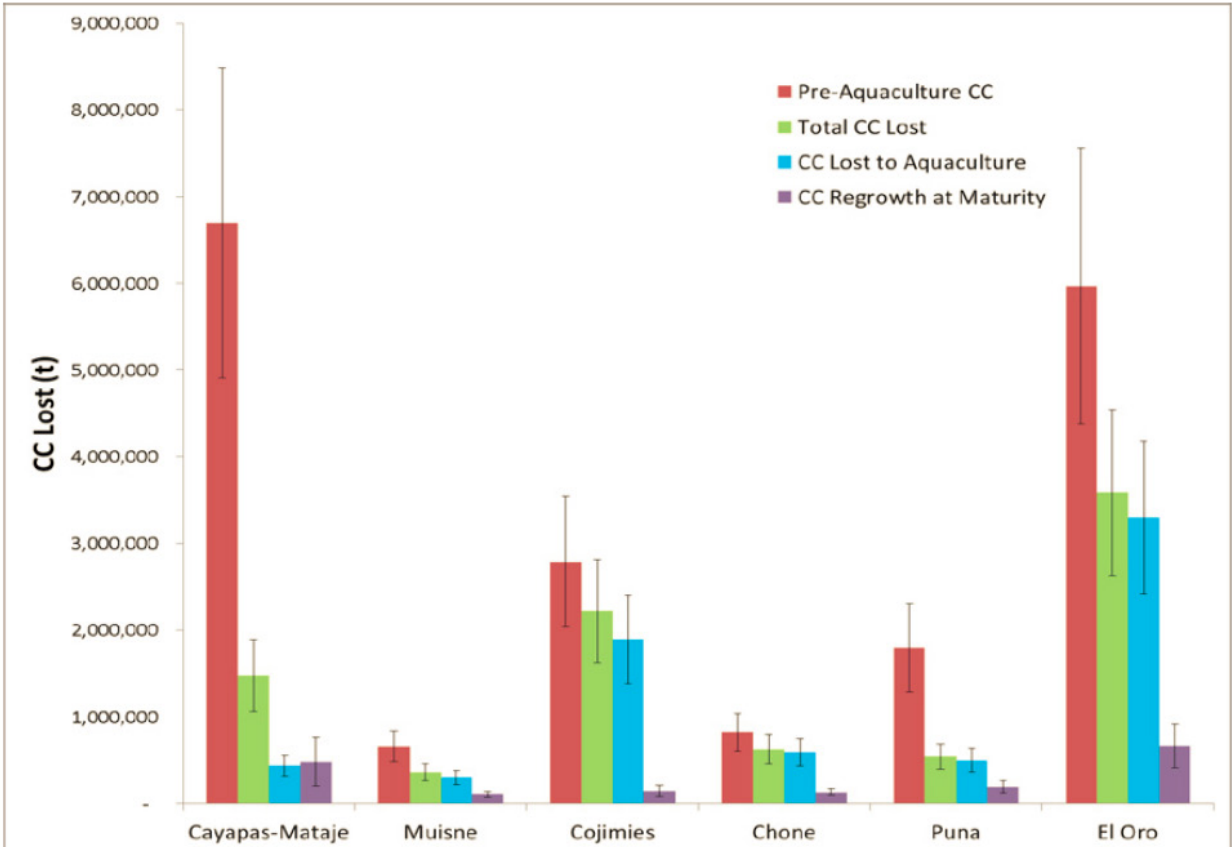
It may be worthwhile, in this context, to compare any findings against the expansion of aquaculture over the same time. Recent research confirms that 80% of mangrove carbon losses in Ecuador are due to direct displacement of mangrove forests by shrimp aquaculture (Hamilton & Lovette 2015, see Figure 1). While the figures on the total area of shrimp farms in Ecuador vary according to the source, ranging from 145,000 hectares (PROFAFOR 2015) to 208,000 hectares (CNA 2005),<sup>1</sup> the resulting losses of mangrove forests would still be higher than 30%.

Recent government calculations are available for year-to-year deforestation rates since 1990 (MAE 2015b). According

to these calculations, year-to-year gross deforestation (all forests) stood at 1260 hectares between 1990 and 2000 and at 1100 hectares between 2000 and 2008. Data for the most recent years is not available.

There are stark differences of deforestation rates between the various locations. Less than 10% of mangrove forests in the Cayapas Estuary were affected by deforestation and degradation, compared with a loss of nearly 80% in the Cojimies Estuary, confirming that the main shrimp farm locations are in the provinces of Esmeraldas, Guayas, and El Oro.

<sup>1</sup>In 2010, the Undersecretary of Fisheries Resources put the figure at 178,000 hectares according to PROFAFOR 2015.



**Figure 2.** Combined above-ground and below ground carbon (CC) losses in different mangrove areas of Ecuador. The red column shows the pre-aquaculture CC stock; the green column shows total CC losses of which the losses due to aquaculture are marked blue; the purple figure shows regrowth activities. Source: Hamilton & Lovette 2015.

## 1.1 Shrimp farming in Ecuador

The economic and social benefits of the shrimp farming industry are highly debated. Recent case studies suggest that despite high industrial trade outputs, the consequences for the local population in terms of income, livelihood, food security, and social coherence may have been poor (Hamilton & Collins 2013). This stems from the fact that shrimp farming is not labor-intensive (Seafood Watch 2014) and that the expansion of shrimp farms diminish the prospects of artisanal fishing and traditional aquacultures on a large scale.

The low input production systems and the improved production technology have some moderate environmental impacts associated with waste, feed, and the use of chemicals. Thompson (2014) further laments that despite existing regulations to address environmental issues, data on the level of compliance resulting from the required annual inspections is rare.

In the early 2000s, Ecuador had one of the lowest productivity rates (output / surface of farms) in the world, indicating a large number of abandoned shrimp farms in coastal areas that were formerly mangroves (Ocampo-Thomason 2005). Output figures have risen dramatically in recent years, however.<sup>2</sup> This suggests that many previously abandoned shrimp farms have been recovered for economic use and that the industry as a whole has increased its productivity. Whether and to what extent the rise in output has also been caused by an expansion of shrimp farm areas – realized on some of the mangrove lands lost at an annual pace of 1100 hectares – is a matter of speculation. There is decidedly little research available on this issue.

Aquaculture inventories show that by 2010, two-thirds of the 2400 shrimp farm concessions have an area of less than 50 hectares, with the remainder being shared roughly equally between concessions of up to 250 hectares and those greater than 250 hectares (Miño and Samaniego 2010). Exact demarcations and changes over time have not been made available to the authors.

Work is underway to improve the management of those farms already in place. In a pilot project, Blueyou Consulting is working in Ecuador with its local partner, Omarsa, at the shrimp farming and processing levels in order to improve shrimp farm management, practices and farming inputs, and to reduce environmental and social impacts of marine shrimp farming (FIT Fund 2015). The specific goal of the project is to ensure that there is full traceability back to the farms and that each farm complies with the new Aquaculture Stewardship Council (ASC) shrimp standard.

<sup>2</sup>The White Spot Syndrome Virus, a disease, hit in 1999 causing shrimp exports to drop from its peak-disease high in 1998 (114,000 tonnes) to drop to 37,700 tonnes in 2000, see FAO 2002, at [http://www.fao.org/fishery/countrysector/naso\\_ecuador/en](http://www.fao.org/fishery/countrysector/naso_ecuador/en); since then, growth has gone steadily up to reach close to 245,000 tonnes in 2014, cf. FAO Globefish 2014 (footnote 1 above).

## 1.2 Mangrove restoration activities in Ecuador

Traditionally, local fishermen gathered clams and mussels from estuaries. Shrimp farm expansion, however, has contributed to a decline in all local fisheries since so many marine species depend on mangroves for at least part of their development. Small-scale reforestation and regeneration efforts are underway although there is still not much information available on overall reforestation areas or efforts. One example is the FIDES Foundation's intervention with families dedicated to fishing and gathering that allows the generation of alternative livelihoods for mangrove communities of Manabí through the protection and sustainable use of mangrove resources. An important example of this is the recovery of the Mouthless crab in situ, in a process that combines ancestral knowledge and practices with new technical knowledge. The case study shows an ongoing pilot project that is generating positive results for the recovery of the mouthless crab (IPSI 2014).

The case studies aside, early information on reforestation activities on the basis of Presidential Decree 1391 from 2008 has recently become available. 1747 hectares of mangroves have been transferred into heritage reserves, 240 hectares of which have already been successfully reforested.<sup>3</sup> Concerning central-level planning, mangroves do not appear to be targeted by the National Forest and Reforestation Plan (MAE 2014b). The Ministry of Environment did commission a study on criteria for priority mangrove reforestation in the past (Briones 2009) and other in 2014 (Astudillo et al 2014). In late 2014, the Ministry of Environment signed a Reforestation Agreement with the shrimp farm industry and civil society (MAE, 2015d; the details of the arrangement have not been published, however).

<sup>3</sup>Information MAE 2016 (with the authors)





## 2. Blue carbon protection in Ecuador: Status Quo

Mangrove protection in Ecuador developed in several phases. The first phase of protection regimes (1950s-1970s) focused on the establishment of a few national parks and local reserves. In 1974, the Fisheries Law prohibited, for the first time, the destruction or alteration of mangroves, although this was restricted only to protected areas.

The second phase was marked by the adoption of the Preliminary Conservation Strategy in 1976 (see box below), the first ban on certain mangrove harvesting techniques and aquaculture development in mangrove areas in 1978 (Decree 2939), and by the adoption of the Forestry Law in 1981 which banned all mangrove extraction and destruction activities, unless a specific authorization had been issued.

The third phase was triggered by local grassroots movements starting in the late 1980s and early 1990s, when the impact of industrial aquaculture on the environment and social communities became even more apparent (Ocampo-Thomason, 2005). In 1986-87, the government gave more than 300,000 hectares of mangrove forests the status as “protection forest” (Ministerial Accords 498 and 238). The government also established a dedicated research network in 1989, created the forest guard and issued a hunting ban in mangrove forests in 1994 (Ministerial Accord 1907), and drew up, in 1996, the first national protection zone integrating major mangrove areas (Ecological Mangrove Reserve Cayapas-Mataje (“REMACAM”).<sup>4</sup> Today REMACAM is part of Ecuador’s Protected Areas National System (SNAP, see box below). One-third of the area’s 53,000 hectares are covered with mangroves (Ocampo-Thomason 2005).

The fourth phase of mangrove protection, in place today, focuses on the design of a more comprehensive protection status, reforestation activities, and the introduction of special incentive schemes to address local communities and individuals.

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<sup>4</sup>Arguably the first protection reserve aimed at mangroves was the Churute Reserve, established in 1979 (PATRA, 1999).

concessions for heritage areas concerning the “provision of services or the sustainable use of resources”, strictly in line with the relevant management plans (Article 179). The fifth chapter of TULSMA (Management of Coastal Resources), however, clarifies that the conservation, protection and restoration [reposición] of the mangrove forests is in the “public interest”, and “any form of exploitation” – whether inside protective zones or out – is forbidden, except for artisanal (ancestral) fishing (Article 19).<sup>5</sup>

Outside the protection zones, however, concessions may be handed out, each time in accordance with the respective management plan, for the construction of canals to feed and discharge aquaculture operations (Article 34), but not for any new ponds.

TULSMA V also instructs the Sub-Secretary of Coastal Management, in coordination with the Merchant Marine and Coastal Directorate (DIGMER) and the General Directory for Fisheries, to provide and update, every other year, an inventory (including mapping) of existing shrimp ponds (Article 53). Article 54 lays down that “no entity or state authority may authorize the construction of new shrimp ponds or the extension of existing shrimp farms in the mangrove ecosystem and the transitional zone”.

All owners, concessionaries and users of installed shrimp farms must hold an environmental license [licencia ambiental], the absence of which will be sanctioned in accordance with the law (Article 58).

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<sup>5</sup>MAE’s Sub-Secretary for Marine and Coastal Management is responsible for giving out “usage agreements” in mangrove zones for ancestral users (Libro I, Article 9.7(p)).

### 2.1 Mangrove restoration activities in Ecuador

Mangroves are considered “forest” in Ecuador (Article 107 Forestry Law). As per Article 1 of the Forestry Law, mangroves are declared “public goods”, with no commercial value attached, “even when located on private property”. Their appropriation and exploitation requires a concession granted in conformity with the Forestry Law and its regulations.

In line with the Forestry Law, the MAE adopted secondary legislation in 2003 with modifications made in 2009 and 2011, consolidated in the Texto Unificado de Legislación Ambiental Secundaria (TULSMA), which has five chapters [libros]. According to its third chapter (TULSMA III) on the forestry regime, in general, the MAE has the right to hand out

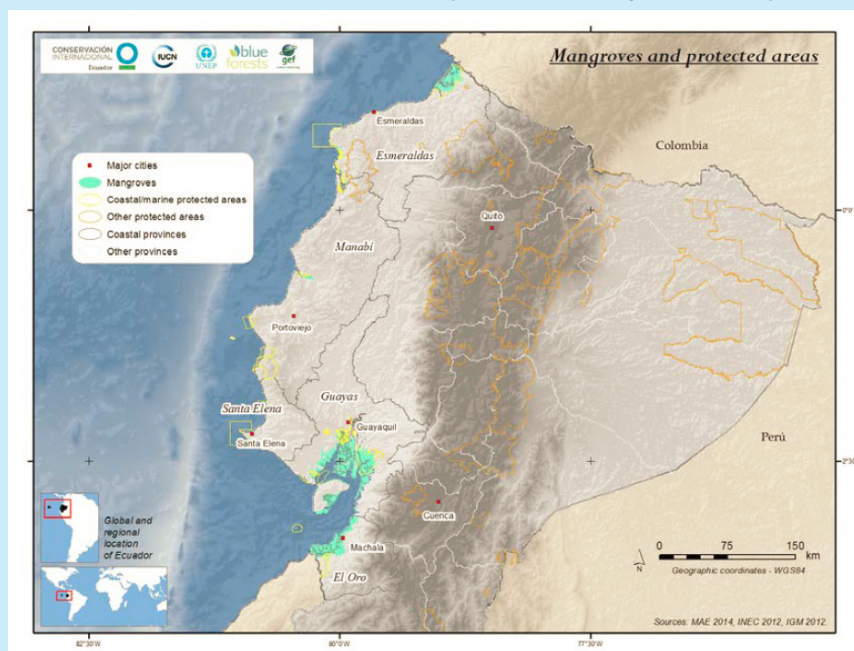


## *The National System of Protected Areas - Sistema Nacional de Áreas Protegidas (SNAP)*

Ecuador was a regional pioneer in establishing national parks and nature reserves – the Parque Nacional Galápagos (1959), the Reserva Geobotánica Pululahua (1966) and the Reserva Ecológica Cotachachi Cayapas (1986). In 1976, the government issued its first policy strategy on nature protection, the Preliminary Forest Conservation Strategy (Estrategia Preliminar para la Conservación de Áreas Silvestres Sobresalientes del Ecuador). The adoption of the Forestry Law (Ley Forestal y de Conservación de Áreas Naturales y Vida Silvestre) followed in 1981. In 1989, the government released its second policy strategy on nature protection aiming at the creation of a National System of Protected Areas (Sistema Nacional de Áreas Protegidas, SNAP).

The development of the respective institutional framework followed. The Ecuadorian Institute of Forestry, Natural Areas and Wildlife (Instituto Ecuatoriano Forestal y de Áreas Naturales y de Vida Silvestre, INEFAN) was created in 1991 and the Ministry of Environment (Ministerio del Ambiente de Ecuador, MAE) in 1996. The Constitution of 1998 formally established the SNAP (Article 86 (3)). The Constitution of 2008 – which remains effective today – confirmed the constitutional mandate of the SNAP and identified four sub-systems: (1) State Natural Heritage Areas (Patrimonio de Áreas Naturales de Estado, PANE) which enjoy the highest possible protection status (MAE 2015c), (2) autonomous/decentralized areas (established by regional governments), (3) community/indigenous areas, and (4) privately held areas.

As of 2013, Ecuador had 48 state/heritage reserves, amounting to 20% of the national territory, and a few decentralized protection zones (see Map 2). Community/indigenous protection zones, as well as privately-held protection zones, were under development, some of them notably in coastal/mangrove zones (MAE 2013a).



**Map 2.** Protected areas in the coastal region of Ecuador.

The Constitution of 2008 recognizes peatlands [páramos], wetlands [humelades] and mangroves [manglares] as among those ecosystems that are “fragile and at risk” and mandates the government to “regulate the conservation, management and sustainable use, recovery, and the rights of entitlement [dominio]” (Article 406).

The total mangrove area located in SNAP zones amounts to roughly 38,000 to 65,000 hectares, representing about 30%-40% of the total mangrove area left in Ecuador.

The only activities allowed in the SNAP are “preservation, protection, investigation, recuperation and restoration, education and culture, controlled recreation and tourism, fishing, sport fishing, and the fair use of forest fauna and flora” (Article 170 TULSMA Libro III). All heritage sites are under the direct control of MAE (Article 4 Forestry Law and Article 171 TULSMA Libro III). The Environmental Management Law of 2004 (Ley de Gestión Ambiental) adds that any use of non-renewable natural resources in heritage areas must be sustainable [rational] and requires an economic feasibility and environmental impact assessment.

## Administrative Responsibilities

The Ministry of Environment of Ecuador (Ministerio del Ambiente de Ecuador, MAE) is the highest authority to administer mangrove forests, inside and outside protected zones. This is, however, notwithstanding any specific jurisdictional competences of the Maritime Police, the Sub-Secretary for Fisheries, or “other institutions related to the ecosystem resources” (Article 26 of TULSMA V) or any auxiliary roles of specific authorities. For instance, the state-owned mangrove forests in Esmeraldas, Manabí, Guayas, and El Oro – the provinces where all of Ecuador’s mangrove forests are located – are declared “special protection zones” [bosques protectores] which means that the Ministry of Defense, the National Council for Water Resources, and regional development corporations (Article 20 of TULSMA V) are obliged to render support to their administration.

MAE has both centralized and decentralized (regional) offices. Underneath the MAE, the port authorities

[capitanías de puerto] have the responsibility for on-the-ground (mangrove) policing.

Depending on the conclusion of specific devolution agreements between MAE and the regions and provinces, competences for policymaking and environmental management may be devolved to the lower level of government. The Decentralization Code of 2010 (Código Orgánico de Organización Territorial, Autonomía y Descentralización) further extends conservation obligations even to the lowest government level, the parishes, which are to promote biodiversity conservation and environmental protection, including through programs and projects on sustainable management of natural resources and fragile ecosystems recovery, and concerning the protection of sources and water streams (Article 136).

## 2.2 Other laws

The Fisheries and Fishery Development Act (Ley de Pesca y Desarrollo Pesquero) of 2005, as well as the Organic Law on Food Sovereignty (Ley Orgánica del Régimen de Soberanía Alimentaria) of 2009, broadly echo the Forestry Law and its implementing provisions (TULSMA). According to Article 44 of the Fisheries Act, it is forbidden to destroy or alter mangroves. According to Article 16 of the Food Sovereignty Act, the state has to promote sustainable fisheries and aquaculture production. Illegally operating shrimp farms will be seized by the government, unless they can be regularized within one year. No regularization is possible within protected zones.

The shrimp-farm regularization process is in the hands of the Ministry of Agriculture (Under-Secretary for Aquaculture). According to Presidential Decree No 1391 of October 2008 (PD 2008), any shrimp pond operator with an installation being completed before the year 2000 may ask for regularization. Regularization is granted, provided the operator undertakes reforestation activities in the amount of 10% of the installed area (if the total area does not exceed 10 hectares) and up to 30% (if the total installed area exceeds 50 hectares). From the moment of regularization, annual costs of 25 USD per hectare must be paid above the free initial amount of 10 hectares. The MAE needs to approve the reforestation plan and oversees the reforestation activities.

## 2.3 Sanctions

Ecuador’s Penal Process Code (Código de Procedimiento Penal) of 1971 makes it an offense, punishable with incarceration from one to three years, to destroy or damage protected forests and protected natural formations (Article

437-H). Under the recently adopted Organic Integral Penal Code (Código Orgánico Integral Penal) of 2014, the intrusion [invasión] into the SNAP or any fragile ecosystem is equally punishable with incarceration from one to three years.

In Resolution 56 of 2011, MAE established a fine to cut, harvest, alter or destroy mangrove forests. The fee amount is roughly 90,000 USD per hectare of affected mangroves. Arguably more of a threat for concession-holders is Article 94 of the Fisheries Executive Decree No 3198 (Decreto Ejecutivo N° 3198 del Reglamento General a la Ley de Pesca y Desarrollo Pesquero) of 2002, which lays down that the logging of mangroves or the non-compliance with any relevant regulation is grounds for the termination of a concession (Article 94).

## 3. Government Initiatives

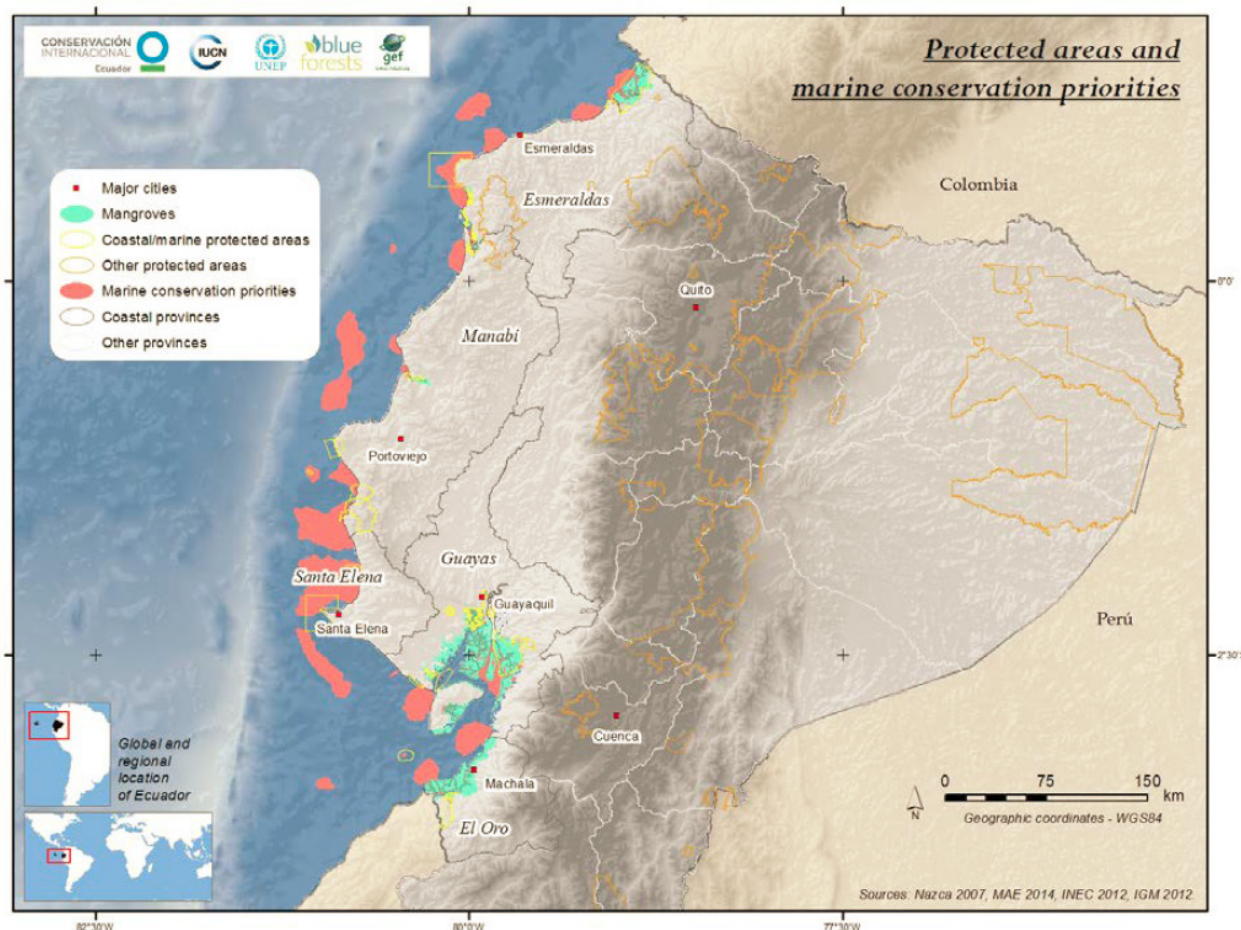
### 3.1 National development plan

In its most recent development strategy – Plan Nacional para el Buen Vivir 2013-2017 – the Government of Ecuador formulates twelve national objectives, three of which make reference to the country's coastal ecosystems. Under Objective No 5, Ecuador commits to the principle of sustainable management of its forests, including wetlands and mangroves; the precautionary principle; access to resources for priority groups; and the capacity to respond to the impacts of climate change. Objective No. 7 guarantees the “rights of nature”, and commits the government to protect the environment and to take into account the “priorities for conservation and environmental management of coastal and marine territories, as presented in Map 3.

Objective No. 10 concerns the promotion of sustainable production and use of resources in agriculture, aquaculture,

and fisheries. It highlights the need for the strengthening and diversification of coastal production and harvesting activities in order to preserve the environment and the stability of stocks, and to enhance communities and the ancestral fishing culture.

The National Plan of Good Living embodies a holistic governance strategy which goes well beyond the vertical legal approach of ‘command-and-control’. Rather than simply enforcing sanctioned and unsanctioned action – a governance approach that requires the highest levels of administrative capacity to ever become successful – the Ecuadorian government has been pioneering horizontal governance tools for at least the past two decades. In the area of mangrove protection, the key horizontal policy tool has proven to be the Sustainable Use and Custody Agreement Scheme.



**Map 3.** The green areas show protection zones (SNAP). The red areas show priority conservation zones.



The scheme largely responded to the fact that the introduction of a protection regime for mangroves, which goes back to at least the 1970s (see above), had not met with a significant reduction in the deforestation rate. Indeed, the opposite was the case. The shrimp farm industry increased the production (pond size) area dramatically over the 1990s (Ocampo-Thomason, 2005). This trend was doubtless triggered by high global demand for shrimp. From a protection policy perspective, however, it implied a distinct failure of the country's forestry protection regime. The reasons are manifold. The SNAP as an institutional structure was only being built in the second half of the 1990s. Individual and collective rights to mangrove areas were often contested – formal legal titles and demarcations were rare (Bravo, 2013). Indeed, the protection regime had the effect of stripping ancestral communities of their inherited rights to mangrove use (Ocampo-Thomason, 2005) and there was little to gain from respecting the law, when others did not, without the risk of being sanctioned.<sup>6</sup>

<sup>6</sup>For a comparative analysis of mangrove and land tenure regimes see Barbier & Cox, 2004.

## 3.2 National biodiversity plan

Ecuador became a signatory to the Convention on Biological Diversity (CBD) in 1993 and to the Cartagena Protocol in 2003. Under the CBD, Ecuador produced the National Biodiversity Policy and Strategy (Política y Estrategia Nacional de Biodiversidad del Ecuador (2015-2030)) which addresses a range of themes in terms of process (participatory and decentralized governance) and substance (different ecosystems and species), as well as strategy (biodiversity as a structural asset for good living/buen vivir) (MAE 2015d). It aims at responding to criticisms that “requirements for coherent implementation of biodiversity-related conventions are missing from policy planning” (Gomar et al, 2014).

The strategy document has a specific focus on mangroves. It seeks to establish “alliances of co-responsibility” between the State and communities, as well as knowledge platforms, for the conservation of wetlands and mangroves. It also includes mangroves in the 2017 goals to restore 500 million hectares of forests, mangroves and wetlands, and to protect a further 1.8 million hectares.

## 3.3 Sustainable Use and Custody Agreements

The Sustainable Use and Custody Agreements, introduced in 1999 through Executive Decree 1102<sup>7</sup> (and since consolidated in TULSMA), are offered to “ancestral communities”, which are given, at no direct cost, the right to the use and harvest of a demarcated mangrove area in exchange for a commitment, as identified in a specific management plan, of sustainable management and care (and periodic reporting obligations).

Between April 2000 and September 2004, 26 agreements, initially valid for 10 years, had been concluded (Coello et al 2008). They covered areas between 12 hectares (in El Oro)

and 3,400 hectares (Guayas). Three more agreements were concluded in 2007 (ranging from 560 hectares to 2,600 hectares). Altogether, by that year, more than 20,000 hectares of mangroves were under agreement inside and outside protected areas. An evaluation of 2008 showed mixed results concerning the implementation of the respective management plans, participation of users, and the tracking of forest cover changes (Coello et al 2008).

By early 2016, 62 sustainable use and custody agreements had been given out covering 67,460 hectares of mangrove forests.<sup>8</sup> Eleven agreements have since expired. A study from 2013 (Bravo 2013) showed that at the time, 69% of the total area was located in Guayas, 24% in Esmeraldas, and 7% in El Oro. The beneficiaries then were 45 ancestral communities (with almost 5,000 families in total). 40% of the agreements were no longer formally effective, however (the 10-year lifetime had come to an end), and only 8% had been renewed. A policy assessment nonetheless came to the conclusion that the mechanism has proven effective, and users appear to agree that it has overall enhanced the mangrove protection status. Trespassing by individual (non-authorized) fishermen and shrimp farmers, piracy, lack of capacity, and the absence of the authorities were identified as major challenges.

<sup>7</sup>See also Executive Decree 172 (2000) and Acuerdo Ministerial 129, which lays down further details for the conclusion of sustainable use and custody agreements.

<sup>8</sup>Figures from MAE with the authors.

## 3.4 Socio Bosque

The program Socio Bosque, initially enacted in 2008, has emerged as one of the country's key policies to intensify forest protection among communities and individuals. Mostly funded by domestic sources – the Fondo Ambiental Nacional – but supported also from international donors (in particular the German KfW), Socio Bosque combines voluntary forest management agreements with subsidy payments (conservation payments). By 2014, 2,748 agreements with individual landowners and communities had been concluded, covering almost 1.5 million hectares of land (Kill 2015). Cumulative payments had amounted to 25 million USD.

The program extends to native forests, moorland and other vegetation formations, and since 2014 also includes mangroves (Socio Manglar) (MAE 2014). It contains land within and outside of the SNAP (MAE 2012). Beneficiaries need to sign a preservation and protection agreement having a duration of 20 years (for Socio Manglar: 10 years). For mangrove forests, only holders of Sustainable Use and Custody Agreements are eligible. The target of Socio Manglar is ambitious: it attempts to have at least 100,000 hectares of mangrove forest under agreement by 2018. Successful candidates receive a mix of fixed and variable payments. The yearly fixed payment amounts to 7,000 USD for areas between 100 and 500 hectares, 10,000 USD for areas between 501 and 1,000 hectares, and 15,000 USD for areas greater than 1,000 hectares. The variable payments depend on the actual size of the area under agreement and amounts to 3



USD per hectare per year. Continued payments are conditional upon successful evaluation, although currently a carbon assessment of any kind is not part of either the Sustainable Use and Custody Agreements or the subsidy payments. By mid-2015, 7 440 hectares of mangrove areas were included into Socio Bosque/Socio Manglar in six concessions with an annual incentive of US\$ 102 322 (García, 2015).

### 3.5 REDD+

Ecuador has been actively engaged in the REDD+ policy framework. “REDD+” stands for Reducing Emissions from Deforestation and Degradation, with “+” signifying the role of conservation, sustainable management of forests and enhancement of forest carbon stocks. While international negotiations within the United Nations Framework Convention on Climate Change (UNFCCC) are ongoing, multilateral initiatives such as the Forest Carbon Partnership Facility (FCPF) and UN-REDD have started preparations for implementation, including launching pilot initiatives.

Ecuador has not joined the FCPF but it registered as an observer to UN REDD in 2009 and became a beneficiary country in 2011. Ecuador also signed a quadrilateral Memorandum of Understanding with Germany, Norway and Colombia to participate in the “REDD Early Movers Program”, a scheme originally designed by Germany to provide “REDD bridge finance relative to verified emissions reductions resulting from reduced gross deforestation from historical levels” (German Federal Ministry for Economic Cooperation and Development, Norwegian Ministry of Climate and Environment, Colombian Ministry of Environment and Sustainable Development; and Ecuadorian Ministry of Environment 2014). Under the

program, Ecuador is set to receive up to 63 million USD for pioneering carbon-specific results-based action.

A national REDD framework – including the development of a national REDD+ strategy, the installation of a national of a national monitoring system, the finalization of a national REDD safeguards system, and the calculation of country-wide reference levels (i.e., a baseline calculation of deforestation trends against which successful action will be measured) – has been under development since. MAE is the official government partner to UN-REDD and the UNFCCC. In 2013, MAE issued Ministerial Accord No. 33 on the implementation of the REDD+ mechanism in Ecuador, and in February 2016, as one of the first countries internationally, it presented its reference level proposal to the international partners (MAE 2015b). As confirmed in MAE’s presentation of the country’s proposed forest reference levels, the mangrove forests are one of the pillars of Ecuador’s REDD+ policy. Note, however, that current calculations do not reflect soil organic carbon pools (MAE 2015b).

The actual national “REDD+ mechanism” (MAE 2013b) is yet to be established, and on-the-ground REDD+ activities have not yet been implemented. However, it is envisaged to link the country’s REDD+ roll-out with the Socio Bosque program (Fehse 2012).

Over the course of recent years and in parallel to the government’s REDD+ policy, voluntary private campaigns for REDD+ project crediting have been launched (Silvestrum 2015). As of yet, however, none have reached registration or commissioning. The Verified Carbon Standard reports one project in its development pipeline (VCS 2015); it concerns reforestation activities of degraded grasslands. It is unclear,



however, whether these projects will be allowed by the government to go ahead outside, or as part of, the country's REDD+ framework. The Ministerial Accord on REDD (MAE 2013b) excludes the possibility for non-government proponents to have "direct access" to carbon benefits but foresees what it calls "indirect access". As long as the details of such indirect access are not clear, however, and as long as the direct access to carbon commoditization is not established, potential proponents will be weary to engage. In this context, reference is also made to Article 75 of the Constitution, which, on the one hand, acknowledges individual rights to "benefit from environmental and natural resources", but on the other hand prohibits any "appropriation" of environmental services, while subjecting the usage and exploitation to State regulation. This leaves the potential for individual carbon campaigns in the forest sector somewhat in limbo. A forthcoming Environmental Code (Código Ambiental) may clarify matters.

### 3.6 Other climate finance initiatives

Ecuador was among the first countries to host carbon projects under the Clean Development Mechanism. Today, it hosts about 30 projects countrywide (CDM 2016) across sectors (mainly hydro, biomass, landfill (with biogas), agriculture, and wind). The number does not compare favourably with the CDM's big four (China, India, Brazil and Mexico), but it is in the same range as neighbouring Peru and it shows a robust base capacity for carbon project campaigns.

Ecuador has been a vocal supporter of new mechanisms under the UNFCCC (UNFCCC 2012) and appears to embrace individual carbon project initiatives, at least those outside the LULUCF sectors. Ecuador has so far shown less enthusiasm for other climate finance formats. Ecuador made no submission on nationally appropriate mitigation actions (NAMAs) under the Copenhagen Accord, and none to the UNFCCC NAMA Registry. Two NAMA initiatives are under development (Ecofys 2015) nonetheless (concerning the transport sector). The country may have witnessed a set-back in its enthusiasm for climate finance projects when international donors pulled out of the proposed Yasuní Ishpingo-Tambococha-Tiputini (Yasuní ITT) initiative, whereby the government hoped to attract large amounts of USD in exchange for the commitment not to exploit the Yasuní National Park, an area in the Amazonian rainforest of high biodiversity, for its proven large oil reserves.

Ecuador has not yet engaged in the preparation of a National Adaptation Plan (NAP) under the Cancún Adaptation Framework. In its Climate Change Strategy 2012-2025, the government acknowledges that the loss of mangroves threatens the reproduction of fish and crustaceans and announces the adoption of a National Adaptation Plan (MAE 2012). At the time of writing, this plan had not been issued. In its second national communication (MAE 2011), submitted in 2012, Ecuador commits to "promote adaptation programs" and to "incorporate risk management to territorial planning", while referencing a previous GEF project on adaptation. Concrete policy objectives were missing, however.

### 3.7 Integrated Coastal Zone Management

Information around Integrated Coastal Zone Management (ICZM) in most developing countries, even those which are considered 'successes' – such as Ecuador – rarely appear in the literature. The history of ICZM in Ecuador goes back to 1983 when USAID became the first international assistance institution to create an ICZM to assist developing nations. Ecuador was one of the beneficiaries of this early step towards coastal management. The result of this was Ecuador's first national coastal management program to be supported by a loan from the Inter-American Development Bank (Olsen 2000).

In Ecuador, ICZM is implemented under Executive Decree 3399 from 1992 (Decreto de Constitución y Reglamentos del Programa de Manejo de Recursos Costeros, PMRC) and governed through an inter-agency committee placed at the highest level of government and composed of seven key ministries, to serve both as a coordinating and decision-making body. The PMRC has since been eliminated and established under the Undersecretariat of Marine and Coastal Resources in the MAE. The underlying ICZM legislation is not very extensive but concentrates on declaring policy and designating and allocating institutional responsibilities. Ecuador's 'parallel' approach to ICZM program design includes a national policy and strategic framework alongside community level projects. National and regional NGOs, either interested in the entire coast or aspects of it, have played an important role in supporting and coordinating coastal management efforts. The Fundación Pedro Vicente Maldonado has played an important role in developing the partnership with government and communities (Robadue, 1995). Training for community level management has also contributed to local management capacity. There is a particular emphasis on local level management through Special Area Management (SAM) initiatives. In Ecuador, SAMs are the primary vehicle through which the national ICZM framework is implemented (Meltzer 1998).

Under ICZM in Ecuador, the coastal zone is defined by the specific issue to be addressed, acknowledging the limitations of legally established boundaries for transboundary ecosystems. It is however unclear (a) how this relates to blue carbon ecosystems, and (b) to what degree ICZM has in itself been successful in supporting the conservation of blue carbon ecosystems in light of pressures from shrimp farming.

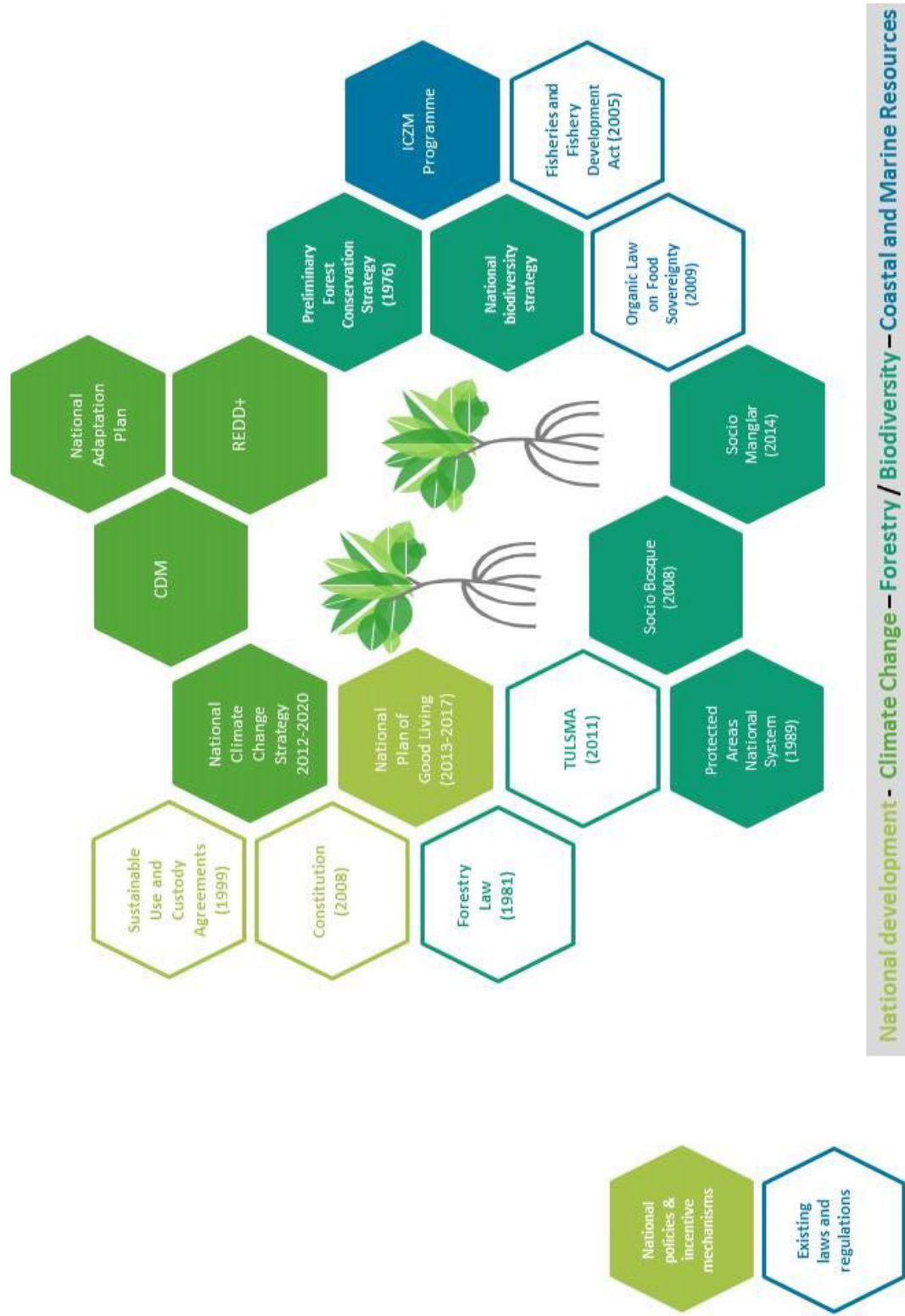


Figure 3: Existing national laws, policies and initiatives with an impact on blue carbon ecosystem management.







## 4. Gaps, challenges & opportunities

The goal of this report is to showcase the myriad of legal and policy instruments with an influence on mangrove management – from national development and climate change to forestry and biodiversity as well as coastal and marine resources (see Figure 3) – and to provide an outlook on gaps, challenges and opportunities of the existing framework (Figure 4). These will be addressed again in more detail in the synthesis study comparing the five country analyses (see Figure 1).

Despite a sound legal protection status for mangroves and the implementation of important incentive schemes for mangrove protection, deforestation and mangrove degradation are ongoing. Restoration activities, on the other hand, appear not to have advanced much. The most recent mangrove area figures show continuous decline. In its submission to the UNFCCC on forest reference levels, Ecuador reported a net-loss of more than 1,100 hectares annually between 2000 and 2008 (MAE 2015b).

Overall there is, however, a notable lack of information on published reforestation data and activities on the basis of Presidential Decree 1591 from 2008.<sup>9</sup> The situation needs to be thoroughly examined. Concerning central-level planning, mangroves do not appear to be targeted by the National Forest and Reforestation Plan (PNFR 2015). The Ministry of Environment did commission a study on criteria for priority mangrove reforestation in the past (Briones 2009) and it commissioned another study in 2014, which identified an area of 1,600 hectares to be most suitable for initial mangrove reforestation (Astudillo et al 2014). The Ministry of Environment also recently signed a Reforestation Agreement with the shrimp farm industry and civil society (MAE, 2015d), the details of which have not yet been published, and others are reported to be under way. These are promising developments to recover some of the mangrove areas lost.

There are many drivers for the continuing deforestation trend. A comparative analysis between the relatively undisturbed Cayapas Mataje and the heavily degraded Muisne Estuary suggests that the level of development of the local shrimp industry and the availability of access and transport ways are decisive factors (Hamilton & Collins 2013). In Cayapas Mataje, a hard-to-get-to location, shrimp farms arrived late and remained at low-intensity levels. Local communities here report violations of the law and are active campaigners against the industry. The fairly accessible Muisne Estuary, by contrast, has a strong shrimp farm industry supported by the local population, as outlined by Hamilton & Collins 2013. There are, however, environmental groups actively contesting the industry (Ecuadorinmediato 2016; CCONDEM 2016).

In both case studies, the relative absence of the state and its local enforcement authorities is notable. The constitutional push towards decentralization, including a range of responsibilities

from planning to land records and, notably, environmental management (Ocampo-Thomason, 2005), in the first decade of this century may have had the unintended effect of weakening the institutional capacity to protect mangrove forests. It is not apparent that the lower levels of government have been provided with the relevant technical and financial resources to assume devolved competences (ibid.).

The institutional capacity within MAE and local authorities with devolved competences aside, MAE is still not given the sole responsibility for shrimp farm concessions in mangrove areas. While the Ministries of Industry and Defence play a lesser role today, it is the Ministry of Agriculture, Cattle, Aquaculture and Fisheries which is to regularize any shrimp pond established before the year 2000 (i.e., 22 years after the shrimp pond construction was banned in Ecuador), as long as the location is outside the SNAP and as long as the operator commits to marginal reforestation (10%-30%). The MAE is given a supportive role alone and cannot even intervene when operators fail to honour reforestation commitments. Operators need not show that ponds are still in operation, which secures operator rights even to shrimp ponds that have long fallen out of use. Equally, it is not the MAE, but the Ministry of Agriculture, which is responsible for the seizure of illegal shrimp farms, of which – given the ongoing deforestation rates – there are many. As seizure does not happen on any significant scale, opportunities for reforestation are not tapped into.

While case studies show important improvements, it is not clear to what extent shrimp farm operations today are robustly regulated and enforced in terms of hygiene, larvae sourcing, pond size, liabilities for environmental spills, and more. While closer assessments are needed, it is noted that a lack of regulation and enforcement in the past has increased pressure on remaining mangrove areas as a whole.

The programs on sustainable use and custody agreements and Socio Bosque/Socio Manglar have so far (in parts) shown robust results, but the rollout is slow, and wide segments of the local population are (so far) excluded. Efforts and initiatives to work with local communities need to be expanded with care, and hopefully further results will be available in the near future. Long-term technical support with the management of the concessions, as well as with reporting or other administrative duties, could provide the needed support to local communities (for example, by NGOs or universities). The target to reach 100,000 hectares within four years seems overly optimistic. It may only be reached, if the process for accessing Socio Manglar (which currently requires the pre-existence of a sustainable use and custody agreement) will be simplified; the effective period extended (above 10 years); and a mechanism included, which targets the reforestation of abandoned and illegal shrimp ponds, in particular. A combination of Socio Manglar and a project-carbon-based approach, extending explicitly to mangrove reforestation, within the framework of an internationally supported NAMA may be an appropriate

<sup>9</sup>According to Andes 2013, MAE did evaluate more than 1,000 regorestation campaigns based on the Presidential Decree, however; the author is not aware of the results having been published, however.

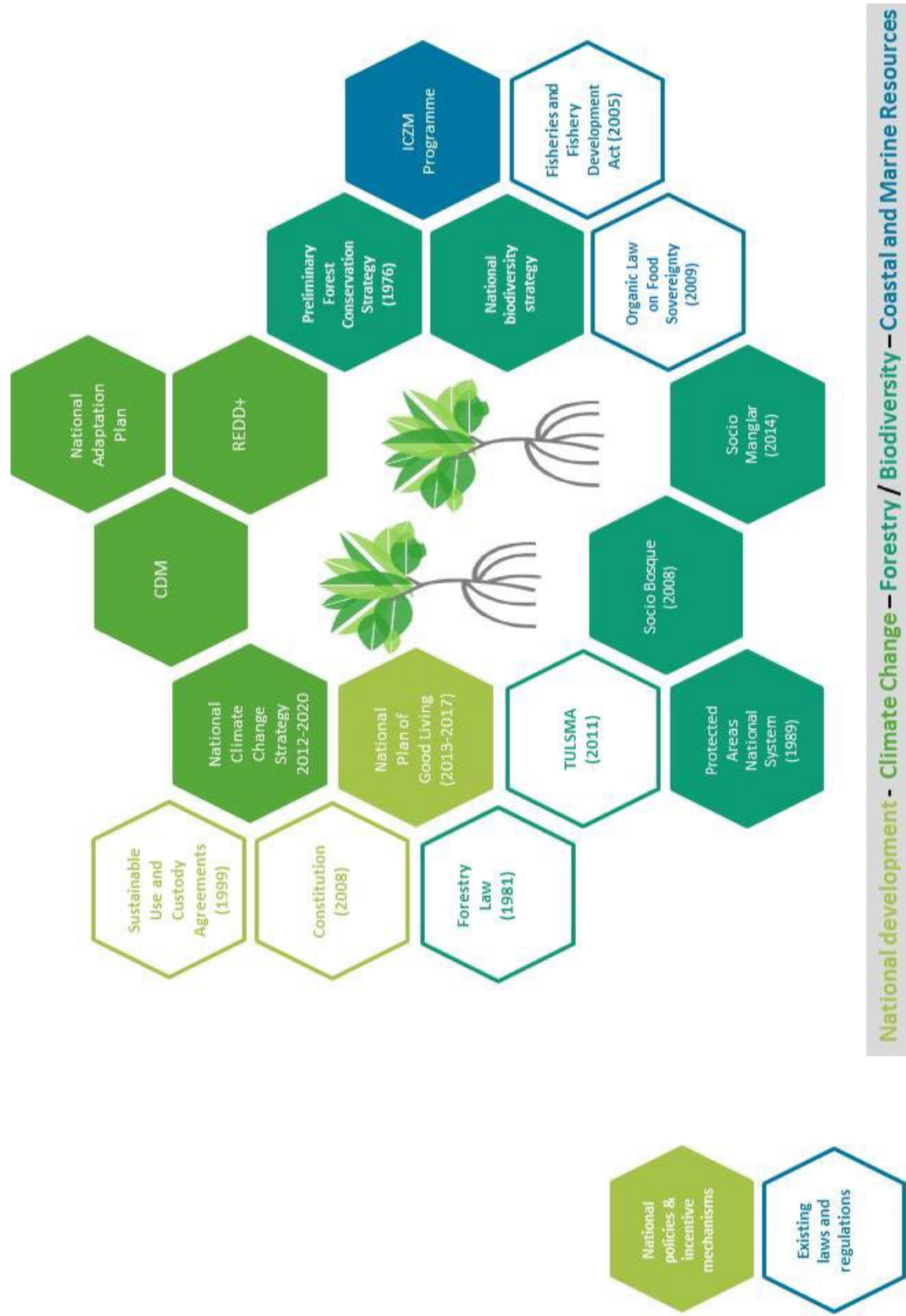


Figure 3: Existing national laws, policies and initiatives with an impact on blue carbon ecosystem management.



and effective way forward. Adding a carbon component may not only leverage dedicated international funding, but would also be a complementary tool for mitigation assessment and MRV within the REDD+ framework. Methodologies for carbon assessments could be used from existing standards, including the Verified Carbon Standard (VCS).

So far, voluntary carbon initiatives in the field of forestry and land-use are yet largely absent from Ecuador. As elsewhere in the world, the establishment of a REDD+ framework adds uncertainty in that the national policy may not allow project-based crediting in the future. Other than deciding whether and how to add a carbon component to the Socio Manglar program, it is crucial that the government completes its REDD+ mechanism on the ground in the shortest possible timeframe and clarifies whether project-based engagement will be allowed and integrated in the national REDD+ strategy through 'nesting' or other instruments. A possible framework for such clarification may be the new Environmental Code, which is currently being debated by the legislative bodies.

The use of the current NBPAS has been limited, as it is outdated (2001-2010) and has not been fully and successfully implemented. Ecuador finished the development of a new

biodiversity strategy but this has not yet been approved by the authorities. This could be an opportunity to 1) highlight the role of mangroves for climate change mitigation (and adaptation); 2) to highlight the economic value of mangroves, their contribution to sustainable development, education and health; and 3) to ensure the management of mangroves is addressed in a cross-cutting manner – via the various laws and initiatives outlined in this report (see also Figure 2). There is a need to foster a more synergistic implementation of various international agreements addressing the same ecosystems from different angles and using different policy mechanisms.

ICZM is an ongoing process in Ecuador, but the scant literature does not reveal much about detailed steps of implementation, and how the role and value of blue carbon ecosystems, in this case mangroves, is integrated into planning processes. This is an area for future research and analysis, to ensure the suite of legal and policy instruments – from national development and climate change to forestry and biodiversity as well as coastal and marine resources – are working in a synergistic manner.



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