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| Defra International Climate Finance (ICF) |
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| A 2018 ICF Business Case |

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Table of Contents

[1. Intervention Summary 4](#_Toc527027956)

[1.1. UK Support 4](#_Toc527027957)

[1.2. What are the main programme activities? 4](#_Toc527027958)

[1.3. Why deliver through the Inter-American Development Bank (IDB)? 5](#_Toc527027959)

[1.4. How does the programme align with our strategic objectives? 5](#_Toc527027960)

[1.5. What are the expected results? 6](#_Toc527027961)

[1.6. What are the key risks to the programme? 6](#_Toc527027962)

[2. Strategic Case 7](#_Toc527027963)

[2.1. Global Context – HMG’s International Commitments 7](#_Toc527027964)

[2.2. Defra’s strategic objectives 7](#_Toc527027965)

[2.3. Why Mangroves? 11](#_Toc527027966)

[2.4. Rationale for Intervention: Threats to Mangroves 14](#_Toc527027967)

[2.5. Existing Approaches to Mangrove Conservation 16](#_Toc527027968)

[2.6. Synergies with wider work 19](#_Toc527027969)

[3. Appraisal Case 22](#_Toc527027970)

[3.1. Summary 22](#_Toc527027971)

[3.2. Introduction 22](#_Toc527027972)

[3.3. Shortlisting Options 24](#_Toc527027973)

[3.4. Options Appraisal 25](#_Toc527027974)

[4. Commercial Case 41](#_Toc527027975)

[4.1. Competency of the Organisation to Deliver in Country 41](#_Toc527027976)

[4.2. DfID’s ‘Central Assurance Assessment’ (CAA) 43](#_Toc527027977)

[4.3. Compliance with gender sections of 2002 International Development Act 43](#_Toc527027978)

[4.4. Procurement Policies 44](#_Toc527027979)

[4.5. Ensuring results are delivered at agreed cost 45](#_Toc527027980)

[4.6. Commercial Risk 45](#_Toc527027981)

[4.7. State Aid 46](#_Toc527027982)

[5. Financial Case 47](#_Toc527027983)

[5.1. Expected Costs 47](#_Toc527027984)

[5.2. Affordability 49](#_Toc527027985)

[5.3. Expected Agents and Beneficiaries 49](#_Toc527027986)

[5.4. Reporting and Accounting for Funds 49](#_Toc527027987)

[5.5. The IDBs Financial Strengths and Weaknesses 50](#_Toc527027988)

[5.6. Financial Accounting Considerations 51](#_Toc527027989)

[5.7. Avoiding Fraud and Corruption 53](#_Toc527027990)

[6. Management Case 56](#_Toc527027991)

[6.1. A Single Donor Trust Fund 56](#_Toc527027992)

[6.2. Management and Governance Arrangements 56](#_Toc527027993)

[6.3. Monitoring and Evaluation Governance 57](#_Toc527027994)

[6.4. Risks 59](#_Toc527027995)

[7. Annexes 61](#_Toc527027996)

[7.1. Sensitivity Analyses 61](#_Toc527027997)

[7.2. Theory of Change – IDB 65](#_Toc527027998)

[7.3. Theory of Change – SMF 66](#_Toc527027999)

[7.4. IDB Detailed Drawdown Schedule and Budget 67](#_Toc527028000)

[7.5. Choice Matrix for ICF Mangroves Program Delivery Mechanism 68](#_Toc527028001)

[7.6. Results of Multi-Criteria Analysis on Mangrove Country-level Prioritisation 69](#_Toc527028002)

Table of Figures

[Figure 1: Delivery niches of the three ICF departments 9](https://sp.demeter.zeus.gsi.gov.uk/Sites/aa16/INT/ICF/ICF%20Spend_%202017-2020/Mangroves/ICF%20Mangroves%20Business%20Case%202018/Mangroves%20Business%20Case%20-%20All%20sub-cases.docx#_Toc523990655)

[Figure 2: 2018 Cross-Government ICF Results 10](#_Toc523990656)

[Figure 3: Current Defra ICF portfolio 11](#_Toc523990657)

[Figure 4: Indicative ToC for a Defra ICF mangroves intervention 19](https://sp.demeter.zeus.gsi.gov.uk/Sites/aa16/INT/ICF/ICF%20Spend_%202017-2020/Mangroves/ICF%20Mangroves%20Business%20Case%202018/Mangroves%20Business%20Case%20-%20All%20sub-cases.docx#_Toc523990658)

[Figure 5: Appraisal Summary – Cost-benefit Analysis 22](#_Toc523990659)

[Figure 6: Proposed Projects for ICF-IDB Blue Carbon Program 27](#_Toc523990660)

[Figure 7: Cost and Benefit Summary for ICF-IDB Mangroves Programme 29](#_Toc523990661)

[Figure 8: DAC-eligible Countries with Mangrove Dependent Species, Top 10 33](#_Toc523990662)

[Figure 9: Proposed Projects for Sustainable Mangroves Facility 35](#_Toc523990663)

[Figure 10: Cost and Benefit Summary for the Sustainable Mangroves Facility 36](#_Toc523990664)

[Figure 11: Alignment of IDB with UK priorities from DfID’s MDR 42](https://sp.demeter.zeus.gsi.gov.uk/Sites/aa16/INT/ICF/ICF%20Spend_%202017-2020/Mangroves/ICF%20Mangroves%20Business%20Case%202018/Mangroves%20Business%20Case%20-%20All%20sub-cases.docx#_Toc523990665)

[Figure 12: a) Procurement Processes and b) the Selection of Consultancy Services 45](#_Toc523990666)

[Figure 13: Summary of perceived commercial risks 46](#_Toc523990667)

[Figure 14: Expected staff resource implications of this Defra ICF intervention 48](#_Toc523990668)

[Figure 15: IDBs Organisational Strength Index as part of DfID’s MDR in 2016 50](#_Toc523990669)

[Figure 16: Provision for the return of any uncommitted funds to Defra from IDB 55](#_Toc523990670)

[Figure 17: Perceived management risks with Defra ICF intervention delivered through IDB 60](#_Toc523990671)

# Intervention Summary

## UK Support

### What support will the UK provide?

Approval is sought to invest in the *Sustainable Management, Conservation and Restoration of Mangrove Habitats.* This investment will support climate change mitigation through the reduction and avoidance of greenhouse gas (GHG) emissions from anthropogenic degradation of mangrove ecosystems and through enhancing carbon sequestration through agriculture, forestry and other land use (AFOLU) activities. Other benefits focused on climate change adaptation, biodiversity conservation, poverty alleviation and coastal zone management are also expected.

Defra will provide £12.75 million of official development assistance (ODA) funding through International Climate Finance (ICF) over an investment period of six years. Defra does not expect reflows from the investment and any returns from blended finance mechanisms will be redeployed into projects as grants before the end-term evaluation of the programme.

### Why is UK support required?

Climate change is one of the biggest threats to our national, economic and environmental security and we need to act now in order to avoid more detrimental and costly effects in the future. According to the World Bank, 100 million people are at risk of being pushed into extreme poverty by rising temperatures and increasing floods by 2030[[1]](#footnote-2), with associated political instability and migration.

As part of the Paris Agreement, the UK - alongside 195 other countries - committed to act together to keep a global temperature rise to below 2 degrees. Developed countries have confirmed a collective commitment to mobilise $100bn of climate finance a year by 2020 from public and private sources to help developing countries mitigate and adapt to climate change. Through ICF, the UK demonstrates that we are delivering against that goal.

The UK’s International Climate Finance was set-up in 2011 with the aim to help developing countries access support to tackle climate change and move to a pathway of sustainable economic growth. Since then ICF has evolved and grown, most recently the Prime Minister committed to provide ‘at least’ £5.8bn of climate finance to developing countries between 2016 and 2020.

Mangroves and their “Blue Carbon” environments can play a significant role in reducing emissions, while also supporting biodiversity and fisheries habitat protection; contributing to the wellbeing and prosperity of coastal communities and reducing the effects of natural disasters. However, they are also one of the most threatened forest ecosystems with more than 35% of the world’s mangroves thought to have been lost; in some regions they are cleared faster than tropical rainforests.

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## What are the main programme activities?

In the preferred option delivered with the Inter-American Development Bank (IDB) the programme will be used to accelerate the development of the Blue Economy of key countries in Latin America and the Caribbean (LAC) by catalysing and mobilising strategic public and private sector investments in Blue Carbon sector and closely linked thematic areas such as sustainable fisheries, sustainable aquaculture, coastal zone management, payment for ecosystem services and eco-tourism. The program will target the main drivers of degradation and barriers to the conservation and sustainable management of mangrove forests in both the public and private sectors.

There will be a focus on incentive-based instruments, which will be implemented via the various financial products of the IDB Group including technical cooperation grants, loans, high-risk investment grants and equity, tailored to the intervention to maximize value for money.

## Why deliver through the Inter-American Development Bank (IDB)?

The UK has built a close working relationship with the IDB, through DFID, BEIS and ongoing Defra investments; our shared experience has been very positive. Our approach to the implementation of countries’ commitments under the Paris Agreement and the direct links to sustainable development very much align with the IDB’s strategy. Both colleagues at BEIS and within Defra have given positive feedback on working with the IDB, particularly around their flexibility and client focus. Although this intervention would be separate to other UK funds and allow for a different focus it would utilise and built on this positive and effective delivery relationship.

An additional advantage of working with the IDB is their reputation locally, connections to partner Governments, and that their core activities are closely joined up with their private finance arm. Our programme will therefore aim to draw on these cross-sectoral expertise, while building on the effective network that the IDB has developed over the years throughout Latin America and the Caribbean (LAC).

DFID have recently performed a Central Assurance Assessment (CAA) of the IDB and found the IDB to be “a minor risk partner for DFID, in terms of central systems and processes. It carries no unacceptable fiduciary or reputational risks” (CAA, 2017). The IDB was also one of the only 7 international organisations that qualified for the top ranking of “Very good” in transparency, in the 2018 Aid Transparency Index.

## How does the programme align with our strategic objectives?

In addition to the UK’s international climate commitments outlined above, there are strategic synergies to be found across government from this intervention. It would:

1. Fit the ICF strategic profile of avoiding GHG emissions, reducing pressure on remaining forests, improving forest management and promoting sustainable land use.
2. Build on the strong oceans leadership the UK has shown at the Commonwealth Heads of Government Meeting and demonstrate a continuing commitment to tackle climate issues that affect all Commonwealth countries;
3. Encourage collaborative working with BEIS on forest monitoring, inventories and other systems for monitoring mangroves;
4. Be relevant to the Prime Minister leading the resilience theme at the UN Secretary General’s climate summit in 2019.
5. Bring benefits from climate change mitigation that can be quantified towards the countries’ NDC pledges.

## What are the expected results?

The expected impacts for the programme are:

* 2,912,000 tonnes of GHG emissions sequestered or avoided
* 5570ha of mangroves restored or protected
* £48m of ecosystem services restored or protected[[2]](#footnote-3)

The program will be designed to concurrently deliver significant livelihoods benefits for program recipients, though further detailed scoping in cooperation with the project partner is required to quantify the number of people who will benefit.

## What are the key risks to the programme?

Some of the key financial, commercial and management risks are as follow. More detailed risks are described in the relevant sub-case sections and where appropriate given a RAG rating.

* **Exchange rate risk** between the USD and GBP, further depreciation of the Pound Sterling could translate into execution limitations for the programme.
* **Untested market** for implementing mangrove/blue carbon blended finance mechanisms.
* **Projected benefits not realised** or sustained beyond the lifetime of the programme.
* **Intervention design** oversights and overlaps with other HMG interventions
* **Limited impact** due to the limited scale of Defra ICF funding.

# Strategic Case

## Global Context – HMG’s International Commitments

Climate Change is one of the greatest challenges of our time and is a threat to economic and national security globally. According to the World Bank, 100 million people are at risk of being pushed into extreme poverty by rising temperatures and increasing floods, alongside associated political instability and migration, by 2030. It will have the greatest impact on the poorest and most vulnerable in the developing world, including girls, women and other marginalised groups. Geographically it particularly effects low-lying areas, fragile states and increasingly crowded urban areas. The evidence clearly suggests that a key driver of poverty and a constraint on sustainable and inclusive growth is the unsustainable exploitation of natural resources.

At the Paris UN Climate negotiations in 2015 (UNFCCC, COP21) the UK signed up to a collective pledge with Germany and Norway that will make up to $5bn available to support international efforts to tackle deforestation. This was also a historic and significant step forward globally, with all 195 countries committing for the first time to make Intended Nationally Determined Contributions (INDCs) to keep the average global temperature rise to below 2°C and pursue efforts towards 1.5°C. Despite the USA withdrawing from this pledge, climate finance is still vital to support ambitious action by developing countries to mitigate and adapt to climate change, and to implement the Paris Agreement.

### Sustainable Development Goals

The UN’s 17 Sustainable Development Goals (SDGs), also known as the “Global Goals”, recognise the importance of integrating climate issues as part of good development assistance. The SDGs are a universal call to action to end poverty, protect the planet and make sure that all people enjoy peace and prosperity. Delivering the relevant environmental aspects of UN Sustainable Development Goals (Agenda 2030) for the UK requires cross-government, cross-industry and individual participation and there is a huge socio-economic and environmental dividend to be gained through SDG implementation. The Business & Sustainable Development Commission has estimated that the economic prize to business of implementing the SDGs could be up to US$12 trillion (£9 trillion) globally by 2030.

There are two SDGs that specifically relate to ICF forestry projects:

* **SDG 13** focuses specifically on urgent action on climate change and the commitments made by developed nations to support developing countries in tackling climate change through mobilisation of climate finance.
* **SDG 15** focuses specifically on managing forests sustainably, restoring degraded lands and successfully combating desertification, reducing degraded natural habitats and ending biodiversity loss.

## Defra’s strategic objectives

Defra’s 25 Year Environment Plan (25 YEP) sets out a strategy for the department’s ambitious long term aims, and the positive differences we will make to the environment of the UK and beyond. Delivering ICF investments to combat climate change is an integral part of delivering Defra’s objectives on the international stage. The 25 YEP includes a chapter on protecting and improving our global environment which includes commitments to:

* Provide international leadership and lead by example in tackling climate change and protecting and improving international biodiversity.
* Help developing nations protect and improve the environment by providing assistance and supporting disaster planning.
* Support and protect international forests and sustainable agriculture.
* Leave a lighter footprint on the global environment by enhancing sustainability and supporting zero deforestation supply chains.

Climate change poses a significant threat to agricultural production and food security, whilst also contributing significantly to the problem. It is in the UK’s interests to encourage others to take action on sustainable development that results in reduced emissions to limit the impacts of climate change. The UK agriculture sector is already a world leader in both reducing greenhouse gas emissions and adapting to climate change and we are in a unique position to do this by in providing expertise through climate finance investments.

Forests support the livelihoods 1.6 billion of the world’s poorest people. Over 350 million poor people depend almost entirely on forests for their subsistence and survival. Conserving and restoring forests also helps vulnerable communities become more resilient to climate impacts. Some of the most cost-effective climate change adaptation options involve conserving or restoring forests rather than creating new infrastructure.

### Climate Finance

The UK is one of the world’s leading donors of climate finance and is playing its part in the goal to mobilise $100 billion per year by 2020. Alongside others, the UK will provide at least £5.8bn from the UK aid budget between 2016 and 2021 as climate finance which will continue to provide strong support to help vulnerable developing countries adapt to climate change and take up sustainable, low carbon, resilient and inclusive development.

The main objectives of Climate Finance endorsed by the ICAI (Independent Commission for Aid Impact) are:

* To demonstrate that building low carbon, climate resilient growth at scale is feasible and desirable.
* To support International Climate Negotiations particularly through providing support for adaptation in poor countries and building an effective international architecture.
* To recognise that climate change offers real opportunities to drive innovation and new ideas for action, and create new partnerships with the private sector to support low carbon climate resilient growth.

More specifically, International Climate Finance (ICF) is the primary mechanism by which the UK meets its international forest commitments, and all projects within Defra’s (ICF) portfolio contribute to the following commitments:

* Playing a leading role in supporting developing countries tackle the drivers of deforestation. This was reiterated in the New York Declaration on Forests in 2014 which committed to halve the rate of global deforestation by 2020 and halt it by 2030.
* Working alongside Germany and Norway, to invest $5 billion between 2015 - 2020 to support countries that are reducing emissions from deforestation and forest degradation. ICF represents the UK’s contribution to this $5 billion, with approximately 20% of ICF funding aimed at deforestation projects.

ICF also aims to support international poverty eradication by:

* Helping countries, communities and individuals to manage risk and build their resilience to the effects of climate change;
* Helping to drive sustainable and inclusive economic development which prevents emissions now or in years to come by supporting countries shift to cleaner, low carbon approaches; and
* Promoting good governance of, and equitable access to, natural resources such as land, water, forests and ecosystems, and tackling causes of insecurity and conflict

### ICF’s Strategic Objectives

ICF is helping poor countries adapt to climate change, supporting the creation of jobs and livelihoods to reduce poverty, reducing greenhouse gas emissions and promoting sustainable economic growth. It focuses on three key areas:

* Supporting growth and trade that uses natural resources in a sustainable way, building up rather than depleting assets – such as forests – for the future;
* Building resilience of people, businesses and economies to increases in weather-related disasters or changes in climate trends;
* Low-carbon growth, which exploits the economic benefits of clean energy technologies and helps poor people to access clean energy.

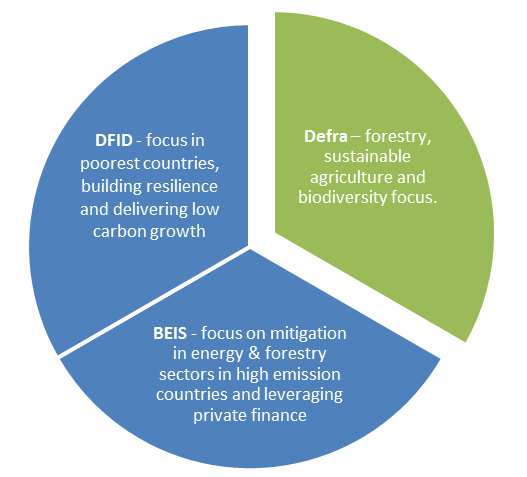
The ICF is delivered by three UK government departments, DfID, BEIS and Defra, with DfID and BEIS delivery a majority of the aid.

Figure 1: Delivery niches of the three ICF departments

Defra’s contribution to the ICF enables the UK to meet its international commitments to support developing countries protect the world’s most biodiverse forests; promote sustainable livelihoods through improved land use and low carbon agriculture; and contribute to global food security and resilience to climate change.

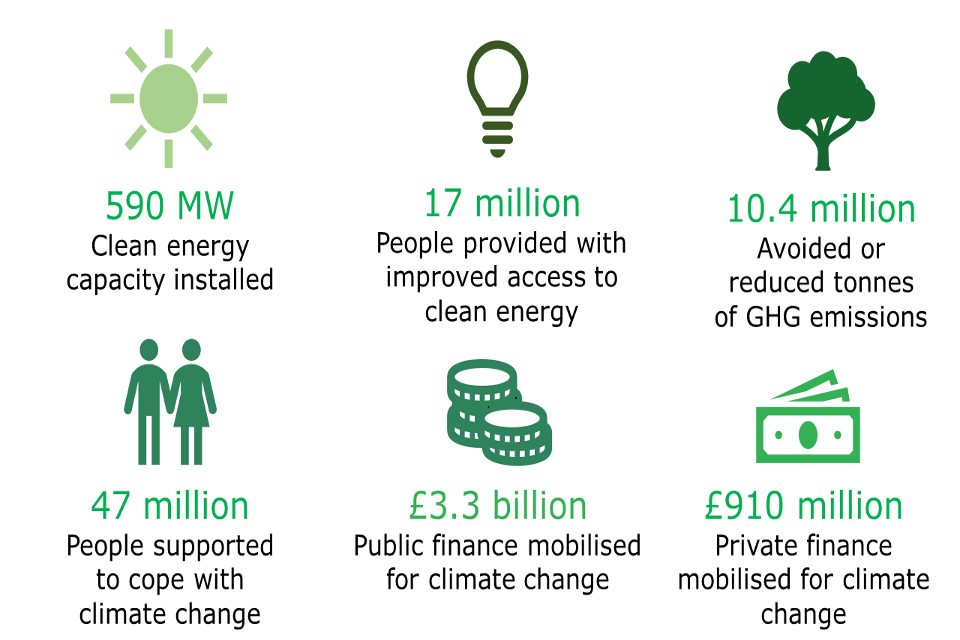
Defra’s engagement ensures that ICF projects balance the objectives of BEIS (large scale climate mitigation) and DFID (poverty alleviation) with Defra objectives on sustainable natural resource management, food security and biodiversity. To achieve this Defra secured a £210m share of the £5.8 billion in climate finance for 2016-2021. Defra expertise and capacity is essential to achieving these goals. Defra has committed to invest in International Climate Finance projects that will:

* Secure biodiversity benefits;
* Support sustainable agriculture and global food security;
* Maximise the power of the private sector; and
* Contribute to research and development.
* Reduce the impact of climate change on the environment

Any intervention delivered through ICF should consider the impact on gender equality and compliance with domestic and international law particularly in relation to counter terrorism; in the context of DfID principles on these. Financing of terrorism is a serious threat even though instances of aid diversion are rare.

### ICF Results 2018

Across HMG there is a commitment to understanding and measuring the impact of ICF investments, and a set of key results are published annually; summary of the 2018 results is below.



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Figure 2: 2018 Cross-Government ICF Results

### Defra’s current ICF portfolio

Defra has invested £228m since 2011 into ICF projects (see summary *Figure 3* below) around the globe to avoid 37mtCO2e and 500,000ha of avoided deforestation. The existing portfolio of programmes includes:

|  |  |
| --- | --- |
| **Programme** | **Value (£m)** |
| Low Carbon Agriculture for Avoided Deforestation and Poverty reduction in Brazil. | 54.9 |
| Reducing Deforestation in the Brazilian Cerrado, Brazil | 10 |
| The BioCarbon Fund – Initiative for Sustainable Landscapes | 65 |
| Ecosystem Conservation and Management Project- Sri Lanka | 19.5 |
| eco.business Fund – Sustainable forest consumption practices in South America | 20 |
| Blue Forests mangrove conservation and sustainable livelihood promotion | 10.1 |
| Knowledge for Forests Programme (KNOWFOR) policy and strategy work | 7 |
| The Global Environment Facility 6 and 7 | 142 |

Figure 3: Current Defra ICF portfolio

### Current ICF and Wider Defra Investment in Mangroves

UK climate finance takes a ‘portfolio approach’ to addressing deforestation and transforming land management, testing different but complementary approaches. Since the start of the ICF in 2011, the UK has spent just over £800 million on forest and land use programmes. Mangrove programmes fit the strategic profile of promoting sustainable land use, improving forest management, reducing pressure on remaining forests and avoiding GHG emissions.

Although the UK currently invests both bilaterally and multilaterally into mangrove conservation efforts (through the below funding mechanisms) additional mangrove work would allow us to continue to diversify our portfolio which has historically had a tropical rainforest focus.

#### ICF – “Blue Forests” Project

In 2016 Defra Ministers approved the ICF Blue Forests project, managed by UK NGO Blue Ventures, to reduce deforestation of mangrove habitat, create new sustainable livelihoods, support community health and women’s empowerment and increase climate resilience in coastal communities. This project will initially be executed in Madagascar, expanding to Indonesia and an additional country in south-east Asia.

Planned investment in the programme is £10.1 million over a period of seven years. The total impact is intended to be 20 years under the expectation of leveraging additional funding from the private sector for the remaining time. This programme is projected to protect around 20,000 hectares of mangrove forests; deliver approximately 13.9 million tonnes of carbon dioxide savings and benefit over 100,000 people.

An Annual Review was undertaken on the project’s first year was undertaken in December 2017 where it received an overall rating of “A” and delivered as expected against all output indicators.

#### ICF – The Global Environment Facility

The Global Environment Facility (GEF) alongside its various co-financing partners has invested in 25 projects with a mangroves conservation element to their objectives. They vary from approval to completion phase and are being delivered globally. These range from the newly approved “Sustainable Community Based Management and Conservation of Mangrove Ecosystems” project in Cameroon to the completed “Integrated Ecosystem Management” project in Mexico. Defra has already invested £42 million in the GEF and have an additional £50 million committed until 2020/21.

#### The Darwin Initiative

Similarly Defra’s Darwin Initiative has funded multiple projects with a mangroves focus including one scoping project and several Darwin Initiatives projects that have now completed including one work in Madagascar and Ecuador.

## Why Mangroves?

Mangroves – or “Blue Forests” – are some of the most carbon rich and productive habitats on earth whilst playing a critical role in supporting endangered biodiversity. Conservative estimates suggest that they provide at least $1.6 billion in ecosystem services and sequester 25.5 million tonnes of carbon each year[[3]](#footnote-4). In addition, hundreds of millions of coastal people rely on mangroves for their day to day livelihoods.

However, they are also one of the most threatened tropical ecosystems with more than 35% of the world’s mangroves thought to have been lost and in some places they are being cleared at a rate faster than tropical rainforests[[4]](#footnote-5). The erosion of coastlines, unsustainable use of coastal resources and loss of coastal livelihoods, reduces the capacity of developing coastal dependent communities to face the growing impacts of climate change. Through a combination of institutional and market failures, the communities dependent on mangrove forests often lack the knowledge base, management structures or property rights that could enable them to sustainably utilise mangroves long term. The valuation of and methodology behind mangrove ecosystem services is a new field with a lack of consistency and understanding which limits the ability of these communities to receive the true value from these habitats.

### The Value of Mangroves

Mangrove forests are comprised of unique plant species that form the critical interface between terrestrial, estuarine, and near-shore marine ecosystems in tropical and subtropical regions. They have been used by coastal communities for generations with the earliest reports from up to 20,000 years ago5. Mangroves continue to be of tremendous value to humanity through a range of environmental, social and economic ecosystem services. ICF analysts estimate the value of ecosystem services flowing annually from mangrove forests across the globe at upwards of £73bn[[5]](#footnote-6).

The spread and profusion of mangroves has been extensively studied and the total global area of mangrove forest cover is thought to be between 137,760 and 152,000 km2 across the 118-124 countries within which they are found; an area larger than the size of the England. These ranges can be accounted for by the recentness, differing spatial resolutions and remote techniques used by the studies referenced. The largest extent of mangroves are found in Asia (42%) followed by Africa (20%), North and Central America (15%), Oceania (12%) and South America (11%). Approximately 75% of mangroves are concentrated in just 15 countries.

It is not only the distribution of mangroves that varies globally, the benefits and services that they provide also vary in significance and theme. The benefits of mangroves to those both directly and indirectly dependent on them can be broadly broken down into four categories: carbon (GHG mitigation); coastal resilience (adaptation); biodiversity; and natural resources. An ICF mangroves investment can cover all of these themes, however the region in which we deliver will have a considerable impact on which of these benefits will be the thematic focus of the programme.

#### Carbon Benefits (Mitigation Benefits)

The carbon richness of mangrove soil means that they are able to store up to six times the amount of carbon than primary tropical rainforest. The deforestation of tropical coastal wetlands such as mangrove forests contributes disproportionately to anthropogenic greenhouse gas emissions. High carbon densities per unit area coupled with high deforestation rates mean that emissions from the degradation of mangroves could be as high as 10% of the total emissions from deforestation globally, even though mangroves account for only 0.7% of tropical forest area[[6]](#footnote-7). Outside of the tropics, global mangrove deforestation may be contributing as much as 4% of the anthropogenic Forest and Other Land Use (FAOLU) GHG emissions to the atmosphere despite mangroves only making up 0.3% of the world’s forest. FAOLU emissions make up approximately 24% of global emissions across all sectors and deforestation is estimated by the IPCC to contribute four fifths of this.[[7]](#footnote-8)

Indonesia for example has 23% of the world’s mangrove habitat but also the highest potential annual emissions due to mangrove deforestation – approximately 50% of the potential global total emissions from mangroves[[8]](#footnote-9) - and emissions from deforestation and degradation of mangroves in Mexico are thought to be 31 times greater than the values used to determine national emission reduction targets for the Paris Agreement[[9]](#footnote-10). Conserving the mangrove forests in these regions is critical to avoiding further GHG emissions.

#### Coastal Protection (Adaptation Benefits)

Mangroves are on the front line to many coastal hazards. The fact they thrive in many coastal settings indicates their ability to cope with such hazards or recover from major impacts. They often modify coastlines through their ability to attenuate waves, capture sediments and build soils. Wave height can be reduced by up to 66% for every 100m of mangrove habitat breadth; large established mangroves can attenuate storm surges by up to 50cm surge height per kilometre of mangrove; mangrove belts several hundred meters wide have been shown to reduce tsunami height by between 5 and 30%; and other connected ecosystems like sand dunes, barrier islands, saltmarshes, seagrasses and coral reefs all play an additional role in reducing waves action.

Those nations with a high percentage of mangrove cover by land area are increasingly sensitive to sea level rises or to the extreme weather events associated with climate change as mangroves are lost. The Philippines, Guatemala and the Solomon Islands for example, might fit into this category. Contrastingly, these countries, particularly the small island developing states (SIDS) have mangroves with lower than average biodiversity dependence and carbon stores.

#### Biodiversity and Endemism Benefits

Although the floral diversity of mangrove forests themselves are low their endemism is high; only 70 species make up the mangrove forests of the world compared to the 16,000 species of tree in the Amazon alone. According to the IUCN more than one in six of these mangrove species are now in danger of extinction and 40% of species are considered threatened[[10]](#footnote-11).

The fauna is equally endemic and threatened. One study found 48 bird, 14 reptile, 1 amphibian, and 6 mammal species to be endemic to mangroves, the majority of which are found in Asia and Australia with Malaysian and Indonesian mangroves, having some of the highest biodiversity and endemism in the world. IUCN also report that more than 40% of assessed mangrove-endemic vertebrates are globally threatened[[11]](#footnote-12).

Due to the high abundance of food and shelter, and low predation pressure below the water line, mangroves also form an ideal aquatic habitat for a variety of species. Tunicates, sponges, algae, and bivalves are prevalent as are motile fauna such as prawns, crabs and fishes. Although aquatic mangrove species are not typically as endemic as the terrestrial fauna, the multi-habitat dynamic of the mangrove forests significantly contributes to their biodiversity value.

#### Natural Resource Benefits

In some of the poorest parts of the world, coastal communities are dependent on mangroves for their subsistence. Countries such as Madagascar and Mozambique are particular examples. Mangroves function as nursery habitats for small and large scale, commercially important crab, prawn and fish species, and also support offshore fish populations and fisheries. They provide construction materials and firewood to rural populations living in and around them and various other livelihood or food security benefits depending on region. Most recently this has also included eco-tourism practices.

The potential for mangroves to support artisanal and industrial supply chains through their plentiful natural resources also jeopardises them and conversion to salt pans or shrimps farms are some of the biggest causes of anthropogenically driven mangrove loss.

## Rationale for Intervention: Threats to Mangroves

Despite their immense value, mangrove forests are subject to a variety of natural, climatic and anthropogenic threats which include but are not limited to coastal development, climate change, logging, aquaculture and agriculture. These have caused global rates of mangrove loss to peak at 3% per year at the end of the 20th century. However there are, and have been, high degrees of local and national variation. For example between 1968 and 1990 the Philippines lost 70.4% of its total mangrove habitat with an average rate of 5.4% and in the same period Thailand lost 53% at a rate of 2.5% a year. Both are much higher than the average rates of loss in other tropical forests.

### Traditional Threats

WWF has categorised the threats to mangroves under the following headings, however mangrove loss is often not attributable to a single driver like agriculture; instead, many natural and anthropogenic stressors can interact additively or synergistically, leading to rapid and large-scale die-offs in some regions.[[12]](#footnote-13)

* Clearing: Historically mangroves were seen as unproductive and cleared to make room for agricultural land, human settlements, infrastructure (such as harbours), and industrial areas. More recently, clearing for tourist developments, shrimp aquaculture, and salt farms has taken place. Clearing continues to be a major factor behind mangrove loss around the word.
* Overharvesting: Mangrove trees are used for firewood, construction wood, wood chip and pulp production, charcoal production, and animal fodder. While harvesting has taken place for centuries, in some parts of the world it is no longer sustainable, threatening the future of the forests.
* River changes: The human modification of waterways through dams and irrigation can reduce the amount of water reaching mangroves leading to inhospitable salinity changes and drying out. Increased terrestrial soil erosion from poorly managed land use can also increase the amount of sediment in reaching mangroves, smothering them.
* Overfishing: Many species of fish, including those of commercial importance, use the protection offered by mangroves as nursery sites and to replenish offshore fish populations when they reach their adult size. Some species show high dependence on mangroves of up to 100%, with adult populations significantly depleted in areas where mangroves are lost.[[13]](#footnote-14)
* So the global overfishing crisis effects and alters the ecological balance of food chains and aquatic communities within mangrove forests.
* Destruction of coral reefs: Coral reefs are the first line of coastal defence in many tropical coastal environments. When they are lost, waves and currents reach new areas of the coast undermining the sediments mangroves are dependent on for nutrient supply and seedling settlement and growth.
* Pollution: Fertilisers, pesticides, and other toxic chemicals carried by river systems can kill animals living in mangrove forests, while oil pollution can smother mangrove roots and suffocate the trees.
* Climate change and extreme weather: Mangrove losses as a result of climate change are mainly attributed to sea-level rise, high water events, storms, altered ocean circulation patterns, health of linked ecosystems, and socio-economic activities. Mangrove forests require relatively stable sea levels for long-term survival and are therefore extremely sensitive to current rising sea levels caused by climate change.

Other smaller scale factors commonly cause degradation rather than total loss of forest cover. These include disease which, in Bangladesh for example, “top-dying disease” has degraded 45 million hectares of trees (20% of the entire mangrove forest cover) and biological pests and parasites.[[14]](#footnote-15)

### Land Tenure and Ownership Rights

Outside of the list proposed by WWF there are also significant socio-economic threats to mangroves related to issues with access, land tenure and ownership rights. In fact one of the key reasons mangroves are being destroyed despite their importance for the livelihoods of so many people is that there is a lack of management or usage rights; the evidence on both sides reflects this. Studies at RAMSAR sites in Ghana showed that the existing ownership regime of mangrove resources directly effects the effectiveness of mangrove conservation in those regions.[[15]](#footnote-16) Work in the Ambaro-Ambanja Bay region of northwest Madagascar found that 81% of mangroves lacked any formal management arrangements. This lack of security allows third parties to exploit the mangroves without any legal consequences, while also decreasing local communities’ incentive to invest in the conservation and sustainable management of mangrove forests.

A key part of any programme therefore should seek to understand the legal structures that exist in the target region and work with local and national partners to establish these in a more transparent framework whilst developing an integrated approach that addresses some of underlying drivers of mangrove loss.

### Ecosystem Services

As with other types of deforestation, mangrove destruction also occurs because the value that mangroves provide to local ecosystems and global climate regulating services (such as CO2 sequestration and coastal protection) are not adequately compensated by existing markets. These market failures include:

* **Local externalities** such as where mangrove habitats support fisheries in the local area. Often those felling mangroves used for these purposes are not required to compensate the fishermen whose livelihoods are jeopardised.
* **Wider externalities** through ecosystem services which may not robustly support any particular market activity. For example it is possible to value the ability of mangroves to sequester carbon or support important biodiversity and yet currently those clearing the mangrove will value this service at zero. A mangrove programme that focusses on these additional ecosystem services should aim to value these services and report against them. One such methodology involves utilising the TEEB (The Economics of Ecosystems and Biodiversity) database and a value for mangrove habitats is currently under development.

## Existing Approaches to Mangrove Conservation

Mangrove protection and restoration is not new, however the scope and levels of success found by these projects has been varied. Lessons can be learned from the successes and failures of historical and existing interventions and these lessons should be incorporated into the design of any future programming.

The UN has identified several potential intervention strategies for governmental and non-governmental organisations to take action to halt the dramatic loss of mangrove forests. These measures range from traditional conservation approaches including the creation of designated protected areas; legislation restricting or prohibiting clearing; and education and restoration projects on local, national, regional, or international scales. These often involve local communities and organisations as stewards of mangrove ecosystems and sometimes allow sustainable harvest within project areas.

### Conservation through conventions and protected areas

Utilising international conventions to protect mangroves is commonplace. The Ramsar Convention already protects mangrove forests at 278 locations across 68 countries (as of 2014) and 26 UNESCO designated sites have mangrove habitat within their boundaries. The percentage mangrove loss within Ramsar sites was on average found to be 75% lower than the global average mangrove loss at 0.08% per year between 2000 and 2012 and the percentage of mangrove loss within all global classifications of protected areas (i.e. IUCN & UNEP) is also almost 50% lower than the global average[[16]](#footnote-17). Examples of the successful establishment of terrestrial and marine protected areas conserving mangrove forests include the Mangroves National Park in the Democratic Republic of Congo and Parc Marin de Moheli in the Comoros. Despite these efforts only 6.9% of the world’s mangroves are thought to fall within existing IUCN standard protected areas compared to approximately 12.4% of the world’s forests that exist inside terrestrial protected areas.[[17]](#footnote-18),[[18]](#footnote-19) Utilising this strategy and working to close the disparity between the terrestrial and coastal forests under the protection of conventions depends on buy-in and engagement of governments at a national level.

### Conservation through legislation

In some localities mangroves are successfully protected by legislation restricting or limiting mangrove clearing. For example Brazil’s Federal Forestry Code includes a section prohibiting the use of any components of mangrove trees or plants. However with 70% of Brazil’s mangroves now found within Permanent Preservation Areas it is difficult to attribute success to this specific legislation since the existence of the protected areas make it easier to sustainably manage the mangrove stands. This is approach is not without its drawbacks as simply legislating an area of mangroves as protected, particularly in populous regions, can remove the income and livelihoods of coastal communities without finding a viable replacement.

### Conservation through habitat management (restoration)

The plight of mangroves has meant increased engagement from NGOs in restoration of these habitats. Internationally these include the Western Indian Ocean Mangrove Network, the Mangrove Alliance, and Mangrove Watch, as well as domestic organisations including Honko; a mangrove conservation and education organization in Madagascar. The engagement of local communities in natural resource governance is a key part to the success of these projects.

Restoration projects have had mixed success with many resulting in large failure rates. In some cases huge efforts are put into mangrove rehabilitation and creation at landscape scales but these interventions are generally unsuccessful due to poor species selection, inappropriate choice of rehabilitation locations, and local governance issues.[[19]](#footnote-20) It is thought these failures also highlight the importance of utilising advances in the science of mangrove restoration and ensuring ongoing monitoring of the newly restored ecosystem.[[20]](#footnote-21) Lessons have been learned however and recent restoration successes have involved using a soft technique to break waves and trap sediments to promote the rehabilitation of the mangrove ecosystem. Conservation International’s Suriname Project‘Building with Nature’has seen significant success following this technique and Wetlands International no longer advocates for the planting of mangroves, but for a restoration approach that facilitates their natural regrowth by creating ecologically suitable conditions.[[21]](#footnote-22)

### Other emerging strategies

The movement to implement viable economic solutions based on the carbon sequestered by coastal vegetation to reduce atmospheric CO2 is still relatively new and there is not yet a widely agreed methodology for verification. Tools such as Payment for Ecosystem Services and REDD+ have been used, but as yet predominantly in terrestrial forests. They could be effective for mangroves especially as more countries include these habitats in their NDCs and particularly in countries where there are not sufficient resources for more traditional conservation and management.

Allowing landward migration is another newly considered approach to allow mangroves to adapt to rising sea levels caused by climate change. Although threatened by these changes, mangrove forests are able to keep pace if they can migrate landward unhindered. This could protect or potentially grow mangrove forests as sea levels rise. However, the potential for human conflict is high with this strategy as the land they would be migrating into is likely to be more and more populated, farmed or cultured, or an existing protected habitat.

### Lessons learned

ICF aims to catalyse transformational change that enables developing countries to follow low carbon development paths. Combatting deforestation is a major part of this effort and contributes to several of ICF’s target impacts. Where existing or historical strategies have fall down is ensuring that transformational change occurs, i.e. positive effects beyond the life span of the project. The question of how a Defra ICF investment can fill this space depends on the focal point of the programme. As aforementioned, an ICF mangroves investment could cover the themes of adaptation, mitigation, biodiversity and natural resources, but the region in which the programme is delivered will have a considerable impact on which of these benefits will be the thematic focus. [Redacted]

### Potential Impact

Mangrove forests provide important benefits to the poor coastal communities that depend on them, and to the greater global good. Of particular note are the benefits from:

* **Mitigation** – i.e. carbon savings from preserving standing mangrove forests.
* **Adaptation** – i.e. protection of coastal communities from natural hazards and effects of climate change.
* **Livelihoods** – i.e. ensuring the livelihoods of poor people with high levels of mangrove natural resource dependence are supported.
* **Biodiversity** – i.e. ensuring we are working to protect especially biodiverse mangrove forests.

[Redacted]

Therefore, while an ICF mangroves investment will contribute across all four themes, while taking into account Defra’s strategic focus of working in the world’s most biodiverse (in this case mangrove) forests, this strategic steer will contribute to refining project selection.

Having these thematic focusses will also effect the region in which we deliver. This will be considered further during appraisal by:

* Ensuring any pipeline of sub-projects have strong mitigation and adaptation benefits.
* Ensuring strong governance (e.g. on boards or investment committees) to ensure the pipeline of projects have significant mitigation and adaptation benefits.
* Ensuring we are able to robustly report particularly against adaptation and mitigation benefits

#### Key Performance Indicators

Across all options for appraisal we would look to report on a suite of core KPIs.

* KPI 3: Number of forest dependent people with livelihoods benefits protected or improved as a result of ICF support. (Number of people)
* KPI6: Change in Greenhouse Gas (GHG) emissions as a result of ICF support. (tCO2e)
* KPI 8: Number of hectares where deforestation and degradation have been avoided through ICF support. (Hectares)
* KPI 10: Value of ecosystem services generated or protected as a result of ICF support. (£)

Additionally, and depending on the proposed financing mechanism we could also look to report against KPIs 11 and 12 to measure the volume of private and public financing leveraged.

Finally we will look long term at KPI 15 – the extent to which the ICF intervention is likely to have a transformational impact.

#### Indicative Theory of Change

Figure 4: Indicative ToC for a Defra ICF mangroves intervention

Figure 4 shows an indicative theory of change for a mangroves conservation, blue carbon and livelihoods programme to be delivered through Defra ICF. This should form the basis of any ToC specific to particular programmes; for appraised options these can be found in the Annex.

## Synergies with wider work

Mangroves are intrinsically linked to other Blue Carbon ecosystems including sea grasses, tidal marshes and other wetland habitats. Beyond the policy work of Defra International (i.e. ICF and Darwin), other teams, other government departments and non-departmental public bodies are engaged in the growing Blue Carbon sector. A Defra ICF investment in mangroves will put us at the forefront of an emerging economy and forestry policy area while providing an opportunity to reduce deforestation in a threatened and undervalued habitat and support sustainable international development and resilience building within that habitat.

### Within HMG – BEIS and CEFAS

BEIS are active in the Blue Carbon landscape through their work including the development of robust Measurement, Reporting and Verification (MRV) methodologies and the Natural Environment Research Council (NERC) where they have co-financed a project looking at the role and value of the carbon in the marine environment.

CEFAS are also involved in mangrove work and provide bespoke marine and freshwater science and technology services to a diverse range of commercial clients, from a variety of sectors and markets. They are also involved through the Commonwealth Marine Economies Programme in Blue Carbon assessments in the Pacific and as invited experts for the International Blue Carbon Initiative (see below) Scientific Working Group.

### Blue Economy knowledge – International partnerships and initiatives

The inclusion of mangroves in the design and implementation of forestry conservation and management programmes is relatively new, as is the emerging nature and international appetite for the developing Blue Economy. This has caused an influx of partnerships and initiatives at the international level with various aims including to knowledge share, provide technical assistance, unlock financing streams or develop policy across the evolving Blue Carbon landscape.

These international cooperatives are increasingly contributing to the global blue carbon research and development community. Additional mangrove conservation efforts through Defra’s ICF provide an opportunity to engage and increase our global standing in this sector, whilst maintaining and establishing positive working relationships with those countries in the Commonwealth and beyond who are involved.

#### International Partnership for Blue Carbon (IPBC)

The IPBC was launched by Australia at COP21. Led by Defra’s ICF team we have historically participated through our contributions to the Finance Focal Group which offers expertise for establishing projects; for governments to implement frameworks, policies and technology; and for supporting on-ground projects.

In August 2018 we received ministerial approval at Defra and BEIS to join formally as partners which was welcomed by Australia. Going forward there will be stronger collaboration with and contribution to the partnership. An additional mangroves programme will significantly boost the expertise we can offer, influence we can leverage, and experience we can glean through this global platform.

Our current ICF project partner, Blue Ventures, is also a partner of the IPBC; currently sharing the knowledge and expertise generated from our ICF investment in the Technical Focal Group.

#### Blue Charter Mangroves Action Group - Sri Lanka

At the Committee of the Whole on 21-23rd March 2018, several commonwealth governments came forward proposing to lead action groups in support of the Commonwealth Blue Charter. Sri Lanka proposed leading a group on mangroves. There is little in-depth information on the mangroves action group as yet but broad aims include knowledge sharing, protection of mangroves, restoration and development of a commonwealth mangroves database.

[Redacted]

#### Other initiatives

The international landscape for Blue Carbon (mangrove conservation) funding and knowledge sharing frameworks is burgeoning with many new initiatives founded each year. Further ICF investment into mangrove projects would not only create multiple strategic benefits for, and synergies with, existing work across government, but also complement this with a commitment to this growing area of international policy. With further involvement in this sector there is an opportunity for the UK to show strong leadership and to shape this critical sector of the environment on the global stage.

# Appraisal Case

## Summary

Multiple distinct options for delivery were initially discussed and assessed including NGOs (such as The Nature Conservancy) and international organisations (such as IUCN). These were ruled out due to questions around capacity, their untested nature and our 2018/19 spend targets as discussed in section 3.2.1. Two options were carried forward for full economic appraisal which follows.

The appraisal estimates the economic costs and benefits to society of two options to invest £12.75m of Defra’s International Climate Finance (ICF). The impact of these options, when compared to a ‘do nothing’ baseline, is summarised in Figure 5.

Sensitivity analysis, through the production of low and high scenarios, is detailed in Annex 1.

|  |  |  |
| --- | --- | --- |
|  | **Option 1.1** | **Option 1.2** |
| **Funding Option** | **IDB Blue Carbon Program - £12.75m** | **Althelia Sustainable Mangroves Facility - £12.75m** |
| **Costs** | £19.0m | £39.1m |
| **Benefits[[22]](#footnote-23)** | £217.8m | £122.3m |
| **NPV (£m)** | £198.9m | £83.2m |
| **NPV/G** | 15.6 | 6.5 |
| **Benefit Cost Ratio (Range)** | 11.5  (2.8-27.2) | 3.1  (0.7-7.5) |
| **GHG emissions saved (TCO2e)** | 2.9m | 1.6m |
| **Mangroves restored or protected (Ha)[[23]](#footnote-24)** | 5570 | 3000 |
| **Option 1.1 is considered the preferred option for investment**  The difference in benefit-cost ratios reflects a) the difference in tonnes of C02 avoided per pound of ICF investment, and b) the significantly higher delivery risks associated with option 1.2. | | |

Figure 5: Appraisal Summary – Cost-benefit Analysis

Note: all figures above are calculated across the 20 year appraisal period

## Introduction

Mangroves are some of the most carbon rich and productive habitats on earth and play a critical role in supporting both endangered biodiversity and the livelihoods of coastal communities.

However, they are also one of the most threatened tropical ecosystems. The erosion of coastlines, unsustainable use of coastal resources and the loss of coastal livelihoods all reduce the capacity of developing coastal dependent communities to face the growing impacts of climate change.

As part of the £210 million allocated to Defra International Climate Finance work for the spending period 2016 to 2021, there is £12.75m assigned to an investment in the sustainable management, conservation and restoration of mangrove habitats. A global need, alignment with Defra’s strategic priorities, ministerial appetite and growing cross government engagement in this sector have been the driving forces behind this investment concept.

### Aim and objectives

The aim of this appraisal is to provide the ICF policy team with evidence to make a decision as to how to invest £12.75m of ICF funds. It will achieve this aim by estimating the costs and benefits of two investment options to restore and protect mangrove forests in developing countries relative to a “do nothing” baseline:

* One option (1.1) is an investment through the Inter-American Development Bank (IDB) focussing on supporting climate change mitigation through the reduction and avoidance of greenhouse gas (GHG) emissions from anthropogenic degradation of mangrove ecosystems and through enhancing carbon sequestration through agriculture, forestry and other land use (AFOLU) activities. Indirect benefits focused on climate change adaptation, biodiversity conservation, poverty alleviation and coastal zone management are also expected. The project will be delivered over six years.
* The second option (1.2) is an investment in a bespoke sustainable mangroves facility in the format of an impact investment fund. The investments will provide long term financial solutions to sustainable activities that address the drivers of mangrove deforestation, improvements in related livelihoods and also in coastal resilience infrastructure. This Sustainable Mangrove Facility will provide funding on a repayable loan basis creating a pool of dedicated capital able to be deployed for the long term with repayments being re-invested creating an “ever-green” financing facility.

### Scope

The scope of the analysis is as follows:

* Costs included in the analysis are investment, leveraging, management, staffing costs. The opportunity costs faced by invested private capital is also quantified.
* Benefits related to a) sequestration or avoidance of GHG emissions, and b) the ecosystem services provided through the protection or restoration of mangrove forests as a result of the program, have been selected on the basis that these are the most significant and can be readily quantified for all options given existing evidence and analysis. Benefits related to increased productivity for benefits have been monetised for Option 1.2, though no quantitative estimate could be reached for the IDB program.
* Further benefits from ecosystem services, and benefits from job creation have not been quantified due to lack of existing evidence.
* The impact of the investment options is estimated by comparing against a ‘do nothing’ baseline;
* The appraisal period is 20 years in line with the assumed timeline of delivery and realisation of project impacts;
* An additionality assumption has been applied to the benefits associated with each investment, to account for a) optimism bias, b) uncertainty around the evidence base for benefits, and c) the delivery risks attached to investment.
* A 50% discount is applied to Option 1.1, in line with standard ICF appraisal guidance
* A 60% discount is applied to Option 1.2 – this reflects the significant delivery risks attached to this option in the short-to-medium term.
* Sensitivity analysis is undertaken for low and high scenarios (see Annex 1).

The remainder of this economic case sets out the evidence underpinning the baseline and estimates of costs and benefits that are summarised in Figure 5.

## Shortlisting Options

### What delivery model is best placed to deliver the programme?

In order to commit to this programme, to begin timely and thorough implementation and to maximise value for money, our international delivery partner needs assurances from the outset that we are committed to them and the programme. Therefore a promissory note is the most suitable way to achieve this and finance the programme. Promissory notes also ensure that funds are not provided in advance of need by maintaining a pre-agreed drawdown schedule.

The entirety of the budget (i.e. £12.75m) needs to be committed within this financial year to ensure there is no ICF (ODA) underspend. Therefore the delivery partner needs to be have proven capacity and capability to quickly and effectively utilise this scale of funding as well as have a promissory registered with it.

The long-list of potential delivery mechanisms initially included NGOs and international organisations but after consideration of the above, several of these have been discounted using a top-level appraisal matrix (Annex 5). The matrix showed that the most appropriate recipient of this funding will be a tested or high capacity multi-lateral bank, multi-lateral facility, or impact investment fund, all of which fulfil the requirements outlined above and the capability to deliver across all thematic focusses.

### What region should we deliver in?

A multi criteria analysis (MCA) was developed in order to assess the value of the world’s mangrove forests by country. We considered multiple cross-sectoral metrics and weighted according to the priorities of Defra’s ICF and those issues discussed in the strategic case. The top 25 countries are included in Annex 6. The MCA showed several priority regions including Latin America and the Caribbean (10 countries within the top 25 countries) and South East Asia (6 countries in the top 25).The MCA was also taken into account when shortlisting proposals for full appraisal.

### What impacts should the intervention have?

When taking the preceding strategic case into consideration, an intervention to target the drivers of mangroves loss and bring about financial, social and environmental benefits across multiple fronts and in line with ICF and wider strategic objectives should include some distinct activities leading to impacts across three themes:

1. Climate change mitigation through the reduction and avoidance of greenhouse gas (GHG) emissions from anthropogenic degradation of mangrove ecosystems
2. Climate change mitigation by enhancing carbon sequestration through agriculture, forestry and other land use (AFOLU) activities.
3. Benefits focused on climate change adaptation, biodiversity conservation, poverty alleviation and coastal zone management.

When considering the delivery matrix, the MCA and the proposed impacts, a short list of proposals was taken forwards for full appraisal. .

## Options Appraisal

The resulting shortlist is the two investment options in the above summary (3.1) in addition to the baseline “do nothing” option:

### Option 0. Baseline. Do nothing

There are currently high levels of mangrove loss globally, with over 15,000ha of mangrove deforestation every year[[24]](#footnote-25). Under a ‘do nothing’ scenario current levels of mangrove deforestation are assumed to continue.

Associated with this are the global annual emissions of 12 million tonnes of carbon dioxide, of which 90% is in developing countries[[25]](#footnote-26). Carbon dioxide emissions due to mangrove deforestation will continue to fuel climate change, exacerbating negative impacts including:

* Stronger natural events such as tsunamis, storms and hurricanes which is likely to be felt disproportionately by developing nations;
* A divergence of resources away from global economic growth and development towards disaster recovery, as coastal protection services from mangroves are reduced or lost;
* Degradation of global fish stocks, risking global biodiversity and presenting significant challenges to the hundreds of millions of poor people across the developing world who rely on fishing as their primary income or food source;
* Damaging wider UK Government and global efforts to tackle climate change to ensure that the global temperature does not rise by more than 2oC

The UK Government have commitments to Official Development Assistance and to mobilising $100bn of climate finance by per year 2020. Not spending the allocated £12.75m would risk Defra not meeting these targets which carries significant reputational risk.

### Option 1. Investing £12.75m in mangrove restoration, conservation and sustainable management

Both sub-options within option 1 focus investment in innovative projects which, were they to prove effective, could be scaled up and replicated across the globe, driving a sustainable approach to mangrove use and amplifying any Defra ICF investment significantly in the long term. This would not be the case under the “do nothing” option.

### Option 1.1: Establish a Blue Carbon Program with IDB

This option uses £12.75m of ICF funding to establish a Blue Carbon Program focused on the protection, restoration and sustainable management of mangrove forests in South and Central America. This program would be delivered through the Inter-American Development Bank (IDB). The IDB have experience of working with ICF on programs in developing countries throughout Latin America, including 2 projects in Brazil.

#### Aim

This investment option aims to produce a transformational change in the conservation of mangroves by developing and embedding operational blue carbon markets across Latin America that provide local communities with a sustainable income and assist in moving low-income countries towards low-emission, climate-resilient development.

The program will mobilise strategic public and private sector investments in the blue carbon sector, funding projects in sectors such as sustainable aquaculture, coastal zone management and eco-tourism that target the main drivers of mangrove degradation and barriers to mangrove conservation. This will ensure the sustainable management of mangrove forests and accelerate sustainable development in key mangrove-focused countries in South and Central America.

There will be a focus on developing and implementing incentive-based instruments via the various financial products of the IDB Group including technical cooperation grants, loans, high-risk investment grants and equity. These will be tailored to the intervention to maximize value for money of ICF funding. The IDB Group will also utilise its ongoing programs on Sustainable Islands Platform and its Natural Capital Lab in order to leverage additional resources, knowledge and complement and maximise the impact of ICF resources through various blended finance solutions.

#### Project Delivery

Figure 6 provides a summary of activities that will be undertaken across eight projects highlighted as highest priority in terms of readiness and alignment with Defra’s ICF priorities and risk appetite. These projects will form the complete pipeline for implementation.

Three from these eight were selected to appraise as they held the most robust data on benefits and across the widest range of indicators including carbon, area of mangrove protected or restored, and levels of public and/or private finance leveraged; thus best reflecting the pipeline portfolio as a whole. Although the remaining pipeline did provide data across these KPIs, uncertainty around the methodology used to calculate GHG emissions and hectares avoided deforestation, specifically the level of attribution to impacts was sufficient to discount them from the analysis.

The eight identified projects will:

1. Deliver but to varying extents against Defra ICF target areas of climate change mitigation, adaptation, biodiversity and sustainable livelihoods
2. Work across at least 5 countries, including low income nations such as Haiti and small island developing states such as Jamaica
3. Constitute funding of £12.75million in total, of which £11.73m of projects will be chosen to be funded through the ICF-IDB program.

|  |  |  |  |
| --- | --- | --- | --- |
| **Project title** | **Country** | **Funding** | **Summary** |
| 1. Sustainable Forest Management Project Mangrove Restoration | Jamaica | £0.9m | Focus on changing the hydrological regime from agricultural activities in surrounding areas to restore mangrove forests in Jackson Bay |
| 2. Community Based Mangrove Restoration | Haiti | £3.0m | Rehabilitation of mangroves through community-based management; the development of SLM practices in south of Haiti |
| 3. Blue Carbon Colombia – Strengthening Local Governance & Benefits | Colombia | £1.9m | Support implementation of blue carbon projects in at least priority areas in Colombia, while developing national mangrove restoration frameworks |
| 4. Blue Carbon Panama – Strengthening Local Governance & Benefits | Panama | £1.9m | Restoration of mangrove forests in the Chiriqui Gulf; capacity building and strengthening of local stakeholder involvement; technical and financial assistance to increase/diversify community benefits |
| 5. Regional Blue Carbon, Ecosystem Services, Resilience, and Biodiversity Program | Panama and Colombia | £2.3m | Implementation of strategic pilot projects that restore and improve protection of mangroves; assess and share the value of ecosystem services of coastal wetlands; educate communities and build processes that reduce impacts to mangroves from plastic pollution and poor land-use planning. |
| 6. Blue Carbon Ecuador – Strengthening Local Governance & Benefits | Ecuador | £1.6m | Restoration and protection of mangroves across 3 areas in the Gulf of Guayaquil; ensuring co-benefits for local communities; and developing long-term financial strategies to ensure sustainable management of the sites |
| 7. Carbon Offering | Honduras | £0.5m | Develop a blue carbon program to finance the protection of mangroves in Mosquitia, with income distributed to community projects. |
| 8. Innovation Competition | Caribbean Developing States | £2.3m | A competitive grant scheme, to support innovative post-concept pre-commercial businesses/technological models which offer solutions for reforestation, sustainable use, conservation or monitoring of mangroves. If businesses are successful, the grant funding is converted to an equity stake. |

Figure 6: Proposed Projects for ICF-IDB Blue Carbon Program

All figures assume a £/$ exchange rate of 1.3.

The program will be centrally managed by IDB which will disburse the funds, and oversee monitoring of the projects in line with Defra ICF’s M&E requirements. IDB policy for grant funding assumes a one-off management cost of 5% of total finance committed. In this case, this would entail a one-off cost of £637,500.

Target countries for the program are selected based on:

Presence of threats to mangrove

Reference to mangroves conservation/restoration as CC mitigation strategy in the country’s NDC and/or NAMAs;

Existence of a forest monitoring system in the country capable to account for land use cover changes affecting mangroves;

Where marine resources are an important part of GDP;

On a demand-basis, where private-sector partners evidence demand for project support;

Where the local regulatory framework may help develop this sector;

Eligibility for ICF funding.

In all cases, projects will aim to serve as examples for scale, replicability and innovation.

#### Project Monitoring and Evaluation (M&E)

IDB have developed a theory of change for the program in collaboration with ICF officials which sets out the expected activities-outputs-outcomes-impacts of the program of work – this is detailed in Annex 2. This enables Defra and IDB to assess and consider the mechanisms, theory and assumptions through which the proposed program will deliver on its objectives, covering the strategic picture of the expected path towards a project’s intended impact.

An M&E framework will be refined pre and post-implementation and in addition to the regular IDB monitoring and reporting, an *Evaluation Plan* will be collaboratively designed by IDB and Defra during the first year of implementation. This evaluation plan will include a schedule for independent mid and end term evaluations. ICF is legally obliged to commission these evaluations.

IDB will monitor the use of resources and report activities and outputs of each project, and aggregate this information to be incorporated into quarterly progress reports and Annual Reviews to be written by Defra each year. Data from IDB will be provided for these Annual Reviews no later than April 30th every year. Information about the individual operations will be available to DEFRA as needed.

IDB and DEFRA will design a results framework to guide monitoring and evaluation efforts. The results framework will follow and be aligned with ICF indicators.

The following table shows the Costs and Benefits for Option 1.1

|  |  |
| --- | --- |
| **Costs** | **Present Value (20 years), 2018 pounds sterling** |
| ICF Funding costs | £11,700,000 |
| Fund Management costs | £637,500 |
| Monitoring and Evaluation costs | £334,100 |
| Finance leveraged | £4,926,600 |
| ICF staff costs | £576,200 |
| Opportunity cost of foregone investments by private funders | £751,400 |
| **Present Value Total Costs** | **£18,955,900** |
|  |  |
| **Benefits** |  |
| Carbon savings | £169,771,700 |
| Ecosystem service benefits | £48,044,700 |
| **Present Value Total Benefits** | **£217,816,400** |
| **NPV** | **£198,860,500** |
| **BCR** | **11.5** |

Figure 7: Cost and Benefit Summary for ICF-IDB Mangroves Programme. All figures to nearest £100.

#### Approach

Three of the eight projects in Figure 7[[26]](#footnote-27) were chosen as a basis for the appraisal, based on the robustness of the data on projected costs and benefits provided by IDB for these projects across a range of indicators including a) carbon savings, b) area of mangrove protected or restored, and c) levels of public and/or private finance leveraged. Costs and benefits for the program as a whole were extrapolated from analysis of these three projects.

Data for projects where estimated benefits were adjudged to be optimistic were not used in assessing the costs and benefits of the program, to ensure that analysis of potential costs and benefits of the program were realistic and robust.

For example, the carbon savings estimates for three proposed projects[[27]](#footnote-28) were calculated by multiplying the area of mangroves in an indicative area in which the project would be operating by the estimated level of carbon stocks held per hectare in this area. Attributing this entire carbon stock to a single small-scale development project was not considered appropriate.

Program operation is assumed to be over a timeline of 6 years in the analysis. An additional year has been added to the estimate of program life provided by IDB to account for the possibility of delay in program delivery.

##### Costs

The costs that were within scope to monetise as part of this analysis are:

* **ICF staff costs:** FTE capacity of different posts is as follows: EO (0.05); HEO (0.7); G7 (0.1); G6 (0.1); SCS (0.05). This is drawn from information provided in the Financial Case. The costs associated with this capacity have been provided by Defra Finance.
* **ICF funding costs**: The £12.75m of ICF funding provided to the program, assumed to be faced at the start of year 1.
* **Monitoring and evaluation costs:** Assumed to be 3% of total program costs, and spread across the 7 years of program lifetime.
* **Finance leveraged through ICF funding:** Based on the median value of leveraged finance from IDB data for the 3 pipeline projects appraised, finance is expected to be leveraged into funded projects at a rate of 1:0.42. These costs are assumed to be faced at the start of year 1.
* **The opportunity cost of foregone investments for private finance leveraged through ICF funding:** It is important to account for the returns the private sector would have made had the money been utilised for a different investment throughout the five-year lifespan of the program. This level of forgone return has been set at 3.5% annually, as per DfID guidance.

Following advice from colleagues across HMG, it is assumed that there is no opportunity cost associated with public funding, whether provided by ICF or other donors.

##### Benefits

* **GHG emissions:** An indicative estimate for the tonnes of carbon sequestered or emissions avoided has been estimated based on the estimates of mangrove area protected or restored from the three projects appraised. This has been extrapolated across the total funding provided under this investment to reach an estimation of 5570ha, once additionality and leakage considerations have been accounted for. It is assumed that half of this figure is mangroves protected, while the other half is mangroves restored.

For mangroves protected, the area is multiplied by the IPCC carbon stock value for mangroves of 1,874tCO2e/ha[[28]](#footnote-29). This was used as a conservative estimate. (Recent literature reviews of mangrove carbon stocks in Latin America suggest that carbon stock per ha on average is significantly higher - upwards of 900tC/ha[[29]](#footnote-30), equivalent to over 3,300tCO2e /ha). We assume that deforestation of a hectare of mangroves will lead to the loss of 50% of the carbon stock, as reflected at the conservative end of the range (25%-100%) offered in relevant literature[[30]](#footnote-31). The volume of stock protected is shared equally from year 4 to year 20.

For mangroves restored, it is assumed that each hectare will sequester 6.4tCO2e [[31]](#footnote-32) per year from year 4 to year 20.

The value of each tonne has been derived from the BEIS International Carbon Price Series, which assumes that the value of every tonne sequestered or avoided will rise throughout the appraisal period.

In the central scenario, it is assumed that the programs will provide no GHG benefits until year 4 of operation, as it may take time for projects to become operational and for carbon benefits to accrue. The volume of carbon savings are assumed to be constant from year 4 onwards to the end of the 20 year appraisal period, at 171,300tCO2e /year. However, the value of these emissions is projected to rise from £61/t in Year 4 to £140/t in Year 20 following the international carbon price series agreed by ICF analysts across HMG.

* **Wider ecosystem services:** The value of coastal protection service (£1452/ha) and food provision (£39/ha) provided on an annual basis by a typical hectare of mangrove forest was drawn from the TEEB Ecosystem Service Values database (2010)[[32]](#footnote-33), a synthesis of academic studies on the value of services provided by different biomes. This typical value for mangroves globally is considered an appropriate value to use to use in this analysis because of the range of countries for which investment in mangroves is being made. These values were multiplied by the expected area of mangroves protected or restored by the program (5570 ha).

Ecosystem service benefits are not projected to begin until year 4 of the program. These are then expected to rise to 100% over 5 years at a linear rate of increase.

##### Discounting and Adjustments for Uncertainty

To account for the tendency of individuals to value benefits in the present over benefits in the future – and vice versa for costs – social discount rates have been applied to future impacts of the program, as per HMG appraisal guidance[[33]](#footnote-34). Values have been discounted at an annual rate of 7.9% for investment costs and productivity benefits, as this is the average of the social discount rates of countries in which the projects in Figure 6 are proposed: 65% UMICs, 10% LMICs, and 25% LDCs.

Annual benefits from avoided GHG emissions are discounted at 3.5% annually, in accordance with ICF analytical guidance on discounting of global goods[[34]](#footnote-35). The opportunity cost faced by private capital is also discounted at 3.5% a year, in accordance with guidance from DfID analysts – this is based on the assumption that the capital will be sourced from developed countries.

The uncertainty related to this option is derived from three main sources:

* The level of additionality delivered by ICF funding of projects under the program, and the benefits which are delivered *over and above* those delivered by actions which recipients would have taken in the absence of funding
* Uncertainty around the source of data for benefits, for example the application of generic biome ecosystem service values to specific areas of mangrove forests

To account for the uncertainties around the level of additionality offered by any ICF program when compared to the counterfactual of the activities individuals would have undertaken regardless of support, a 50% discount has been applied to the area of mangroves protected or restored. To account for potential leakage effects, a further 25% discount has been applied. Both of these assumption are standard in HMG ICF appraisal guidance.

As a result of applying these discounts, the model monetises 37.5% (50%\*75%) of the original gross projected impacts of the program.

Low and high scenarios were developed for the purposes of sensitivity analysis, using the lower and upper bounds for each input variable: $/£ exchange rate; funding leveraged; emissions avoided; additionality of benefits; ecosystem service values. This produced a range of the benefit-cost ratio of 2.8-27.2. The size of this range reflects the significant uncertainties attached to this quantitative appraisal. Detailed results of this analysis are available in the Annex 1.

#### Results

##### Costs

£11.7m of ICF project funding (after accounting for IDB management costs of 5% and M&E costs of 3%) will be expected to leverage £4.9m of funding. It is estimated, based on evidence from the project pipeline, that 35% of funding leveraged for the program through the ICF commitment will be public funds, with the remaining 65% in the form of private capital.

Fund management costs are projected as a one-off payment of £637k in Year 1.

Monitoring and evaluation costs are projected at £383k, spread equally across 7 years - the 6 years of the program plus a further year for program evaluation. This produces a present value cost of £334k.

ICF staffing costs, including overheads, are estimated at £106,000 a year. The overall present value of staffing costs over 7 years is £576k.

Opportunity costs of private capital are projected over the six year programme. £3.2m of leveraged capital is projected to be private and subject to opportunity costs. The costs are projected to rise from £112k in Year 1 to £135k in Year 7. This produces a present value of £751k.

Overall, present value of project costs over the 20 year appraisal period comes to £18.9m.

##### Benefits

The GHG emissions benefits of the program rise from £10.4m in year 4 to £24.0m in year 20. This produces an overall present value of £169.8m.

Benefits from coastal protection and food provision are projected to rise from £1.6m in year 4 to £8.1m in year 8, staying constant at this value until year 20. This produces a present value of £48.0m.

Overall, present value of project benefits over the 20 year appraisal period comes to £217.8m.

The net present value of an investment in the ICF-IDB Blue Carbon Program is projected to be £198.9m.

#### Discussion

The estimate of net present value is considered conservative because:

1. **Further ecosystem services beyond coastal protection and food provision are not monetised.** The most recent estimates produced by the UN Environment Program put the value of all ecosystem services provided by mangroves at a minimum of £120,000/ha/year[[35]](#footnote-36). Further, analysis of the TEEB ESV Database gave a value for all monetisable ecosystem services of around £8590/ha/yr[[36]](#footnote-37). However, ICF analysts adjudged it more effective to monetise two services (with a combined value of £1452/ha) for which a considerable body of evidence exists, enabling decision makers to implicitly consider the value of further ecosystem services which would also benefit through this program.
2. **Positive impacts related to increased income and productivity** for local communities engaged as part of the programme, as the level of uncertainty attached to any values produced was considered too great. The challenge of quantifying these impacts across the range of countries, geographies, wealth levels and sectors of primary income targeted through this program to any degree of certainty is significant. In addition, it is challenging to estimate the indirect and knock-on impacts such as multiplier effects from more efficient allocation of economic resources.
3. **Impacts on biodiversity** are not captured. The inherent uncertainty attached to the value of biodiversity on a local, national and global level meant that this benefit could not be quantified. Defra country-level application of academic literature suggests that 5 of the 6 countries in which country-level projects would potentially operate through the program all place within the top 20 countries in the world for the diversity of mangrove-dependent species – Panama, Colombia and Haiti all place within the top 10, as *Figure 8* highlights. In addition, 4 of the countries contain mangrove-dependent species which are critically endangered.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Country | Number of Mangrove Dependent Species | Number of VU/NT Mangrove Dependent Species | Number of EN Mangrove Dependent Species | Number of CR Mangrove Dependent Species | Weighted Score |
| **Malaysia** | 23 | 3 | 1 | 0 | **37** |
| **Cuba** | 10 | 2 | 0 | 2 | **36** |
| **Indonesia** | 24 | 1 | 1 | 0 | **32** |
| **Panama** | 9 | 1 | 1 | 1 | **27** |
| **Costa Rica** | 10 | 2 | 2 | 0 | **26** |
| **Philippines** | 16 | 0 | 0 | 1 | **26** |
| **Thailand** | 17 | 3 | 0 | 0 | **26** |
| **Colombia** | 9 | 2 | 0 | 1 | **25** |
| **Haiti** | 9 | 2 | 0 | 1 | **25** |

Figure 8: DAC-eligible Countries with Mangrove Dependent Species, Top 10

Note in Figure 8 that CR - critically endangered; EN – endangered; VU – vulnerable; NT – near threatened. Countries with endangered or critically endangered species are given an additional weighting.

Given these issues, we estimate the cost-benefit ratio of 1:10.8 (i.e. £1 cost delivers £10.80 in societal benefit) as a conservative estimate of the positive impacts of an ICF investment in the program.

Estimated physical impacts for the program would be:

* 2,911,600 tonnes of GHG emissions sequestered or avoided
* 5570ha of mangroves restored or protected

As currently proposed, some of the projects prioritised for funding through this programme involve elements of both grant funding and blended finance and the terms of these mechanisms need refining pre-programme implementation. These are likely to be a combination of risk capital and concessional loans selected depending on the market at the time of implementation and the level of development of the country the finance will be disbursed into. IDB have a strict set of concessionality guidelines which we will adhere to.

It is important to note that a wider range and depth of public goods should be obtainable with grant finance than private finance, given that there would be considerably less focus on financial returns. This would aim to compensate for any limit in private funding leveraged or funding recycled through debt financing. Any returns or dividends from blended finance solutions would be redeployed as grants, ideally before the end of programme impact assessment. A more complete breakdown of the budget including the proportion of blended and grant financing mechanisms can be found in section 4.1 and Annex 4.

### Option 1.2: Establish Althelia Sustainable Mangroves Facility

In this option, ICF would invest £12.75m through Althelia Natural Capital to establish an investment vehicle known as the Sustainable Mangroves Facility.

#### Aim

The Sustainable Mangroves Facility would be a new and unique concept, with the objective of providing blended public/private finance to projects which address the primary drivers of mangrove deforestation. These investments will aim to restore and protect mangrove habitats while directly benefiting local communities and stakeholders.

The secondary aim of the Facility would be to prove the viability of private sector investments in sustainable mangrove use, which can generate positive financial *and*environmental/social returns. In the long term, this could have a transformational effect on mangrove conservation by mobilising private capital flows to achieve conservation objectives. The Facility would be an ‘evergreen’ fund, meaning that initial capital provided to the Facility would continue to be reinvested in projects for the foreseeable future. For this analysis, we have assumed that the Facility would operate for at least the duration of the 20-year appraisal period.

#### Project Delivery

The Sustainable Mangroves Facility would be managed by Mirova-Althelia, an asset management firm focused on delivering responsible investments in sustainable development. The firm has experience of managing conservation-focused funds such as the Althelia Climate Fund and the Land Degradation Neutrality (LDN) Fund. The Sustainable Mangroves Facility would be operated as a mangroves-focused extension of the Sustainable Ocean Fund (SOF) (launched in July 2018), with a shared management and back office team. This would enable existing knowledge of similar investments to be utilised while reducing costs.

SMF investments would aim to generate financial returns, attracting private sector capital, while delivering non-financial returns in climate change mitigation, mangroves protection, alternative livelihoods and other environmental and social priorities. The facility would prioritise projects which have clearly considered strategies to ensure permanent mangrove protection and climate change mitigation. Projects would also need to demonstrate potential to scale to other locations or geographies. Examples of proposed projects are detailed in Figure 9 below where all figures assume a £/$ exchange rate of 1.3.

|  |  |  |
| --- | --- | --- |
| **Project Name** | **SMF Investment** | **Description** |
| Colombia – Re-establishment of shrimp ponds and protection of mangroves | £0.8m | Sustainable management of shrimp ponds employing local communities, with protection and rehydration of surrounding mangroves. |
| Dominican Republic – Marine park creation and protection of mangroves | £0.8m | Establish and manage protected marine parks, funding restoration and protection of mangroves. |
| Fiji – Sustainable crab aquaculture | £1.1m | Sustainable aquaculture model of crab pens employing local people, and restoration and protection of surrounding mangroves |

Figure 9: Proposed Projects for Sustainable Mangroves Facility

Work is ongoing to identify further projects which satisfy the Facility’s criteria and meet the priorities for Defra ICF funding. Investment proposals will be reviewed by four independent experts for viability before a final decision is taken by the Facility Investment Committee. A Defra official would sit on this committee, with a veto right over any proposed project.

The managers would aim to leverage additional finance into the Facility through other investors at a 1:1 ratio – the European Investment Bank and KfW have been proposed as potential match-funding investors. Leveraging these funding sources, and potentially others from the private sector, would increase the impact of any Defra investment. However, further confirmation of potential investors would be requested before any Defra investment in the SMF was finalised. The Facility would also look to leverage additional private-sector investment into any projects in which SMF chooses to invest.

The Facility would target financial returns of 6% per annum overall on capital invested. This could be re-invested in new projects or funnelled towards the SMF’s technical assistance facility, which would work to amplify the impact of SMF-funded projects. The Facility would be open-ended, meaning that Defra’s investment could be recycled for multiple projects –this has the potential to substantially increase the impact of funds invested.

The facility managers have proposed setup costs of 1% of committed capital, within annual management costs of 3% on assets under management. Given that the variable management cost is higher than the cost structure proposed by Mirova-Althelia for other funds in which ICF is engaged, there is scope for this percentage cost to be reduced.

#### Project Monitoring and Evaluation

Althelia have developed a theory of change for the Facility in collaboration with ICF analysts which sets out the expected activities-outputs-outcomes-impacts of the program of work – this is detailed in Annex 3. This enables the ICF team and Althelia to assess and consider the mechanisms, theory and assumptions through which the Facility would deliver on its objectives, covering the strategic picture of the expected path towards a project’s intended impact.

The Facility has proposed a strong framework for monitoring projects, with requirements for annual reporting of up to 22 Key Performance Indicators (KPIs). These would include indicators concerning ecosystem integrity, species protection, local livelihoods and sustainable enterprises. Projects receiving investment would be required to achieve, maintain and report quantifiable net gains in indicators on an annual basis. A similar impact framework is currently in use with the Althelia Climate Fund, one of the management team’s existing conservation investment funds.

#### Economic Appraisal

##### Approach

|  |  |
| --- | --- |
| **Costs** | **Present Value (20 years), 2018 pounds sterling** |
| ICF Funding | £12,750,000 |
| Leveraged funds | £15,937,500 |
| Fund Management costs | £4,797,600 |
| ICF staff costs | £944,200 |
| Opportunity cost of foregone investments by funders (private and public) | £4,669,900 |
| **Present Value Total Costs** | **£39,099,200** |
|  |  |
| **Benefits** |  |
| Carbon savings | £91,439,400 |
| Productivity benefits | £6,556,600 |
| Ecosystem services | £24,292,300 |
| **Present Value Total Benefits** | **£122,288,300** |
| **NPV** | **£83,189,000** |
| **BCR** | 3.1 |

Figure 10: Cost and Benefit Summary for the Sustainable Mangroves Facility. All figures to nearest £100.

This appraisal assumes that once ICF funding is committed to the Sustainable Mangroves Facility, funding **will not be repaid** to ICF in the future. This is due to:

1. The logistical and political challenges relating to the UK Government technically receivingODA funding, even as a repayment, in any given financial year.
2. Financial questions around whether mechanisms exists through which funding would be repaid to Defra – this has been flagged by the Finance team

As such, it is assumed that ICF funding will be exhausted through the provision of non-repaying finance to SMF recipients, either through technical assistance or grant funding. However, as we assume that these actions would take place after the 20-year appraisal period, these actions are considered **out-of-scope**.

The facility aims to operate as an ‘ever-green’ fund, meaning it would operate in perpetuity. However, in line with the operational framework in place for the Eco.business Fund - the evergreen finance fund in which Defra ICF currently holds a stake – the operational of the fund will be reviewed after 15 years, with Defra ICF having the option to withdraw its funds at that point. As such, the appraisal assumes a 15-year fund operation.

##### Costs

The costs that were within scope to monetise as part of this analysis are:

**ICF funding costs**: The £12.75m of ICF funding provided to the facility.

**Finance leveraged through ICF funding:** Based on data provided in the terms sheet for the SMF, the fund managers project funding to be leveraged into the SMF at a 1:1 ratio. To account for optimism bias we have reduced this by 50% - as such, the central scenario assumes in-fund leveraging of 1:0.5. Hence £6.37m is expected to be leveraged. 100% of this funding is assumed to be public. Further, the fund managers are targeting external funding to be leveraged into projects which the Facility invests at a 1:1 ratio. Reducing this by 50% again, this totals a further £9.5m, all of which is assumed to be private. Overall, £15.9m of funding is projected to be leveraged, 40% public funds and 60% private capital.

**Fund management costs:** The facility managers have proposed setup costs of 1% of committed capital, within annual management costs of 3% on assets under management. M&E costs are assumed to be covered by these expenses.

**The opportunity cost of foregone investments for private finance leveraged through ICF funding:** It is important to account for the returns the private sector would have made had the money been utilised for a different investment throughout the lifespan of the program. This level of forgone return has been set at 3.5% annually on commitments, in line with guidance from DfID analysts.

Following advice from colleagues across HMG, it is assumed that there is no opportunity cost associated with public funding, whether provided by ICF other donors, since ODA budgets are already committed.

**ICF staff costs:** FTE capacity of different posts is as follows: EO (0.05); HEO (0.7); G7 (0.1); G6 (0.1); SCS (0.05). The costs associated with this capacity have been provided by Defra Finance.

##### Benefits

**GHG emissions:** An indicative estimate for the tonnes of carbon sequestered or emissions avoided has been estimated based on mangrove area protected or restored from the three projects appraised. This has been extrapolated across the total funding provided under this investment to reach an estimation of 3,000 ha. It is assumed that half of this figure is mangroves protected, while the other half is mangroves restored.

For mangroves protected, the area is multiplied by IPCC figures for the volume of carbon stocks on average for mangroves globally[[37]](#footnote-38) - 1,874tCO2e /ha. We assume that deforestation of a hectare of mangroves will lead to the loss of 50% of the carbon stock, a conservative estimate based on the ranges offered by relevant literature[[38]](#footnote-39) (25%-100%).The volume of stock protected has been shared equally from year 4 to year 20.

For mangroves restored, it is assumed that each hectare will sequester 6.4tCO2e [[39]](#footnote-40) per year from year 4 to year 20.

The value of each tonne has been derived from the BEIS International Carbon Price Series, which assumes that the value of every tonne sequestered or avoided will rise throughout the appraisal period from £61/t in year 4 to £140/t in year 20 following the international carbon price series agreed by ICF analysts across HMG.

In the central scenario, it is assumed that the programs will provide no GHG benefits until year 4 of operation. The carbon savings are assumed to be constant from year 4 onwards to the end of the 20 year appraisal period.

**Productivity benefits:** Increases in productivity and the more efficient allocation of economic resources resulting from an investment have been modelled through the rates of return targeted by the SMF on any investment. In theory, if recipients are able to repay an investment at the target rate of 3% annually, then productivity must be increased by *at least* 3% on an annual basis to meet these repayments. Productivity increases are modelled to start in year 4 and accumulate up to year 20.

**Ecosystem services:** The services of coastal protection and food provision provided on an annual basis by a hectare of mangrove forests was drawn from the TEEB Ecosystem Service Values database, a synthesis of academic studies on the value of services provided by different biomes. The two services combined were valued at £1452/ha. These values were multiplied by the expected area of mangroves protected or restored by the program – 3,000 ha.

##### Discounting and Adjustment for Uncertainty

To account for the tendency of individuals to value benefits in the present over benefits in the future – and vice versa for costs – social discount rates have been applied to future impacts of the program, as per HMG appraisal guidance. The SMF expects to spread the value of its project funding at a close-to-equal proportion between LDCs (10%), LMICs (8.5%) and UMICs (7%). As such, values have been discounted at an annual rate of 8.5% for costs and benefits other than GHG emissions.

Annual benefits from avoided GHG emissions are discounted at 3.5% annually, in accordance with ICF analytical guidance on discounting of global goods[[40]](#footnote-41). The opportunity cost faced by private capital is also discounted at 3.5%, as it is assumed to be sourced from developed country capital funds.

The uncertainty related to this option is derived from four main sources:

* The level of additionality delivered by ICF funding of projects under the program, and the benefits which are delivered *over and above* those delivered by actions which recipients would have taken in the absence of funding
* Uncertainty around the source of data for benefits, for example the application of generic biome ecosystem service values to specific areas of mangrove forests
* The lack of project data supplied by the fund management team, which made assessing the impacts of an investment in the SMF challenging
* The significant degree of risk attached to setting up a new investment fund, especially in an untested sector

To account for additionality considerations, a 50% discount has been applied to the project impacts of the program.

Further:

1. To account for the possibility of leakage of deforestation to areas adjacent to the program area, a further 25% discount is applied
2. To account for i) the risks (as raised by the project partners) of a lack of investable proposals being identified for funding through the Facility – only 2 proposals totalling $2m of SMF funding are considered as suitable for investment to date, and ii) the lack of experience of the fund managers in mangrove conservation to date, a further 25% risk discount has been applied.

In all, a 28.1% rating (50%\*75%\*75%) has been applied to the gross expected impacts of the program before any impacts are monetised.

These delivery risks may be mitigated through further scoping of the investment field by the project partners – this would increase the likelihood that benefits are realised and create a situation where an ICF investment in SMF represents strong value-for-money. However, given the strict timeline attached to a 2018 ICF investment, we recommend that this option is not considered for investment in 2018.

Low and high scenarios were developed for the purposes of sensitivity analysis, using the lower and upper bounds for each input variable. This produced a range of the benefit-cost ratio of 0.7-7.5. Detailed results for this analysis are available in the Annex.

#### Results

##### Costs

ICF funding costs are assumed to be a one-off payment of £12.75m at the start of year 1.

The costs of leveraged funding are also assumed to be taken in Year 1 when ICF funding is committed. Funding is projected to be leveraged at a ratio of 1:1.25. £12.75m of ICF funding will be expected to leverage £15.9m of funding. It is projected that 40% of funding leveraged by ICF’s investment will be public funds, with the remaining 60% in the form of private capital.

Fund management costs on the projected £19.1m of assets within the Facility compose of a 1% setup, faced before operation, of £191k. In addition, 3% is faced annually on assets under management. This is projected to fall from £566k in year 1 to £554k in year 15, the final year of fund operation. The overall present value cost is projected to be £4.8m.

ICF staffing costs, including overheads, are estimated at £106,000 a year. This is assumed to be constant through the 15-year lifespan of the facility. This produces a present value overall of £944k.

Private capital, totalling £9.5m, is subject to opportunity costs. Opportunity costs of private capital are considered as cumulative over the 15 year lifespan of the program. Costs are projected to rise from £334k in Year 1 to £488k in Year 15. This produces an overall present value of £4.7m.

Overall, present value of project costs over the 20 year appraisal period comes to £39.1m.

##### Benefits

Carbon savings benefits are not projected to begin until Year 4 of the facility. The GHG emissions sequestered or avoided are expected to stay constant between year 4 and year 20 at 92,250tCO2e.As such, the GHG emissions benefits of the program rise from £5.6m in year 4 to £12.9m in year 20. This produces an overall present value of £91.4m.

Productivity benefits are expected to begin in year 4 at a value of £860k, rising to £1m in year 20. This produces an overall present value of £6.6m.

Ecosystem service benefits are not projected to begin until year 4 at £872k. These are then expected to rise to 100% over 5 years at a linear rate of increase. Benefits are then projected to stay constant from year 8 to year 20 at £4.4m. This produces an overall present value of £24.3m.

Overall, present value of project benefits over the 20 year appraisal period comes to £122.3m.

The net present value of an investment in the Sustainable Mangroves Facility is projected to be £83.2m.

#### Discussion

A number of potentially significant benefits of the Facility remain un-monetised, such as:

1. **Other ecosystem services beyond coastal protection and food provision.**
2. **the impact of additional jobs on the local economy** – the capacity required to quantitatively assess the impacts of jobs across a wide range of locations, circumstances and sectors, as well as the proportion of jobs newly created as opposed to displaced from elsewhere in the economy, was not considered proportionate to the level of impact.

Given these issues, we estimate the cost-benefit ratio of 1:3.1 (i.e. £1 cost delivers £3.10 in societal benefit) as a conservative estimate of an ICF investment in the Sustainable Mangroves Facility.

£12.75m of ICF Investment in this option, along with £6.4m of funding leveraged into the Facility as a result of ICF investment, would aim to deliver target impacts of:

* 1,568,200 tonnes of C02 emissions sequestered or mitigated
* 3000ha of mangroves restored or protected

There are significant economic question marks attached to this program from an ICF perspective. Althelia have raised questions around the availability, feasibility and number of economic models which can both provide a return on investment and support mangroves. While the Facility managers do have a substantial amount of expertise in the sustainable investment sector, there is a significant degree of risk attached to establishing a new fund, specific to mangroves especially in such an untested sector.

[Redacted]

Overall, a decision not to invest in the Sustainable Mangroves Facility at this point is considered as justified by these concerns.

# Commercial Case

The Appraisal Case provides a high level justification for establishing a new regional programme with the IDB, including the associated costs and benefits. The following sections (Commercial and Financial) provide further information on the capabilities and capacity of the IDB to deliver the programme against the objectives, in line with the delivery plan while limiting risk. Thorough due diligence assessments of the IDB have been carried out by DfID and the Multilateral Organisation Performance Assessment Network (MOPAN) within the last three years and as such we will focus on summarising these to evaluate their track record, the strength of the systems and policies in place to ensure rigorous financial, social and environmental oversight.

Due to the comprehensiveness of assessments carried out by MOPAN the overall number of bilateral assessments of multilateral organisations is diminishing. MOPAN’s assessments – with their focus on organisational performance – provide a solid evidence base that donors can draw upon on to minimise the multiplication of demands on the Multilateral Partners. Today most donors are drawing on MOPAN for performance-based information. Some donors complement this with an assessment of the fit of the multilateral organisation’s policies with their own national policies and strategies – as in DfID’s MDR.

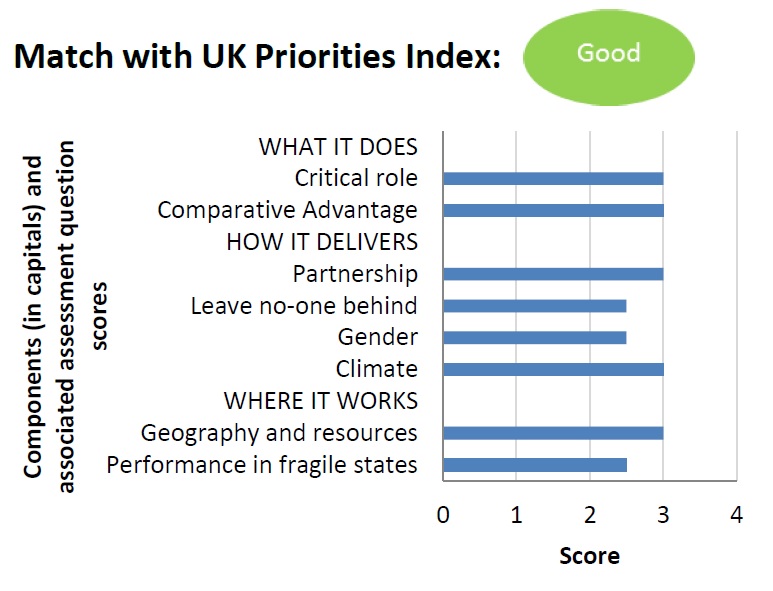
## Competency of the Organisation to Deliver in Country

IDB and the UK have an ongoing and expanding partnership with approximately £300 million in commitments and under administration, and a partnership involving multiple different UK agencies (DfID, Defra, BEIS, and UK Export Finance) in areas such as agriculture, blue carbon, climate, competitiveness and private sector development. The UK is a member country of the IDB and it is represented by an Executive Director in the IDB Board of Directors.

The IDB has 48 member countries: 26 borrowing and 22 non-borrowing countries. The UK is the sixth largest non-regional shareholder at just under 1%. The UK purchased shares valued at £10.5million in IDB’s most recent General Capital Increase (2011-15). The UK is also the sixth largest donor to the Fund for Special Operations, making a one-off payment of £5.3 million in 2011. The UK Representative is the Alternative Executive Director as part of a Board constituency led by Japan.

BEIS reported that the IDB was rated as the largest and best regarded international organization in Latin America and the Caribbean in the 2006 Latinobarometro public opinion survey. Latinobarómetro is an annual public opinion survey that involves some 20,000 interviews in 18 Latin American countries.

DfID’s Multilateral Development Review (MDR) in 2016 assessed the IDB’s ability to deliver in the LAC region and how they align with UK objectives. Summary figure from DfID’s paper is below.



As the largest development finance institution of LAC, the IDB has extensive experience, processes and system to manage donor-funded programs. The OECD DAC data, recognises that in recent years, IDB has been the individual largest channel of bilateral non-core ODA through the multilateral system for Latin America and the Caribbean. This programme falls within one of the five priority areas of the bank namely addressing climate change and environmental sustainability.

Figure 11: Alignment of IDB with UK priorities from DfID’s MDR

DfID’s MDR noted that the IDB has the internal processes in place to ensure and enforce the transparency of their execution procedures, including the procurement of consulting goods and services, and cash transfers to producers.

In 2015, the bank also implemented a major reform programme to improve its strategic focus to provide a better results focus, and address value for money issues. A key element of these competencies is that IDB’s policies and procedures in areas such as fiduciary and financial management, procurement and transparency, social and environmental safeguards, all follow international standards and are monitored by a resident Board of Directors, comprised from representatives from the 48 member countries, including the UK.

In respect to partnerships, according to the latest cycle of assessment by the Multilateral Organisation Performance Assessment Network (MOPAN), which included organizations such as the World Bank, GAVI, the Global Fund, UNDP and UNICEF, among donors and client governments; the IDB was the highest rated international organization in relationship management – partnerships and resources. The IDB’s operational performance and cost-efficiency was also rated highly satisfactory in the same report, the highest possible mark in the assessment.

According to the 2016 Joint Report on Multilateral Development Bank Climate Finance, the IDB is second only to the European Bank for Reconstruction and Development (EBRD) in respect to climate finance as a percentage of total MDB operations.

## DfID’s ‘Central Assurance Assessment’ (CAA)

DfID has recently undertaken a ‘Central Assurance Assessment’ (CAA) of the IDB, a due diligence report on their performance and procedures. Overall it assessed the IDB as “a minor risk partner for DfID, in terms of central systems and processes. It carries no unacceptable fiduciary or reputational risks” (CAA, 2017). It also reviewed the bank’s internal procedures and processes and made an assessment of acceptability, a summary of the reports finding are provided below:

1. **Governance and Control:** The IDB has a well-established system for corporate governance. The Board oversees a well-developed system of internal control, which complies with international best practice and has been tested exhaustively.
2. **Financial Capacity:** The Bank’s financial management is subject to a high degree of external and internal scrutiny, including credit rating agencies, internal and external audit, and periodic independent assessments such as the 2016 MOPAN review. The IDB is seen as posing no significant financial risks. It manages donor funds well ensuring they can demonstrate that funds are being used as intended.
3. **Ability to Deliver:** The bank’s organisational systems and financial management systems have a high degree of transparency and accountability, although the procedures for those implementing projects can seem quite cumbersome. The Bank has 26 local offices and the staff’s technical expertise, at a local level is a key asset.
4. **Downstream Partners:** The bank encourages the use of local systems, where possible putting the responsibility for implementation into the hands of client countries, but takes care to ensure that countries have the capacity and instruction for project/programme management.
5. **Fraud and Corruption:** The IDB has a zero tolerance approach to fraud corruption and other sanctionable practices. The IDB enforces policies and control mechanisms against corruption, fraud and abuses in all the projects it finances, as well as in the activities of its employees, who must abide by the highest standards of integrity.

## Compliance with gender sections of 2002 International Development Act

Under the Act, the ODA delivering partner should have a meaningful yet proportionate regard to the contribution its assistance is likely to make to reducing gender inequality before assistance is provided. The decision to approve funding should consider the impact on gender inequality – the impact of the intervention on the different genders (men and women) and the relationship between them. It is the responsibility of the SRO to ensure that the impact of this development assistance on gender equality receives ongoing consideration.

### The IDB’s Environmental and Social Safeguards (ESG)

The IDB is committed to maximizing the positive environmental and social outcomes of the Bank’s work while minimising the risks and negative impacts to people and natural capital. In practice this means protecting and investing in natural and social resources, responding to the challenges of climate change, promoting sustainable infrastructure solutions, and ensuring social inclusion and accountability.

The IDB applies a set of environmental and social safeguard policies and guidelines to projects they finance to help protect against environmental and social harm and to enable borrowers to meet best international practices. The safeguards and policies focus on; Environment, Natural Disaster Risk Management, Involuntary Resettlement, Indigenous Peoples and Gender Equality (DFID CAA, 2016).More information on IDBs policies and procedures on ESG can be found at the following [link](https://www.iadb.org/en/topics/sustainability/about-us).

The IDB have also responded to HMGs request for further safeguarding assurances, providing confirmation that they have policies and processes in place to combat the four key points identified below

* Provide a safe and trusted environment which safeguards anyone who your organisation has contact with, including beneficiaries, staff and volunteers;
* Set an organisational culture that prioritises safeguarding, so that it is safe for people to report any incidents and concerns with the assurance they will be handled sensitively and properly;
* Have adequate safeguarding policies, procedures and measures to protect people and these are shared and understood, and;
* Be absolutely clear as to how incidents and allegations will be handled should they arise, including reporting to the relevant authorities.

## Procurement Policies

The IDBs procurement policies reflect the interest of the bank and its member countries to grant transparency, competition, equality of opportunities, and the principles of economy, efficiency and integrity in the procurement of IDB-financed operations. The IDB provides funding to its borrowing member countries with a broad range of loans and development programs. These operations involve procurement processes for goods, works, and services provided by firms and individuals. The IDB is supporting borrowing member countries in their effort to strengthen their procurement systems so that they meet international best practices.

The policies, bidding documents, informative material, and other resources for the Procurement of Goods and Works of the IDB in the following [link](https://www.iadb.org/en/procurement). For additional information on independent evaluation regarding the IDB’s procurement processes, please refer to [MOPAN](http://www.mopanonline.org/assessments/iadb2015-16/Mopan%20IDB%20%5binteractive%5d%20%5bfinal%5d.pdf).

The DfID 2017 CAA (their due diligence report on the IDB) reviewed the IDB procurement processes and found them to be “strong and transparent” with strong systems in place to ensure procurement is “fair and transparent”. This is echoed by the 2016 MOPAN report which also found that IDB had clear policies and guidelines for procurement, which are all publically available. The report states that “the IDB’s procurement policies reflect both the Bank’s and member countries’ interests in ensuring transparency, competition, equality of opportunities, and the principles of economy, efficiency and integrity in the procurement of IADB-financed operations”.

Two infographics below summarise the procurement milestones at the IDB.

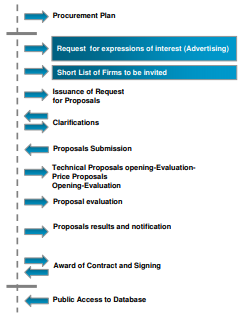
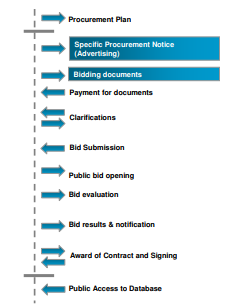


Figure 12: a) Procurement Processes and b) the Selection of Consultancy Services

## Ensuring results are delivered at agreed cost

In addition to the monitoring and evaluation processes in place that are detailed in the Management Case the IDB ensures results are delivered at cost through their management fee.

The management fee charged by IDB (one off fee of 5%) is part of a cost-sharing initiative across the IDB group. This cost-sharing enables the general costs of administration to be equal and consistent throughout the bank’s portfolio regardless of programme/investment size.

The implementation of any programme and the portfolio of operations are often not covered by the administration fee amount for each project, according to estimates by BEIS. Thus the IDB group absorbs the additional cost associated with Fund at no extra cost to the Donor by cost-sharing and the standard of care is always guaranteed regardless of the actual cost of the programme.

It is important to note that the fee is distributed to the departments of the IDB Group directly supporting the Fund for which any additional workload required in preparing, executing and monitoring projects and general programme management, implementation, supervision and compliance activities.

## Commercial Risk

Building on the lessons learned from the existing suite of IDB implemented ICF investments, the positive relationship the UK has with the IDB team and the extensive work carried out to assess and evaluate the capacity and capability of IDB to deliver successfully and efficiently in this landscape (internally by DfID in the MDR and in the MOPAN report) we expect the commercial risks to be minimal. Those foreseen and any mitigation strategies in place are summarised in the figure 13 below.

### Summary of perceived commercial risks

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Risk Summary (Event and Effect)** | **Probability** | **Impact** | **Level** | **Current Mitigation Plan** |
| **Exchange rate risk:** Given current exchange rate trends between the USD and GBP, further depreciation of the Pound Sterling could translate into execution limitations for the program, as all costs are calculated by the IDB taking into consideration the local currency/USD exchange rate**.** | Unlikely | Moderate |  | Components of programme can be scaled up or down to meet the effective budget availability.  The Promissory Note commits funding in GBP and each draw down will be in GBP therefore the exchange rate risk is taken on by the IDB |
| **Untested market** for implementing mangrove/blue carbon blended finance mechanisms means the commercial impacts of these solutions are limited. | Possible | Major |  | The blended finance aspect of the programme is limited and funds will eventually be redeployed in full as grants. |

Figure 13: Summary of perceived commercial risks

### IDB’s Risk Management Policy

The IDB has an independent [risk management department](https://www.iadb.org/en/about-us/departments/rmg)in charge of managing risk within the organization, including the assessment of credit, operational and market risks. For more information please refer to the following [link](https://www.iadb.org/en/idb-finance/idb-finance-portal).

## State Aid

This intervention is not expected to have the potential to distort competition and trade in the European Union, and is therefore not deemed to amount to State aid.

# Financial Case

The following Financial case establishes that the preferred option outlined previous is affordable, is the best use of Defra ICF funds, and that the principles of sound financial management for public funds are followed. To do so it covers a brief financial assessment of the flow of funds, governance, financial control and accountability for resources. As IDB is a tested partner with a positive reputation and robust commercial processes in place the financial risks are expected to be minimal financial management is expected to be of a high standard.

## Expected Costs

As part of the approved Defra ICF implementation plan for projects to the end of SR15, £12.75 million has been allocated to a mangrove investment for the financial year 2018/2019. This implementation plan received ministerial approval in June 2018.

In order to ensure timely implementation and give assurances to our delivery partner we are looking to lodge a promissory note with a finalised draw down schedule for this investment by 15th December 2018. Defra will be contributing 100% of costs. The budget breakdown by component activities and a drawdown schedule follows:

### Proposed Budget

|  |  |  |
| --- | --- | --- |
| **Finance Type** | **Activity** | **Value** |
| Blended finance | **Blended finance investments** | **$ 6,320,000** |
| Grant funding | **Total investment grants (and technical assistance)** | **$ 8,220,000** |
| Evaluation and audits | Independent mid-term assessment | $ 120,000 |
| Impact evaluation (baseline, final) | $ 600,000 |
| Financial audits | $ 90,000 |
| Communications of results (starting in year 4) | $ 300,000 |
| **Total evaluations and audits** | **$ 1,110,000** |
| Sub Total | Total investment before administration | $ 15,710,000 |
| Administration costs | Blended finance fees (2.5%) | $ 158,750 |
| Trust fund set-up cost | $ 35,000 |
| Grant administration (5%) | $ 468,000 |
| **Total administration** | **$ 661,750** |
| **Total** | **Total investment (withdrawn schedule)** | **$ 16,311,750** |
| **£ 12,750,430** |
|  |  |  |
| Proportions of investment | % Blended finance (total) | 39% |
| % Technical assistance grants (total) | 50% |
| % Evaluation and audits (total) | 7% |
| % Administration costs (total) | 4% |

### Drawdown Schedule

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Year** | **2019** | **2020** | **2021** | **2022** | **2023** | **2024** |
| Blended finance | $0 | $4,400,000 | $1,950,000 | $0 | $0 | $0 |
| Grants and TA | $2,050,000 | $1,500,000 | $2,100,000 | 1,600,000 | $1,000,000 | $0 |
| M&E and audits | $330,000 | $10,000 | $40,000 | $170,000 | $130,000 | $430,000 |
| Administration | $154,000 | $185,500 | $155,750 | $88,500 | $56,500 | $21,500 |
| Total | $2,534,000 | $6,095,500 | $4,245,750 | $1,858,500 | $1,186,500 | $451,500 |

### Disbursement Mechanisms

The programme will disburse funding using a combination of grant finance and blended finance mechanisms, as outlined in the Appraisal Case.

The assumptions around blended finance are that a competition will identify eight enterprises and each will receive up to $500,000 of risk capital investment. Originally this will be booked as a grant, and it will convert to equity at the point that an enterprise offers return in a subsequent round[[41]](#footnote-42). The model assumes that up to half will convert to equity and pay back the investment.  In addition, the competition would cost $400,000 to structure and run.  This entrepreneur competition will be counted as one operation of $4.4m.  At the point of return, which may be below, at, or above the value of the initial grant, the resources should be re-used. However, this $4.4m will be predominantly counted as grant finance due to the high-risk nature of the investment and the time frame of the review.  In addition, the model assumes two reimbursable operations of $1m each which are expected to be concessional loans.

### Administrative Costs

The table below indicates the expected staff resource implications of this programme. There are ongoing plans to increased resource within the ICF team to accommodate not only this programmes implementation but also any others defined in the implementation plan to the end of this spending review.

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Internal Defra Staff Dedication Required (FTE)** | | |
| Grade | Defra 2019 | Defra 2020+ | FCO |
| SCS | 0.05 | 0.05 | 0 |
| G6 | 0.1 | 0.1 | 0 |
| G7 | 0.1 | 0.1 | 0 |
| S/HEO | 0.7 | 0.4 | 0 |
| EO | 0.05 | 0.05 | 0 |
| **TOTAL** | **1** | **0.7** | **0** |

Figure 14: Expected staff resource implications of this Defra ICF intervention

## Affordability

The ICF budget has sufficient Capital (CDEL) to fund this £12.75m project in the 2018/19 budget allocation. Full committal of funds are required this calendar year (before 15th December) to provide assurances to the delivery partner and allow the project to launch across its entire pipeline as per the proposed budget and drawdown schedule.

A promissory note is required to fund this programme due to the requirements for full, irrevocable commitment of the funds this year which in turn will allow IDB to launch and implement across the entire portfolio of pipelined projects. This is therefore the most appropriate funding mechanism to ensure the funds are not provided in advance of need but to also allow the programme is incepted and begins delivery on schedule.

### Avoiding payment in advance of need

In line with HMT’s guide on Managing Public Money, we will ensure that Defra is not paying the IDB in advance of need. The ICF team at Defra will monitor the disbursement schedule agreed with the IDB to assess if they are ahead or behind schedule, and revise the disbursement schedule for the Promissory note if necessary. In this way, Defra can ensure that none of the funding is paid in advance of need.

## Expected Agents and Beneficiaries

The indicative organisations that the IDB will be working with include NGOs, local and national governments (including municipalities, ministries,) private sector entities such as fishermen associations, local alliances, and corporations, and universities. This list will be refined to specific agencies and beneficiaries during Log Frame development.

## Reporting and Accounting for Funds

Quarterly, internally produced reports on the spend progress against budget will be requested from IDB as well as an annual, externally audited financial report for the programme. These audited reports should separately identify Defra funding and spend, associated disbursements and show any unspent funds. This is in line with the precedent set by our existing ICF portfolio and meets the expectations of our Finance Business Partner.

These reports are expected to disaggregate financial data by project and category of spend and should also align with delivery plans for these projects.

### Monitoring and Evaluation (M&E)

#### Costs of M&E

Ongoing M&E at the project level is budgeted for and financed through the administrative fees charged by the IDB (outlined above). Any additional costs outside this will be absorbed by the Bank as part of their management cost-sharing initiatives outlined previous.

Independent evaluations are scheduled in addition to the internal M&E carried out by the IDB and in line with the paper approved by the ODA Board in July. These independent evaluations will be carried out in year 1 to provide baseline data, in the midterm (approximately year 4) and as an end-term impact assessment of the project, likely at the end of year 6. As discussed in section 5.6 the costs of the creating and implementing of monitoring and evaluation systems can be classed as capital investments and have been budgeted for as such. These budgeted costs will be drawn down from the promissory note to be lodged at the end of 2018 but only for the years appropriate to the activities.

Additionally to the financial justifications for this approach, external independent evaluations require significant resource (staff and financial), beyond the capacity of the current Defra ICF team. Contrastingly the IDB, as a trusted partner, have a database of independent M&E consultants from which they can tender a contract for this work, QA the product and manage the selected organisation. Defra ICF team will be involved in the design of the evaluation plan (to include these independent assessments).

There is an understanding between both parties that although the project will “close” after 6 years, the risks associated with these blended finance mechanisms and the proceeding recycling of any returned risk capital as grants could mean that not all funding is redeployed at this stage. An end of term impact evaluation should take this into consideration.

## The IDBs Financial Strengths and Weaknesses

DfID’s MDR showed that the IDB promotes prosperity and tackles inequality and pockets of extreme poverty in the Latin America and Caribbean region, where the UK has a limited development relationship. It provides loans, grants and technical assistance and has the most diversified sectorial portfolio among the regional development banks. Its borrowing countries regard it as highly influential.

The IDB’s debt rating is Triple-A, the highest available. By the end of 2017, the IDB had approved more than US$ 272 billion in loans and guarantees, including non-sovereign guaranteed lending through 2015, to finance projects with investments totalling over US$ 552 billion, as well as US$ 7.1 billion in grants.

IDBs 2017 Annual Report can be found [here](https://publications.iadb.org/bitstream/handle/11319/8824/Inter-American-Development-Bank-Annual-Report-2017-The-Year-in-Review.pdf?sequence=1&isAllowed=y).

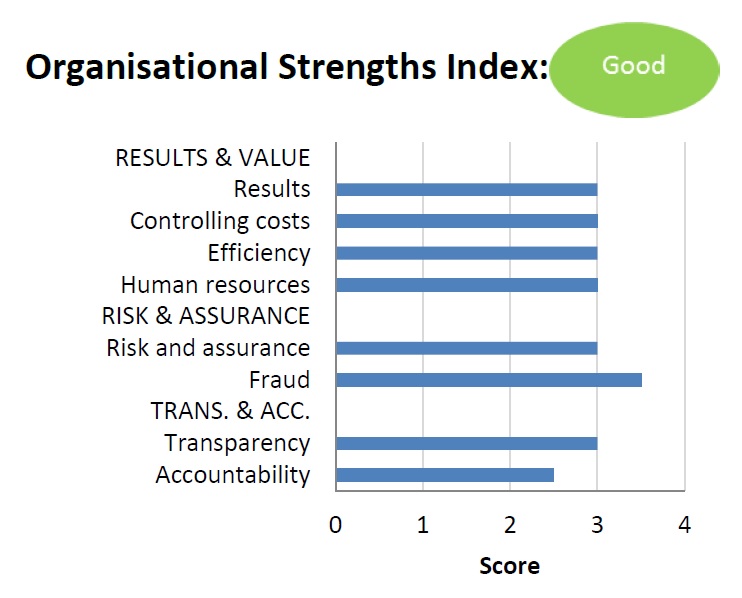


Figure 15: IDBs Organisational Strength Index as part of DfID’s MDR in 2016

### Transparency

DfID’s MDR explains that generally agencies are taking transparency more seriously, with much more data now published in an accessible way, based on the standards of IATI, a foundation that the UK helped to set up. DfID expects all its partners to meet IATI standards as a minimum. Most agencies are now following this standard including IDB. The report concluded that the IDB generally performs well in aid transparency but does fall short by allowing countries to object to disclosing certain information, however it scored a *Good* in the review.

The IDB was one of only 7 international organizations that qualified for the top ranking of “Very good” in transparency, in the 2018 Aid Transparency Index, an independent measure of aid transparency. The ranking includes 45 organizations worldwide. For more information and full report, please refer to the following [link](http://www.publishwhatyoufund.org/the-index/2018).

The MDR noted that “building on its stated focus on inequality, IDB could put greater emphasis on girls and women and demonstrate broader ambition on the *Leave No-one Behind* agenda. It needs to continue progress with accountability reforms”. As such Defra ICF will ensure pressure is put on the Bank to report against these metrics.

### Projected Downstream Partners

The programme will be working across multiple sectors including with NGOs, local and national governments (including municipalities, ministries,) private sector entities such as fisher associations, local alliances, corporations, and universities. Specific organisations and businesses will be developed and finalised before the end of 2018 in time for implementation in 2019.

## Financial Accounting Considerations

### ODA Eligibility

Target countries for the programme include: Belize, Colombia, Dominican Republic, Ecuador, Guatemala, Guyana, Haiti, Honduras, Jamaica, Nicaragua, Panama and Suriname. The IDB have confirmed that all prospective delivery countries and activities within these countries will be ODA eligible.

### Capital (CDEL) Expenditure

Capital assets can be financial (bank deposits, bonds, loans, shares, accounts receivable) or non-financial (land, buildings, vehicles, equipment, machines, rights to use physical structures or information, goodwill and other intangibles such as knowledge products, those intended to be preserved for future generations because of their environmental associations, and those taking steps to increase the value of natural assets by the productive activity of economic entities.

Analysis undertaken by financial accountants at BEIS as part of a review of a World Bank paper on expenditure types showed that expenditure on projects of this sort could in almost all instances be counted as capital (CDEL).

### CDEL Categories

In this instance, the capital purchases involved in this project can be grouped into three categories.

#### CATEGORY 1: Investments

This expenditure category focuses on both tangible and intangible assets. Items included could be seeds, seedlings, trees, irrigation systems, fertilisers, vehicles, computers, and the establishment of participatory forest management areas and plans.

The International Financial Reporting Standards (IFRS) body publishes International Accounting Standards (IAS) pertinent to this categorisation. IAS 16, 38 and 41 all state that an asset may be recognised when it is probable that future economic benefits will flow to the entity, and the cost of the asset can be measured reliably.

In this expenditure category the investments clearly meet the above criteria and can be classed as CDEL expenditure. The economic life, and benefits derived from holding the assets are expected to be greater than one year, and as such the investments would be classed as non-current assets.

#### CATEGORY 2: Monitoring, Reporting and Verification (MRV) Systems

In order to receive payments, perform effectively and report issues, all programmes need to have monitoring systems in place. This could include evaluation plans for independent assessments and large databases. These systems may also include management information systems for forests, land use or registries.

IFRS - IAS 16 states that an asset may be recognised when it is probable that future economic benefits will flow to the entity, and the cost of the asset can be measured reliably. IAS 16 also states that costs incurred initially to acquire or construct an item of property, plant and equipment can be recognised as capital, and so these costs may be capitalised too.

It is reasonable to class the monitoring and evaluation systems as assets since they involve the generation of a knowledge product which is an asset in itself but also adds value to other assets within the programme. The economic life, and benefits derived from holding the asset are also expected to be greater than one year. Furthermore, the costs incurred to acquire these assets can be recognised as assets.

#### CATEGORY 3: Other capital costs

##### Land Use & Enforcement

The activities in this expenditure category ensure that staff can utilise assets (e.g. trees, vehicles, fire prevention equipment) in order to intervene in deforestation activity supports and preserves assets.

IFRS - IAS 16 states that asset costs include all costs necessary to bring the asset to working condition for its intended use.

These activities are necessary to allow assets to be fully utilised and are therefore directly attributable to the creation of an asset (in this case, a productive, protected forest environment).

##### Design & Implementation Inputs

This is defined in the World Bank paper as analytical work, advisory services, and technical input to directly guide the design and implementation of individual projects.

IAS 16 states that asset costs include all costs necessary to bring the asset to working condition for its intended use, and that costs incurred initially to acquire or construct an item of property plant and equipment can be recognised as capital.

The analytical work, advisory services, and technical input are necessary building blocks to the creation of individual assets in working condition. The associated costs should therefore be capitalised.

##### Advisory services and Investment Services

Blended finance mechanisms will be established as part of several of the projects. The costs of these advice and financing solutions are expected to support and enhance assets, and where they are directly attributable to a specific asset, i.e. the forest, they can be capitalised.

##### Delivery of carbon credits

There is a wider point that the entire programme (investments, technical assistance, capacity building) has a significant focus to contribute to the creation of carbon credits which are themselves financial assets. The HMT document ‘*Capital and financial transactions*’ confirms that grants to acquire long term financial assets may be treated as capital. It is therefore reasonable to conclude that each activity within those projects creating carbon credits is essential to the creation of those credits, and therefore each of these projects should be classed as CDEL in their entirety.

### CDEL Conclusions

It is expected that a small proportion of project activity does not strictly meet the criteria for capitalisation under accounting standards. However, consideration of the following points can allow us to overcome this:

1. Spend will be non-discretionary
2. Non capital spend is negligible (less than 10%)
3. Spend towards several of the largest projects appraised contributed to the creation of a capital asset, carbon credits.

For this purpose of this programme several activities have been classed as RDEL in line with this guidance; these are: financial audits; communications and dissemination of results; blended finance fees; trust fund set-up cost; and grant administration. The total value of these activities is $1,051,750 (£821,680), equal to 6.9% of the programme budget.

## Avoiding Fraud and Corruption

DfID expects all organisations to have a zero tolerance approach to fraud and corruption; acting immediately if it is found, working with authorities to bring perpetrators to account and pursuing aggressive loss recovery approaches**.** The Review confirmed that all agencies have systems in place to detect and combat fraud, with multilateral development banks (MDBs) such as IDB having some of the best developed.

Transparency and anti-corruption are important instruments for the IDB to achieve its goal to reduce poverty and inequality in Latin America and the Caribbean. The Bank addresses these issues in two ways: through good governance mechanisms and working closely with countries to strengthen governance, enforce the rule of law, and fight corruption at both local and national levels.

Please refer to independent assessment by [MOPAN](http://www.mopanonline.org/assessments/iadb2015-16/Mopan%20IDB%20%5binteractive%5d%20%5bfinal%5d.pdf) regarding financial standing.

The following links have complete descriptions of IDBs integrity policies and systems

* How to [report fraud and corruption](https://www.iadb.org/en/topics/transparency/integrity-idb-group/how-report-fraud-and-corruption)?
* [Prohibited practices](https://www.iadb.org/en/topics/transparency/integrity-at-the-idb-group/prohibited-practices-at-the-idb,2704.html) at the IDB.

### Financial Risks

The IDB has established a focus on results and has solid policies and procedures relating to risk management, including a revised liquidity policy.

#### Currency Risks

Defra will issue the Promissory Note in Pound Sterling while IDB will draw down the amounts in USD. Therefore, the payments are susceptible to currency fluctuations in exchange rates between USD and Pound Sterling. This means, in the event of adverse currency movement, there will be reduced potential for project fulfilment.

To mitigate this, Defra will track the movement in exchange rate between USD and Pound Sterling and adjust the timing of payments to IDB to avoid liquidity risk if necessary. However it should be noted that, perfect matching may not be possible.

IDB have the option to disperse some funding or operate at project level in local currency. This may expose individual investments to local currency risk and could have implications for reflows. This will be monitored by the IDB and any potential impacts for the programme will be reported to Defra.

### Provision for Defra to Withdraw Funding

In previous administrative agreements with IDB several clauses were identified which Defra would seek to follow in this instance.

Firstly in the event the Contribution has not been used for the defined purposes DEFRA may consult the IDB to resolve. Moreover, as part of these consultations, DEFRA may send a written notice requesting that the IDB:

1. Provide specific information as may be maintained by the IDB in the course of its regular operations regarding the use of the Contribution;
2. Implement appropriate measures to ensure the Contribution is used in accordance with the purposes stated in the TC Document.

If the measures agreed by DEFRA and the IDB in the context of the consultations stated above are not or cannot be implemented within 30 days (or any other period agreed), as of the last remittance by the IDB to DEFRA of the requested information (which will be deemed as the final period of such consultations), then DEFRA or the IDB may, on one month’s written notice, terminate this Administrative Agreement. In this instance any remaining balance of the Contribution, which was not committed for the purpose of the Project prior to the receipt of such notice, shall be returned to DEFRA within sixty (60) days of the date of the notice.

Upon completion of the Project or closure of, the Facility the IDB shall return any remaining uncommitted balance of the Contribution to DEFRA within thirty (30) days, if applicable.

|  |  |
| --- | --- |
| **Scenario** | **Timing and reporting trigger (if relevant)** |
| Occurrence of any illegal or corrupt practice | Annual Reviews (by Defra), Quarterly updates (from IDB) |
| “Extraordinary circumstances that seriously jeopardise the implementation, operation or purpose of the programme”  This is primarily designed to cover instances of force majeure. We assess this may also provide some cover in extreme cases of under-delivery. | Quarterly Delivery reports, Annual Reviews, independent evaluations at mid-term |
| “If IDB does not fulfil its commitments according to the cooperation contract” | At the time if/when this happens or if identified as part of Annual and quarterly Delivery Plan reporting, Annual Reviews, independent evaluations at mid-term |

Figure 16: Provision for the return of any uncommitted funds to Defra from IDB

# Management Case

An existing Cooperation Framework Arrangement between the UK and IDB (signed 29 February 2012) is already in place and sets out general terms for the cooperation in the financing of development projects, programmes and other activities of common interest between the two parties. More specifically the framework agreement includes:

1. administrative aspects;
2. financial aspects;
3. reporting, consultation and monitoring;
4. effectiveness, amendment, termination and disputes

In addition Defra already has existing Administrative Agreements with the IDB for delivery projects in LAC. This should streamline the creation of a new Administrative Agreement for this programme and will take into account the disbursement profile, any specific reporting requirements and termination of the agreement.

## A Single Donor Trust Fund

Based on lessons learned from previous IDB programmes, a streamlined and flexible fiduciary internal structure for the management and implementation of the programme will be created. As advised by IDB the programme will be structured as a Trust Fund, this is an IDB multipurpose internal financial instrument that allows for the execution of large-scale interventions through individual subprojects (one per component). The Facility provides a quick fiduciary set-up for implementation while incentivizing operational effectiveness, and better coordination. Moreover, the TF better leverages the IDB’s monitoring and supervision capabilities and standards at the component/project level.

To reflect the IDB’s inner governance arrangements, the project documentation to follow will provide further project content and outcome expectations. The first disbursement will be contingent on this documentation approval.

## Management and Governance Arrangements

The IDB will be responsible for the day to day management of the programme and its suite of projects. Defra’s ICF team will take an oversight role.

The pipeline of projects and implementation plan will be road-mapped during year 1 of the programme and will be a collaborative effort between the IDB and Defra. Once this is in place regular calls (at least monthly) will be arranged to ensure progress, quarterly performance reports will be provided by the IDB, Annual Reviews will be collaboratively written by Defra and IDB and field missions will be carried out by Defra ICF staff.

### IDB

It is expected that IDB will provide quarterly performance and delivery reports on the projects activity and spend. These reports should when relevant include:

* Amounts received from the donor (ICF/Defra) in relation to the project;
* Approved and disbursed amounts relating to the project, broken down by components;
* General description of each approved activity and its implementation, broken down by components; and
* Results achieved in respect to the project’s expected M&E results

IDB will also provide content for a collaborative effort between IDB and Defra to write an Annual Review in line with DfID’s best practice guidelines for project management. The scoring from this Annual Review will be based on the performance against milestones set at the output, outcome and impact level within the Log Frame.

In collaboration with Defra ICF policy and economist teams, it is expected that the Log Frame will be finalised within 6 months of first draw down of Funds.

### Defra

Within Defra the ODA Board has a remit to monitor progress of funds, portfolios and projects against expected results including to:

* Monitor and provide advice on risks associated with the ODA budget, including for high risk and transformational programmes.
* Reflect and advise on Monitoring and Evaluation for the ODA budget.
* Recommend remedial actions if operational or financial performance is off track.

The ICF team will report to the board periodically on progress of this project alongside others in the Defra ICF portfolio.

## Monitoring and Evaluation Governance

As outlined in the Appraisal Case, Defra and IDB will work together to develop a robust and streamlined approach to Monitoring and Evaluation that provides the assurance the HMG needs and also works to complement and utilise the IDBs existing procedures and experience.

#### Management of M&E

There is a sustained corporate commitment within IDB to achieving results and improving development effectiveness, which is led from the top of the organisation. Evaluation at the IDB is a shared responsibility between [management](https://www.iadb.org/node/325) and the [Office of Evaluation and Oversight (OVE)](http://www.iadb.org/ove) of the Board of Directors. Management focuses on project evaluations and monitoring portfolio performance. OVE is independent of management and answers to the Board of Executive Directors. Please refer to the following website for more information [link](https://www.iadb.org/en/office-of-evaluation-and-oversight/public-private-partnerships-at-the-idb%2C20865.html).

In respect to management, two different offices provide performance guidelines and monitoring and evaluation. The office of strategic planning and development effectiveness is responsible for designing and monitoring performance at a corporate level. In addition, the office of outreach and partnership grants and co-financing management unit is responsible for monitoring performance of all IDB externally funded trust funds and programs, and fiduciary implementation. Please refer to the [OVE IDB](https://www.iadb.org/en/office-of-evaluation-and-oversight/public-private-partnerships-at-the-idb%2C20865.html) website for more information.

### Reporting

The IDB will provide impact and financial performance results to Defra no later than the 30th April of each year. This will used to evidence the creation of an Annual Review to be written in accordance with DfID Smart Guides and templates. Although this is expected to be a collaborative effort between IDB and Defra, Defra are responsible for the final scoring, conclusions and publishing of this document.

All supported projects will have a monitoring and evaluation plan, this includes periodic monitoring of progress which is fed back to the bank through a ‘Progress Monitoring Report’. All projects will comply with the IDB’s credit supervision process. The credit supervision process has the following purposes and objectives:

1. Monitor implementation and financial health of each transaction, and report on performance and adjustments to the risk profile of each transaction;
2. Ensure that transactions do not deviate materially from the original plan;
3. Manage ongoing relationship with borrowers or related parties for all assigned portfolio transactions;
4. Propose and implement actions to mitigate potential and/or actual risks in a proactive manner;
5. Ensure that the funds are allocated and used as authorized in the financing agreement;
6. Ensure that clients meet their contractual obligations. Analyse, negotiate, recommend and process any waivers, amendments and consents;
7. Compile information that will enable IDBG to monitor the development impact of transactions, and advances in project outputs and activities, and work with clients to enhance the development profile of the operation when opportunities arise;
8. Monitor integrity and reputational risks associated with the transaction; and
9. Prepare and disseminate portfolio lessons learned throughout the organization.

**Annual Supervision Reports (ASRs)** are prepared annually for all projects with outstanding exposure at the end of the previous year. ASRs are prepared by the project officer responsible for the ongoing monitoring of the project. The Aggregated results of the ASRs are included in the Annual Report submitted to the donor every year by April 30th.

**The Radar Review Control report** is prepared on a quarterly basis to serve as an early warning system for projects with key trigger events and conditions that deserve to be monitored  (e.g., capital modifications, environmental findings, political events, etc.). Radar projects are those where signs of financial distress are (deemed to be) developing, but have not yet resulted in a payment default or a material breach of contract. The report is prepared and updated on a monthly basis but it is only circulated on a quarterly basis.

Any reporting will include information such as approval status, disbursements and project performance, and other information contained in project supervision tools and reports. DEFRA will also be able to monitor progress through regular contact with the technical advisors.

### Independent Evaluations

**Mid-term evaluation:** Upon the request of UK, the Bank shall be responsible for contracting the services of a third party to undertake a mid-term evaluation of the Fund’s activities. The scope of such mid-term evaluation will be mutually agreed upon between the IDB and UK, which may include verification of project results.

**Impact evaluation:** The IDB shall be responsible for contracting the services of a third party to undertake an impact evaluation of the Fund’s overall development effectiveness over time. The scope of such evaluation will be mutually agreed upon between the IDB and UK.

**Financial Audits.** Performed by the Auditors of the Bank and pay by the fund/programme. The midterm, impact evaluation and financial audits are covered by resources of the program. The ASRs are included in the administration fee by the program.

### Monitoring and Evaluation Risks

There is a risk that projected benefits of the project will not be sustained beyond the lifetime of the programme. This issue is prevalent across ICF forestry programmes as takes years before the success of forest restoration activities can be properly judged (by both remote sensing and ground based methods).

To address this, the programme has been extended to run for 6 years as opposed to the initial 5 and the M&E component including the Evaluation Plan will be designed as a collaborative effort between IDB and Defra and finalised within the first year to ensure that the project outputs are monitored at the technical, social and environmental level and that long term sustainability is built in.

Reporting against ICF Key Performance Indicators (KPIs) including KPI 15 (transformational change) will also help counteract this risk. In addition as Defra’s ICF portfolio is already delivering in LAC and with the possibility of further expansion there could be an opportunity to explore in future years a detailed monitoring and evaluation system that extends to the LAC region. This will involve engagement with OGDs in areas where ICF programmes are being similarly implemented.

## Risks

Beyond the specific financial, commercial and monitoring risks outlined above there are some general risks associated with successfully managing programme delivery; outlined in the table below.

**Probability** (or likelihood) is based on a scale of Very unlikely > Unlikely > Possible > Likely > Certain; **Impact** is based on the scale of Insignificant > Minor > Moderate > Major > Severe; and the overall level is based on the Red Amber Green (**RAG**) system.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Risk Summary (Event and Effect)** | **Probability** | **Impact** | **Level** | **Current Mitigation Plan** |
| **Intervention design**  Some details of the intervention are still to be worked through, and there will be flexibility built into the delivery model. As such, there is a risk that some objectives are not met, for example that the blended finance isn’t deployed in line with the delivery plan or doesn’t achieve maximum impact. | Possible | Moderate |  | We are working very closely with the IDB and will be sharing the business case with them to ensure the design is in line with our expectations. We have also engaged their senior officials to flag this risk |
| **Overlap with other interventions**  There are other interventions working in this region through IDB – within Defra (in Brazil) but particularly from within BEIS. We need to be aware of the risk of crowding markets, or overlapping with other programmes and reducing efficiency and value for money. | Unlikely | Minor |  | By working through the IDB there are strong links to and institutional for other programmes and other donors. We are also collaborating closely with other donors in country particularly BEIS to avoid overlap. The niche nature of the Blue Carbon sector also reduces likelihood of overlap. |
| **Limited scale of funding**  These are large countries and projects that require significant amounts of finance. The funding available through Defra ICF is limited and as such limits the scope of what we can achieve. There is a risk that if not used well the impact is reduced. | Possible | Moderate |  | Although these countries are large, the programme has a well-defined and targeted focus of mangroves management. This in combination with the cost-sharing processes of the IDB to ensure the duty of care and administrative value for money for our investment will also maximise impact and mitigate this risk. |
| **Key person**  The success of the intervention depends in substantial part upon the skill and expertise of the technical advisors within the IDB. These individuals will have a significant role in the set-up of the interventions. If this team is not capable, does not understand our requirements or experiences high and inconsistent turnover then there is a delivery risk. | Possible | Major |  | We will ensure regular and close contact between the policy team at Defra and the programme implementation team at IDB. This will take the form of calls, proactive progress report updating and quarterly and annual reports and reviews. |
| **Political risk**  There is an inherent political risk from working in developing countries including local buy-in, changes in the political landscape (and/or resulting changes in policy) and lack of engagement needed for transformational impact. | Unlikely | Major |  | We judge these countries as vital for inclusion so we can only manage this risk through working with an experienced and well connected delivery partner such as IDB. |

Figure 17: Perceived management risks with Defra ICF intervention delivered through IDB

# Annexes

## Sensitivity Analyses

Six input variables were varied to reach low and high scenarios for each option. Each variable has been amended based on existing evidence, and the level of uncertainty attached to the central figure.

#### Option 1.1: ICF-IDB Mangroves Program

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Input Variable** | **Low Scenario** | **Central Scenario** | **High Scenario** | **Source of Range** |
| **Exchange Rate** | 1.2065 | 1.3 | 1.5738 | Bank of England spot £/$ rate, range in past 3 years |
| **Leverage Ratio** | 0.21 | 0.42 | 0.63 | ±50% of central value – considerable uncertainty |
| **Mangroves protected/restored** | 2200ha | 5570ha | 11540ha | Reflects variability in program funding levels and additionality |
| **tCO2e avoided** | 1.9m | 3.8m | 5.8m | Dependent on total funding levels of program |
| **Additionality of impacts** | 25% | 50% | 75% | Reflects ICF appraisal guidance for sensitivity analysis |
| **Ecosystem service value/ha** | £1089 | £1452 | £1816 | ±50% of central value – considerable uncertainty |
| **Carbon Price (2018)** | £27 | £53 | £80 | Scenarios provided by BEIS Int’l Carbon Price Series |

#### Low Scenario

|  |  |
| --- | --- |
| **Costs** | **Present Value (20 years), 2018** |
| ICF Funding costs | £10,886,300\* |
| Fund management costs | £637,500 |
| M&E costs | £334,100 |
| Leveraged funds | £2,286,100 |
| ICF staff costs | £576,200 |
| Opportunity cost of foregone investments | £348,700 |
| **Present Value Total Costs** | **£15,069,000** |
|  |  |
| **Benefits** |  |
| Carbon savings | £33,958,400 |
| Ecosystem services | £7,526,100 |
| **Present Value Total Benefits** | **£41,484,500** |
| **NPV** | **£33,594,300** |
| **BCR** | **2.8** |

\*Decrease due to modelled exchange rate fluctuations

Decreases in both BCR and NPV in this scenario are significant, reflecting the considerable levels of uncertainty attached to a number of variables. Though costs have fallen due to exchange rate and leveraging decreases, the value of carbon savings has fallen significantly – this is connected to lower carbon prices and tonnes of emissions saved. The value of ecosystem services protected also drops, as the projected area of mangroves protected/restored decreases from 5570ha to 2100ha. However, the BCR remains well above one, suggested that even if the program faces significant contextual challenges, it will deliver high value for money.

#### High Scenario

|  |  |
| --- | --- |
| **Costs** | **Present Value (20 years), 2018** |
| ICF Funding | £14,200,500\* |
| Fund management costs | £637,500 |
| M&E costs | £334,100 |
| Leveraged funds | £8,946,300 |
| ICF staff costs | £576,200 |
| Opportunity cost of foregone investments | £1,307,100 |
| **Present Value Total Costs** | **£26,011,800** |
|  |  |
| **Benefits** |  |
| Carbon savings | £522,118,200 |
| Ecosystem services | £185,256,700 |
| **Present Value Total Benefits** | **£707,374,900** |
| **NPV** | **£681,373,100** |
| **BCR** | **27.2** |

\*Increase due to modelled exchange rate fluctuations

The significant increases in both BCR and NPV are drawn from the rise in the value of carbon savings and ecosystem services – as additionality assumptions rise, the area of mangroves protected/restored increases, increasing the value of benefits associated with the program. Costs do not rise considerably, as the level of funding leveraged remains fairly low.

#### Option 1.2: Althelia Sustainable Mangroves Facility

Seven input variables were varied to reach low and high scenarios for each option. Each variable has been amended based on existing evidence, and the level of uncertainty attached to the central figure.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Input Variable** | **Low Scenario** | **Central Scenario** | **High Scenario** | **Source of Range** |
| **Exchange Rate** | 1.2065 | 1.3 | 1.5738 | Bank of England spot £/$ rate, range in past 3 years |
| **Leverage Ratio** | 0.5 | 1.25 | 3 | Low scenario uses conservative assumption of 1:0.5 leverage; high scenario assumes successful high value leveraging of funds. |
| **Mangroves protected/restored** | 930ha | 3000ha | 9670ha | Reflects variability in program funding levels and exchange rates |
| **tCO2e avoided** | 1.3m | 2.1m | 4.4m | Reflects variability of overall funding |
| **Additionality of imapcts** | 25% | 50% | 75% | Reflects ICF appraisal guidance for sensitivity analysis |
| **Delivery risks rating** | 80% | 80% | 80% | Reflects significant delivery risks attached to the project |
| **Productivity benefits** | 1% | 3% | 5% | +/-2% of central value - reflects uncertainty around returns |
| **Ecosystem service value/ha** | £1089 | £1452 | £1816 | ±50% of central value – considerable uncertainty |
| **Carbon Price (2018)** | £27 | £53 | £80 | Scenarios provided by BEIS Int’l Carbon Price Series |

#### Low Scenario

|  |  |
| --- | --- |
| **Costs** | **Present Value (20 years), 2018** |
| ICF Funding | £11,833,000\* |
| Leveraged funds | £5,916,500 |
| Fund Management costs | £2,908,800 |
| ICF staff costs | £944,200 |
| Opportunity cost of foregone investments by funders (private and public) | £2,889,400 |
| **Present Value Total Costs** | **£24,491,900** |
|  |  |
| **Benefits** |  |
| Carbon savings | £14,354,100 |
| Productivity benefits | £1,005,700 |
| Ecosystem services | £2,964,500 |
| **Present Value Total Benefits** | **£18,324,200** |
| **NPV** | **-£6,167,700** |
| **BCR** | **0.7** |

\*Decrease due to modelled exchange rate fluctuations

The low scenario shows a drop in costs due to the lower level of funding leveraged through an ICF investment, and subsequent lower management fees. However, the combination of a lower additionality rating and a fall in a) the volume of carbon saved, b) value of carbon per tonne, and c) the additionality of impacts offered by ICF funding, drives the value of investment to a point where benefits only slightly outweigh costs.

#### High Scenario

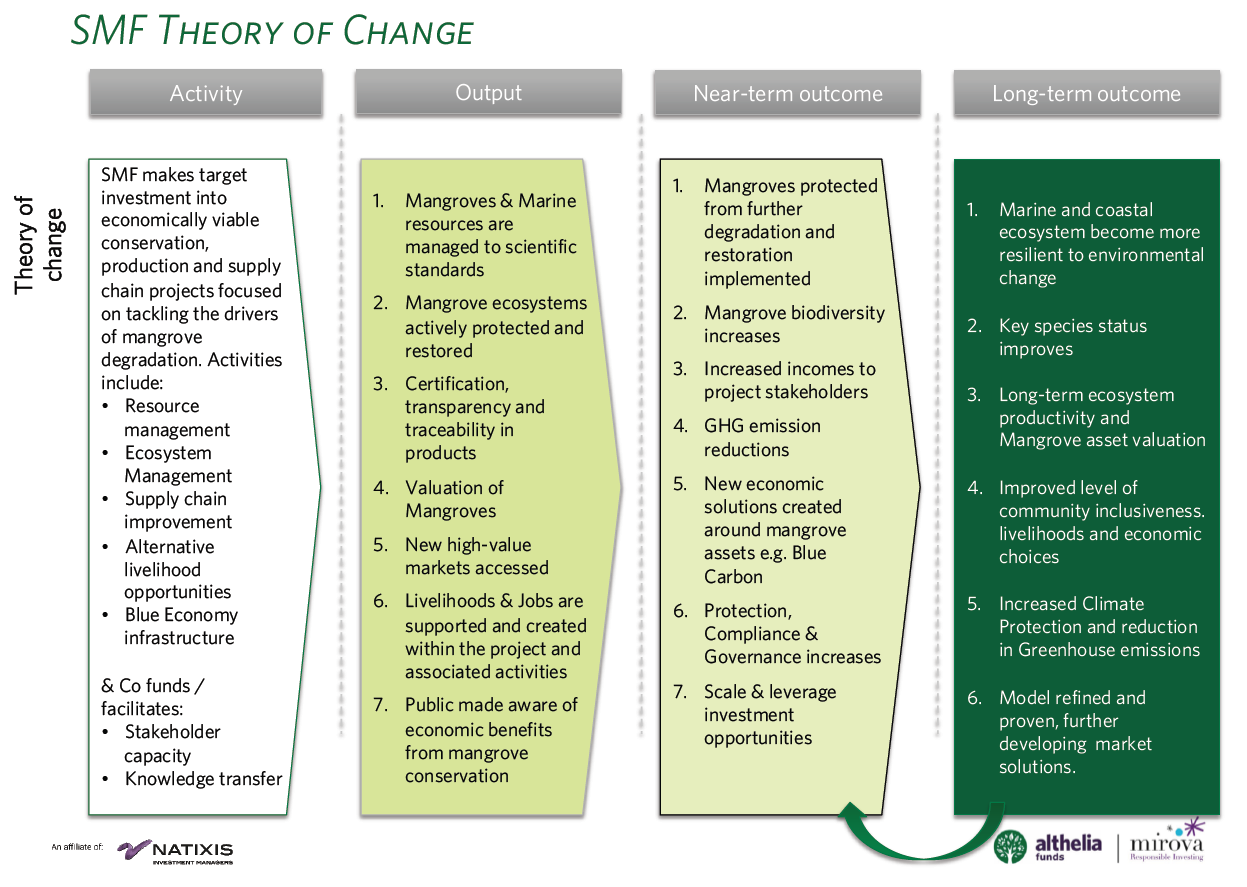
|  |  |
| --- | --- |
| **Costs** | **Present Value (20 years), 2018** |
| ICF Funding | £15,435,300\* |
| Leveraged funds | £46,306,000 |
| Fund Management costs | £7,126,100 |
| ICF staff costs | £944,200 |
| Opportunity cost of foregone investments by funders (private and public) | £123,092,100 |
| **Present Value Total Costs** | **£82,903,900** |
|  |  |
| **Benefits** |  |
| Carbon savings | £438,951,300 |
| Productivity benefits | £32,365,400 |
| Ecosystem services | £146,861,900 |
| **Present Value Total Benefits** | **£618,178,600** |
| **NPV** | **£535,274,700** |
| **BCR** | **7.5** |

\*Increase due to modelled exchange rate fluctuations

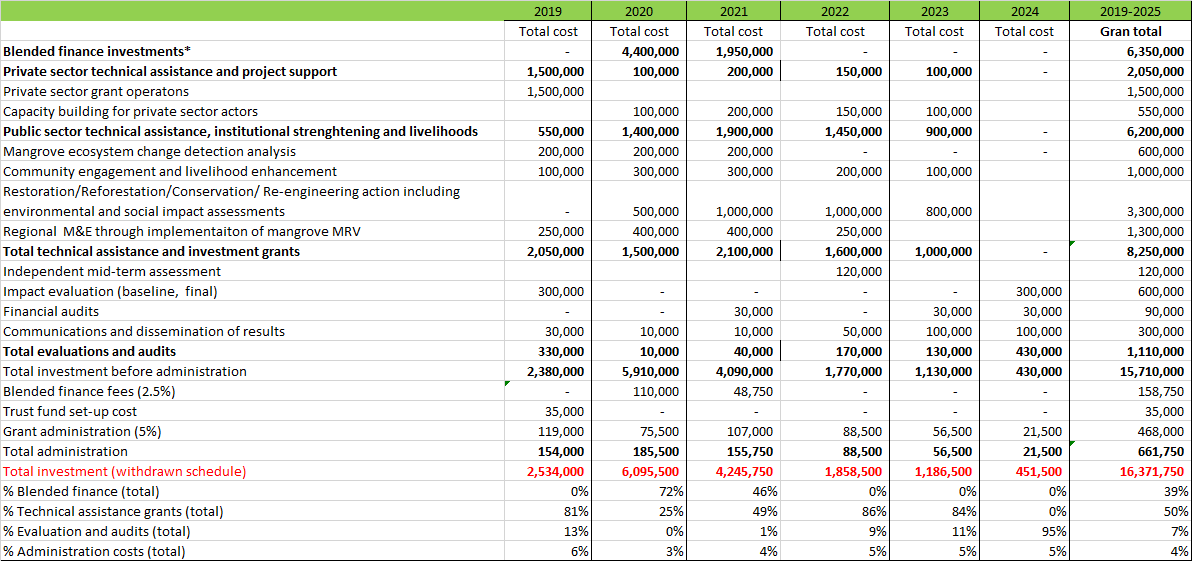
A significant increase in the value of carbon savings and ecosystem service benefits, driven primarily by the increase in the additionality rating from 50% to 75%, is offset to an extent by the increase in leveraging costs. Both the NPV and BCR rise considerably from the central scenario.

## Theory of Change – IDB

## Theory of Change – SMF



## IDB Detailed Drawdown Schedule and Budget



## Choice Matrix for ICF Mangroves Program Delivery Mechanism

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Capacity to Absorb Finance** | **Organisational Delivery Capacity** | **Experience of working with HMG** | **In-country presence** | **Operational costs** | **Score** |
| **Weighting** | **1.5** | **1** | **1** | **0.5** | **1** |  |
| **NGOs** | **No capacity to absorb finance through HMG’s preferred structure** | **Little experience of large-scale programs** | **Little experience of collaboration at this funding level** | **Significant** | **<5%** | **5** |
| **MDBs** | **Able to receive promissory notes** | **Significant experience of large-scale programs** | **Proven track record of delivery** | **Significant** | **5-10%** | **10** |
| **Direct Operation** | **Challenges with structure of ODA financing** | **No experience of direct program delivery** | **HMG** | **None** | **<5%** | **4** |
| **Blended Finance** | **Able to receive promissory notes** | **Experience of large-scale programming** | **Little track record of delivery** | **Variable** | **<5%** | **6.5** |

Four delivery mechanisms were assessed on the criteria in the above table, with MDBs assessed as the most effective delivery mechanism for the size of the program, given a) Defra ICF’s skill set and delivery capacity, and b) Bank of England financing rules prohibiting the service of promissory notes to NGOs.

## Results of Multi-Criteria Analysis on Mangrove Country-level Prioritisation

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **COUNTRY** | **2014 Mangrove Extent** | **2000-2014 Area Mangrove Loss** | **% Mangrove Loss** | **Mangroves as % of Territory** | **Mangrove Diversity** | **Diversity of Associated Species** | **Low Income** | **Corruption** | **World Risk Index** | **Soil C-Stocks** | **CC Adaptation and Mangroves** | **LECZs – Population, Area** | **Overall Score** |
| **Indonesia** | 100 | 100 | 38.4 | 11.7 | 100.0 | 86.5 | 79.2 | 61.7 | 28.8 | 58.9 | 31.4 | 19.2 | **70.3** |
| **Myanmar** | 10.9 | 30.3 | 100.0 | 3.6 | 52.8 | 56.8 | 94.7 | 46.7 | 24.9 | 20.3 | 34.0 | 16.0 | **47.1** |
| **India** | 3.4 | 3.6 | 40.2 | 0.2 | 52.8 | 51.4 | 91.3 | 66.7 | 19.2 | 18.8 | 55.9 | 18.1 | **37.7** |
| **Philippines** | 8.9 | 3.3 | 14.8 | 6.6 | 30.6 | 70.3 | 83.2 | 58.3 | 76.0 | 18.1 | 32.9 | 8.9 | **36.8** |
| **Vietnam** | 3 | 1.1 | 13.8 | 2.0 | 11.1 | 32.4 | 88.0 | 55.0 | 35.2 | 12.9 | 63.6 | 56.5 | **34.9** |
| **Vanuatu** | 0 | 0 | 0 | 0.8 | 8.3 | 10.8 | 83.8 | 58.3 | 100.0 | 25.5 | 65.6 | 1.5 | **33.7** |
| **Thailand** | 8.1 | 6.2 | 29.5 | 3.5 | 83.3 | 70.3 | 63.9 | 58.3 | 17.4 | 19.4 | 18.7 | 14.1 | **33.3** |
| **Guatemala** | 1.1 | 2.3 | 77.9 | 2.2 | 5.6 | 35.1 | 75.4 | 46.7 | 56.1 | 30.3 | 0.4 | 0.4 | **32.9** |
| **Suriname** | 2.2 | 1.5 | 26.1 | 3.0 | 5.6 | 27.0 | 64.1 | 75.0 | 23.3 | 25.5 | 33.5 | 52.0 | **32.2** |
| **China** | 0.1 | 0.1 | 22.4 | 0.0 | 5.6 | 10.8 | 49.4 | 66.7 | 18.7 | 13.3 | 100.0 | 44.0 | **32.1** |
| **Cuba** | 7 | 3.9 | 21.6 | 14.1 | 5.6 | 97.3 | 52.8 | 78.3 | 17.4 | 27.1 | 26.0 | 8.4 | **32.0** |
| **Cambodia** | 1.4 | 2 | 53.4 | 1.7 | 11.1 | 32.4 | 78.1 | 35.0 | 46.4 | 18.1 | 33.5 | 8.1 | **30.9** |
| **Bangladesh** | 7.6 | 0.1 | 0.7 | 11.4 | 52.8 | 45.9 | 93.6 | 43.3 | 53.7 | 9.2 | 11.8 | 18.5 | **30.0** |
| **Nicaragua** | 2.4 | 0.6 | 9.6 | 4.1 | 8.3 | 37.8 | 88.4 | 43.3 | 40.8 | 30.8 | 53.1 | 2.9 | **29.9** |
| **Jamaica** | 0.2 | 0.1 | 19 | 3.8 | 5.6 | 37.8 | 70.6 | 65.0 | 33.1 | 24.9 | 54.6 | 5.3 | **29.7** |
| **Timor-Leste** | 0 | 0 | 14.9 | 0.5 | 5.6 | 10.8 | 93.3 | 58.3 | 44.9 | 15.1 | 68.4 | 1.2 | **29.4** |
| **Honduras** | 2.3 | 1.3 | 22.7 | 4.5 | 8.3 | 35.1 | 87.1 | 50.0 | 29.7 | 29.2 | 41.2 | 2.2 | **29.3** |
| **Solomon Islands** | 1.7 | 0.2 | 5.8 | 13.3 | 8.3 | 13.5 | 89.4 | 70.0 | 51.5 | 26.1 | 27.1 | 3.5 | **29.1** |
| **Belize** | 1.3 | 0.4 | 13.5 | 12.6 | 5.6 | 37.8 | 71.5 | 48.3 | 18.1 | 46.9 | 23.4 | 21.7 | **28.6** |
| **Ghana** | 0.1 | 0.1 | 45.5 | 0.1 | 5.6 | 5.4 | 92.6 | 71.7 | 23.8 | 17.5 | 33.5 | 3.0 | **28.6** |
| **Papua New Guinea** | 18 | 2.2 | 4.9 | 8.6 | 44.4 | 51.4 | 86.2 | 46.7 | 44.8 | 12.3 | 8.3 | 1.0 | **28.4** |
| **Saint Vincent & Grenadines** | 0 | 0 | 0 | 0.5 | 5.6 | 27.0 | 56.7 | 100.0 | 9.3 | 24.8 | 83.2 | 5.2 | **28.4** |
| **Micronesia, FS** | 0 | 0 | 4 | 9.5 | 5.6 | 5.4 | 82.0 | 63.3 | 75.7 | 32.3 | 6.9 | 11.4 | **28.3** |

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2. Based on ICF analysis of the TEEB Ecosystem Service Value database, valuing coastal protection and food services offered by a hectare of mangrove forest - £1453/ha/yr. [↑](#footnote-ref-3)
3. Polidoro, A. *et al* (2010) The Loss of Species: Mangrove Extinction Risk and Geographic Areas of Global Concern [↑](#footnote-ref-4)
4. http://wwf.panda.org/about\_our\_earth/blue\_planet/coasts/mangroves/mangrove\_threats/ [↑](#footnote-ref-5)
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