

The Biodiversity Financial Needs Assessment in Thailand

The Biodiversity Finance Initiative
UNDP Thailand

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Abbreviation and Acronym

BAU	Business As Usual
BER	The Biodiversity Expenditure Review
BIOFIN	The Biodiversity Finance Initiative
CBD	Convention on Biological Diversity
DMCR	Department of Marine and Coastal Resources
DNP	Department of National Parks, Wildlife and Plant Conservation
FNA	The Biodiversity Financial Needs Assessment
MM	Million
MONRE	Ministry of Natural Resources and Environment
NBSAP	National Biodiversity Strategies and Action Plan
NESDB	Office of the National Economic and Social Development Board
ONEP	Office of Natural Resources and Environmental Policy and Planning
PCD	Pollution Control Department
PIR	The Biodiversity Policy and Institutional Review
RFD	Royal Forest Department
SDGs	United Nations Sustainable Development Goals
THB	Thai Baht
UNDP	United Nations Development Programme
USD	United States Dollar

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Executive Summary

The Biodiversity Finance Initiative is a UNDP-managed global partnership that supports countries to enhance their financial management for biodiversity and ecosystems (UNDP, 2016). Following the BIOFIN methodology, the Biodiversity Financial Needs Assessment (FNA) aims to make a comprehensive estimate of the financial resources required to achieve national biodiversity targets. It compares these financial needs to projected biodiversity expenditures, in this case, over a short-to medium-term planning horizon to estimate the finance need and the gap for biodiversity conservation in the country.

The specific objectives of the FNA are as follows:

- Clarify the strategies and actions in the national biodiversity plans in order to describe “costable actions” that link to expected biodiversity results.
- Produce a detailed budget for each costable action by defining unit costs and quantities over the target timeframe.
- Use the detailed budgets to make a stronger case for biodiversity finance— linking the costs of achieving specific results to the national budget processes.
- Calculate the finance gap between Business As Usual (BAU) biodiversity expenditure projections (from the BER) and financial needs identified in the FNA in as detailed a manner as possible.

The FNA follows on from the Biodiversity Policy and Institutional Review (PIR) component of BIOFIN as it considers Thailand’s biodiversity vision alongside key national strategies and plans in the PIR for costing in the FNA. For Thailand, national biodiversity targets are articulated in the National Biodiversity Strategy and Action Plan (NBSAP) and the Ministry of Natural Resources and Environment (MONRE) Strategic Plan. Further to this, the three agencies with the largest amounts of biodiversity spending have been reviewed, namely, the Department for National Parks, Wildlife and Plant Conservation (DNP), the Royal Forest Department (RFD) and the Department of Marine and Coastal Resources (DMCR). Through a series of meetings, we went through the chosen Department’s Strategic Plans and selected activities where ‘additional funding’ would make it possible for the departments to expedite their assigned tasks. With regards to Thailand’s Biodiversity and Expenditure Review (BER), the ‘agency’ approach was considered when a series of Focus Group Discussions emphasized on what are the biodiversity investments they envision, which should relate to the NBSAP or their mandates. With the agency approach, DNP, RFD, and DMCR were evaluated for its intended financial contribution to biodiversity, based on the biodiversity relevancy coefficient attribution. Thus, this FNA builds on the findings of Thailand’s BER, which showed that the main domestic source of biodiversity funding in Thailand is from the government’s budget allocation, which mostly pays for the operations of these core environmental agencies. The total expenditure for these agencies accounted for around 80 percent of the overall biodiversity related budget in 2015.

In trying to achieve more accuracy in the Financial Needs Assessment, BIOFIN Thailand has tried to experiment with a ‘bottom-up’ approach. Through close engagement with key stakeholders and through consultative and participatory workshops, meetings, team discussions and expert inputs, the three Departments’ Strategic Plans that contain relevant

actions related to biodiversity conservation were analysed. After reviewing the area coverage and costing specific actions, we have been able to make use of the unit costs to estimate the financial needs for biodiversity conservation.

The finance gap is the difference between the BAU budget allocation scenario and the required budget to execute the actions in the target areas amounts to \$942 million (THB 31,978 million) for the remaining three-year period of the current NBSAP (2019-2021). This result has considered the feedback from both bilateral meetings and focus group discussions, which stated that BIOFIN might consider excluding the NBSAP budget estimates. Arguably, this is a more realistic approach, given the possibility of double counting some budgets that may have already been requested by the line agencies themselves.

Therefore, the process for estimating the biodiversity finance gap as detailed in the BIOFIN workbook (UNDP, 2016) has been adapted to the Thai context in which it has benefited from close engagement with key stakeholders through consultative and participatory workshops. However, in experimenting with a 'bottom-up' approach, two main challenges were encountered. First, there was the limitation of only having access to a relatively small group of individuals during the data collection stage. Second, the FNA is limited by the fact that the unit cost figures could be underestimations. In other words, the 'official' figures do not necessarily reflect the current costs for the procurement of those services but rather what the line agencies can request for specific budget items. To manage this challenge, BIOFIN Thailand has had to rely on the members of Project Steering Committee to link the BIOFIN technical team with the key personnel in their own departments. The official letters have been issued by UNDP BIOFIN Thailand to the Director Generals in different line agencies so as to request for official meetings with the Budget Planning Division. The responses from line agencies were positive. BIOFIN team has met with a group of officials in the Planning Division from DNP and RFD in various sessions. Even the Deputy Director General of RFD has received the BIOFIN Technical team in his office and acknowledged the importance of using the unit cost for budget adoption at agency level.

Nevertheless, the results of this report are critical for the next stage of informing the Biodiversity Finance Plan for Thailand and in mobilizing financial resources for biodiversity conservation and the sustainable development of Thailand.

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Introduction

The purpose of this report is to present the estimates of financial needs for biodiversity conservation in Thailand as part of the BIOFIN Financial Needs Assessment (FNA). Following the BIOFIN methodology¹, the FNA aims to make a comprehensive estimate of the financial resources required to achieve national biodiversity targets.

For Thailand's biodiversity financial needs assessment, the national biodiversity targets are articulated in the National Biodiversity Strategic Action Plan (NBSAP) and the Ministry of Natural Resources and Environment (MONRE) Strategic plan as highlighted in Thailand's Policy and Institutional Review report. However, recently the Thai government line agencies have complete the preparation of their respective 20-Year departmental strategic plan as requested by the current government². Thus, the country will move forward achieving the 20-Year National Strategy (2017 – 2036). In the National Strategy, the government will focus on six key areas as follows: (i) National security, (ii) Competitiveness enhancement, (iii) Development and empowerment of human capital, (iv) Broadening opportunity and equality in society, (v) Environmentally friendly development and growth, and (vi) Reforming and improving government administration.



Figure 1: Source: NESDB, Thailand Focus 2017 forum

Therefore, in this FNA, in addition to the two key reference points highlighted above, namely (i) NBSAP of Thailand and (ii) MONRE's Strategic Plan, we have also made special reference to the targets included in the 20-Year National Strategy. In doing so, the FNA focuses on the added financial needs of the three agencies responsible for the management of terrestrial ecosystem

¹ BIOFIN Workbook 2016: https://www.biodiversityfinance.net/sites/default/files/content/publications/undp-biofin-web_0.pdf

² Thailand PM office letter's Ref 0506/17057 dated 8 June B.E. 2561
http://library.senate.go.th/document/mSubject/Ext81/81986_0002.PDF (Document in Thai language)

and marine ecosystem, namely the Royal Forest Department (RFD), the Department of National Parks, Wildlife and Plant Conservation (DNP), and the Department of Marine and Coastal Resources (DMCR). This FNA builds on the findings of Thailand's Biodiversity Expenditure Review (BER) that showed the main domestic source of biodiversity funding in Thailand is from the government's budget allocation, which mostly pays for the operations of these core environmental agencies – RFD, DNP and DMCR. The total expenditure for these agencies accounted for 80 percent of the overall biodiversity related budget in Fiscal Years 2011 - 2015.

BIOFIN Thailand has had a series of meetings with these departments and have relied on the unit cost information as the basis of our calculation of the financial gap. Indeed, after team discussions and continued work on the NBSAP and MONRE targets, it was found that these former plans did not cover all the details on measures that were to be undertaken by the key agencies. While some estimates have been made for the NBSAP and MONRE's Strategic Plan, ***the lines agencies' strategic plan was not costed and hence the need for BIOFIN to prepare these cost estimates***. Therefore, the key inputs for this FNA are discussed in detail- beyond the NBSAP and MONRE targets- using the 'bottom-up approach' together with the three selected departments/agencies. The Strategic Plans from the three departments essentially 'run parallel' to NBSAP activities, which also includes a validation process. Therefore, in identifying the timeline for the FNA, initially we followed the NBSAP implementation period in Thailand (2015-2021). The reason for this was to be able do something concrete within the current NBSAP timeframe. Therefore, the FNA timeframe was chosen as the remaining three years of the NBSAP period, 2019-2021.

1. Methodology

The following process suggested in the BIOFIN Workbook (UNDP, 2016) was adopted in producing the FNA for Thailand (Figure 2).

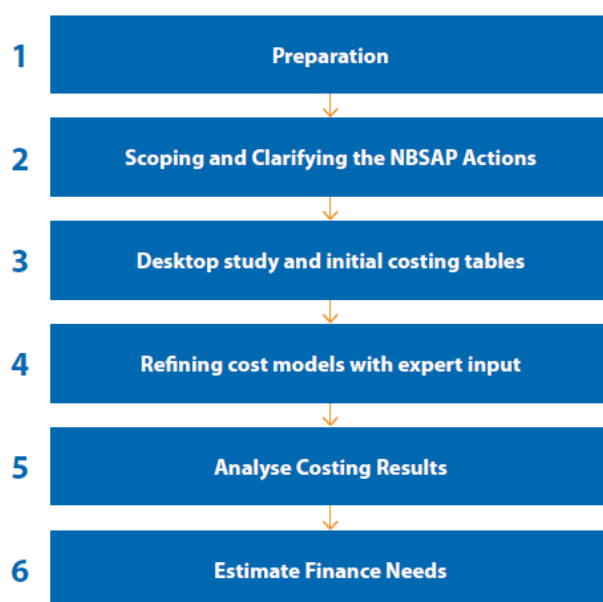


Figure 2: Source: UNDP, 2016

Following the BIOFIN emphasis on developing a ‘bottom-up’ approach, we reviewed the strategic plans of the key government departments. This was followed by a series of focus group discussions with two of the chosen departments— the RFD and DNP— between January and April 2018. During these meetings and workshops, the relevance of the NBSAP was discussed as well as the relevant data that would be required from the respective departments. In this regard, we reviewed the departmental budget estimates and the unit costs that have been used to form the basis of the analysis in the FNA.

We conducted preliminary calculations and discussed with the key departments whether the estimates were acceptable in terms of the items, unit costs and assumptions used. We were able to make use of the unit costs that the departments themselves use when they prepare their departmental budget for approval by the cabinet each year.

In order to make our estimations concrete, it was decided first to discuss with the departments the activities that can be done by way of protecting and restoring biodiversity and the area that is feasible to be covered within the NBSAP period. This approach was validated by key stakeholders—Department of National Parks, Wildlife and Plant Conservation, Royal Forest Department and the Office of Natural Resources and Environmental Policy and Planning during the BIOFIN Phase I’s exit strategy workshop³. Thus, the concept of unit cost was widely accepted by governments and was used in the FNA for calculating financial resource needs.

Finally, the remainder of this FNA is organized into six Sections. Following this introduction and discussion of the methodology used, Section 2 presents Thailand’s biodiversity vision and strategy in relation to role of the NBSAP and the ecosystem strategies of the three departments. In Section 3, we present our estimates of the financial needs of Thailand’s NBSAP and MONRE’s 20-Year ministerial strategic plan. Using the bottom-up approach, we estimate the additional financial requirements if the efforts of the three key line agencies (DNP, RDF and DMCR) were to step up their biodiversity protection and conservation efforts. In section 4, we link these financial needs under three different Scenarios. In Section 5, we provide a summary of what would be the finance gaps based on differences between the costs under the different scenarios and the base scenario which is Business as Usual (BAU). Further analyses of the cost distribution of the finance gap are done according to the BIOFIN categories, Aichi Targets and Sustainable Development Goals. Section 6 concludes by highlighting the main results and policy recommendations for biodiversity financial needs in Thailand.

2. Thailand’s Biodiversity Vision and Strategy

Policy and institutional arrangements in Thailand are built around the country’s National Economic and Social Development Plans. During the First National Economic and Social Development Plan (1961-1966), much emphasis was placed on infrastructure, economic and social development at the cost of conservation. However, the importance of biodiversity resources has recently been recognized in Thailand’s National Plans. For instance, Thai policymakers are beginning to understand that the crucial role of biodiversity in socioeconomic development, and natural resource conservation has since become a mainstay of the National Plan, starting with the Sixth Plan (1987-1991) up until the present Twelfth Plan (2017-2021).

³ See BIOFIN Thailand Facebook page for Training of Trainers: The BIOFIN Process in Thailand, February 26-28, 2018, Khao Yai National Park, Thailand: <https://th-th.facebook.com/UNDP.BIOFIN.th/videos/1844426628915244/>

2.1 The NBSAP strategy (2015-2021)

In terms of biodiversity governance, Thailand's National Biodiversity Strategy and Action Plan (NBSAP) is an important instrument for implementing the country's vision for biodiversity. It is articulated in specific plans, such as, the National Economic and Social Development Board (NESDB) strategy, which contains a vision for Thailand's terrestrial ecosystem, and the Department of Marine and Coastal Resources (DMCR) roadmap, which provides strategies and guidelines for the marine and coastal ecosystem. The current NBSAP consists of four strategies as follows:

Strategy 1

- Integrating the value and management of biodiversity resources involving stakeholders at all levels through participatory processes

Strategy 2

- Conservation and restoration of biodiversity resources

Strategy 3

- Protecting the national rights in term of access and benefit sharing that is consistent with the concept of green economy

Strategy 4

- Developing the knowledge and standardized database on biodiversity resources so that it is consistent with international standards

2.2 Key department strategies

Unlike in other BIOFIN countries where the NBSAP is recognized as the 'core' document, the NBSAP will only be treated as *one* of the major documents that defines Thailand's policy directives related to biodiversity resources. There are three institutions that are key players as by mandate and these are the institutions that look after the ecosystems home to the biodiversity resources. These departments have been chosen as a result of the findings of Thailand's Policy and Institutional Review (PIR) and Biodiversity Expenditure Review (BER).

The first two key institutions refer to the Department of National Parks, Wildlife and Plant Conservation (DNP) and the Royal Forest Department (RFD), these being the line agencies responsible for the management of the terrestrial ecosystem. The third is the Department of Marine and Coastal Resources (DMCR) responsible for management of wetlands, marine and coastal ecosystems. Their Strategic Plans have a direct bearing on access, utilization and conservation of biodiversity resources.

2.2.1 DNP, RFD and Thailand's terrestrial ecosystem strategy

First, Box 1 specifies the targets and indicators related to terrestrial ecosystems as contained in the 12th National Economic and Social Development Plan (NESDP). It should be noted that whilst the 12th NESDP contains ten Development Strategies, for the purpose of the terrestrial ecosystem, the most relevant information is included in the fourth Strategy entitled 'Environmentally-Friendly Growth for Sustainable Development'.

Strategy 4: Environmentally-Friendly Growth for Sustainable Development

Target 1: Conserve and restore the stock of natural resources: increase the area of forest for conservation and commercial use, and reverse mangrove forest depletion; curb biodiversity loss; solve the problem of public land encroachment and provide the poor with common rights to use land.

- **Indicator 1.1:** 40 % of the country is forest area, classified into forest for conservation (25 %), and commercial forest (15 %). The mangrove forest area is enlarged from 1.53 to 1.58 million *rai*. Watershed restoration areas also grow substantially.
- **Indicator 1.2:** A smaller number of species and populations of living organisms with threatened status or nearly extinct.
- **Indicator 1.3:** A complete demarcation map of public land (One Map Project) which is formally announced to the public. The number of land

Box 1: Strategy 4: Target and Indicators related to terrestrial ecosystems in the 12th NESDP

A further example of plans specific to the terrestrial ecosystem in Thailand is a flagship project entitled ‘Project for Promoting the Cultivation of Long-Term Economic Value Trees’, promoted in the 12th NESDP. This project encourages the growing of long-term ‘economic value trees’, which aims to develop afforestation procedures and the sustainable management of forest plantations, while also creating a high-value timber industry in the entire supply chain. The general idea is to restore the use of wood in conservation, construction of houses, temples and other buildings, as well as wood carving as a national art. In a supportive role, the government should set incentive measures, designate the suitable areas with potential in the ecological landscape and establish a central timber market. The logistics system for transporting timber should also be developed along with supporting the study of and research into the genetic improvement of tree varieties. Meanwhile the introduction of new financial mechanisms, such as, forest bonds, tree banks, and forestation funds can help enable innovations that add new value to wood and timber. The project aims to increase the economic forest to 15 percent of the country’s total area, while forest for conservation will grow to around 25 percent. The economic forest plantations, with a long-term harvesting period, will therefore create several co-benefits including revenue generation, ecosystem restoration, and greenhouse gas sequestration. As a result, this project can contribute to green growth not only at the national but also the global level.

In terms of the key implementing agencies, this project assumes an integrated implementation approach by several parties. The Office of the National Economic and Social Development Board (NESDB) needs to work with other key agencies in the form of a working group. The working group should comprise the Royal Forest Department alongside the Forest Industry Organization, the Plant Genetic Conservation Project under the Royal Initiative of Her Royal Highness Princess Maha Chakri Sirindhorn, the Agricultural Land Reform Office, the Bank for Agriculture and Agricultural Co-Operatives, academia, and the private sector.

Finally, a few significant long-term strategies exist that seek to address issues related to terrestrial ecosystems in Thailand. These plans and frameworks are listed in Table 1 below.

Table 1: Thailand's long-term strategic plans related to terrestrial ecosystems		
<u>Agency:</u> Royal Thai Government	<u>Plan:</u> The 20-Year National Strategy (2017 – 2036)	<u>Targets:</u> conserve and restore the stock of natural resources; increase the area of forest for conservation and commercial use, and reverse mangrove forest depletion; curb biodiversity loss; solve the problem of public land encroachment; and provide the poor with common rights to use land.
<u>Indicators:</u> - Proportion of the country's forest, forest plantation and restoration area - A complete demarcation map of public land (One Map Project)		
<u>Agency:</u> NESDB, Office of the Prime Minister of Thailand	<u>Plan:</u> The 12th National Economic and Social Development Plan (2017 – 2021)	<u>Strategy 4:</u> Environmental-friendly Growth for Sustainable Development.
<u>Indicators:</u> - 40 percent of the country is forest area, classified into forest for conservation (25 percent), and commercial forest (15 percent). The mangrove forest area is enlarged from 1.53 to 1.58 million rai ⁴ . Watershed restoration areas also grow substantially. - A smaller number of species and populations of living organisms with threatened status or nearly extinct. - A complete demarcation map of public land (One Map Project), which is formally announced to the public. The number of land plots allocated to communities for common use.		
<u>Agency:</u> Ministry of Natural Resources and Environment	<u>Plan:</u> The 20-Year ministerial strategic plan (2017 – 2036)	<u>Strategic Issue 1:</u> conserve, protect, restore, promote and develop the natural resources and BD in sustainable manner. Target 1: protect and maintain the forest area without encroachment and deforestation, and prevent the occurrence of wild fire.
<u>Indicators:</u> Protect the protected forest of 80.88 million rai (25 percent of the total area of the forest in the country); Protect the reserved forest of 39.87 million rai, reclamation 918,000 rai, and support the local administrative organizations in preventing and controlling wild fire 100 percent of the target local administrative organization. Develop the area of 500 forests (300,000 rai) to be learning centres.		
<u>Agency:</u> Ministry of Natural Resources and Environment	<u>Plan:</u> The 20-Year ministerial strategic plan (2017 – 2036)	<u>Strategic Target 2:</u> Increase the forest area by restoring the degraded forest area and create economic forest.
<u>Indicators:</u> The protected forest of 3.17 million rai will be restored. The national reserved forest of 16.25 million rai will be restored (the degraded forest of 8.42 million rai/economic forest of 3.83 million rai).		

⁴ A rai is equal to 0.16 hectares; rai is the unit for land measurement in Thailand.

The mangrove forest area will be increased to not less than 10 percent (increase to 1.69 million rai and land reclamation of 100,000 rai).		
<u>Agency:</u> Ministry of Natural Resources and Environment	<u>Plan:</u> The 20-Year ministerial strategic Plan (2017 – 2036)	<u>Strategic Target 4:</u> solve the problems of local people in the forest areas in a systematic and fair manner
<u>Indicators:</u> Solve the problem that communities live in protected forest by using the protected forest area of 169,254 people/235,283 land plots (1,599,777-1-94.76 rai). Arrange the national reserved forest area that already is degraded for local people to sustainably live in such areas (3.4 million rai). Arrange the degraded mangrove area for local people to sustainably live in such areas (not less than 50,000 rai).		
<u>Agency:</u> Ministry of Natural Resources and Environment	<u>Plan:</u> The 20-Year ministerial strategic plan (2017 – 2036)	<u>Strategic Target 5:</u> significantly reduce the loss of natural resources and biodiversity
<u>Indicator:</u> There will be robust research and the research can be used for application.		
<u>Agency:</u> Ministry of Natural Resources and Environment	<u>Plan:</u> The Royal Forest Department's 20-Year Strategic Plan (2017 – 2036)	<u>Strategic Issues:</u> there are two strategies that are directly associated with the forest, namely, Strategy 1: protect and maintain the forest area in a sustainable way; Strategy 2: efficiently restore the degraded forest.
<u>Indicator:</u> Natural resources will be managed in a balanced and sustainable manner at least 40 percent of the country's forest area in 20 years) by conserving the forest area 53.80 million rai; managing the area that is without forest condition; reforestation 14.02 million rai and promoting economic forest 8.68 million rai.		

2.2.2 DMCR and Thailand's wetlands, marine and coastal ecosystem strategy

The policy direction for coastal and marine resources is in the DMCR Road Map. The latter is a comprehensive plan with 10 areas of intervention, as illustrated in the Figure 3 below. Compared to the NBSAP, this document lays out in greater detail the activities that will be undertaken by the DMCR. Some of the activities listed are presented below in Table 2 and these have been classified into five broader categories, namely supporting, damage assessment, protection, pollution control, protection and preventing habitat loss. Also indicated in Table 3 are the relevant sections in the DMCR Act. Note that some of these activities can be said to have already been included in the NBSAP, but most have not. **For Thailand BIOFIN, they will be considered as NBSAP plus activities.** Since these activities have not been costed as such, additional work will need to be done to estimate the costs of implementation and included in the analysis of finance gaps. Moreover, though DMCR will be playing an important role in these activities, collaboration with other agencies will be instrumental in successfully undertaking what is proposed.



Figure 3: Category of measures for protection, restoration and conservation of coastal and marine resources identified in the DMCR road map

The key areas of the long-term intervention plan under the roadmap of Department of Marine and Coastal Resources of Thailand are as follows: i) Measures to enforce the DMCR Act, ii) Mangroves, iii) Seagrass, iv) Coral reefs, v) Marine endangered species, vi) Building the knowledge on ecosystem and promoting participation, vii) Establishing MPAs, viii) Marine debris, ix) Information system, and x) Promotion of participation.

Table 2: Proposed activities, categories and legal aspects in the DMCR road Map of Thailand		
Activities	Category	Legal aspects
1. Clearly define mangrove, beach forest, beach swamp, island, canals	Mangrove – Supporting	DMCR Act Section 3
2. Create land use map indicating each type of land	Mangrove – Supporting	-
3. Verification of activities no. 1 and 2 (as listed above) by area-based authorities	Mangrove – Supporting	-
4. Establish criteria for determining the extent of the damages to mangroves.	Mangrove – Damage assessment	DMCR Act Section 17
5. Notify relevant authorities so that criteria set can be used as guidelines for damage assessment	Mangrove – Damage assessment	-
6. Declare protection area	Mangrove – Protection	DMCR Act Section 18
7. Manage mangrove forests	Mangrove – Protection	DMCR Act Section 19
8. Declare selected areas as Coastal and Marine Protected Areas	Mangrove – Protection	DMCR Act Section 20

9. Define the critical level of damage coastal resources and mangrove	Mangrove – Damage assessment	DMCR Act Section 22
10. Reduce pressures on seagrass	Seagrass – Pollution	-
11. Monitor measures to reduce impact from coastal development projects as required by the EIA	Seagrass - Protection/ habitat loss	-
12. Monitor measures to reduce impacts from projects that do not have to submit an IEE or and EIA report	Seagrass - Protection/ habitat loss	-
13. Reduce threats from fishery activities	Seagrass - Protection/ habitat loss	-
14. Review approval for all types of stationary fishing equipment such as piers	Seagrass - Protection/ habitat loss	-
15. Organize a meeting of coastal fishers to discuss the impacts on sea grass from various us type of fishing equipment's	Seagrass - Protection/ habitat loss	-
16. Increase capacity for restoration	Seagrass – Supporting	-
17. Promote Measures for Sustainable use	Seagrass – Supporting	-
18. Identify measures for protection of sea grass beds	Seagrass – Protection	DMCR Act Section 23
19. Monitor the status of sea grass beds for reporting purposes according to the DMCR Act (Section 9)	Seagrass	-
20. Increase capacity for restoration of coral reefs	Coral – Supporting	-
21. Reduce threats to coral reefs	Coral – Protection/Habitat loss	DMCR Act Section 17
22. Develop the standard for sustainable utilization of benefits from coral reefs	Coral – Protection/Habitat loss	-
23. Introduce measures to protect coral reefs in accordance with the stipulations of the DMCR Act section 20 and 22.	Coral – Protection/Habitat loss	DMCR Act section 20 and 22
24. Monitor the status of coral reefs for reporting purposes according to the DMCR Act Section 9 (7)	Coral – Protection/Habitat loss	DMCR Act Section 9 (7)
25. Ensure that there is adequate enforcement of the DMCR Act	Coral – Protection/Habitat loss	-
26. Increase the capacity to provide assistance to animals washed ashore	Endangered species – Protection/Habitat loss	-
27. Reduce harm from human beings (getting caught in fish traps, boat accidents, marine litter and other pollutants)	Endangered species – Protection/Habitat loss	-
28. Research and improve conservation of marine endangered species	Endangered species – Protection/Habitat loss	-

29. Identify sanctuaries and measures to protect marine endangered species according to Section 22 and 23 of the DMCR Act	Endangered species – Protection/Habitat loss	DMCR Act Sections 22 & 23
30. Monitor the status of marine endangered species for reporting purposes according to the DMCR Act, Section 9 (7)	Endangered species – Protection/Habitat loss	DMCR Act, Section 9 (7)
31. Declare areas as Marine Protected Areas	Establish new Marine Protected Areas	-

3. Financial Needs Assessment

The findings of the financial needs assessment and more specifically, the additional financial resources required for the achievement of national targets of biodiversity conservation in Thailand are presented in this section. The initial process of assessing the financial needs of Thailand for biodiversity conservation involved the quantification and costing of the key strategies identified in the previous section. The starting point has been to consult the NBSAP as one of the principle instruments for implementing the country's vision for biodiversity. In addition to the NBSAP, one other source that has been used as reference for the FNA is the Strategic Plan of the Ministry of Natural Resources and Environment (MONRE), which covers the same period as the NBSAP, i.e., 2016-2021.

However, after team discussions and continued work on the NBSAP and MONRE targets, it was found that these plans did not cover the measures that were to be undertaken by the key agencies (these details are shown in the Strategic Plans described in the preceding section). While some estimates have been made for the NBSAP and MONRE's Strategic Plan, *the lines agencies' strategic plan was not costed and hence the need for BIOFIN to prepare these cost estimates*. Therefore, beyond an assessment of the financial needs of the NBSAP and MONRE targets –detailed costings of the three top agencies is shown in section 3.3.

3.1 Financial Needs according to the National Biodiversity Strategies and Action Plan

The estimates of what is needed to implement activities listed in the current National Biodiversity Strategies and Action Plan, which was endorsed by the Cabinet in March 2015, comes from two documents, namely the NBSAP Action Plan for 2015-2016 and the NBSAP Action Plan for 2017-2021. Similar to the ways the activities have been listed, the Office of Natural Resources and Environmental Policy and Planning (ONEP) takes on the responsibility of communicating with line agencies and asking the latter to estimate the budget required. Among the four strategies, Strategy 2-Conservation and restoration of biodiversity resources- has the largest share of the budget equivalent to 76 percent of the total proposed.

As Table 3 below indicates, the cost estimates for the five years of the NBSAP are slightly less than the estimate for one single year, meaning in effect, that the estimated budget for the remaining years is only around 1/5 of the first year estimates. In terms of why this should be the case, we have not been able to obtain an explanation from ONEP. As such, there remains several uncertainties over the budget estimations in the NBSAP and, therefore, the extent to which the latter can be used to represent 'the development direction' in matters related to

biodiversity resources for Thailand. Listed below are details of some of the uncertainties, that surfaced during our discussions with the representatives of the DNP and the RFD during the months we were working toward alternative estimates of financial needs using a bottom-up approach.

1. *Were the figures reporting the additional amounts that line agencies would need to better execute their mandates?* Communications seem to have broken down at some point with the result being (i) line agencies were reporting their actual budget request and not the additional sum, (ii) line agencies were not clear as to what constituted ‘biodiversity-related’ activities and therefore did not report them. Indeed, both factors may have contributed to the peculiarities of the budget estimates, i.e., whether 2015-2016 figures were overestimates or if 2017-2021 were underestimates. Even if 2015-2016 were overestimates, the budget estimate for the DNP for 2016 of THB 10,928 million is the entire sum estimated in the NBSAP for all agencies⁵.
2. *By the request of the current government, the line agencies have been preparing their 20 Year Development Strategy.* For the agencies whose mandates are directly or indirectly related to biodiversity resources, it seems that these efforts were made with little if any reference to the NBSAP.
3. As we cannot rule out the possibility that *line agencies may have reported their actual budgets into the NBSAP, inclusion of the NBSAP budget estimates will result in double counting.* It will only be valid to add the NBSAP’s budget estimate to BIOFIN’s estimate if the estimation is indeed the additional finance needs to implement the NBSAP. In our estimation of the financial gap in Section 5, we therefore presented the financial gaps both ‘*with*’ and ‘*without*’ NBSAP budget estimates.

Strategy	2015-2016		2017-2021	
	MM THB	MM USD	MM THB	MM USD
<p>Strategy 1: Integrating the value and management of biodiversity resources involving stakeholders at all levels through participatory processes. Under this Strategy, there are two action plans:</p> <p>(i) Action Plan 1.1 is increasing awareness and providing knowledge about biodiversity resources and</p> <p>(ii) Action Plan 1.2 to integrate and promote participation in the management of biodiversity resources.</p>	890	26	1,088	32

⁵ DNP STRATEGIC PLAN B.E. 2559 – 2654 was presented to the BIOFIN Project Steering Committee on November 11, 2016.

<p>Strategy 2: Conservation and restoration of biodiversity resources. This Strategy comprises 5 Action Plans, which are:</p> <ul style="list-style-type: none"> (i) Conserve, restore and protect biodiversity, (ii) Reduce the pressure and ensuring sustainable use of biodiversity resources, (iii) Management of wetlands, (iv) Management of alien invasive species and (v) Biosafety 	7,539	222	8,637	254
<p>Strategy 3: Protecting the national rights in terms of access and benefit sharing that is consistent with the concept of Green Economy. This strategy comprises two Action Plans.</p> <ul style="list-style-type: none"> (i) Protect genetic resources, with an estimated budget of THB 51 million. (ii) Research and Development to create market values for biodiversity with an estimated budget of THB 265.7 million 	2,078	61	288	8
<p>Strategy 4: Developing the knowledge and standardized database on biodiversity resources so that it is consistent with international standards. This strategy comprises two Action Plans with a combined budget of THB 541.76 million.</p> <ul style="list-style-type: none"> (i) Knowledge management and database. (ii) Protect local and traditional knowledge about Biodiversity 	542	16	2,622	77
Total	11,049	326	12,634	372
*Note: Average exchange rate for 2017= THB 33.94/\$1.00				

3.2 Financial Needs According to the Ministry of Natural Resources and Environment

In addition to the NBSAP, the other source that we consulted in preparing the FNA is the Strategic Plan of the Ministry of Natural Resources and Environment (MONRE), which covers the same period as the NBSAP, i.e., 2016-2021. MONRE's Strategic Plan consists of five strategies and a total estimated budget of THB 315,793.9 million, which is 14 times higher than the total NBSAP estimate for the same period.

Of the five strategies, the highest budget estimate is for Strategy 1: 'Integrated conservation and restoration of natural resources that fulfills the objective of development, sustainable

utilization and fairness'. This Strategy is incidentally the one that stands to create a direct impact on biodiversity resources. The estimated budgetary requirement to implement this strategy is THB 113,722 million, which is about five times higher than NBSAP estimates. While the precise impact of the other strategies on biodiversity is perhaps somewhat indirect, substantial benefits could be generated by merely preventing or reducing the pressures on biodiversity.

Table 4: MONRE's estimates for the period 2016-2021	Million THB	Million USD	Relevance to Biodiversity
Strategy 1: Integrated Conservation and restoration of natural resources that fulfills the objective of development, sustainable utilization and fairness	113,721.50	3,446.10	Direct
Strategy 2: Integrated and efficient management of surface and ground water	99,852.10	3,025.80	Indirect
Strategy 3: Participatory conservation and restoration of environmental quality	8,731.00	264.60	Indirect
Strategy 4: Prevention, mitigation and adaptation to extreme weather events and climate change	9,523.10	288.60	Indirect
Strategy 5: Institutional improvement for management of natural resources and the environment	83,966.10	2,544.40	Indirect
Total	315,793.90	9,569.50	

To assess the extent to which the THB 315,793.9 million estimated in the MONRE Strategic Plan differs from the Business-As-Usual scenario, we compared the latter with MONRE's actual and projected budget estimates in the MONRE Expenditure Report. In Figure 4, the budgets for 2015-2017 show the actual budget allocation. The figures for 2018-2021 are MONRE's estimates whereas the figures for 2020 and 2021 are estimates made based on the assumption that the budget will increase by 4 percent from the previous year. We then summed up the figures for the NBSAP period 2016-2021. For MONRE, the total for the NBSAP period (2016-2021) would amount to THB 232,628.44 million. Compared to the budget estimate in MONRE's Strategic Plan, which is THB 315,793.9 million, this is a difference of THB 83,165 million, which is a difference of around 30 percent.

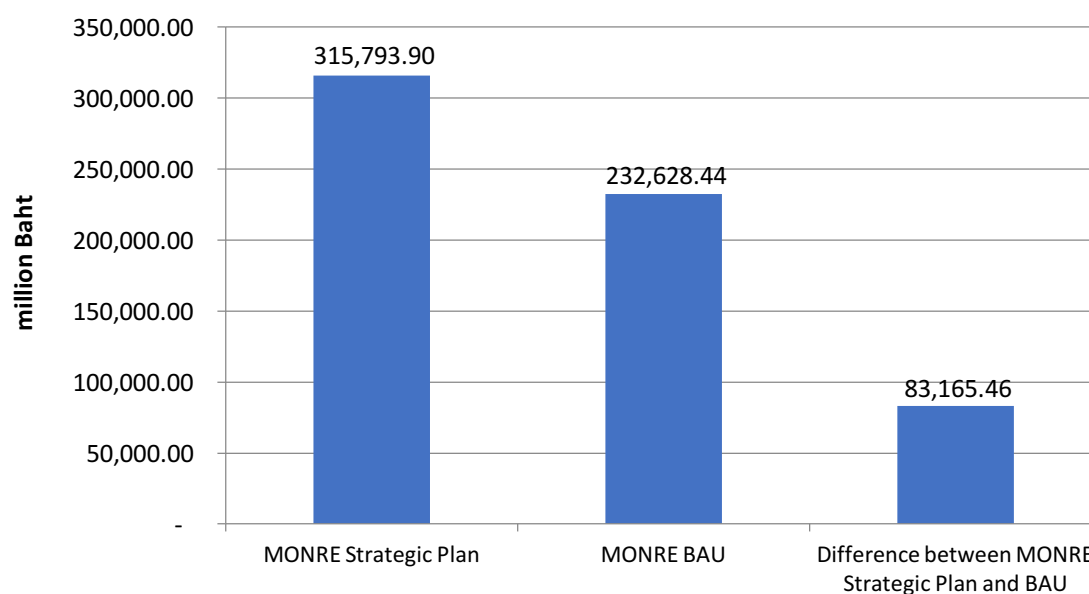


Figure 4: Difference in Financial Needs between MONRE’s Strategic Plan, MONRE’s BAU budget estimates and NBSAP estimates.

Similar to the NBSAP, although these estimates have been made, it is unclear whether the numbers would be used by MONRE to justify increase in budget requests. This is unlikely, given the information we had from the discussions with the representatives of the DNP, RFD and the DMCR, that annual budget increase is capped at 4 percent per annum. Therefore, at best, the budget estimates from MONRE serves as an indicator that there are parallel efforts to come up with budget estimates that simply stopped at the stage when these numbers have been produced. Unlike the budget estimates in the NBSAP, *we did not include MONRE’s estimates in our analysis of the financial gap.*

3.3 Estimating Financial Needs Using a ‘Bottom-Up’ Approach

To calculate the financial needs for biodiversity conservation in Thailand, the scope of our analysis should now extend to include the three line agencies, namely the Department of National Parks, Wildlife and Plant Conservation (DNP), the Royal Forest Department (RFD), and the Department of Marine and Coastal Resources (DMCR). The justification for focusing only on these three agencies is because their expenditures account for around 80 percent of the national budget spending (Fiscal Years 2011 – 2015) defined as related to biodiversity resources.⁶ As the previous section showed, the three agencies perform different but complementary functions. The DNP’s role is primarily in forest protection, conservation and restoration. The RFD is tasked to cover those roles in areas designated as national forest reserves and ‘sustainable’ uses. The DMCR is responsible for conservation of coastal and marine ecosystems that lie outside of Marine National Parks, such as, mangroves, coral reefs and seagrass beds. The DMCR is also responsible for protecting and conserving of marine endangered species.

In addition to the three Departments, we included the cost estimates for the Pollution Control

⁶ REF: See Thailand’s Biodiversity and Expenditure Review report

Department (PCD). Although unlike the three other agencies, the PCD does not have mandates specific to the ecosystems, the inclusion of the PCD is made on the premise that the management of effective pollution control is crucial for reducing the pressure on the natural resources base and also to prevent, control and minimize pollution.

3.3.1 Financial needs Assessment of the Royal Forest Department ⁷

In estimating the financial needs for the RFD, we reviewed the Department's 20-Year Strategic Plan as the reference. Through discussions with the RFD, we jointly identified measures that would be critical for improving the efficiency and effectiveness in protecting forest resources and restore degraded forests.

The 20-Year Strategic Plan of the RFD includes 7 strategies, namely:

- Strategy 1: Protect and maintain areas still under forest coverage*
- Strategy 2: Restore degraded forests*
- Strategy 3: Promote the development of economic forests (reforestation of urban and rural areas) *
- Strategy 4: Addressing issues of community settlements inside protected areas
- Strategy 5: Promoting R&D for improved management of forest resources
- Strategy 6: Promoting people participation*
- Strategy 7: Institutional improvement

In Table 5, we have calculated costs to implement selected activities for four of the strategies, namely:

- Strategy 1: Protect and maintain areas still under forest coverage;
- Strategy 6: Promoting people participation;
- Strategy 2: Restore degraded forest; and
- Strategy 3: Promote the developing economic forests (reforestation of urban and rural areas)

For Strategy 1, we focus on costs for improving the efficiency of the forest patrol units. The RFD currently has 521 units. Each unit is technically able to cover 149,797 rai. While the RFD has some routine budget for this, for the purpose of the present report, we assume that an increase in funding for an additional 30 forest patrol units per year would help strengthen effectiveness. Moreover, capacity building for all of the 521 forest patrol units would be necessary, and therefore this cost has been taken into account in our calculation. It should also be noted at this stage that the details in Table 8 show the estimates in column 2017-2018 as blank, as it is assumed that actions will not occur until 2019.

For Strategy 6, we have focused only on RFD's mandate regarding community forests. According to the RFD's 20-Year Development Strategy, the total area coverage of this target is 19.1 million rai. If this area were divided evenly during the 20-year period, each year the coverage would be 955,000 rai. Thus, for the purpose of calculation, we assume that for each year within the NBSAP period, 1 million rai would be covered— for a target of 1,000,000 rai per year. As actions are most likely to take place at the earliest in 2019, by the end of NBSAP period, we assume that only 3,000,000 rai will be developed as community forests. Using the RFD's

⁷ BIOFIN Thailand would like to thank Dr. Surang Thienhirun, Director of Forest Biodiversity Division and Mr. Apiwat Ua-Areelert, Forestry Technical Officer for their contribution and the consultation sessions in calculating these costs.

ratio of 500 rai of community forest area for each community, 2,000 communities will receive funding each year.

- a. *Financial needs to establish community forests.* At a rate of THB 20,000/community to establish community forests, the cost each year for this item would amount to THB 40 million.
- b. *Financial needs to manage community forests.* In addition to the cost of establishing community forests, there is also the cost of community forest management of THB 70,000/community forest. The annual cost for this will be THB 140 million per year.
- c. *Financial needs to set up utility forests.* Utility forests technically refers to an area of 10 rai within each community forest where access by the community looking after that forest is permitted for the purpose of collecting timber and non-timber forest products. RFD sets a budget of THB 5,000/community forest for this purpose. Based on this rate, the annual financial requirement will be THB 10 million.
- d. *Financial needs to set up wet forest fire lines.* To provide additional protection for the community forest, one cost item is for making wet forest fire lines. Wet forest fire lines refer to the idea of planting tree crops that also can be used by the local community. Technically, the ratio used by the RFD is 1 rai of fresh forest fire line per 20 rai of community forest area. Thus, if 1,000,000 rai of community forest is to be established each year, then the area to be set aside as fresh forest fire line would be 50,000 rai/year. Using the RFD unit cost of THB 6,595/rai, the financial requirement for this would be THB 348,250,000.

For Strategy 2, the RFD has set a target of 8.7 million rai of degraded forest for restoration. Again, if this area was divided evenly during the 20-year period, each year the coverage would be 435,000 rai. Within the three remaining years of the current NBSAP, the total area of degraded forest restored would be 1,305,000 rai. The annual requirement of THB 1,696,500,000 is calculated by multiplying the area restored each year with the RFD's unit cost of THB 3,900/rai for year one. Similarly, the unit cost of THB 1,020 per rai for maintenance is multiplied by the area restored to derive a figure of THB 443,700,000 per year.

For Strategy 3, we calculated the cost for promoting the development of economic forests for urban forests and for rural/agricultural areas. The target area set by the RFD is 3.5 million rai. If the work for establishing urban forests would be evenly distributed over the 20 years, the target for each year will be 175,000 rai. Also assuming that each of the urban forests would cover an area of 100 rai/urban community, the number of communities to receive funding each year would be 1,750 households. Multiplying 1,750 communities with the unit cost of THB 831,200, we derive an annual cost of THB 1,454,600,000.

Within the same Strategy, the target for increasing area under tree cover in rural/agricultural land is 8.6 million rai for the 20-year period or 430,000 rai per year and 1,290,000 rai for the three years (2019-2021). The cost of THB 430 million/year is derived from multiplying the area to be planted each year (430,000 rai) with the unit cost of THB 1,000 per rai. Similarly, the maintenance cost is derived from multiplying the area to be planted each year (430,000 rai) with the unit cost of THB 700 per rai. ***Based on all the above calculations, our estimates for the RFD for the period 2019-2021 is amounted at THB 4,952,873,000 per year.***

Table 5: Budget estimation for Royal Forest Department				
Strategy 1: Protection and maintaining areas still under forest coverage	Unit cost (THB)	2019	2020	2021
Target: establish forest patrol unit *30 units/year ^{1/}	1,745,100	52,353,000	52,353,000	52,353,000
Target: capacitate forest patrol unit * 521 units ^{2/}	70,000	36,470,000	36,470,000	36,470,000
Strategy 6: Promote people participation	Unit cost (THB)	2019	2020	2021
Target: create forest area in the period 2017-2036 *19.1 million rai ^{3/}				
Target: create forest area in the NBSAP period 2017 – 2036 *3 million rai ^{4/}				
Target: create community forest area in the period 2019 – 2036 *1 million rai				
Target: fund the community forest *500 rai/community forest ^{5/}	2,000			
Target: establish community forest ^{5/}	20,000			
Target: Community forest *2,000 communities	20,000	40,000,000	40,000,000	40,000,000
Target: provide fund for community forest management *2,000 villages	70,000	140,000,000	140,000,000	140,000,000
Target: Planting trees to demarcate land designated for utility purposes *10 rai/village ^{5/}	5,000	10,000,000	10,000,000	10,000,000
Target: Wet forest fire line	6,965	348,250,000	348,250,000	348,250,000
Strategy 2: Restoring degraded forests	Unit cost (THB)	2019	2020	2021
Target: Restore degraded forest in the period 2017 – 2036 *8.7 million rai ^{3/}				
Target: Restore degraded forest in the NBSAP period 2017-2021 *1,305,000 rai ^{4/}				
Target: Restore degraded forest area in the period 2019-2021 *435,000 rai ^{5/}	3,900	1,696,500,000	1,696,500,000	1,696,500,000

Target: Maintain degraded forest area in the period 2019-2021 *435,000 rai ^{5/}	1,020	443,700,000	443,700,000	443,700,000
Strategy 3: Promoting the development of economic forests (reforestation of urban and rural areas)	Unit cost (THB)	2019	2020	2021
Target: Urban forest area for 1,750 communities/year *100 rai per community ^{3/}	831,200	1,454,600,000	1,454,600,000	1,454,600,000
Target: Increase in tree coverage in agricultural area during 20 years *8,600,000 rai ^{3/}				
Target: Increase in tree coverage in agricultural area during NBSAP period *1,290,000 rai				
Target: Area to cover each year for reforestation of rural areas * 430,000 rai per year				
Planting cost for the 1 st year per rai ^{5/}	1,000	430,000,000	430,000,000	430,000,000
Maintenance cost for the area to be planted ^{5/}	700	301,000,000	301,000,000	301,000,000
Total		4,952,873,000	4,952,873,000	4,952,873,000
<p>1/ RFD currently has 521 patrol units each to cover 149,797 rai. Budget allocated in 2561 was 34,902,000 for 20 units = THB 1,745,100/unit. Our calculation is based on the assumption that 3 additional units will be financed per year. Note: No costs are estimated for 2560 and 2561 based on the assumption that funds mobilization is unlikely to have taken place during this period.</p> <p>2/ Current budget allocation is THB 128,153,600 for 521 units = THB 245,796/unit. Since there is already normal budget allocation, our calculation assumes that an increase of 30% per unit would help increase the effectiveness of forest patrol.</p> <p>3/ Area is indicated in the RFD 20-year plan.</p> <p>4/ Assuming that activities can only realistically start in 2562, this means that funding will only be for the last 3 years of the current NBSAP period.</p> <p>5/ Based on unit costs information provided by the RFD, it is stated that community forest area per village (rai) is 500 rai.</p>				

3.3.2 Financial Needs Assessment of the Department of National Parks, Wildlife and Plant Conservation⁸

The estimation of financial needs for the DNP was conducted in close collaboration with the agency. We estimated costs for different types of Protected Areas under the jurisdiction of the DNP. For each type, we calculated three main types of expenses, namely;

- (i) Cost of replanting the degraded forest areas;
- (ii) Cost of maintaining the areas replanted to ensure the highest rate of survival; and
- (iii) Cost of making forest fire lines.

⁸ BIOFIN Thailand would like to thank Dr. Pinsak Suraswadi, Deputy Director General, Mr. Suraphoj Kanjanasing, Planning and Information Office Director and Mr. Manus Ruadrew, Forestry Technical Officer, Senior Professional Level.

Starting with the National Parks, which cover a total area of 39.25 million rai, we assume that at most only 10 percent would need to be replanted. This means that the total area to be replanted is 3,925,324 rai. If the task is to be evenly spread out in 20 years, which is the timeframe of the DNP's Strategic Plan, then each year's target would be 196,266 rai. If the replanting efforts had started from Year 1 of the current NBSAP, the total area that would have been replanted by the end of Year 6 would be 1,177,597 rai. However, with no actions having been undertaken in the first three years, the replanting work would have to be expedited if the same area target is to be achieved. This means that each year between 2019 and 2021, the target for replanting would be 392,532 rai. For a normal budget request, the DNP uses the unit cost of THB 3,900 per rai. We multiplied this with the area to be replanted to derive an annual cost of THB 1,530,876,399. With a unit cost for maintenance of THB 1,020 per rai, the annual cost to maintain the replanted forest is THB 400,383,058.

For forest fire line, the DNP has a standard rule that a 1 kilometer distance of forest fire line is to be constructed for every 100 rai of forest. For the total area of 3,925,324 rai to be reforested, the total distance of forest fire line to be constructed would be 39,253 km. Again, if the task is evenly spread over 20 years, the workload for each year would be 1,963 km of forest fire line. The distance of forest fire line to be constructed in 6 years but to be accomplished only in the remaining three years would be 3,925 km per year. The unit cost for forest fire line is THB 5,140 per km. Thus, the annual cost would be amounted to THB 20,176,042.

Apart from the National Parks, we have calculated the cost to replant 5 percent of the current area defined as Forest Parks. The total area to be replanted is 45,494 rai and total area under the NBSAP period is 13,648 rai. The annual costs for replanting and maintenance, using the same unit costs as above are THB 17,742,765 and THB 4,640,415 respectively. The costs of making forest fire lines for Forest Parks is THB 4,677,400.

Wildlife Sanctuaries are separated into two categories, namely;

- (i) Existing Wildlife Sanctuaries covering a total area of 23,142,359 rai;
- (ii) Additional areas of 150,900 rai to be declared as new Wildlife Sanctuaries.

In both cases, we assume that only 5 percent of the area would need to be replanted and that the remaining 95 percent of the forests would still be good condition. We used the same assumptions regarding the area to be replanted each year and the area to be replanted during the NBSAP period. Using the unit costs for replanting, maintenance and forest fire lines, the annual costs for replanting and maintaining existing Wildlife Sanctuaries would be THB 12,534,600 and THB 3,278,280 respectively. Added to this would be the annual costs for making the forest fire lines of THB 59,436,980.

For areas to be declared as new Wildlife Sanctuaries, the annual costs for replanting and maintaining existing Wildlife Sanctuaries would be THB 2,944,500 and THB 770,100 respectively. Each year, there will also be an additional cost of THB 41,120 for making the forest fire lines.

In addition to replanting, maintaining, and constructing forest fire lines, we calculated the cost of stepping up protection measures. The annual cost of THB 31,826,000 year is based on the capacity building cost of THB 159,130 per unit, and 200 units per year.

Based on all the above calculations, the additional investment requirements for the DNP for each year would amount to THB 2,035,836,118.

Table 6: Budget estimation for DNP				
Costable activities of DNP	Target	2019	2020	2021
1. Protected Area				
1.1. National Park (Unit: rai)	39,253,241			
1.1.1 Replanting				
<ul style="list-style-type: none"> Assuming 10% of national park area needs to be reforested 	3,925,324			
<ul style="list-style-type: none"> Area to be replanted each year within 20 years 	196,266			
<ul style="list-style-type: none"> Area to be replanted within NBSAP period 2017-2022 (6 years) 	1,177,597			
<ul style="list-style-type: none"> Area to be replanted each year in the 3 remaining years of current NBSAP 	392,532	392,532	392,532	392,532
<ul style="list-style-type: none"> Unit cost for replanting at THB 3,900/rai 		1,530,876,399	1,530,876,399	1,530,876,399
1.1.2 Maintenance at THB1,020 /rai		400,383,058	400,383,058	400,383,058
1.1.3 Forest fire line				
<ul style="list-style-type: none"> Coverage at 1 km/100 rai = 39,253 km of forest fire line for 3,925,325 rai to be reforested 				
<ul style="list-style-type: none"> Forest fire line to be constructed each year within 20 years 	1,963			
<ul style="list-style-type: none"> Forest fire line to be constructed within NBSAP period 2017-2022 (6 years) 	11,776			
<ul style="list-style-type: none"> Forest fire line to be constructed each year in the 3 remaining years of current NBSAP 		3,925	3,925	3,925
<ul style="list-style-type: none"> Cost per 1 km of forest fire line THB 5,140 		20,174,500	20,174,500	20,174,500
1.2 Forest Park (Unit: rai)	909,885			
<ul style="list-style-type: none"> Assuming 5% of forest park area needs to be reforested 	45,494			
<ul style="list-style-type: none"> Area to be replanted each year within 20 years 	2,275			
<ul style="list-style-type: none"> Area to be replanted within NBSAP period 2017-2022 (6 years) 	13,648			

<ul style="list-style-type: none"> Area to be replanted each year in the 3 remaining years of current NBSAP 		4,549	4,549	4,549
<ul style="list-style-type: none"> Unit cost for replanting at THB 3,900/rai 		17,742,765	17,742,765	17,742,765
1.2.1 Maintenance at THB 1,020 /rai		4,640,415	4,640,415	4,640,415
1.2.2 Forest fire line				
<ul style="list-style-type: none"> Coverage at 1 km/100 rai = 454.94 km of forest fire line for 45,494 rai to be reforested 				
<ul style="list-style-type: none"> Forest fire line to be constructed each year within 20 years 	455			
<ul style="list-style-type: none"> Forest fire line to be constructed within NBSAP period 2017-2022 (6 years) 	2,730			
<ul style="list-style-type: none"> Forest fire line to be constructed each year in the 3 remaining years of current NBSAP 		910	910	910
<ul style="list-style-type: none"> Cost per 1 km of forest fire line at THB 5,140 		4,677,400	4,677,400	4,677,400
1.3 Existing wildlife sanctuary	23,142,359			
<ul style="list-style-type: none"> Assuming 5% of existing wildlife sanctuary area needs to be reforested 	1,157,118			
<ul style="list-style-type: none"> Area to be replanted each year within 20 years 	57,856			
<ul style="list-style-type: none"> Area to be replanted within NBSAP period 2017-2022 (6 years) 	9,643			
<ul style="list-style-type: none"> Area to be replanted each year in the 3 remaining years of current NBSAP 		3,214	3,214	3,214
<ul style="list-style-type: none"> Unit cost for replanting at THB 3,900/rai 		12,534,600	12,534,600	12,534,600
1.3.1 Maintenance at THB 1,020 /rai		3,278,280	3,278,280	3,278,280
1.3.2 Forest fire line				
<ul style="list-style-type: none"> Coverage at 1 km/100 rai = 11,571 km of forest fire line for 1,157,118 rai to be reforested 	11,571			
<ul style="list-style-type: none"> Forest fire line to be constructed each year within 20 years 	579			
<ul style="list-style-type: none"> Forest fire line to be constructed within NBSAP period 2017-2022 (6 years) 	3,471			

<ul style="list-style-type: none"> Forest fire line to be constructed each year in the 3 remaining years of current NBSAP 		1,157	1,157	1,157
<ul style="list-style-type: none"> Cost per 1 km of forest fire line = THB 5,140 		5,946,980	5,946,980	5,946,980
1.4 Wildlife sanctuary to be declared	150,990			
<ul style="list-style-type: none"> Assuming 5% of wildlife sanctuary area to be declared needs to be reforested 	7,550			
<ul style="list-style-type: none"> Area to be replanted each year within 20 years 	377			
<ul style="list-style-type: none"> Area to be replanted within NBSAP period 2017-2022 (6 years) 	2,265			
<ul style="list-style-type: none"> Area to be replanted each year in the 3 remaining years of current NBSAP 		755	755	755
<ul style="list-style-type: none"> Unit cost for replanting at THB 3,900/rai 		2,944,500	2,944,500	2,944,500
1.4.1 Maintenance at THB1,020/rai		770,100	770,100	770,100
1.4.2 Forest fire line				
<ul style="list-style-type: none"> Coverage at 1 km/100 rai = 75.5 km of forest fire line for 7,550 rai to be reforested 	75			
<ul style="list-style-type: none"> Forest fire line to be constructed each year within 20 years 	4			
<ul style="list-style-type: none"> Forest fire line to be constructed within NBSAP period 2017-2022 (6 years) 	24			
<ul style="list-style-type: none"> Forest fire line to be constructed each year in the 3 remaining years of current NBSAP 		8	8	8
<ul style="list-style-type: none"> Cost per 1 km of forest fire line = THB 5,140 		41,120	41,120	41,120
2. Increasing capacity to forest patrol				
<ul style="list-style-type: none"> Assuming 200 units/year at THB 159,130 		31,826,000	31,826,000	31,826,000
Total		2,035,836,118	2,035,836,118	2,035,836,118

3.3.3 Financial Needs Assessment for Department of Marine and Coastal Resources

For coastal and marine ecosystems, a range of activities, that have been proposed are not

reflected in the NBSAP. Most important among these is the DMCR roadmap (2018-2036). While this document contains detailed information on programme, projects, measures and activities, and yet none of the items have been costed. Reflected in the scope of our analysis of the estimation of financial needs of the coastal and marine sector at this stage, is the costs of protecting and restoring mangroves, coral reefs and the seagrass ecosystem.⁹

a. Mangrove Restoration Costs

According to the DMCR roadmap and action plan, measures related to mangroves include targets for replanting, replenishing as well as reclaiming some of the mangroves that have been encroached (see Table 7).

Mangrove Restoration	Unit cost (THB) ^{1/}	Target for achievement (rai) ^{2/}				
		2016-2017	2018-2021	2022-2026	2027-2031	2032-2036
Protection	1,160 per rai ^{3/}	1.5647	1.5954	1.6260	1.6567	1.6874
Reclaim	3,560 per rai ^{4/}	15,000	30,000	50,000	75,000	100,000
Replant	6,390 per rai	5,000	54,000	78,000	104,000	153,000

^{1/} Data from the Bureau of Budget
^{2/} Based on DMCR Action Plan for 2016-2036
^{3/} Cost of maintaining the conditions of the mangroves and is used as the lower bound estimate of the cost of protection.
^{4/} Cost for replenishing the mangroves based on the assumption that, whatever is reclaimed is in degraded condition and needs to be replenished.

Using the information on the target areas provided by the DMCR and unit cost estimates from the Budget bureau, the budget estimate for each year is the sum of the cost to protect, replant and replenish.¹⁰ In the analysis of financial requirement, we only included the estimations for 2019-2021 to cover the last three years of the current NBSAP.

Year	Cost to protect (THB MM)	Cost to replant (THB MM)	Cost to replenish (THB MM)	Total (THB MM)
2018	1,815	86	27	1,928
2019	1,815	86	27	1,928
2020	1,815	86	27	1,928
2021	1,815	86	27	1,928
2022	1,886	100	36	2,021
2023	1,886	100	36	2,021
2024	1,886	100	36	2,021

⁹ For coral reefs and seagrass, financial needs were only calculated for restoration for two reasons. Firstly, as these figures would indicate, the restoration costs are high and is unlikely to be covered by normal budgetary allocation. Secondly, it is the assumption that the costs of protection would be covered by the DMCR's annual budget and that only a smaller percentage of 'damaged area' would need to be restored.

¹⁰ Replanting is done when the entire mangrove has been destroyed and has to be completely replanted. Replenishing on the other hand is when only patches of the mangroves have been destroyed in which case, replanting is only limited to the destroyed patches.

2025	1,886	100	36	2,021
2026	1,886	100	36	2,021
2027	1,924	133	53	2,110
Total	18,614	977	341	19,927

b. Coral Reef Restoration Costs

According to experts in the DMCR, there are three possible options for replanting coral reefs, namely transplanting reefs on concrete, developing floating nurseries and providing artificial restoration (AR). Among the three techniques, the lowest unit cost is transplanting on concrete at THB 106,400/rai of coral reefs. Middle range costs would be to providing AR at THB 7,560,000/rai. The highest cost is developing the floating nursery at THB 18,720,800/rai. Although the choice of which option to take would depend on the physical setting of the reefs, for demonstrating which of the resources are required to restore coral reefs, we have used the middle range unit cost of THB 7,560,000/rai as the basis for the calculations. We set the target area to be restored at 121 rai/year. (See Table 9).

Low investment Scenario of coral reef restoration	Unit
Area to be restored each year (rai)	121
Unit cost (THB million per rai)	7.560
Budget required for restoration (THB million per year)	916.27

Using the information in Table 10 below, the restoration costs for the period 2019-2021 amounts to THB 2,490 million.

Year	Cumulative area restored	Budget (THB MM)	Maintenance ^{1/} (THB MM)	Total cost (THB MM)
2019	121	916	n/a	916
2020	242	916	14	930
2021	364	916	27	944
Total		2,478	41	2,490

^{1/} Maintenance cost is assumed to be 1.5 percent of restoration cost

c. Seagrass Restoration Costs

Using information on the condition of sea grass at the province level, we assumed that only 1 percent of the 'poor' condition areas are replanted, which would be an area of 1,003 rai (see Table 11). This area was then used to multiply the unit costs of replanting sea grass, which is THB 10.6 million/rai¹¹.

¹¹ Nabangchang O. (2012) Economic Value of Seagrass Ecosystem: A Case Study of Trang Province, Southern Region of Thailand. A Report Submitted to the Department of Marine and Coastal Resources.

For the NBSAP period, assuming that 100 rai of seagrass would be planted each year, the total area to be replanted is 300 rai and total costs would be THB 3,240 million.

Target area: sea grass in “poor” condition areas	10,034 rai
Area to be restored each year	100 rai
Unit cost for replanting	THB 10.60 million/rai
Annual budgetary requirement	THB 1,063.6 million/rai
Maintenance cost	THB 1.5 million

Year	Area replanted (rai)	Replanting cost (THB million)	Maintenance cost (THB million)	Total cost (THB million)
2019	100	1,064	n/a	1,064
2020	201	1,064	16	1,080
2021	301	1,064	32	1,096
Total	602	3,192	48	3,240

4. Financial Needs under Different Scenarios

In this section, the financial needs estimates according to the NBSAP and the three departments are used and combined as different financial need scenarios as shown in Figure 5.

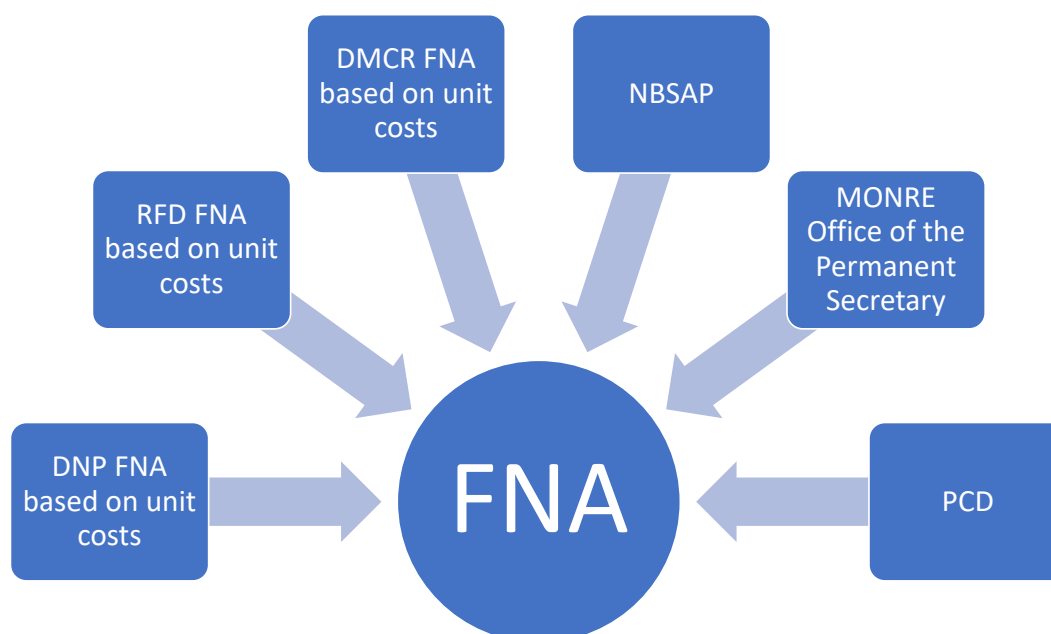


Figure 5: Inputs used in the analysis of financial needs

4.1 Scenario A (Business as Usual)

The Business as Usual scenario assumes that there will be no changes in the rate of increase in annual budget allocation. Table 13 includes annual budget estimates for the three line agencies, DNP, RFD and DMCR. As mentioned earlier, we include the annual budget estimates for the PCD as the role of the Department in managing pollution will in principle contribute reduce costs of remedying damages to the natural resources base and the ecosystems. The budget of the Office of the Permanent Secretary of MONRE is also included in recognition of the supporting role of in management of biodiversity resources and the ecosystems where they can be found. The budgets for 2016 and 2018 are actual budget allocations. Figures from 2019 onwards to 2021 are project increases based on assumption that budget will increase by a fixed rate of 4 percent per year. The total budget for the NBSAP period would amount to THB 125,700 million.

Table13: Finance needs under the Business As Usual scenario						
Scenario A for the current NBSAP Period 2016 – 2021 (Unit: THB million)						
Agency	Budget in 2016*	Budget in 2017*	Budget in 2018	Budget in 2019	Budget in 2020	Budget in 2021
DMCR	1,370	1,397	1,497	1,572	1,680	1,764
DNP	10,928	10,916	11,574	11,902	12,437	12,996
MONRE	1,547	1,598	1,682	1,754	1,833	1,915
PCD	656	616	567	517	515	506
RFD	4,461	4,605	5,501	5,581	5,779	6,035
Sub -Total	18,963	19,131	20,820	21,325	22,244	23,217
Total NBSAP budget for 2016 – 2021 = THB 125,700 million						
*Note: Budgets in 2016 and 2017 are actual budgets						

4.2 Scenario B

Under Scenario B, we included the results of the financial needs for the DNP, RFD and DMCR discussed in Section 3. The costs estimate is the *additional* investments that would make it possible for the DNP, RFD and DMCR to execute the measures and activities included in their 20-year strategic plans. Without these additional investments, the plans will be no more than paper documents and the goals set elusive. What must be said is that in jointly working with staff of the three departments, we had encouraged our partners to assess the feasibility of the scope of work and the magnitude of the tasks that were being budgeted. In other words, the additional investment requirement is consistent with the capacities of the agencies to execute them.

Table 14, as with the preceding table, shows the figures for the PCD and MONRE Office of the Permanent Secretary for 2019-2021 which are assumed to increase by a fixed rate of 4 percent p.a. For these two agencies, therefore, information is the same for Tables 14 and 15. The difference between Scenario B and A is in budget estimates for the DNP, RFD and DMCR for 2019-2021. To this, we added the budget estimated to finance the NBSAP of THB 23,679 million. The total financial requirement would amount to THB 181,357 million or \$5,343 million. (Table 14)

Table 14: Financial needs with unit costs to implement selected measures in NBSAP						
Scenario B for the current NBSAP Period 2016 – 2021 (Unit: THB million)						
Agency	Budget in 2016*	Budget in 2017*	Budget in 2018	Budget in 2019	Budget in 2020	Budget in 2021
DMCR	1,370	1,397	1,497	3,667	3,805	3,920
DNP	10,928	10,916	11,574	13,938	14,473	15,032
MONRE	1,547	1,598	1,682	1,754	1,833	1,915
PCD	656	616	567	517	515	506
RFD	4,461	4,605	5,501	5,581	5,779	6,035
NBSAP estimates	11,049	2,526	2,526	2,526	2,526	2,526
Sub -Total	30,012	21,658	23,347	34,480	35,428	36,432
Total NBSAP budget for 2016 – 2021 = THB 181,357 million						
*Note: Budgets in 2016 and 2017 are actual budgets						

4.3 Scenario C

Given the uncertainty that there can be additional government budget allocation to cover the expenses indicated to implement the NBSAP Action Plans, in Scenario C, therefore we omitted the estimate of THB 23,679 million. We believe that the omission of the NBSAP budget estimates will provide a more realistic base for calculation of the financial gap. Therefore, the total financial estimate for this Scenario is THB 157,678 million or \$4,645.79 million. (Table 15)

Table 15: Financial needs without NBSAP budget estimates						
Scenario C for the current NBSAP Period 2016 – 2021 (Unit: THB million)						
Agency	Budget in 2016*	Budget in 2017*	Budget in 2018	Budget in 2019	Budget in 2020	Budget in 2021
DMCR	1,370	1,397	1,497	3,667	3,805	3,920
DNP	10,928	10,916	11,574	13,938	14,473	15,032
MONRE	1,547	1,598	1,682	1,754	1,833	1,915
PCD	656	616	567	517	515	506
RFD	4,461	4,605	5,501	12,078	12,276	12,533
Sub -Total	18,963	19,132	20,821	31,954	32,902	33,906
Total NBSAP budget for 2016 – 2021 = THB 157,678 million						
*Note: Budgets in 2016 and 2017 are actual budgets						

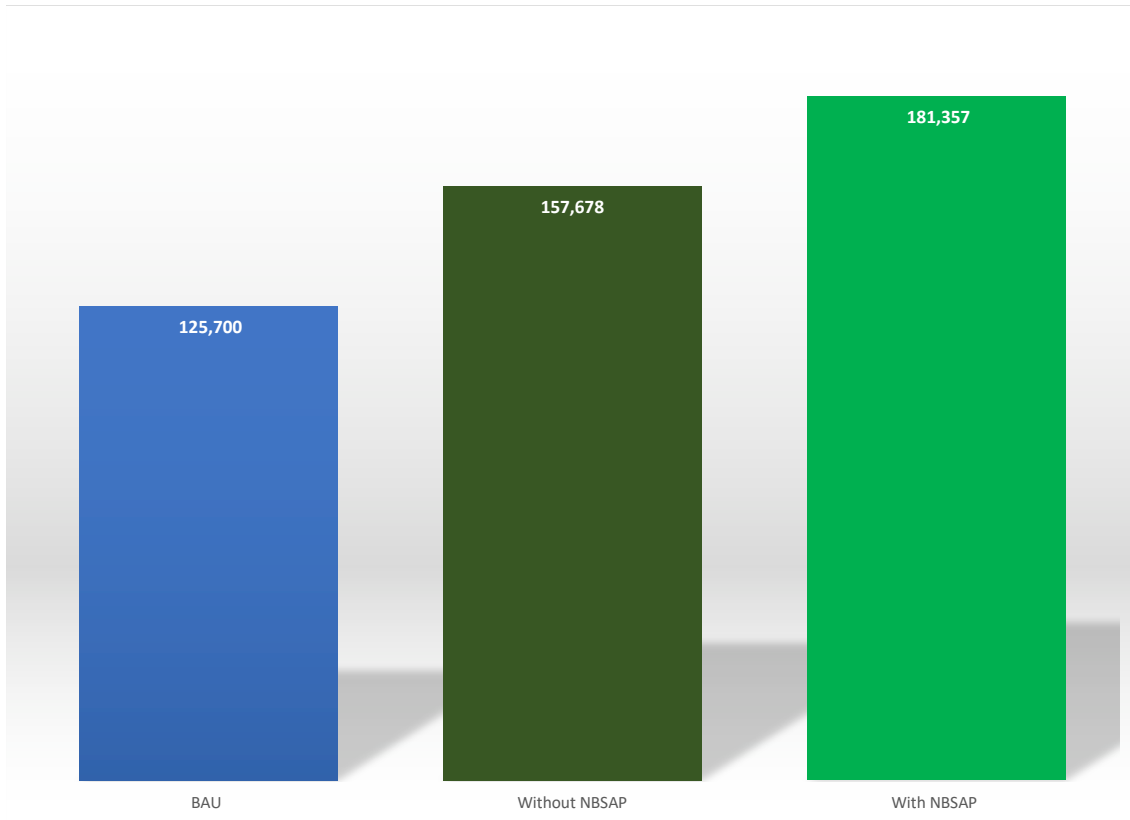


Figure 6: Scenario A, Scenario B and Scenario C

5. Financial Gaps

In taking a bottom-up approach and starting with our three key agencies, our aim is to focus on the implementing agencies whose mandate is directly related to the three main ecosystems, (terrestrial, coastal and marine and some of the inland wetlands).¹² We believe that this will complement the efforts vested in preparing the NBSAP and its budget estimates. By starting with the 20-Year Development Strategy formulated by these agencies, we believe that the activities we costed better reflect what the agencies themselves plan to undertake. At this juncture where the military government is planning for the transfer of power to 'democratically' elected government, the efforts being vested in drafting the 20-Year National Strategy and requests to Ministries and Departments to formulate their own 20-Year Development Strategy in many ways reflects the desire to see both clear directions and continuity of efforts. Plans, if endorsed, have a longer shelf-life than governments, which come and go. For agencies that formulate them, however, the Plans reflect more the 'What' rather than the 'How' to do. The major answer to the 'How' is the financial resources required to implement the 'What' and the modality to mobilize the needed funds. Apart from the justifying of the annual budgets to be approved by the Cabinet before the beginning of each fiscal year, the agencies take the 4 percent increase ceiling as given. This is where BIOFIN enters. Through dialogues, we reviewed the overall targets, and discussed the area scope and the amount of

¹² Again referring to the justification given by the BER, that these three agencies are responsible for 80% of the current biodiversity related expenditure.

work that realistically can be achieved each year. Finally, we costed the activities. As guided by the BIOFIN Workbook, most of the estimates were based on unit costs used by the agencies, which are standard costs approved by the Bureau of Budget under the Ministry of Finance. These estimates are reflected in Scenario B and C in the differences between the budgets of the DNP, RFD and the DMCR.

If the 'gap' is defined as the difference between the normal budget allocation and the requirement to step up protection and conservation efforts, then there are **two options** that we can adopt. Given that the current activities are inadequately supported, there is no difference in annual budgets of the Office of the Permanent Secretary (PS) of MONRE and the PCD in the three Scenarios. This is because no additional activities are envisaged that require additional expenditures, at least not at this stage. They are included because of the supportive role of these two institutions is duly recognized, the Office of the PS MONRE because of its potential supporting role at the policy/decision making level and the PCD because greater effectiveness of pollution control measures will mean reduced pressure on biodiversity resources in the ecosystems.

The two options for calculating the financial gap refer to whether we include the NBSAP budget estimates. Therefore, we conducted the discussion with agency personnel from key line agencies, and the indication received from the concerned agencies stated that the NBSAP budget estimates could be excluded from the calculation. This is to avoid the error of double counting as the budget estimates made by the NBSAP may already be budget requested by the line agencies and already approved. With this indication, the financial gap is estimated for the last three years of the current NBSAP, which is the period of 2019-2021. Three years have passed since the beginning of the current NBSAP in 2016, and any identified measures in the NBSAP and sectoral plans must be expedited to be accomplished in the next three years. Even so, this means adopting an optimistic view that things can start to move forward by the end of 2018.

Option 1: The gap between Scenario A and Scenario B.

Scenario A is essentially the Incremental Budgeting Approach (IBA) where we assumed that the annual budget for each year is a 4 percent increase from the previous year's budget.

Scenario B includes the unit costs estimates of the planned activities¹³ of the DNP, RFD and the DMCR **as well as** the NBSAP budget estimates.

For this option, the financial gap would amount to THB 55,656 million or \$1,639 million for the period 2019-2021.

Option 2: The gap between Scenario A and Scenario C.

Scenario C includes the unit costs estimates of the planned activities¹⁴ of the DNP, RFD and the DMCR **without** the NBSAP budget estimates.

Therefore, the difference between this and the previous option is the exclusion of the NBSAP

¹³ Referred to in the Workbook as the Activity Based Costing (ABC) linked to sector plans

¹⁴ Referred to in the Workbook as the Activity Based Costing (ABC) linked to sector plans

budget estimates.

For this option, the financial gap would amount to THB 31,978 million or \$942 million for the period 2019-2021.

Options for financial assessment in Thailand	Million THB	Million USD
Option 1: Difference between Scenario B (with NBSAP) and Scenario A	55,657	1,639
Option 2: Difference between Scenario C (without NBSAP) and Scenario A	31,978	942

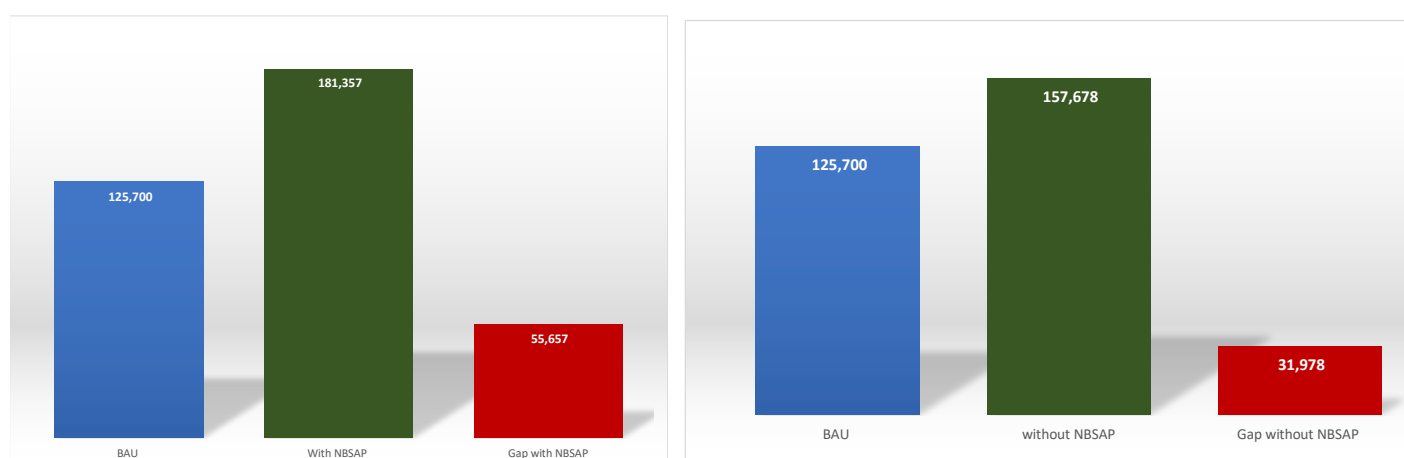


Figure 7: Assessment of Financial Gaps of the two options

Of the two options, *the more realistic is Option 2*. This is to avoid the error of double counting as the budget estimates made by the NBSAP may already be budget requested by the line agencies and already approved, particularly for the fiscal years 2016 and 2018. The additional resources to be mobilized in the Biodiversity Finance Plan is therefore THB 31,978 million for the three remaining years of this current NBSAP, or the period 2019 to 2021. This would be twice the budget of that of biodiversity-related expenditures estimated in Thailand's BER report. With this investment, we can see that Thailand NBSAP fulfils the commitments in the 20 targets of the Convention on Biological Diversity Strategic Plan.

5.1 Cost distribution

Referring to the previous discussion on the finance gap, if we were to break down the financial needs estimate of THB 31,978 million, of this total:

81 percent are financial needs estimates for the two departments that have direct mandates over terrestrial ecosystem, namely the Department of National Park, Wildlife and Plant Conservation and the Royal Forest Department.

19 percent are financial needs estimates for the department that has a direct mandate to engage in additional protection and conservation of the coastal and marine ecosystems, namely the Department of Marine and Coastal Resources.

Below are the targets of what the THB 31, 978 million will be spent on. These are targets that are based on the 20-Year ministerial strategic plan and the 20-Year departmental strategic plan, scoped down in terms of evaluation of the agencies themselves on what needed to be done and realistic to undertake within the timeframe given. Without additional funding, it is most likely that only small fractions of these targets will be achieved. The additional funding will complement the annual budget allocation and thus increases the likelihood that the targets below can be achieved.

5.1.1 Royal Forest Department

- Strategy 1 : Protection and maintaining areas still under forest coverage RFD
 - Establishing 90 forest patrol units
 - Capacity building for 521 forest patrol units
- Strategy 2 : Restoring degraded forests: 1,305,000 rai of degraded forest restored
- Strategy 3 : Promoting the development of economic forests
 - 525,000 rai of urban forests established
 - increasing area under tree cover in rural/agricultural covering an area of 1,290,000 rai
- Strategy 6 : Promote people participation: 6,000 community forests established

5.1.2 Department of National Parks, Wildlife and Plant Conservation

- Replanting degraded forests within National Parks: 1,177,597 rai
- Replanting degraded Forest Parks: 13,648 rai
- Restoring degraded in existing Wildlife Sanctuaries: 9,643 rai
- Restoring degraded forests in new Wildlife Sanctuaries 3,471 rai

5.1.3 Department of Marine and Coastal Resources

- Replanting 364 rai of degraded coral reefs
- Replanting 301 rai of degraded seagrass beds
- Mangrove targets:
 - 1,564,655 rai of mangroves protected
 - 22,500 rai of mangroves reclaimed
 - 40,500 rai of mangroves replanted

5.1.4 Meeting National Biodiversity Strategies, Aichi Biodiversity Targets and the United Nations Sustainable Development Goals

It is improbable that the above targets can be achieved under the BAU scenario with the ceiling of an increase in annual budget allocation set at only 4 percent. The additional financial resources estimated will be able to expand the scope of conservation as well as expedite the execution of the tasks in addressing five BIOFIN categories, namely (i) Forest/terrestrial, (ii) Protected Areas, (iii) Inland wetlands, (iv) Coastal and marine and (iv) Urban biodiversity. This will bring Thailand closer to achieving Strategy 2 of the NBSAP which is '*Conservation and Restoration of Biodiversity*'.

At the same time, Thailand will also be addressing four of the Aichi Targets, namely (i) Target 5 that *'By 2020, the rate of loss of all natural habitats, including forests, is at least halved and where feasible brought close to zero, and degradation, and fragmentation is significantly reduced'*, (ii) Target 11 that *'By 2020, at least 17 percent of terrestrial and inland water, and 10 percent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well connected systems'*, Target 14 that *'By 2020, ecosystems that provide essential services, including services related to water, and contribute to health, livelihoods and well-being, are restored and safeguarded, taking into account the needs of women, indigenous and local communities, and the poor and vulnerable'* and (iv) Target 15 that *'By 2020, ecosystem resilience and the contribution of biodiversity to carbon stocks has been enhanced, through conservation and restoration, including restoration of at least 15 percent of degraded ecosystems, thereby contributing to climate change mitigation and adaptation and to combating desertification'*.

If we were to breakdown the financial needs estimates in relation to the Sustainable Development Goals, of the total, 81 percent are financial needs estimates for two Departments which have direct mandates over terrestrial ecosystem, namely the Department of National Park, Wildlife and Plant and the Royal Forest Department. The expected outcomes from executing the activities discussed should therefore contribute to Thailand achieving the SDG 15 'Life on Land' and may also indirect contribute to SDG 13 with respect to 'Climate Action'. The estimated budget for the Department of Marine and Coastal Resources to engage in additional protection and conservation of three coastal and marine ecosystems is 19 percent of the additional financial needs. Thus, it should contribute to Thailand achieving the SDG 14 'Life below Water'. In reference to the point made earlier, no financial needs have been estimated for the Office of the Permanent Secretary of MONRE and the PCD.

6. Conclusion

The financial needs assessment for BIOFIN Thailand was successful in understanding the costs required for the achievement of biodiversity conservation goals in the country. Initially, we reviewed Thailand's 'biodiversity vision' and highlighted the strategies and actions in the NBSAP and MONRE Strategic Plan in order to provide a basis for determining the 'costable actions' that link to expected biodiversity results. However, through close engagement with key stakeholders through consultative and participatory workshops, meetings, team discussions and expert inputs, it was found that the NBSAP and MONRE Strategic Plan did **not** cover all the details on measures that were to be undertaken by the key line agencies responsible for the management of terrestrial and marine ecosystems in Thailand. While estimates have been considered for the NBSAP and MONRE's Strategic Plan, ***the lines agencies' strategic plan was not costed and hence the need for BIOFIN to prepare these cost estimates.***

Thus, the FNA focused on the Strategic Plans of the Department of the National Park, Wildlife and Plants (DNP), the Royal Forest Department (RFD) and the Department of Coastal and Marine Resources (DMCR). The selection of these 'top three' agencies in the FNA builds on the findings of Thailand's BER which showed that the total expenditure for these agencies accounted for around 80 percent of the overall biodiversity related budget in Fiscal years 2011 - 2015. The costs estimate is essentially the ***additional*** investments that would make it possible

for these agencies to execute the measures and activities included in their Strategic Plans.

The Financial gap was calculated as the difference between the Business-as-Usual (BAU) budget allocation (Scenario A) and the required budget for the agencies to execute the activities in the target areas (Scenario C). The result indicates that the finance gap amounts to THB 31,978 million or \$942 million for the remaining three-year period of the current NBSAP 2019-2021. This would be twice the budget of biodiversity-related expenditures estimated in Thailand's BER report.

A 'bottom-up' approach employed by BIOFIN in Thailand was more useful for adapting the FNA process for the Thai context as it incorporated more detailed actions for each target and enabled the quantification of the actions (UNDP, 2016). Given the uncertainty that there can be additional government budget allocation to cover the expenses indicated to implement the NBSAP Action Plans, we believe that by omitting the NBSAP budget estimates this provides a more realistic base for calculating the financial gap. This omission also seeks to minimize the risk of double counting as the budget estimates made by the NBSAP may already be budget requested by the line agencies and already approved, particularly for the fiscal years 2016 and 2018. Therefore, in the Thai context, the NBSAP serves as a starting point to demonstrate that complying with the commitment of the Convention on Biological Diversity (CBD) requires substantial funding. What the process of drafting the NBSAP demonstrates (at least for Thailand) is that it needs to be a collaborative process between planning agencies – in this case the Office of Natural Resources Environmental Policy and Planning (ONEP)¹⁵, and the top three agencies who have direct mandates over the ecosystems, namely the DNP, RFD, and DMCR. Without close collaboration, not only is there inadequate 'ownership' of the NBSAP, but the accuracies of the estimates for financial needs also suffers.

Notwithstanding these uncertainties and risk of double counting, the BIOFIN process has been successful in generating substantial interest and uptake amongst the key stakeholders. During the FNA validation workshop entitled 'Training of Trainers: The BIOFIN Process in Thailand' in February 2018, the feedback from the key agencies was highly positive. The representatives from the key departments were able to understand the rationale behind the request from BIOFIN for concrete targets for achievement within their Strategic Plans and the importance of providing rigorous unit costs. The feedback reflects the fact that the approach of making use of the unit costs to calculate budget requirements provides a solid base which can be readily replicated in the future in Thailand. Most importantly, by following the BIOFIN methodology used in this FNA, the agencies would be able to develop a sense of 'ownership' of the final figures estimated and in doing so build a stronger case for biodiversity finance in the national budgeting process.

Indeed, the results of this assessment is vital in understanding how financial resources can be re-allocated and new finances generated for the achievement of the national plans. The section on 'Cost Distribution' (5.1) should serve to suggest areas for immediate funding and/or can inform funding and planning decisions, and the BIOFIN categories allow determining which themes/sectors across biodiversity require more funding. This analysis is therefore extremely useful in proceeding to the next steps of BIOFIN and in developing the biodiversity finance plan for Thailand.

¹⁵ ONEP is an organization under MONRE which is the national focal point for the Convention on Biological Diversity.

It is recommended that the FNA process is institutionalized into ONEP, the three key agencies—DNP, RFD, DMCR—the PCD, and the Office of the National Economic and Social Development Board (NESDB) should act as the coordinating agency. This institutional setup should provide the capacity to update the figures periodically. The first update can be expected to begin in 2020 to cover the duration of the next NBSAP for Thailand.

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