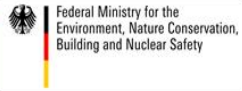
This project is co-funded by the European Union



BIOFIN

Financial Needs Assessment (FNA) of Malaysia

Final Report

21 August 2018

Table of Content

List of Tables

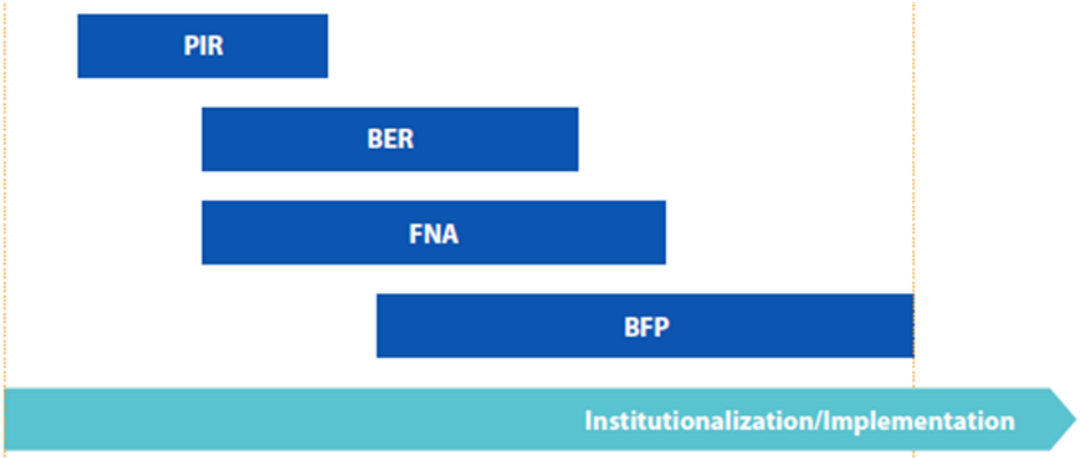
List of Figures

What is BIOFIN?

In 2014, the Biodiversity Financing Initiative (BIOFIN) was launched during the COP 11 by EU Commission and the United Nations Development Programme (UNDP) in recognition of the challenges faced in financing biodiversity. The initiative aimed to develop a common methodology and the capacity of nations to conduct financial planning for biodiversity. In effect, nations would be able to better identify their financing needs to achieve their respective National Biodiversity Strategic Action Plans (NBSAP) as well as understand their current sources of financing, the financing gap that remains and the opportunities available to close the gap through reducing needs and increasing resources.

The BIOFIN methodology

There are four main components to the BIOFIN methodology. First, the Policy and Institutional Review (PIR) is a review of all policy, legal and institutional frameworks and stakeholders that are relevant to biodiversity. This, together with the Biodiversity Expenditure Review (BER), an analysis of biodiversity expenditures through financial inputs such as budgets, allocations and expenditures related to biodiversity, will provide the basis for the Financial Needs Assessment (FNA). The difference between the BER and the FNA, an aspirational estimate of the resources needed to fund biodiversity-related activities, is the biodiversity finance gap. Finally, the Biodiversity Finance Plan (BFP) will lay out a mix of prioritised finance solutions that aims to address the biodiversity finance gap.



Source: UNDP (2016) The BIOFIN Workbook

BIOFIN Malaysia

Malaysia was one of the first 12 countries to participate in BIOFIN and to pilot the methodology from 2014-2018. The Economic Planning Unit (EPU) was the national focal point. A core team was formed to guide the study, and the key members were the EPU, Ministry of Finance, Ministry of Natural Resources and Environment, and UNDP Malaysia. In 2016, the National Policy on Biological Diversity (NPBD) 2016-2025 was launched and the BIOFIN methodology was applied with the purpose of developing a resource mobilisation plan for Policy.

The BIOFIN Malaysia exercise was conducted from March 2017 until August 2018. Three workshops were conducted in May and December 2017, and June 2018, where detailed information about the project and the methodology was shared and discussed. These workshops were supplemented by capacity building sessions with organisations to assist them with data compilation. The BER collected data from 32 samples comprising 18 government organisations, one (1) government trust fund, six (6) private sector firms, four (4) non-governmental organisations, and three (3) portfolio cases from a multilateral and bilateral organisation. The FNA collected data from 31 samples comprising 26 government organisations, one (1) private sector firm and four (4) non-governmental organisations or civil society organisations.

This Report

This report will describe the FNA experience in Malaysia.

1 Introduction

Malaysia is a biodiversity-rich country and a signatory to the UN Convention on Biological Diversity. In 2016, the nation launched its revised National Policy on Biological Diversity 2016-2025 (NPBD) as its National Biodiversity Strategy and Action Plan (NBSAP) towards achieving better biodiversity outcomes in line with the Aichi targets. Resource mobilisation was explicitly mentioned as a specific target (Target 17) within the Policy to ensure successful implementation by 2025. BIOFIN or the Biodiversity Finance Initiative presents an opportunity for building capacity in this aspect through a four-step process. This process comprises a Policy and Institutional Review (PIR), Biodiversity Expenditure Review (BER), Financial Needs Assessment (FNA) and finally a Biodiversity Finance Plan (BFP).

This report presents the methodology and findings of the Financial Needs Assessment (FNA) step that was carried out with 31 sample organisations from July 2017 through to March 2018. The cut-off date for data collected was 16 March 2018. The FNA is a systematic process of estimating the financial resources needed to fully implement the biodiversity strategies and actions. The main outcome is a prioritised, well-documented and fully-costed budget that will help to build a strong business case for resource mobilisation. In Malaysia's context, the FNA will estimate the financial needs for the full implementation of the National Policy on Biological Diversity 2016-2025 (NPBD). Additionally, the financing gap can also be estimated by comparing the BER findings to the FNA. These outputs will then better inform the development of the BFP.

1.1 What is the Financial Needs Assessment?

The Financial Needs Assessment (FNA) is a comprehensive estimate and analysis of the human resources, capital investments and financial resources needed in order to fund biodiversity-related activities in Malaysia to achieve national and sub-national biodiversity targets as articulated in the NPBD and other key national, ministry and agency-level strategic plans. It is aspirational given that this estimated budget may not be immediately achievable in practice. The key elements of the FNA are:

1. Building a business case for the integration of the FNA within national planning and budgeting processes
2. Linking of existing national, ministry or agency-level plans and biodiversity strategies and results to the FNA's outcomes and costable actions in a logical framework that can be systematically costed
3. Creating a detailed budget for each costable action through the definition of unit costs and quantities over the targeted time frame to better justify biodiversity finance
4. Prioritising of biodiversity strategies and actions based on specific biodiversity and cost criteria
5. Linking of the FNA to the BER through the tagging to the NPBD targets and BIOFIN categories
6. A detailed calculation of the finance gap between the BER biodiversity expenditure and the needs identified in the FNA

1.2 Structure of Report

The report consists of five chapters.

Chapter 1 provides an introduction to the Financial Needs Assessment and the Malaysian context in which it is carried out.

Chapter 2 presents an overview of the FNA methodology. This covers both the general BIOFIN methodology and the localised Malaysian methodology adapted by the study team that is used by participants. This chapter then presents the data collection and data analysis of the FNA including the sources of data, the data collection process, challenges and limitations faced, the steps involved in the data analysis, the analysis undertaken and assumptions made.

Chapter 3 presents the FNA results based on data gathered from 31 sample organisations[1] that had been mentioned in the NPBD. This chapter first analyses their financial resources needed to implement the National Policy on Biological Diversity 2016 – 2025 (NPBD). It presents their financial needs according to the 17 Targets in the NPBD, as well as the BIOFIN categories, and an overview of their biodiversity functions. Breakdown by type of action and the lead agencies also is presented. The gap analysis is then explored, where the financial needs for the targeted years are compared to the previous expenditures on biodiversity as identified in the Biodiversity Expenditure Review. Take note that only samples that had both FNA and BER data (either submitted by them in the BER exercise or collected through secondary data) were included in the gap analysis.

Chapter 4 then provides a discussion of the results as presented in Chapter 3. This will be followed by a conclusion in Chapter 5.

1 Note that the bulk of this FNA was conducted in 2017 and the first quarter of 2018. The cutoff date for data submission was March 2018, prior to the reorganization of government that occurred around the middle of 2018. Hence, the names of the ministries, departments and agencies reflect those prior to the reorganization.

2 FNA Methodology

This chapter presents information about the methodology, processes and materials used by the study team to undertake the Financial Needs Assessment (FNA). The general BIOFIN FNA methodology is first described followed by the adapted FNA methodology for Malaysia. The data collection and analysis processes are presented later in the chapter.

2.1 General Methodology

With reference to the Global BIOFIN workbook 2016, the FNA methodology is used to produce a detailed and realistic costing of the targets in the country's NBSAP. In essence, the FNA aims to answer the question of "How much financing is needed for the country to achieve its stated biodiversity targets?" especially in the medium to long run. The process involves building up a budget for the NBSAP from scratch by estimating the full set of human resources, capital investments and financial resources needed. In doing so, the FNA findings can then be compared against the BER findings to estimate the financing gap needed for the effective management of biodiversity in the country. In this sense, the FNA is primarily a strategic planning and costing exercise.

Financial needs can be costed and estimated using various approaches. This includes:

- **Incremental budgeting approach (IBA)** – annual increments are allocated to previous year's budget to estimate future costs;
- **Historical projections** – empirical data of historical costs are used to project future costs;
- **Cost modelling** – quantitative models with input variables used to extrapolate future costs from small cases;
- **Activity based costing (ABC)** – specific programmes and activities identified and the costs related to those activities used to build detailed bottom up budgets; and
- **Results-based costing (RBC), or results-based budgeting (RBB)** – specific objectives are identified and then associated programmes and costs are used to build detailed and outcome-focused budgets.

Each approach has its advantages and disadvantages and combinations of approaches are often used to identify financial needs and build up the budgets.

The results-based budgeting approach used because it is useful for tracking the performance to proposed outcomes and invested resources. This is in line with the implementation of outcome-based budgeting (OBB) by the Malaysian government and the strong international push for this approach. Future budget proposals resulting from this FNA would be better equipped to fit national and international budgetary processes.

This approach uses a logical framework methodology in planning where the desired impact is first defined before detailing out the expected outcomes, outputs, and specific actions to achieve it. The resources needed to deliver specific actions are then identified and their costs estimated. Summing the costs of these actions then produces the total financial needs, i.e. budget for implementing the plan of action.

2.2 Localised Methodology

The study team modified the FNA methodology using the results-based budgeting approach (RBB) into the local context. As several organisations did not want to share their financial data openly, the approach was for each organisation to estimate the financial needs using the modified RBB approach. Notably, the participants were given training to use the methodology within their own organisations. The study team conducted training, facilitated discussions, data query and follow-up clarifications with the participating organisations. The localised methodology is described in a 28-page FNA guidebook produced by the study team together with examples and instructions for using a common data template at each step to guide participants through the process (Appendix I).

Data collection for the FNA required participants to detail out plans into costable actions that would achieve biodiversity outcomes and cost out those actions. Participants were asked to plan according to *'What is needed to deliver the National Policy on Biological Diversity (NPBD) 2016-2025 targets by 2025'*, assuming that government funds will continue to be allocated and other funding and resources will be explored to fill financing gaps.

The localised methodology comprises six steps that are guided by four key questions as shown in Figure 1.

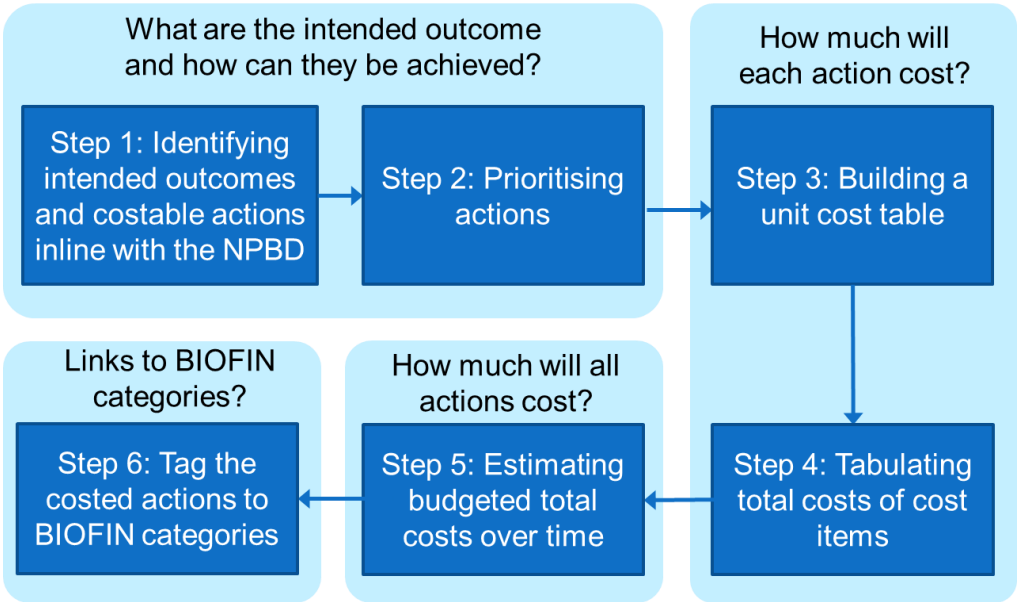


Figure 1: Six steps of the localised FNA methodology of Malaysia

Step 1: Identify intended outcomes and costable actions corresponding to NPBD targets

The first step was to identify the NPBD targets that were associated with their organisations and the intended outcomes. The NPBD was the main reference for this exercise; the FNA is meant to estimate the cost for implementing this Policy. The NPBD has 5 goals, 17 targets and 57 actions to be achieved by 2025. Participants were encouraged to identify relevant NPBD targets by referring to their organisation's mandate, mission statements, management plans, and current portfolio of activities. The main reference material used

was Table 3-1 of the NPBD document (pg. 104-110) that had a list of Lead Agency or Key Partners for each target (reproduced in Appendix II of this report).

Once identified, intended outcomes were specified for each target in a manner that allowed them to be quantifiable or measurable. Participants were informed that one target could have multiple outcomes depending on what the organisation plans to achieve. A guide to writing clear intended outcomes (Table 1) and examples of doing so (Figure 2) were provided to further guide participants.

Table 1: Questions to guide the writing of clear intended outcomes with examples given

Question	Example 1	Example 2
What can my organisation do to achieve the target and policy action?	Help decrease tiger poaching incidents	Engage tourists to improve their understanding of biodiversity
What would be considered a success?	Tiger poaching incidents decrease from 100 to 50 per year	90% of tourists have improved understanding of biodiversity and is fully compliant with visitor guidelines
By when should this be achieved?	by 2020	by 2030

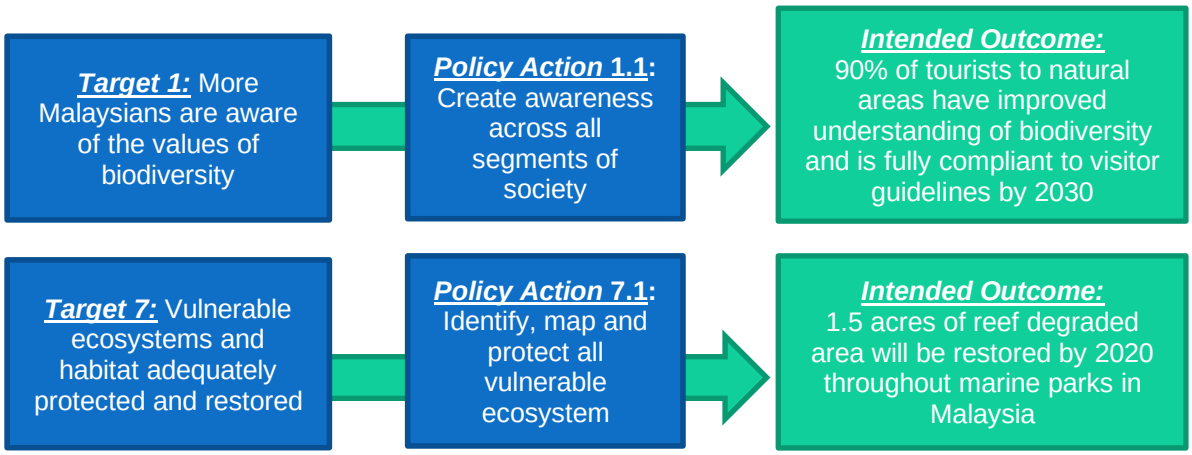


Figure 2: Examples of quantifiable outcomes that are specific to an organisation

After identifying the intended outcomes, costable actions were specified. Participants were informed that a single outcome could have multiple costable actions. Participants could import actions from existing management plans for this step. However, there must be sufficient details to estimate the cost of actions. Figure 3 illustrates this process and highlights the difference between generic actions with little description and costable actions that have sufficient description for costing purposes. Additionally, participants could include actions into the FNA even when the actions were not in their management plans so long as it contributed to the outcome. Where there are no existing plans, participants discussed and identified the actions from scratch.

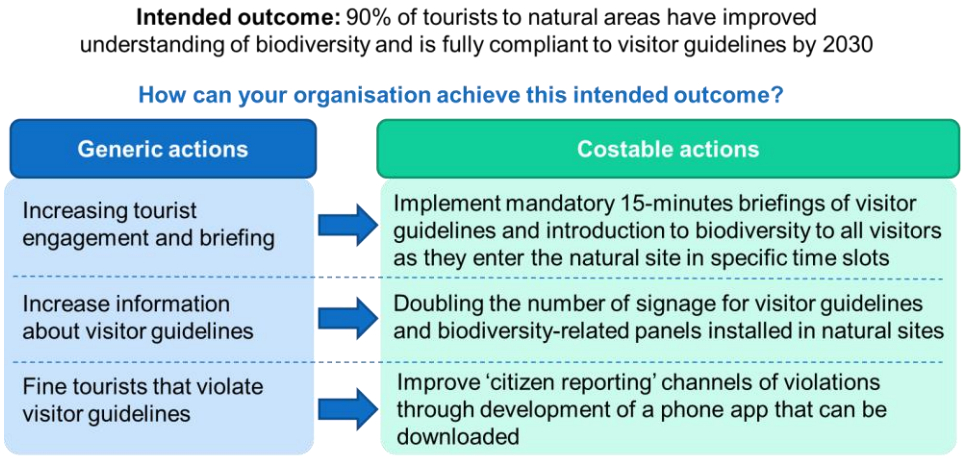


Figure 3: Examples of translating generic actions into costable actions

Step 2: Prioritising costable actions

The second step was to prioritise the identified actions. Prioritised actions were then costed in Steps 3 to 5. Participants were informed that prioritisation means giving priority to the most important actions and that this step is useful to further refine the intended outcomes and costable actions drafted in Step 1. Additionally, prioritising earlier would reduce the burden of costing all identified actions in later steps.

For this FNA, participants were asked to prioritise actions that would deliver the desired impact within the timeframe and estimate the cost of implementation. However, if they preferred, additional criteria could also be used by participants such as impact (most likely to achieve desired results), biodiversity indicators (most critical for biodiversity outcome), financial performance (e.g. most sustainable, highest return or least risky) or even socioeconomic indicators (e.g. impacts to jobs, well-being, security of resources). Participants were encouraged to write notes about the prioritisation done in order to help future users understand their decisions. Figure 4 shows an example of this process.

From the FNA experience, most participants tended to prefer doing this step only after completing the costing exercises (Steps 3-5) for efficiency purposes. For most participants, the FNA data template is sent out by a coordinating person-in-charge to each department or section to be completed (including the costing steps) before it is returned. Once consolidated, the departments/ sections are invited for a joint meeting chaired by top management to present their inputs and budgets. Duplications, similar outcomes and actions, cost figures as well as priority actions are discussed at such meetings before top management finalises and submits the FNA sheet back to the study team. In contrast, smaller organisations tended to prefer doing the prioritising earlier in order to avoid wasting time on the costing steps. In lieu of these reasons, the study team allowed participants to decide when to conduct the prioritisation in accordance to their organisation's needs.

NPBD target	NPBD action	Quantifiable expected outcome	Costable actions *Please list one action per row*	Rapid impact	Long term impact	Cost			Prioritised costable action	Notes
						High	*Medium*	*Low*		
Target 9: Threatened species	9.2: Protect our most threatened species	Decrease poaching incidents of tigers from 100 to 50 per year	Education programme with school children		x	x				
			Increase patrolling staff and patrolling equipment	x			x		x	Currently the most lacking aspect to enforce existing legislation. Also will have the most direct and fastest impact to achieving the inteded outcome
			High fines		x			x		
Target 7: Vulnerable ecosystems and habitat adequately protected and restored.	7.1 Identify, map and protect all vulnerable ecosystem	1.5 acres of reef degraded area will be restored by 2020 throughout Marine Park Malaysia	Surveys and mapping of reef degraded areas and resilient area in 6 marine parks archipelago in year 2016 and 2020	X		X			X	Critical for planning despite high costs. One needs to first know where and why there are degraded and resilient reefs in order to properly plan the next course of action. Will prevent wasted efforts.
			Develop a manual on Coral Reef Restoration	X				X		
			Two training and capacity building programmes for 30 JTLM staff each session on coral reef monitoring and restoration.	X			X			
			Coral transplanting/restoration in 6 marine parks archipelago		X			X	X	A critical follow up to the surveying and mapping work that will directly deliver on the intended outcome
			Reef restoration using artificial reef		X	X				
			One education and awareness programme with various stakeholder in 6 Marine Park for each year.		X		X			
			Monitoring and evaluation of the restoration programme in the 6 marine parks archipelago per year		X	X				

Figure 4: Example of priority criteria for each action and then selecting the prioritised actions

Steps 3 & 4: Building a unit cost table and tabulating total annual cost

The third step of the methodology was to build a unit cost table. The table contains information about various cost items needed by each planned action, including the type of units, unit cost of each item, the number of units needed, and the frequency of use in a year. The annual cost of each cost item was then calculated. Cost items included all development and operating costs in implementing the action. Unit costs were based on current market prices or historical costs if the former was not available.

By preparing this table, adjustments to budgets could be made more easily as if plans change or if better data is available. Organisations could also use these tables to identify opportunities for resource sharing, cost sharing or sponsorship. For this purpose, participants were asked to include all cost items needed by each planned action, regardless of whether the item is already provided for in the organisation, is currently in use or require more units and regardless of whether funding is already secured. Depending on the confidentiality policies, the study team did not receive this cost table from some organisations. Rather, the total cost per year was calculated and provided to the study team.

NPBD target	NPBD action	Quatifiable intended outcome	Planned Costable Actions	Cost Item	Unit Cost (RM)	Unit	Number of units needed	Frquency of use	Total Cost per year	Costing notes
Target 1: More Malaysians are aware of the values of biodiversity	1.1 Create awareness across all segments of society	Strengthen awareness (5-25%), support and compliance of the public, especially communities, in conservation and the importance of marine biodiversity	Approach local residents diplomatically through community dialogues, talks and others (annual)	Staff TNT and OT	81.82	per staff per month	20	10	16,363.64	Frequency is for 10 programs per year and unit cost is 3 days worth of staff claims i.e. RM600/22*3
				Transportation vehicles	3,000.00	per vehicle	2	10	60,000.00	
				F & B	55.00	per person	50	10	27,500.00	
				Administative costs	1,000.00	per session	1	10	10,000.00	
				Logistic (rental of tents, PA system, hall)	3,000.00	per session	1	10	30,000.00	
				Facilitator and trainer	3,000.00	per session	1	10	30,000.00	
				Staff emoluments	272.73	per staff	20	10	54,545.45	Unit cost is 3 days worth of salary per staff i.e. RM2,000/22*3
				Participants (Allowances for source of income loss)	20.00	per person	30	10	6,000.00	
Target 7: Vulnerable ecosystems and habitat adequately protected and restored.	7.1 Identify, map and protect all vulnarable ecosystem	1.5 acres of reef degraded area will be restored by 2020 throughout Malaysia's Marine Parks	Training and capacity building programmes for 30 JTLM staff each session on coral reef monitoring and restoration.	Accomodation	80.00	per staff per day	35	4	11,200.00	Costing for each training for 5 days 4 nights for 30 staff and 2 trainers and 3 facilitators. 2 trainings in 5 years. Administrative cost include printing course materials.
				Meals	45.00	per staff per meal per day	35	5	7,875.00	
				Boat rental	2,000.00	per boat per day	3	3	18,000.00	
				Administative costs	1,000.00	per training	1	1	1,000.00	
				Facilitator and trainer	480.00	per trainer	2	4	3,840.00	

Figure 5: Example of a unit cost table with annual estimated cost

Step 5: Estimating total cost over time

In Step 5, the itemised cost per year was assigned over the period of 2018 -2025 to the years in which the organisation planned to spend it. Year 2025 is the end year of the NPBD and hence was the budgeting timeframe for this FNA. For organisations that had plans only until year 2020, they had to extrapolate the costs until year 2025. In this FNA exercise, the costs were given by the organisations, and are regarded as cost that is estimated in the current period.

NPBD target	NPBD action	Intedend outcome	Planned Costable Actions	Cost Item	Total Cost per year	Year								Sub-total	Grand total	Costing Notes
						2018	2019	2020	2021	2022	2023	2024	2025			
Target 1: More Malaysians are aware of the values of biodiversity	1.1 Create awareness across all segments of society	Strengthen awareness (5-25%), support and compliance of the public, especially communities, in conservation and the importance of marine biodiversity	Approach local residents diplomatically through community dialogues, talks and others (annual)	Staff TNT and OT	16,363.64	16,690.91	17,024.73	17,365.22	17,712.53	18,066.78	18,428.11	18,796.67	19,172.61	143,258	1,859,420	Salary is expexcted to rise by 2% per year
				Transportation vehicles	60,000.00	60,000.00	60,000.00	60,000.00	60,000.00	60,000.00	60,000.00	60,000.00	60,000.00	480,000		
				F & B	27,500.00	27,500.00	27,500.00	27,500.00	27,500.00	27,500.00	27,500.00	27,500.00	27,500.00	220,000		
				Administative costs	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	80,000		
				Logistic (rental of tents, PA system, hall)	30,000.00	30,000.00	30,000.00	30,000.00	30,000.00	30,000.00	30,000.00	30,000.00	30,000.00	240,000		
				Facilitator and trainer	30,000.00	-	30,000.00	-	30,000.00	30,000.00	30,000.00	30,000.00	30,000.00	180,000		
				Staff emoluments	54,545.45	54,545.45	55,636.36	56,749.09	57,884.07	59,041.75	60,222.59	61,427.04	62,655.58	468,162		Salary is expexcted to rise by 2% per year
				Participants (Allowances for source of income loss)	6,000.00	6,000.00	6,000.00	6,000.00	6,000.00	6,000.00	6,000.00	6,000.00	6,000.00	48,000		
Target 9: Threatened species	9.2: Protect our most threatened species	Decrease poaching incidents of tigers from 100 to 50 per year	Increase patrolling staff and patrolling equipment	Staff emoluments	1,200,000	-	1,200,000	1,200,000	1,200,000	1,200,000	1,200,000	1,200,000	1,200,000	8,400,000	232,616,000	
				Satellite and monitoring	2,500,000	2,500,000	-	-	-		-	-	-	2,500,000		
				Rifles, handcuffs	2,500,000	2,500,000	-	-	-	-	-	-	-	2,500,000		
				Transportation vehicles	216,000,000	216,000,000	-	-	-	-	-	-	-	216,000,000		
				Fuel	360,000	-	360,000	360,000	360,000	360,000	360,000	360,000	360,000	2,520,000		
				Administative costs	12,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000	96,000		
				Training sessions	200,000	-	200,000	-	-	200,000	-	-	200,000	600,000		

Figure 6: Example of the budget and total cost of actions from year 2018 to 2025

Step 6: Tagging costed actions to BIOFIN categories

The final step of this methodology was to tag the costed actions to BIOFIN categories (biodiversity function) as done previously in the Biodiversity Expenditure Review (BER). This step will enable the FNA outputs to be mapped to the BER and also be comparable to similar international work undertaken elsewhere. Essentially, pre-tagging actions to BIOFIN categories would reduce the burden of future BERs by allowing organisations to track the amounts spent on various biodiversity functions. The BIOFIN category tags are shown in Appendix III.

2.3 Data Collection

The BIOFIN project Core Team includes the Economic Planning Unit (EPU), Ministry of Finance (MOF), Ministry of Natural Resources and the Environment (NRE), the Ministry of Agriculture (MOA), the Ministry of Plantation Industries and Commodities (MPIC) and United Nations Development Programme (UNDP). Their decision was for the FNA to focus on a sample of organisations, particularly the lead ministries and their agencies at the Federal level as identified in the NPBD, and also some NGO and private sector case studies.

The process was conducted on a voluntary basis. The final sample included stakeholders who were convinced of the usefulness of BIOFIN and who remained committed to the process. Of the 50 organisations approached, only 31 organisations submitted their FNAs as of March 2018. The list of participants who submitted their FNAs is in Appendix IV. Within the sample, some organisations are directly biodiversity-related in their core functions while others have impact on biodiversity directly or indirectly even though biodiversity is not their core functions. The JPS is a good example of the latter.

Data collection for the FNA began in July 2017 and continued over a period of 7 months. The study team worked with the participants during this period, received the data in batches or as and when they joined the study. Data collection had a cut-off in March 2018 for all 31 participants except for one private sector stakeholder that was still finalising its internal planning stage for the next cycle.

2.4 Overall data collection process

The BIOFIN data collection process involved training and facilitating participants to use the FNA methodology and assemble their own data. There were five steps in the data collection process as shown in Figure 7:

1. Briefing and Introduction to the FNA
2. FNA training session, either held on the same or separate day
3. Internal FNA work session to finalise the FNA
4. Presentation to top management
5. Data submission to the study team for quality checking

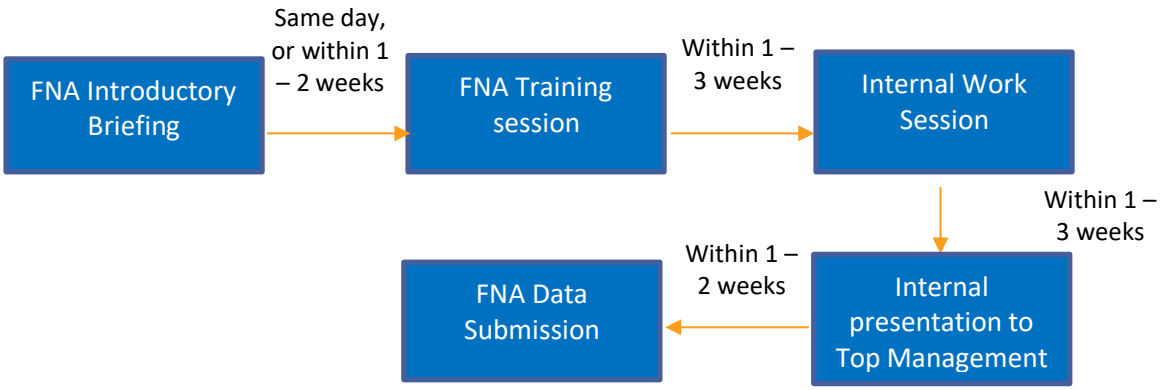


Figure 7: Initial data collection process for FNA

From the engagements in this study, the study team found that organisations that were comprehensively engaged (i.e. top management and officers involved) early in the process also stayed on and completed the FNA. These relevant stakeholders included both the top management decision-makers all the way to the officers compiling or coordinating the statistical compilation.

Following the introductory briefing and FNA training session, the key contact arranged for their top management to attend a half-day awareness raising session (see Figure 8). With support from top management, a two-day training and mini workshop is organised for all relevant development or finance officers, and various division representatives. The outcome of the mini workshop was to complete their FNA.

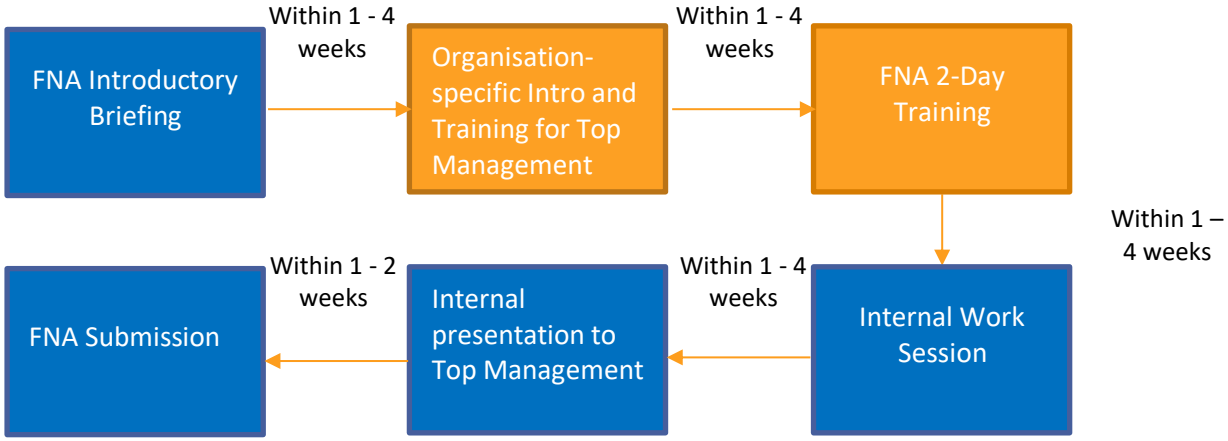


Figure 8: Later-stage data collection process for FNA

Relevant officers from respective divisions or sections were tasked with providing details of their quantifiable outcomes and costable actions according to their 5- or 10-year strategic plans and tag them according to the NPBD targets and BIOFIN categories. The finance or implementation officers then proceeded to fill in the costing details for the identified outcomes and actions. Where needed, additional mini workshops (some held internally) were conducted to consolidate, discuss and complete the FNA. The final step before submitting the FNA data was the presentation to top management. This approach received top management buy-in and participation because it was regarded as a planning exercise to address the NPBD targets and requirements.

2.5 Observations on the Process

The sample size of participants for the FNA in 2018 increased compared to the BER sample in 2017. This is because unlike the BER which could be carried out by a few officers or using secondary data, the FNA requires participation from all levels, sections or divisions of the company as it is essentially a methodology for budgeting and planning the organisation's future activities.

Initially, it was expected that participants would utilise about 8 - 10 weeks to complete the FNA process given the BER experience. However, the process took much longer than expected from 4 - 18 weeks. This was in part because the top management's time was limited but coordination of their time was also needed. However, the benefit was that they had a broader and longer view of the organisation's mission, resources and could see options for institutional cooperation. The FNA exercise was unlike the BER where two to three officers could be assigned to the task. There is a need for collaboration from various stakeholders and buy-in from top management. Participants also realised that the FNA process involved not only convincing top management of their organisation's relevance to biodiversity, but also gathering of top management to participate in the FNA.

While this encouraged more participation, the process of convincing organisations to participate took much more time. For organisations whose core mission was not biodiversity, getting a buy-in was more challenging and took even longer. The study team found that it was more convincing when specific examples were given to relate their policies, plans, mandates, functions or activities to biodiversity. To facilitate this process, the study team prepared a profile for each of these organisations as an internal reference for the briefing meetings. Some examples of the profiles are given in Appendix V.

The study team found that in that process, there were lag periods of about 1-4 weeks where officers tried to arrange meetings, attend to daily operations and avoid the 2017 holiday season. Since the FNA involved a larger number of stakeholders within the organisation, different levels of approval were also needed, which further lengthened the process of data collection.

Since the FNA is outcome driven, organisations also need to be clear of which NPBD targets and related outcomes they want to achieve before estimating the cost of actions. For organisations with clear strategies and plans, aligning them to the FNA methodology was the common approach. For those that did not have such strategies and plans, the process was more complex.

As the mid-term review of the 11MP is expected in 2018, institutionalisation of BIOFIN would accelerate the process of getting organisations to set out or review their strategies and plans, help them plan their activities and estimate budgets for both the 11MP as well as for BIOFIN. It would also be more efficient to integrate the FNA process within the budgeting and planning cycles of various organisations to avoid the need for additional sessions.

Future efforts to enhance the communication of BIOFIN would shorten the amount of time needed for its implementation. Ideally, communication on the wider concept of biodiversity (refer to BIOFIN categories) need to be carried out in order for the relevant biodiversity elements to be included in the planning of activities.

2.5.1 Materials used for data collection

To aid the FNA data collection process, the study team produced the following materials:

a) **FNA introductory slides** - This was used to introduce and raise awareness of the BIOFIN project and to provide information on the FNA. It was used on the same day as the first BER check-in session as well as for special management briefings.

b) **FNA training slides** – This contained an overview of the localised methodology followed by a description and examples of the six FNA steps. Instructions for breakout sessions during the training are also included. This was used together with the FNA data template during FNA training sessions (both theoretical and practical aspects).

c) **FNA data templates** - This Excel file was used for data collection and also for training. In general, the data template had three sheets – Q1 asks for the intended outcomes and costable actions, Q2 lists the unit cost table and calculations of total cost per year by cost items, and Q3 calculates the total cost of an action over time. Examples were provided on the template to guide participants.

   The template and examples were slightly modified for NGO and private sector participants who requested to keep the unit cost table and breakdown of total cost of action over time sheets confidential. The study team also created specific FNA templates based on organisation strategic plans for those struggling with their relevance to biodiversity.

d) **FNA Guidebook** - The guidebook contains details of the methodology. In a step-wise manner, it gives with examples, tips and instructions for using the data template. The guidebook was distributed to participants as the main reference, especially for those who were unable to attend training sessions or who preferred to engage via telephone.

2.5.2 Data quality checking and cleaning (QC) process

Upon receipt of the FNA data, the study team would conduct data quality checking to ensure that the data collected is on track or can be finalised. The overall QC process is similar to the one implemented for the primary data in the BER process. Query emails and follow up calls with participants are used to resolve data issues. Where requested, face-to-face meetings to clarify the data issues are also conducted. The workflow of the QC process is available in Appendix IV.

In general, the QC process took 1 to 6 weeks per organisation depending on the commitments faced by participants or delays due to changing of the persons in charge for the FNA exercise. The shortest time taken to resolve QC matters and to finalise the data is about 1 to 2 weeks. As data from participants usually comes in batches, the QC process happens simultaneously for various organisations. At the end of this stage, a finalised copy is sent to the participant for final confirmation.

Five aspects are usually checked in the QC process.

1) **The tags - NPBD and BIOFIN tags**
   There are two main tagging outputs, namely the NPBD targets and target actions, as well as the BIOFIN categories and sub-categories. If actions have not tagged or if it has only been tagged to their management plans, a query will be sent. If the NPBD and BIOFIN tagging is done, then the following aspects are further checked.

   For identified NPBD targets and sub-targets, they would be compared against Table 3.1 of the NPBD that lists out key stakeholders for each target. Targets in Table 3.1 but did not appear the organisation's list will be flagged as a first query to the participants. The next step would then to be to check whether the outcomes and actions stated correspond to the target and target action chosen.

   Similarly, the BIOFIN categories and sub-categories are then checked through against the functions of the planned actions identified by the organisations. Confirming the selected tags is part of the QC process and is an attempt to increase the robustness of the data. Any challenges to the selected tags will be raised as the second query.

2) **The intended outcomes and costable actions**
   These items are checked to determine whether they have sufficient details to be quantifiable or costable. This is to ensure that the FNA can be a future reference tool and the costing can be justified by measurable outcomes and planned costable actions. Any inquiries under this point will be flagged to the organisation.

3) **Cost reasonableness and appropriateness of the cost items identified**
   Data are checked for whether the cost items are reasonably matched with the identified actions. For example, the related cost items for an internal training session could be possibly training materials, venue and allowances to the relevant staff. Salary of the staff for such a planned action would not be appropriate to add to this item. The reasonableness of the costs associated with the items are also checked. Any inquiries under this point will be flagged to the organisation.

4) **The total financial needs identified**
   The total financial needs are also checked to assure that the assumptions for extrapolating the costs to 2025 are presented in a cohesive manner such as taking consideration into the inflation rate. Any inquiries under this point will also be flagged.

5) **Duplicate checking**
   The Targets, Target Actions, Quantifiable Expected Outcomes, Costable Actions, BIOFIN Categories and Subcategories, Cost Items and Total Cost per Year are checked for consistency where they repeat in one or more than sheets. Any inquiries, especially where the descriptions or numbers differ from one another will be flagged.

Prioritisation of actions is not one of the QC items but it is definitely an important element moving forward especially when different costing scenarios are introduced. It is important for organisations to do their prioritisation and also state other criteria used.

2.5.3 Financial Needs Attribution

For organisations whose total costs were exceptionally high, the study team rechecked 100% of the costable actions and query whether the cost items were biodiversity related. Two agencies that were part of this attribution process were the Malaysian Maritime Enforcement Agency (APMM) under the Prime Minister's Department (JPM) and the Department of Irrigation and Drainage (JPS) of the Ministry of Natural Resources and Environment (NRE). In response to query, APMM indicated that only 70% of their enforcement operations and capacity building is biodiversity related. Thus, an attribution of 70% is applied to the related outcomes.

For JPS, their flood mitigation division indicated that only 10% of their flood mitigation efforts involve soft infrastructure and are thus biodiversity related. Of the remaining 90%, hard infrastructural flood mitigation takes up 70% of the total cost, while 20% goes towards land acquisition. For the analysis, only 10% of the flood mitigation outcomes and projects were attributed to biodiversity.

2.6 Data Analysis

2.6.1 Scope of Analysis

The FNA analysis was done for the 31 participating organisations. Table 2 presents the number of samples by organisation type and lead agency. Cost estimates was not made for organisations that did not submit the FNA as only they know best their own plans and priorities. In any case, the 31 organisations cover most of the major stakeholders identified to deliver the NPBD aspirations.

Table 2: List of stakeholders and their share of NPBD actions

Government	No. of organisations	Notes	Share of NPBD actions (n=53)
NRE	10	4 Ministry divisions + 9 line agencies	75%
MOA	5	Ministry + 4 line agencies	12%
MPIC	5	Ministry + 4 line agencies	2%
KPKT	2	2 line agencies	4%
JPM	1	1 enforcement agency	
Non-government			
NGO/CSO	4		
Private sector	1	1 property developer	

The time frame of the FNA ends only in 2025 as the NPBD document that details the national biodiversity targets has been planned up to then. The year in which the analysis starts is the year 2016, coinciding with the 11th Malaysia Plan. The analysis then stretches onto the 12th Malaysia Plan.

2.6.2 Types of Analysis

General Analysis – NPBD and BIOFIN focus areas and action type

In carrying out the general analysis, data from the 31 organisations are first consolidated and a pivot table analysis is carried out. Financial needs of the NPBD targets and BIOFIN categories are tabulated. For the type of action, a new tagging category is used and expenditures are tagged accordingly. The process is repeated for the BIOFIN categories.

Gap Analysis – FNA vs BER findings

The gap analysis involves comparing the financial needs of organisations with the estimated existing sources of funds extrapolated from the BER findings. From the BER, there are two types of data available – the unattributed biodiversity-related expenditure and the attributed biodiversity-related expenditure. The situation is slightly different for OE where participants are usually unable to identify which specific expenditure item is biodiversity-related hence usually the total OE is included as part of the analysis.

In order to run the estimation analysis, the unattributed biodiversity-related OE and DE data are extrapolated from 2016 based on the Average Annual Growth Rate (AAGR) determined using the time-series data available for the two types of data. Following that, the average of the comparisons between the attributed biodiversity-related data and the unattributed biodiversity-related data is calculated. The average percentage is then applied to the extrapolated unattributed biodiversity-related expenditure to obtain the estimated existing funds that will be used in the financing gap analysis (Figure 9).

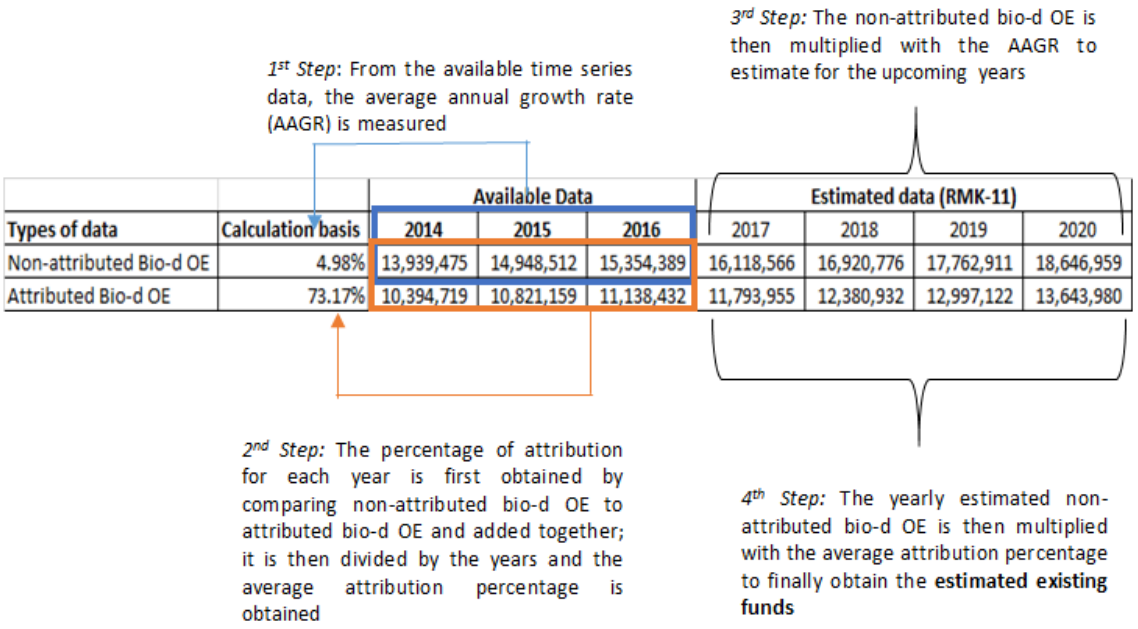


Figure 9: Illustration of the steps taken to estimate the financing gap

The annual average growth rate (AAGR) is calculated by comparing between the Malaysia Plans. Since the BER exercise only covers years 2006 to 2016, the AAGR is determined for two Malaysia Plans – 9MP and 10MP and the rate applied to the next two Malaysia Plans, i.e., 11MP and 12MP.

3 Results

3.1 Biodiversity financing needs

The biodiversity financing needs identified from this FNA amounted to RM 19.0 billion for the period of 2018-2025 (8 years) or RM 2.4 billion a year on average. This amount accounted for 447 outcomes and 1,279 planned actions identified by 31 stakeholder organisations who submitted their FNAs.

In the sub-sections that follow, the patterns are further explored in terms of the distribution across the National Policy on Biological Diversity (NPBD) targets (Appendix II), the BIOFIN categories (Appendix III) and type of activities observed in the planned costable actions.

3.1.1 Breakdown by NPBD targets

As shown in Table 3, every target was costed, with some targets showing greater needs than others. In particular, Target 7, protection and restoration of vulnerable ecosystems and habitats had the largest needs at RM 4.7 billion (25%). This was followed by Target 6, which relates to protected areas and other effective area-based conservation measures, had the second largest needs at RM 4 billion (21.4%); and followed by Target 10, to control and significantly reduce poaching, illegal harvesting and illegal trade of biodiversity at RM 3 billion (15.9%).

Table 3: Breakdown of financing needs by NPBD targets and planned costable actions (2018-2025)

Target	Financing Need (RM million)	% share	No. of planned costable actions
Target 1	365.1	1.9%	89
Target 2	30.7	0.2%	30
Target 3	1,302.1	6.9%	121
Target 4	1,448.2	7.6%	230
Target 5	345.1	1.8%	23
Target 6	4,076.5	21.4%	69
Target 7	4,742.7	25.0%	133
Target 8	271.0	1.4%	26
Target 9	1,475.5	7.8%	132
Target 10	3,029.2	15.9%	85
Target 11	12.4	0.1%	13
Target 12	6.4	0.0%	10
Target 13	128.8	0.7%	48
Target 14	17.6	0.1%	4
Target 15	989.0	5.2%	96
Target 16	737.0	3.9%	153
Target 17	27.6	0.1%	17
Total	**19,004.8**	**100.0%**	**1,279**

Note: Exchange rate is 1 USD = RM 4.10 (August 2018)

There were also a number of targets that require financing for RM 1 billion and above. This included: Target 3 (mainstreaming biodiversity into national planning and sectoral policies and plans); Target 4 (sustainable production and harvesting); and Target 9 (preventing the extinction of known threatened species and improving and sustaining their conservation status).

Interestingly, no organisation had any plans for Policy Action 4.4 (Rationalise incentives that are harmful to biodiversity). Similarly, Policy Action 5.2 (promoting green guide certification) is not being taken up by any organisation even though nature-based tourism is in the portfolio of several organisations.

At the lower end of the financing needs range, there were five targets that jointly account for 0.5% of total needs. Target 12 (biosafety) recorded the least financial needs at RM 6.4 million (0.03%) across the whole 8-year period. Further examination showed that there were two out of three policy actions that had not been identified in the FNA, namely Policy Action 12.2 (Assess LMO impacts on biodiversity and human health) and Policy Action 12.3 (Develop response to biosafety emergencies). Target 11 (invasive alien species) also recorded a small financial need of RM 12.4 million (0.07%).

Target 14 on Access Benefit Sharing also recorded a small need of RM 17.6 million (0.1%) and further examination showed that two out of three policy actions had not been identified in the FNA, namely Policy Action 14.1 (Develop and enforce ABS legislation) and Policy Action 14.3 (Protect and document the traditional knowledge, innovations and practices). Similarly, three out of four policy actions relating to Target 17 were not identified in the FNA, namely Policy Actions 17.1, 17.2, and 17.3. Since Target 17 relates to the actions needed to increase resource mobilisation, this observation suggests that planning for resource mobilisation is in much need of attention. None of the 31 organisations had any plans to raise the amount of resources to aid in implementing the NPBD.

Table 4: Financing needs and planned costable actions by policy targets and actions (2018-2025)

Policy target	Policy Action	Financing need (RM million)	No. of planned costable actions
Target 1: By 2025 more Malaysians are aware of the values of biodiversity and the steps they can take to conserve and use it sustainably.	1.1 Create awareness across all segments of society	335.5	66
	1.2 Nurture participation amongst children and youth	27.6	19
	1.3 Engage with the legislature and judiciary	2.0	4
Target 2: By 2025, the contributions of indigenous peoples and local communities, civil society and the private sector to the conservation and sustainable utilisation of biodiversity have increased significantly.	2.1 Recognise, support and empower indigenous peoples and local communities	15.0	15
	2.2 Recognise, support and empower civil society	3.7	5
	2.3 Develop sustained collaborations with the private sector	10.7	8
	2.4 Enhance stakeholder participation in decision making processes	1.4	2
Target 3: By 2025, biodiversity conservation has been mainstreamed into national development planning and sectoral policies and plans.	3.1 Embed biodiversity conservation into national and state development planning and sectoral policies and plans	836.6	69
	3.2 Recognise the economic value of biodiversity and ecosystem services	8.6	9
	3.3 Protect environmentally sensitive areas in statutory land use plans	2.6	4
	3.4 Promote sustainable consumption and production	454.0	38
Target 4: By 2025, our production forests, agriculture production and fisheries are managed and harvested sustainably.	4.1 Strengthen sustainable forest management	83.1	16
	4.2 Strengthen agricultural planning and improve practices	1,052.4	172
	4.3 Implement the Ecosystem Approach to Fisheries Management	312.7	42
	4.4 Rationalise incentives that are harmful to biodiversity	-	0
Target 5: By 2025, tourism is sustainably managed and promotes biodiversity conservation.	5.1 Identify and mitigate impacts of tourism on biodiversity	253.8	9
	5.2 Promote green guide certification	-	0
	5.3 Engage indigenous peoples and local communities in nature tourism and promote volunteerism	91.4	14

Policy target	Policy Action	Financing need (RM million)	No. of planned costable actions
Target 6: By 2025, at least 20% of terrestrial areas and inland water, and 10% of coastal and marine areas, are conserved through a representative system of protected areas and other effective area-based conservation measures.	6.1 Expand the extent and representativeness of our terrestrial PA network	12.2	5
	6.2 Expand the extent and representativeness of our marine PA network	63.7	22
	6.3 Develop community conserved areas as an integral part of our PA network	2.0	2
	6.4 Improve the effectiveness of PA management	253.3	25
	6.5 Protect and maintain biodiversity in urban areas	3,745.2	15
Target 7: By 2025, vulnerable ecosystems and habitats, particularly limestone hills, wetlands, coral reefs and seagrass beds, are adequately protected and restored.	7.1 Identify, map and protect all vulnerable ecosystems	338.4	48
	7.2 Improve management and rehabilitation of vulnerable ecosystems	4,313.2	79
	7.3 Support the implementation of the National Action Plan on Peatlands	91.1	6
Target 8: By 2025, important terrestrial and marine ecological corridors have been identified, restored and protected.	8.1 Strengthen the implementation of the CFS Masterplan for Peninsular Malaysia	242.0	19
	8.2 Strengthen the implementation of terrestrial connectivity under the HoB initiative	7.5	3
	8.3 Identify, map and protect marine ecological corridors	21.5	4
Target 9: By 2025, the extinction of known threatened species has been prevented and their conservation status has been improved and sustained.	9.1 Conduct conservation assessments for plants and animal species	188.0	60
	9.2 Protect our most threatened species	1,284.0	69
	9.3 Develop a national strategy for ex-situ conservation	3.5	3
Target 10: By 2025, poaching, illegal harvesting and illegal trade of wildlife, fish and plants are under control and significantly reduced.	10.1 Strengthen enforcement to eradicate poaching, illegal logging and illegal trade in wild animals, fish and plants	3,021.4	81
	10.2 Reduce demand through public awareness and behavioural change	7.5	3

Policy target	Policy Action	Financing need (RM million)	No. of planned costable actions
Target 11: By 2025, invasive alien species and pathways are identified, priority species controlled and measures are in place to prevent their introduction and establishment.	11.1 Improve our understanding and public awareness about IAS	9.4	8
	11.2 Conduct risk assessment on all introduced exotic species before their release	1.2	4
	11.3 Strengthen quarantine inspection and enforcement at entry points and international borders	2.1	2
Target 12: By 2025, By 2025, a comprehensive biosafety system inclusive of a liability and redress regime is operational to manage potential adverse impacts of modern biotechnology on biodiversity and human health.	12.1 Enhance inspection and biosafety compliance	6.4	10
	12.2 Assess impacts of LMOs on biodiversity and human health	-	0
	12.3 Develop response to biosafety emergencies	-	0
Target 13: By 2025, the genetic diversity of cultivated plants and farmed and domesticated animals and of wild relatives is adequately conserved.	13.1 Support the implementation of the National Strategies and Action Plans on Agricultural Biodiversity Conservation and Sustainable Utilisation	128.8	48
Target 14: By 2025, Malaysia has an operational ABS framework that is consistent with the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilisation	14.1 Develop and enforce legislation on ABS	-	0
	14.2 Enhance capacity and awareness on ABS	17.6	4
	14.3 Protect and document the traditional knowledge, innovations and practices of indigenous peoples and local communities	-	0
Target 15: By 2025, capacity for the implementation of the national and subnational biodiversity strategies, the CBD and other related MEAs has	15.1 Strengthen the capacity of government agencies to manage biodiversity	862.1	33
	15.2 Strengthen coordination and decision making at the national level	61.6	30
	15.3 Establish a framework and mechanisms for implementing the	0.0	3

Policy target	Policy Action	Financing need (RM million)	No. of planned costable actions
significantly increased.	national policy at the state level.		
	15.4 Strengthen the legislative framework to support the Policy implementation	40.4	21
	15.5 Strengthen international and transboundary cooperation	88.3	16
Target 16: By 2025, knowledge and the science base relating to biodiversity, its values, functioning, status and trends, and the consequences of its loss, are significantly improved and applied.	16.1 Enhance the quality and quantity of research on Malaysia's biodiversity	236.8	40
	16.2 Establish comprehensive databases and monitoring programmes	381.6	77
	16.3 Improve our knowledge on the link between climate change and biodiversity	42.4	20
	16.4 Improve the interface and communication between science and policy	33.6	21
Target 17: By 2025, there is a significant increase in funds and resources mobilised for the conservation of biodiversity from both government and non-government sources.	17.1 Improve the utilisation of the existing funding mechanisms	-	0
	17.2 Scale up the National Conservation Trust Fund for Natural Resources	-	0
	17.3 Explore and implement new and innovative financing mechanisms	7.0	6
	17.4 Diversify state governments' revenue streams	-	0
	Total	**19,004.8**	**1,279**

Note: Exchange rate is 1 USD = RM 4.10 (August 2018)

3.1.2 Breakdown by BIOFIN category

In terms of biodiversity functions, all 12 BIOFIN categories were identified by the sample of 31 stakeholder organisations (Table 5). Sustainable use (RM 4.3 billion) had the largest financing need, mainly in terms of watershed management and sustainable agriculture (Table 6). This is followed by Ecosystem management and restoration (RM 4.0 billion). It was encouraging to see that this amount was largely geared to reducing and stopping the loss of valuable habitats, which is more preventive in nature. However, improving connectivity of ecosystems was relatively underplayed, possibility due to conflicts of interest and jurisdictional limitations involved when attempting to connect ecosystems across multiple land and sea use (Table 6). Biodiversity planning, finance and management (RM 3.7 billion) comes next, mainly in terms of environmental law enforcement.

Table 5: Breakdown of financial needs and planned costable actions by BIOFIN category (2018-2025)

BIOFIN Category	Financial Need (RM million)	% share	No. of planned costable actions
Access and Benefit sharing (ABS)	16.9	0.1%	4
Biodiversity Knowledge	3,209.2	16.9%	649
Biodiversity planning, finance and management	3,773.9	19.9%	184
Biosafety	5.3	0.0%	3
Climate change mitigation and adaptation	54.1	0.3%	15
Conservation areas	473.8	2.5%	71
Ecosystem management and restoration	4,012.0	21.1%	78
Pollution control	330.0	1.7%	18
Resilient Infrastructure	1,387.0	7.3%	21
Sustainable Business	332.7	1.8%	27
Sustainable Use	4,323.7	22.8%	108
Targeted species and genetic conservation	1,086.2	5.7%	101
Grand Total	19,004.8	100.0%	1,279

Note: Exchange rate is 1 USD = RM 4.10 (August 2018)

The fourth highest needs were from Biodiversity knowledge. Further examination showed that these were largely geared towards increasing managerial and technical capacities as well as to improve, share and apply the knowledge.

Biosafety is the smallest biodiversity function with approximately only RM 5.3 million estimated as a need. This is followed by Access Benefit Sharing (ABS) at RM 16 million and Climate change mitigation and adaptation at RM 54 million. This corresponds with the patterns observed when using the NPBD Targets where funding for biosafety and ABS had the lowest shares.

If the level of financing need is an indication of the connection with the BIOFIN category, then there appears to be a significant gap between climate change actions and biodiversity conservation. As Malaysia is accelerating its action plans on climate change, the level of

financing needs seems miniscule compared to the FNA results. Even so, it could be due to an issue with how the matter is reported or classified.

Table 6: Financing needs and planned costable actions by BIOFIN category and sub-categories (2018-2025)

BIOFIN category	BIOFIN sub-category	Financial need (RM million)	No. of planned costable actions
Biodiversity Knowledge	Biodiversity education	250.8	52
	Biodiversity communication	470.5	61
	Indigenous and local community knowledge	4.4	5
	Biodiversity knowledge improved, shared and applied	844.2	306
	Managerial and technical capacity increased	1,284.2	122
	Evaluation, accounting and monitoring methods	361.4	105
Resilient Infrastructure	Public sustainable recreational areas	148.6	7
	Sustainable water systems	1,169.6	7
	Sustainable urban areas	68.6	7
Sustainable Business	Sustainable consumption	24.6	4
	Corporate sustainability (CSR)	5.1	3
	Nature based tourism	302.2	17
	Green supply chain	0.6	3
Sustainable Use	Sustainable land management	13.0	1
	Sustainable marine and coastal management	104.2	10
	Sustainable fisheries	178.0	10
	Sustainable agriculture	482.7	38
	Sustainable aquaculture	2.2	3
	Sustainable forestry	113.0	19
	Sustainable wildlife	100.2	11
	Watershed management	3,329.2	15
Targeted species and genetic conservation.	Ex-situ conservation of endangered species	922.1	28
	In-situ conservation of endangered species outside PAs	26.2	13
	Species extinction threat reduction	97.8	42
	Agro-biodiversity maintained	40.0	18
Climate change mitigation and adaptation	GHG Mitigation	51.8	8
	Ecosystem based adaptation	2.2	7
Biosafety	Invasive alien species	4.6	2
	LMOs and GMOs	0.6	1
Pollution control	Protection of ambient air and climate	84.1	4
	Waste management	6.8	3
	Protection and remediation of soil, groundwater and surface water	175.1	8

BIOFIN category	BIOFIN sub-category	Financial need (RM million)	No. of planned costable actions
	Other pollution reduction	63.9	3
Ecosystem management and restoration.	Reduce of stop loss of valuable habitats	3,479.1	42
	Improve ecosystem connectivity	2.6	1
	Conservation of valuable ecosystem services	21.7	9
	Restoration of ecosystems	508.4	26
Access and Benefit sharing (ABS).	Nagoya Protocol	13.7	2
	Bioprospecting	3.1	2
Conservation areas.	Expand PA Systems	154.4	12
	Improve PA Management	224.8	43
	Expand landscape conservation	2.8	3
	Improve landscape conservation management	91.7	13
Biodiversity planning, finance and management.	Strategic planning	34.3	11
	Biodiversity policy and management	150.1	22
	Environmental finance planning	64.9	2
	Environmental Finance Policy and management	75.8	11
	International environmental agreements and conventions	102.7	28
	Environmental laws and regulations	327.1	62
	Environmental law enforcement	3,013.0	47
	Total	19,004.8	1,279

Note: Exchange rate is 1 USD = RM 4.10 (August 2018)

3.1.3 Breakdown by type of action

The financing needs could also be identified based on types of actions planned. There were 13 types of actions identified from the FNA as shown in Table 7. The majority of funds seem to go towards other operational activities, at RM 8.7 billion (45.9%). However, approximately RM 2 billion of this goes towards flood mitigation projects that involve soft infrastructure, and the remaining RM 7 billion goes towards restoration, management of protected areas, purchasing of seeds and genes and other day to day activities.

Equipment and facilities take up the next largest amount of funds with almost RM 4 billion (17.7%). This is followed by monitoring and surveillance with almost RM 2 billion (10%), which is also an operational activity. Studies and research together with publications take up approximately RM 2 billion (8.6%), followed by capacity building activities in the respective organisations (8.3%).

Awareness programs also take up a relatively large amount of resources at RM 560 million (3%), followed by the formulation of partnerships and also plans, both in the RM 300 million range (both at 1.7%). In overall, operational activities take up the most financial resources.

Table 7: Biodiversity financing needs by type of activities planned (2018-2025)

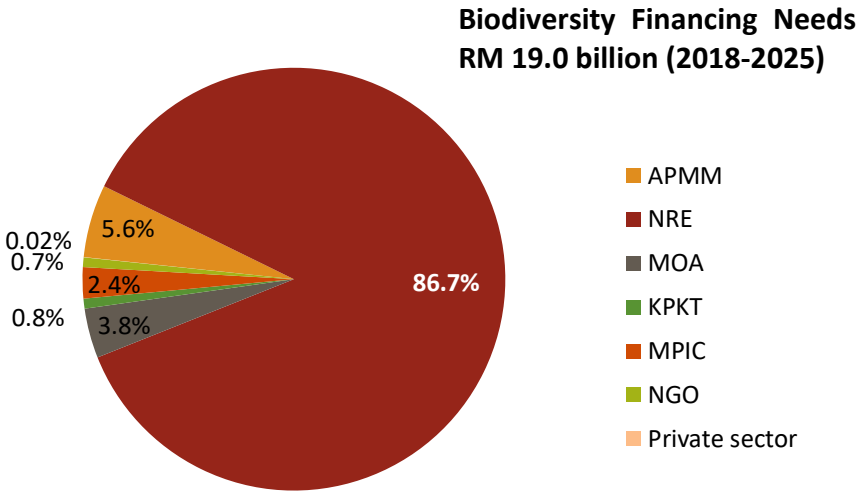
General Categories	Type of actions	Examples	Financing needs (RM million)	% share
Operations	**Awareness programmes**	Talks, seminars, workshops, competitions, school activities, sports events, etc.	560.65	3.0%
	Monitoring and surveillance	Patrols, smart surveillance	1,892.78	10.0%
	Partnership development	NBOS activities, stakeholder engagement, attending conferences	323.98	1.7%
	Laws and policies	Gazetting new laws and policies	164.25	0.9%
	Plans	Local plans, management plans, national actions plans	314.45	1.7%
	Gazettement of new biodiversity areas	Gazetting new PAs or conservation areas	157.45	0.8%
	Other operational activities	Day to day activities such as restoration, purchasing of seeds, management of PAs	8,721.44	45.9%
Incentives and subsidies	**Incentives, subsidies**	Monetary incentives for farmers, citizen reporting	142.51	0.7%
Equipment	**Equipment & facilities**	Offices, new centres, agricultural equipment, patrols equipment	3,366.77	17.7%
	Software, systems,	Databases, systems	149.38	0.8%

General Categories	Type of actions	Examples	Financing needs (RM million)	% share
	databases			
Capacity building	**Capacity building activities**	Training, workshops, increasing number of SMEs, higher education for staff	1,578.81	8.3%
Publications, studies	**Publications, guidelines**	Reports, publications, guidelines, dissemination of data via other means	87.37	0.5%
	Studies and research	Inventories, assessments, studies, stock-taking	1,544.99	8.1%

Note: Exchange rate is 1 USD = RM 4.10 (August 2018)

3.1.4 Breakdown by lead agency

As expected, NRE and its line agencies which are responsible for delivering 75% of the NPBD policy actions also had the largest share of financing needs. This was followed by APMM, who is solely responsible for enforcement in the maritime zone, as well as MOA and MPIC.



Note: Exchange rate is 1 USD = RM 4.10 (August 2018)

Figure 10: Breakdown of financing needs by lead agency (2018-2025)

Further examination showed that financing needs ranged from RM 1.2 million to RM 19 billion. Organisations with the greatest needs included JPS, PERHILITAN, APMM, JAS and JTLM. While this may be the needs pattern observed, it does not imply that financing should automatically be directed to there. Rather, the next stage of the analysis would be to compare these needs to the estimated secured funding from the BER projections and to estimate the financing gap. This is important because some organisations may have large needs but also have large secured budgets and hence very small gaps. In comparison, others may have large needs but small secured budgets and hence require much more attention in closing the gap.

3.2 Gap Analysis

This section presents the gap analysis based on the sample data of 31 organisations that submitted the FNA. Take note that only samples that had both FNA and BER data (either submitted by them previously in the BER exercise or collected through secondary data by study team) were included in the gap analysis. To obtain the figures for this analysis, the estimated secured funding for 2018-2025 was first projected based on expenditure data (2006-2016) for each organisation. This was then summed and compared to the financing needs to obtain the gap.

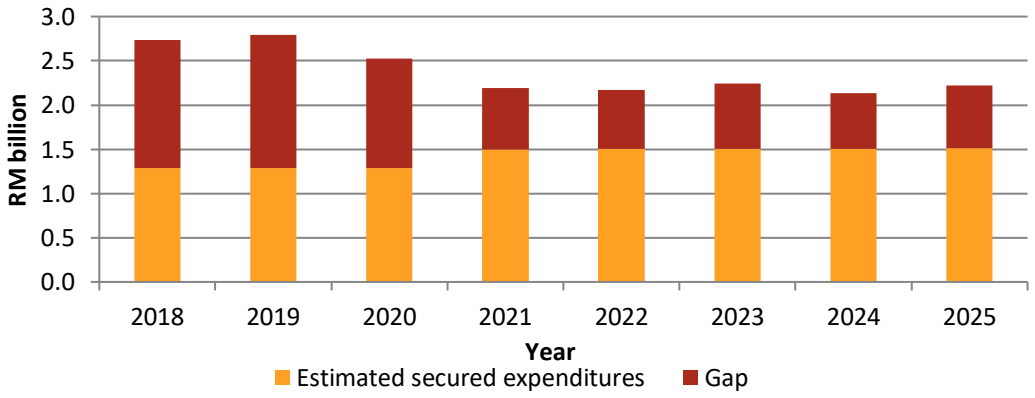
As shown in the Table 8, the financing needs of 31 stakeholders amounted to RM 19.0 billion between years 2018 and 2025. In comparison, the estimated secured funding amounted to RM 11.4 billion, leaving a financing gap of RM 7.6 billion to be filled across the next 8 years. On average, this translated to a gap of RM 0.95 billion to be filled each year. Figure 11 shows the annual secured funding and financing needs.

Table 8: Estimated biodiversity financing needs, secured funding and financing gap, 2018-2025

RM billion	2018	2019	2020	2021	2022	2023	2024	2025	Total
Total financing needs (n=31)	2.732	2.789	2.524	2.194	2.168	2.241	2.135	2.222	**19.0**
Total estimated secured funding (n=31)	1.280	1.283	1.285	1.499	1.501	1.504	1.507	1.511	**11.4**
Financing Gap (n=31)	**1.442**	**1.506**	**1.239**	**0.695**	**0.667**	**0.737**	**0.628**	**0.711**	**7.6**

Note: Exchange rate is 1 USD = RM 4.10 (August 2018)

It is useful to recall that the BER report made a national estimate of RM 2.45 billion a year in terms of biodiversity expenditures for the period 2018 till 2025. That estimate was based on 32 sample government organisations, private sector companies (mostly from Bursa Malaysia), a multilateral development office (UNDP), and 4 NGOs. However, the FNA was done for 31 organisations, and they account for 58% of total expenditures or RM 1.6 billion per year (Table 8). This implies that the samples selected were major contributors to the biodiversity financing landscape. Due to data limitations, it was not possible to estimate a national gap.



Note: Exchange rate is 1 USD = RM 4.10 (August 2018)

Figure 11: Projected gap between estimated secured funding and financing needs

Comparing the financing needs and their expenditures for 31 FNA samples, the largest gap was observed for Target 6 on protected areas and area-specific conservation measures at RM 3 billion (Table 9). This was followed by Targets 7 and 10 which were on protecting and restoring vulnerable ecosystems as well as on reducing illegal poaching, harvesting and trading of biodiversity with gaps of about RM 2 billion respectively.

Table 9: Financing needs, biodiversity expenditures from BER and financing gap by NPBD targets

NPBD Target	Financing Need (RM million)	BER (RM million)	Gap (RM million)
Target 1	365.1	331.34	33.8
Target 2	30.7	89.25	(58.6)
Target 3	1,302.10	904.51	397.6
Target 4	1,448.20	1,138.81	309.4
Target 5	345.1	261.94	83.2
Target 6	4,076.50	298.37	3,778.1
Target 7	4,742.70	2,299.75	2,443.0
Target 8	271	153.09	117.9
Target 9	1,475.50	418.32	1,057.2
Target 10	3,029.20	104.16	2,925.0
Target 11	12.4	31.71	(19.3)
Target 12	6.4	28.09	(21.7)
Target 13	128.8	507.18	(378.4)
Target 14	17.6	5.57	12.0
Target 15	989	369.10	619.9
Target 16	737	530.71	206.3
Target 17	27.6	14.67	12.9
Note: Exchange rate is 1 USD = RM 4.10 (August 2018)			

Upon further examination, the financing needs for Target 6 were extremely large mainly due to costable actions from JPS (86% of Target 6 needs) to protect and maintain urban biodiversity (Policy action 6.5), mainly in terms of ensuring better water quality and reducing flooding in urban areas. Similarly, Target 7 had high financing needs due to projects from JPS to address costal and river bank erosion as well as estuary restoration and flood control (85% of Target 7 needs).

Given these large amounts, the JPS financing needs will likely mask the needs of other targets. When their needs are temporarily removed, the financing needs for Target 6 fall to RM 548 million while Target 7 needs fall to RM 693 million. While still high, these two targets are no longer in the Top 3 targets with large financing needs.

Instead, Target 10, which is on reducing poaching, illegal harvesting and trading of biodiversity, tops the list with a need of RM 3 billion and a gap of RM 2.9 billion. Further examination shows that this is largely due to enforcement needs (policy action 10.1). This is followed by Target 9, which is on threatened species conservation where there is a need of RM 1.5 billion and a gap of RM 1.0 billion. Target 15 on strengthening implementation capacity also emerges as having a large gap of RM 619 million, although this target needs were not very large at RM 989 million.

Table 9 also shows that for Targets 2, 11, 12 and 13, the financing gap is positive, meaning that the funding is higher than the anticipated expenditures. Section 4.1 will discuss this apparent anomaly.

Potential Sources of Funds

In the FNA exercise, Sime Darby Foundation (Yayasan Sime Darby, YSD) provided information about their intention to fund biodiversity related projects from 2018 to 2020 as shown in Table 10. YSD is a private trust fund, similar to other trust funds, that are private sector based and could be potential sources of financing of biodiversity conservation, viz Yayasan Hasanah (under Khazanah), PETRONAS and commercial banks. However, these latter organisations did not participate in the FNA study.

Table 10: Private Trust Fund for biodiversity conservation, 2018-2020

RM billion	2018	2019	2020	Total
Funder participant: YSD Planned expenditures (n=1)	0.0102	0.0023	0.0001	**0.01**

Note: Exchange rate is 1 USD = RM 4.10 (August 2018)

4 Discussion

4.1 Financing Needs: patterns and gaps

From the analyses, all NPBD targets and BIOFIN categories have been identified by the 31 stakeholder organisations. This is encouraging from a mainstreaming perspective because it indicates that stakeholders had considered biodiversity from their operation's perspectives and took on a wider interpretation of their roles in improving biodiversity or reducing threats towards it. In other words, participants considered biodiversity beyond just protection and conservation.

Nonetheless, the needs pattern show that biodiversity functions and policy targets receive varying attention. In the BER exercise, it was originally assumed that the low expenditures recorded were due to agencies being rather new. However, the same patterns of having very low needs were also observed in the FNA. This suggests that some of these topics may be still relatively new and planning for these aspects have yet to be fully considered by organisations. Stark examples of this pattern are demonstrated by Targets 11, 12, 14, 2 and 17, which relate to biosafety, access and benefit sharing, invasive alien species, building functional partnerships with non-government stakeholders and resource mobilisation respectively. Unlike Targets 11, 12 and 14 that are topical in nature, Targets 2 and 17 are mechanisms that are needed for all organisations to implement their planned actions more effectively, especially in light of possible budget cuts. The fact that few planned resources for Targets 2 and 17 actions is a concern.

Exploring the types of actions planned, it was not surprising to see operations being the one that took up the biggest share in needs. As expected, the budget was largest for monitoring and enforcement at least in terms of being a single purpose activity. It was however interesting to note that apart from flood mitigation activities, restoration costs (as categorised under other operational activities) did take up a substantial amount. It provided support for actions that would prevent flood and for restoration in order to avoid future costs.

As for the financing gap, it was good to see that based on the projected spending, Malaysia was only about RM 0.95 billion behind to match the financing needs each year based on the projected secured funding for 31 samples. The national estimate is assumed to stay at RM 2.45 billion a year until 2025. It was observed that some stakeholders did not fully budget their plans, especially for latter years of the FNA (2023-2025) and hence some underestimations may occur. This matter is discussed further in the next discussion section.

4.2 Opportunities and limitations of the FNA

4.2.1 FNA analysis for identifying potential realignment of resources

A more refined gap analysis would be useful to identify where surpluses and gaps exist. It could be in terms of breakdown by targets, BIOFIN categories or even organisations. This will help identify where there are more resources available compared to planned actions or where resources are most dire. In addition, the FNA will enable agencies to have more comprehensive, forward-looking plans that can avoid future costs. For this exercise, such levels of gap analysis were not pursued as not all samples had BER data broken down by targets of BIOIFN categories.

Where surpluses are seen, it signals an opportunity for collaboration and streamlining actions. Follow up analysis on outcomes would then be a good next step. For example, by knowing which organisations have gaps and surpluses in relation to a target and then identifying which outcomes are similar will help inform planners and funders about where opportunities lie for streamlining actions to achieve a common purpose. They include expenditure realignment among various agencies, better delivery through intra- and inter-agency collaboration, such as the NBOS initiatives which address common outcomes. This could be a good foundation for building up NBOS type of projects, or for new partnerships between local communities, social enterprise, NGOs or government.

However, for the analysis to be useful, it is essential that outcomes are clearly defined and planned in an aspirational manner rather than limit the plans to existing capacities. Through this FNA exercise, it was apparent that some organisations had planned their FNA based on the resources they had and could manage at present, rather than on the policy-linked outcomes or mandates they need to achieve. When this occurs, two issues arise.

Firstly, the needs estimated will not reflect the total resources needed to achieve the policy target. It can only estimate what is needed to achieve the outcome defined and since the outcomes were only partially defined in relation to the target, the estimate says little about the full resource needs of the policy target. For the organisation, this helps little to gauge and plan where finances should be going and what performance is expected. For funders, this limits the usefulness of the gap analysis and weakens this organisation’s business case as the link between investments and impact remains unclear. For planners, it limits the potential for identifying opportunities for realignment of resources and collaborations.

4.2.2 Comprehensiveness of FNA

From this FNA process, it was apparent that mainstreaming of biodiversity and promoting awareness and usage of the NPBD is a good way forward. The process challenged participants to consider biodiversity in their operations. By involving more stakeholders, they can review the roles played by their organisations to either improve biodiversity outcomes or reduce negative threats to biodiversity. Nonetheless, a quick look through the list of stakeholders will show that there is potential more collaboration and coordination to make it a more comprehensive exercise. While that is fair, it is important to recognise that this exercise is not a one-off exercise and can include more stakeholders in time to come.

Comprehensiveness of the FNA can be influenced at several levels. The first level is at the membership into the FNA process. In this exercise, the process was kept voluntary. In other words, the team needed to successfully convince organisations of their role in biodiversity and that the FNA was of use to them. Many organisations dropped out when they could not see a role for themselves. In some instances, the team was unable to identify the correct division or line agency with biodiversity functions despite following up on the initial contact.

In other instances, the team was unaware of the organisation's involvement in biodiversity and only after investing substantial time to explore various line agencies under the lead ministry, were the team capable to identifying and convincing non-conventional biodiversity stakeholders to join the process. Importantly, listening to comments from engaged stakeholders on who else should be involved was very useful. There is therefore some degree of selection bias due to incomplete information. On that note, the team highly recommends investing more time into conducting a Policy and Institutional Review (PIR) that identifies and describes their operations in relation to biodiversity as this was a very convincing argument. This point was affirmed at the December 2017 and June 2018 workshops by participants who highlighted that a PIR-like stocktaking based on the 4th and 5th Malaysia CBD Reports is insufficient to meet the PIR needs of the BIOFIN process because their purposes differ. In particular, BIOFIN PIR would need to not only include those involved directly in biodiversity management but also those who finance biodiversity and those whose operations and expenditures would cause adverse impacts to biodiversity.

On another level, comprehensiveness of the FNA can also be influenced by the stakeholder's efforts. For some stakeholders, they managed to involve almost all divisions in their organisation and collectively completed the FNA exercise. Others found this difficult and thus the FNA only reflected part of the organisation's biodiversity financing needs. In addition, some organisations are undergoing a revision of their plans, were engaged with other budgeting or planning activities, or did not gain top management buy-in until a later time and were thus unable to provide more comprehensive data.

On the data aspect, comprehensiveness of the cost items is vital from two aspects. Under-estimation: some agencies forget some cost items and some agencies did not participate in their FNA. Exclusion: some agencies did not even know that they had biodiversity functions. Another type of problem is that stakeholders note that certain administrative rules restrict their inability to deliver the desired outcomes. For example, certain skills or talent is needed but they are unable to hire even if the finances are available due to other restrictions and it is unclear how to go about solving it. Under such situations, it is difficult to cost the resources needed to address the issue of comprehensiveness.

Comprehensiveness can also be influenced by the methodology applied. In this FNA, it was observed that most participants only included projects that had clear biodiversity connections rather than projects with some biodiversity-related elements. In part, this reflects the methodology's limitation in that attribution is not applied to cost estimates as how it would be applied to the BER past expenditures. Addressing this level of comprehensiveness may be necessary as it can encourage organisations to incorporate the biodiversity component further into their usual operations and truly mainstream biodiversity. From the organisation's perspective, there is the opportunity to utilise this information to demonstrate to funders on the additional benefits of their projects.

Based on the feedback received from participating stakeholders, the maiden application of the FNA methodology has raised their planning exercise as it forces their planners and financial officers to plan together, consider outcomes and develop a budget. The majority of participants noted that by being able to estimate how much their plans would cost through the detailed budgeting, they can now re-evaluate their plans and budgets, especially if there are budget limitations in the future. Additionally, the FNA process of gathering together relevant stakeholders for training, discussions and collaboration generated information in various sections and divisions on what their colleagues in other sections are working on and led to better teamwork.

However, comprehensiveness does involve some cost. Apart from time and effort invested, some felt that the detailed costing necessitated by the FNA can limit their flexibility in terms of allocating resources within each outcome or project as it may require them to commit the planned expenditure items instead of the flexibility to adjust their expenses as and when required. This was also the main concern about putting down quantifiable outcomes.

4.2.3 Data availability and gap analysis

Data availability is a main concern in estimating the gap analysis, not only in terms of the comprehensiveness of the FNA but also in terms of the BER data upon which projections of secured funding are made. Much of the Biodiversity Expenditure Review data was sourced from secondary data, and where the agencies provided their own data, it was not a complete record of the 9MP and the 10MP expenditures due to difficulties accessing past expenditure data. Where data is available, the gap analysis is more accurate. However, when data is not available, a series of adjustments and assumptions are needed and thus it is likely to have a higher level of estimation errors.

Despite the effort made, it is still not possible to make an estimate of financial needs for the country as a whole. To do so, it will require all agencies named in the NPBD to take part, and a comprehensive national framework of using the BIOFIN methodology and consistent data collection is undertaken. Streamlining the BIOFIN methodology in the Malaysia Plan process will be an excellent way to start.

5 Way Forward

In terms of the FNA methodology and data template, many of the participants observed that the FNA methodology is an organised, objective driven and systematic means of presenting their budgeting needs as it draws upon the strengths of other budgeting methods such as Logical Framework Method (LFM) and the Creativity Index. The template also allows for a more succinct means of presenting and justifying their budgets. However, other participants mentioned that the FNA could be improved in terms of its synchronising with existing budgeting cycles and also the method of data collection – a minimal degree of familiarity with the data template is required and a few attempts are need for its familiarisation.

One benefit of using the FNA methodology is in budget proposal justification. The methodology is a transparent justification of a policy- or strategic- plan driven, outcome based and costed plan in detail. To get the FNA results, both project and budget officers need to be involved, and that both will have a better understanding of the project. The proposal is also strengthened by its link to department, ministry or national plans. The level of detail required by the FNA methodology also assists the budget officer in defending the budget proposal and enables them to pitch better proposals.

From the funders' perspective, it would also provide feedback to the budget proposal process. The FNA also provides a systematic method of tracking project progress and an overall idea of which areas or targets that their budget is contributing to.

At the national level, the FNA provides, through its quantified outcomes, baselines and targets to measure the performance and delivery of the National Policy for Biodiversity 2016 – 2025 and seek out gaps and or further expansion of the policy. This is especially so given that the policy's mid-term review is due soon. On the other hand, the Ministry of Finance and the Economic Planning Unit can use the FNA data to understand spending plans and develop the budget accordingly.

As for the private sector, if the FNA were to be featured as a Bursa Malaysia requirement for Sustainability Reporting, it would also enable the private sector to identify their contributions towards the national biodiversity targets. The FNA methodology could also serve as an additional budgeting mechanism for private funders and donors as its outcome-based methods do align with existing budget proposal methods.

At the last BIOFIN Phase 1 workshop held in June 2018, 91% of the participants wanted the consolidated FNA results to be shared. Their reasons include the results would benefit all parties and enable the key stakeholders to forge collaborations, partnerships and cost-sharing opportunities among participating organisations. It would facilitate planning and better coordination, improve understanding of who is doing what for biodiversity and thus avoid duplication. However, a few other participants were reticent especially if the information revealed confidential data about their organisations. The conclusion is that there are huge benefits to sharing information at a consolidated level and to avoid sharing confidential data at the organisational level.

Glossary

Term	Acronym	Definition	Source	Website
Average Annual Growth Rate	AAGR	Also known as the compound annual growth rate, the AAGR shows an average value for the annual rate of change over a period of time (typically several years) allowing for the compound effect of growth.	Eurostat	http://ec.europa.eu/eurostat/statistics-explained/index.php/Glossary:Annual_average_growth_rate_%28AAGR%29
Biodiversity Expenditure Review	BER	An analysis of public and private expenditures in the country that benefit biodiversity. The assessment establishes past, present and projected expenditures on biodiversity.	BIOFIN	https://www.biodiversityfinance.net/
Biodiversity Finance Initiative	BIOFIN	BIOFIN supports countries with a methodology that provides innovative steps to measure current biodiversity expenditures, assess financial needs, identify the most suitable finance solutions and provides guidance on how to implement these solutions to achieve their national biodiversity target.	BIOFIN	https://www.biodiversityfinance.net/
Biodiversity Finance Plan	BFP	Identifies and prioritises a mix of suitable biodiversity finance solutions to reduce the biodiversity finance gap.	BIOFIN	https://www.biodiversityfinance.net/
BIOFIN category and sub-categories		These are internationally recognised categorisations according to BIOFIN, of the biodiversity functions that different costable actions can play.	BIOFIN	https://www.biodiversityfinance.net/
Core team		The BIOFIN project Core Team includes the Economic Planning Unit (EPU), Ministry of Finance (MOF), Ministry of Natural Resources and the Environment (NRE), the Ministry of Agriculture (MOA), the Ministry of Plantation Industries and Commodities (MPIC) and United Nations Development Programme (UNDP).		
Creativity Index	CI	Assesses the quantifiable socio-economic impacts of proposed projects.	AMIM	http://www.amim.org.my/AMIM/11th-malaysia-plan-manufacturing-workshop-to-prepare-logical-framework-matrix-and-creativity-index/
Department of Environment	DOE	Also known as Jabatan Alam Sekitar. Formerly a part of NRE, JAS is now an agency under the Ministry of Energy, Technology, Science and Climate Change. DOE functions to prevent, eliminate, control pollution and improve the environment, consistent with the purposes of the Environmental Quality Act 1974 and in line with international agreements and conventions.	DOE	www.doe.gov.my
Department of Irrigation and Drainage	JPS	Also known in Malay as Jabatan Pengairan dan Saliran. An agency under KATS, JPS strives to provide engineering expertise services and water resource management in a holistic way that balances water security, safety and environmental sustainability.	JPS	www.water.gov.my

Term	Acronym	Definition	Source	Website
Department of Marine Parks Malaysia	JTLM	Also known as Jabatan Taman Laut Malaysia. An agency under KATS, JTLM is responsible for the management and conservation of marine protected areas in Peninsular Malaysia.	JTLM	www.jtlm.gov.my
Department of Wildlife and National Parks	PERHILITAN	Also known as Jabatan Perlindungan Hidupan Liar dan Taman Negara Semenanjung Malaysia. This agency under KATS is responsible for the protection and management of wildlife and national parks in Malaysia.	PERHI-LITAN	www.wildlife.gov.my
Economic Planning Unit	EPU	EPU, now under the Ministry of Economic Affairs, is responsible for economic planning for the nation.	EPU	www.epu.gov.my
Financial Needs Assessment	FNA	Estimates the finance required to deliver national biodiversity targets and plans, usually described in the NBSAPs.	BIOFIN	https://www.biodiversityfinance.net/
Kuala Lumpur Stock Exchange	KLSE	Also known as Bursa Malaysia, KLSE is the Malaysian stock market.	KLSE	www.bursamalaysia.com
Logical Framework Method	LFM	Includes outcome, output and activities, with specific key performance indices and verification methods and assumption.	AMIM	http://www.amim.org.my/AMIM/11th-malaysia-plan-manufacturing-workshop-to-prepare-logical-framework-matrix-and-creativity-index/
Malaysia Plan	MP	The Malaysian government plans its development based on 5-year economic development plans also known as Rancangan Malaysia.	EPU	www.epu.gov.my
Malaysian Maritime Enforcement Agency	APMM	Also known as Agensi Penguatkuasaan Maritim Malaysia, APMM is the primary enforcer of Malaysia's marine borders.	APMM	www.mmea.gov.my
Ministry of Agriculture	MOA	Also known as Kementerian Pertanian dan Industri Asas Tani.	MOA	www.moa.gov.my
Ministry of Finance	MOF	Also known as Kementerian Kewangan.		www.treasury.gov.my
Ministry of Natural Resources and the Environment	NRE	As of July 2018, known as the Ministry of Water, Land and Natural Resources, also known as Kementerian Air, Tanah dan Sumber Asli (KATS).	KATS	www.kats.gov.my
Ministry of Plantation Industries and Commodities	MPIC	Also known as Kementerian Perusahaan Perladangan dan Komoditi.	MPIC	www.mpic.gov.my
Ministry of Urban Well-being, Housing and Local Government	KPKT	Also known as Kementerian Perumahan dan Kerajaan Tempatan.	KPKT	www.kpkt.gov.my

Term	Acronym	Definition	Source	Website
National Policy on Biological Diversity	NPBD	Malaysia formulated the National Policy on Biological Diversity (NPBD) 2016-2025, building on its predecessor policy of 1998 to protect this valuable asset and achieve the CBD goals. The Policy functions as Malaysia's National Biodiversity Strategies and Action Plan. The NPBD has 5 goals, 17 targets with 57 policy actions.	KATS	www.kats.gov.my
Outcome-based budgeting	OBB	Similar to results-based costing and results-based budgeting – This approach uses a logical framework methodology in planning where the desired impact is first defined before detailing out the expected outcomes, outputs, and specific actions to achieve it.	BIOFIN	www.biodiversityfinance.net
Policy and Institutional Review	PIR	Looks into the policy and institutional context for biodiversity finance in the country and establishes the key stakeholders to involve.	BIOFIN	www.biodiversityfinance.net
Prime Minister's Department	JPM	Also known as Jabatan Perdana Menteri, this is a federal government ministry in Malaysia. Its objective is to ensure an efficient environment that will enable the Prime Minister to carry out his responsibilities.	JPM	www.jpm.gov.my
Sustainability Reporting		Private sector companies report on the sustainability - economic, environmental and social performance of its everyday activities.		https://www.globalreporting.org/information/sustainability-reporting/Pages/default.aspx
UN Convention on Biological Diversity	CBD	Main objectives: The conservation of biological diversity; The sustainable use of the components of biological diversity; The fair and equitable sharing of the benefits arising out of the utilisation of genetic resources.	CBD	www.cbd.gov.my
United Nations Development Programme	UNDP	Provides strategic policy-oriented advice and support for the national policy agenda as well as institutional capacity building in key areas, in line with the agreed country programme for Malaysia.	UNDP	www.undp.gov.my

Appendices

Appendix I: FNA Guidebook

Please see attached FNA Guidebook.

Appendix II: NPBD targets, policy actions and implementing agencies

Target 1: By 2025 more Malaysians are aware of the values of biodiversity and the steps they can take to conserve and use it sustainably.	Lead Agency	Key Partners	Related Actions
1.1 Create awareness across all segments of society	Ministry of Natural Resources & Environment	Department of Environment, Natural Resources & Environment Board Sarawak, Environmental Protection Department Sabah, civil society, private sector	1.2, 1.3
1.2 Nurture participation amongst children and youth		Ministry of Education, Forestry Department Peninsular Malaysia, Department of Wildlife and National Parks Peninsular Malaysia, Department of Marine Park Malaysia, Department of Environment, Ministry of Resource Planning and Environment Sarawak, Natural Resources & Environment Board Sarawak, Forest Department Sarawak, Sabah Forestry Department, Environmental Protection Department Sabah, Sarawak Biodiversity Centre, Sabah Biodiversity Centre, civil society	1.1
1.3 Engage with the legislature and judiciary		Attorney General's Chambers, Sabah AG Chambers, Sarawak AG Chambers	1.1, 15.4

Target 2: By 2025, the contributions of indigenous peoples and local communities, civil society and the private sector to the conservation and sustainable utilisation of biodiversity have increased significantly.	Lead Agency	Key Partners	Related Actions
2.1 Recognise, support and empower indigenous peoples and local communities	Ministry of Natural Resources & Environment	Ministry of Urban Well-being, Housing & Local Government, Ministry of Rural and Regional Development, Department of Orang Asli Development, Sabah Biodiversity Centre, Sarawak Biodiversity Centre, civil society	1.1, 2.4, 6.3
2.2 Recognise, support and empower civil society		National Biodiversity Centre, civil society	1.1, 2.4, 15.2
2.3 Develop sustained collaborations with the private sector		National Biodiversity Centre, private sector	2.4, 3.4, 15.2
2.4 Enhance stakeholder participation in decision making processes		National Biodiversity Centre, civil society, private sector, higher education institution	2.1, 2.2, 2.3, 15.2

Target 3: By 2025, biodiversity conservation has been mainstreamed into national development planning and sectoral policies and plans.	Lead Agency	Key Partners	Related Actions
3.1 Embed biodiversity conservation into national and state development planning and sectoral policies and plans	Ministry of Natural Resources & Environment	State Economic Planning Units, Ministry of Plantation Industries & Commodities, Ministry of Energy, Green Technology & Water, Ministry of Agriculture and Agro-based Industries, Ministry of Tourism, Ministry of Works Malaysia, Economic Planning Unit, Department of Minerals & Geoscience, Department of Environment, State Economic Planning Units, civil society	3.2, 4.1, 4.2, 4.3
3.2 Recognise the economic value of biodiversity and ecosystem services		Economic Planning Unit, Forestry Department Peninsular Malaysia, Department of Marine Park Malaysia, State Economic Planning Units, Forest Department Sarawak, Sabah Forestry Department, Sabah Parks, Sarawak Biodiversity Centre, Sabah Biodiversity Centre	4.4
3.3 Protect environmentally sensitive areas in statutory land use plans	Ministry of Urban Well-being, Housing & Local Government	Ministry of Resource Planning & Environment Sarawak, Town & Country Planning Department Pen Malaysia, Town & Regional Planning Department, Sabah	6.1, 6.2, 6.5
3.4 Promote sustainable consumption and production	Economic Planning Unit	Ministry of Natural Resources & Environment, Ministry of Finance, Ministry of Energy, Green Technology & Water, civil society, private sector	4.1, 4.2, 4.3

Target 4: By 2025, our production forests, agriculture production and fisheries are managed and harvested sustainably.	Lead Agency	Key Partners	Related Actions
4.1 Strengthen sustainable forest management	Ministry of Natural Resources & Environment	Ministry of Plantation Industries & Commodities, Forestry Department Peninsular Malaysia, Sabah Forestry Department, Forest Department Sarawak, Forest Research Institute Malaysia	3.2, 7.2
4.2 Strengthen agricultural planning and improve practices	Ministry of Agriculture and Agro-based Industries	Ministry of Plantation Industries & Commodities, Department of Agriculture, Malaysian Palm Oil Board, Malaysian Palm Oil Certification Council, civil society, private sector	3.2, 7.2
4.3 Implement the Ecosystem Approach to Fisheries Management		Department of Fisheries, private sector	3.2, 10.1
4.4 Rationalise incentives that are harmful to biodiversity	Ministry of Agriculture and Agro-based Industries, Ministry of Plantation Industries & Commodities,	Ministry of Natural Resources & Environment, Ministry of Finance, Economic Planning Unit, Department of Fisheries	3.2

Target 5: By 2025, tourism is sustainably managed and promotes biodiversity conservation.	Lead Agency	Key Partners	Related Actions
5.1 Identify and mitigate impacts of tourism on biodiversity	Ministry of Tourism & Culture	Ministry of Natural Resources & Environment, private sector	3.2
5.2 Promote green guide certification		Ministry of Natural Resources & Environment, private sector	5.1
5.3 Engage indigenous peoples and local communities in nature tourism and promote volunteerism		Forestry Department Peninsular Malaysia, Department of Marine Park Malaysia, Sabah Forestry Department, Forest Department Sarawak , Department of Wildlife & National Parks, Sabah Parks, civil society, private sector	2.1, 2.2

Target 6: By 2025, at least 20% of terrestrial areas and inland water, and 10% of coastal and marine areas, are conserved through a representative system of protected areas and other effective area-based conservation measures.	Lead Agency	Key Partners	Related Actions
6.1 Expand the extent and representativeness of our terrestrial PA network	Ministry of Natural Resources & Environment	State Economic Planning Units, Forestry Department Peninsular Malaysia, Sabah Forestry Department, Sabah Parks, Forest Department Sarawak	3.3, 6.5, 8.1, 8.2
6.2 Expand the extent and representativeness of our marine PA network		Department of Marine Parks, Department of Fisheries, Sabah Parks, Forest Department Sarawak	3.3, 8.3
6.3 Develop community conserved areas as an integral part of our PA network		Forestry Department Peninsular Malaysia, Sabah Forestry Department, Sabah Parks, Forest Department Sarawak, Department of Fisheries , civil society, Indigenous & Local Communities	2.1
6.4 Improve the effectiveness of PA management		Forestry Department Peninsular Malaysia, Department of Wildlife & National Parks, Sabah Forestry Department, Sabah Parks, Sabah Wildlife Department, Forest Department Sarawak, Johor National Parks Corporation, Perak State Parks Corporation	6.1, 6.2
6.5 Protect and maintain biodiversity in urban areas	Ministry of Urban Well-being, Housing & Local Government	Ministry of Natural Resources & Environment, National Biodiversity Centre, Ministry of Resource Planning and Environment Sarawak, Forest Department Sarawak, Town and Country Planning Department Pen. Malaysia, Sabah Town and Regional Planning Department, Land and Survey Department, Sarawak, Town & Country Planning Department Pen Malaysia, civil society	3.3

Target 7: By 2025, vulnerable ecosystems and habitats, particularly limestone hills, wetlands, coral reefs and seagrass beds, are adequately protected and restored.	Lead Agency	Key Partners	Related Actions
7.1 Identify, map and protect all vulnerable ecosystems	Ministry of Natural Resources & Environment	Forestry Department Peninsular Malaysia, Department of Wildlife and National Parks Peninsular Malaysia, Department of Marine Park Malaysia, State Economic Planning Units, Sabah Forestry Department, Forest Department Sarawak, Sabah Wildlife Department, Research Institutions	6.1, 6.2
7.2 Improve management and rehabilitation of vulnerable ecosystems		State Economic Planning Units, Forestry Department Peninsular Malaysia, Sabah Forestry Department, Forest Department Sarawak, Department of Marine Parks, Research Institutions	6.1, 6.2, 6.3
7.3 Support the implementation of the National Action Plan on Peatlands		National Biodiversity Centre, State Economic Planning Units, Forestry Department Peninsular Malaysia, Sabah Forestry Department, Forest Department Sarawak, Department of Irrigation & Drainage, Department of Environment, Department of Agriculture, Chief Minister's Department Sarawak, civil society	7.1, 7.2

Target 8: By 2025, important terrestrial and marine ecological corridors have been identified, restored and protected.	Lead Agency	Key Partners	Related Actions
8.1 Strengthen the implementation of the CFS Masterplan for Peninsular Malaysia	Ministry of Natural Resources & Environment	State Economic Planning Units, Forestry Department Peninsular Malaysia, Department of Town and Country Planning Peninsular Malaysia, Department of Wildlife & National Parks Peninsular Malaysia, Forest Research Institute Malaysia, civil society	6.1, 6.3
8.2 Strengthen the implementation of terrestrial connectivity under the HoB initiative		State Economic Planning Units, Sabah Forestry Department, Forest Department Sarawak, civil society	6.1, 6.3
8.3 Identify, map and protect marine ecological corridors		State Economic Planning Units, Department of Marine Parks, Department of Fisheries, Sabah Parks, Sabah Town & Regional Planning Department, Forest Department Sarawak	6.2, 6.3

Target 9: By 2025, the extinction of known threatened species has been prevented and their conservation status has been improved and sustained.	Lead Agency	Key Partners	Related Actions
9.1 Conduct conservation assessments for plants and animal species	Ministry of Natural Resources & Environment	National Biodiversity Centre, Forest Research Institute Malaysia, Department of Wildlife & National Parks, Department of Fisheries, Forestry Department Peninsular Malaysia, Sabah Forestry Department, Forest Department Sarawak, Sabah Wildlife Department	7.1, 9.1, 15.4
9.2 Protect our most threatened species		Department of Wildlife & National Parks, Forestry Department Peninsular Malaysia, Sabah Forestry Department, Forest Department Sarawak, Sabah Parks, Sabah Wildlife Department, Department of Fisheries, Forest Research Institute Malaysia, civil society	6.1, 6.2, 7.1, 7.2
9.3 Develop a national strategy for ex-situ conservation		Ministry of Agriculture and Agro-based Industries, National Biodiversity Centre, Department of Wildlife & National Parks, Sabah Wildlife Department, Forest Department Sarawak, Research Institutions	9.1

Target 10: By 2025, poaching, illegal harvesting and illegal trade of wildlife, fish and plants are under control and significantly reduced.	Lead Agency	Key Partners	Related Actions
10.1 Strengthen enforcement to eradicate poaching, illegal logging and illegal trade in wild animals, fish and plants	Ministry of Natural Resources & Environment	Malaysia Maritime Enforcement Agency, Customs Department, Royal Malaysian Police, Department of Fisheries, Department of Wildlife & National Parks, Forestry Department Peninsular Malaysia, Sabah Forestry Department, Sabah Wildlife Department, Forest Department Sarawak	15.1, 15.4
10.2 Reduce demand through public awareness and behavioural change		National Biodiversity Centre, Forestry Department Peninsular Malaysia, Department of Wildlife and National Parks Peninsular Malaysia, Department of Marine Park Malaysia, Forest Department Sarawak, Sabah Forestry Department, Sabah Parks , civil society, private sector	1.1

Target 11: By 2025, invasive alien species and pathways are identified, priority species controlled and measures are in place to prevent their introduction and establishment.	Lead Agency	Key Partners	Related Actions
11.1 Improve our understanding and public awareness about IAS	Ministry of Agriculture and Agro-based Industries	Ministry of Natural Resources & Environment, Ministry of Plantation Industries & Commodities, Department of Agriculture, state agriculture and fisheries departments, Research Institutions, civil society	1.1, 16.1
11.2 Conduct risk assessment on all introduced exotic species before their release		Ministry of Natural Resources & Environment, Ministry of Plantation Industries & Commodities, Department of Agriculture, state agriculture and fisheries departments	12.1, 12.2
11.3 Strengthen quarantine inspection and enforcement at entry points and international borders		Ministry of Natural Resources & Environment, Ministry of Plantation Industries & Commodities, Customs Department, Marine Department Malaysia, Port Authorities	10.1

Target 12: By 2025, By 2025, a comprehensive biosafety system inclusive of a liability and redress regime is operational to manage potential adverse impacts of modern biotechnology on biodiversity and human health.	Lead Agency	Key Partners	Related Actions
12.1 Enhance inspection and biosafety compliance	Ministry of Natural Resources & Environment	Ministry of Agriculture and Agro-based Industries, Department of Biosafety, Research Institutions	11.2, 11.3
12.2 Assess impacts of LMOs on biodiversity and human health		Ministry of Agriculture and Agro-based Industries, Department of Biosafety, Research institutions, civil society	11.2
12.3 Develop response to biosafety emergencies		Ministry of Agriculture and Agro-based Industries, Department of Biosafety	15.1, 15.4

Target 13: By 2025, the genetic diversity of cultivated plants and farmed and domesticated animals and of wild relatives is adequately conserved.	Lead Agency	Key Partners	Related Actions
13.1 Support the implementation of the National Strategies and Action Plans on Agricultural Biodiversity Conservation and Sustainable Utilisation	Ministry of Agriculture and Agro-based Industries	Ministry of Natural Resources & Environment, Department of Agriculture, MARDI, Research institutions, private sector	9.3, 11.1, 11.2, 11.3, 12.1, 12.2, 12.3

Target 14: By 2025, Malaysia has an operational ABS framework that is consistent with the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilisation	Lead Agency	Key Partners	Related Actions
14.1 Develop and enforce legislation on ABS	Ministry of Natural Resources & Environment	Attorney General's Chambers, Sabah Biodiversity Centre, Sarawak Biodiversity Centre, civil society	15.4
14.2 Enhance capacity and awareness on ABS		National Biodiversity Centre, Sabah Biodiversity Centre, Sarawak Biodiversity Centre, civil society	1.1, 15.1
14.3 Protect and document the traditional knowledge, innovations and practices of indigenous peoples and local communities		Sarawak Biodiversity Centre, Sabah Biodiversity Centre, Forest Research Institute Malaysia, Department of Orang Asli Development, civil society	2.1, 16.1

Target 15: By 2025, capacity for the implementation of the national and subnational biodiversity strategies, the CBD and other related MEAs has significantly increased.	Lead Agency	Key Partners	Related Actions
15.1 Strengthen the capacity of government agencies to manage biodiversity	Ministry of Natural Resources & Environment	Public Services Department, National Biodiversity Centre, Ministry of Plantation Industries & Commodities, Ministry of Energy, Green Technology & Water, Ministry of Agriculture and Agro-based Industries, Ministry of Tourism and Culture	3.1, 4.1, 6.4, 10.1, 11.3, 12.1
15.2 Strengthen coordination and decision making at the national level		State Economic Planning Units, civil society	2.4, 15.1
15.3 Establish a framework and mechanisms for implementing the national policy at the state level.		State Economic Planning Units	3.1, 15.1
15.4 Strengthen the legislative framework to support the Policy implementation		Attorney General Chambers	3.1, 4.3, 6.3, 9.3, 10.1, 12.1
15.5 Strengthen international and transboundary cooperation		Ministry of Foreign Affairs, Natural Resource Office, Sabah, Ministry of Resource Planning and Environment, Sarawak, Department of National Heritage, civil society	6.1, 6.2, 8.1, 8.2, 8.3

Target 16: By 2025, knowledge and the science base relating to biodiversity, its values, functioning, status and trends, and the consequences of its loss, are significantly improved and applied.	Lead Agency	Key Partners	Related Actions
16.1 Enhance the quality and quantity of research on Malaysia's biodiversity	Ministry of Natural Resources & Environment	Ministry of Higher Education, National Biodiversity Centre, Ministry of Science, Technology and Innovation, Sarawak Biodiversity Centre Forest Research Institute Malaysia, Department of Wildlife & National Parks, Forestry Department Peninsular Malaysia, Sabah Wildlife Department, Forest Department Sarawak, Department of Fisheries, Research Institutions	7.1, 9.1, 11.1, 12.2, 16.2, 16.3
16.2 Establish comprehensive databases and monitoring programmes			4.3, 9.1
16.3 Improve our knowledge on the link between climate change and biodiversity			7.1, 7.2
16.4 Improve the interface and communication between science and policy			1.1, 15.2

Target 17: By 2025, there is a significant increase in funds and resources mobilised for the conservation of biodiversity from both government and non-government sources.	Lead Agency	Key Partners	Related Actions
17.1 Improve the utilisation of the existing funding mechanisms	Ministry of Natural Resources & Environment	Economic Planning Unit, Ministry of Finance, State Planning Unit, State Treasuries, civil society, private sector	All
17.2 Scale up the National Conservation Trust Fund for Natural Resources			All
17.3 Explore and implement new and innovative financing mechanisms			All
17.4 Diversify state governments' revenue streams	Ministry of Finance	Ministry of Natural Resources & Environment, Economic Planning Unit, State Economic Planning Units	All

Note: The list of key partners mentioned in Table 3-1, is non exhaustive.

APPENDIX III: BIOFIN category tags

Tagging - BIOFIN Categories

Biodiversity Knowledge
- Biodiversity Education
- Biodiversity Communication
- Indigenous and local community knowledge
- Biodiversity knowledge improved, shared and applied
- Managerial and technical capacity increased
- Evaluation, accounting and monitoring methods

Resilient Infrastructure
- Sustainable energy infrastructure
- Sustainable roads
- Public sustainable recreational areas
- Sustainable water systems
- Sustainable transportation
- Sustainable urban areas

Sustainable Business
- Sustainable Consumption
- Corporate Sustainability (CSR)
- Nature based tourism
- Green Supply Chain
- Responsible Extractive Industries

Sustainable Use
- Sustainable Land Management
- Sustainable marine and coastal management
- Sustainable Fisheries
- Sustainable Agriculture
- Sustainable Aquaculture
- Sustainable Forestry
- Sustainable Rangelands
- Sustainable Wildlife
- Watershed Management

Targeted species and genetic conservation
- Ex-situ conservation of endangered species
- In-situ conservation of endangered species outside PAs
- Species extinction threat reduction
- Agro-biodiversity maintained

Climate Change Mitigation and Adaptation
- GHG mitigation
- Sustainable energy
- Ecosystem Based Adaptation

Biosafety
- Invasive Alien Species
- LMOs & GMOs

Pollution control
- Protection of ambient air and climate
- Wastewater management
- Waste management
- Protection and remediation of soil, groundwater and surface water
- Other pollution reduction

Ecosystem management and restoration
- Reduce or stop loss of valuable habitats
- Improve ecosystem connectivity
- Conservation of valuable ecosystem services
- Restoration of ecosystems

Access and Benefit Sharing (ABS)
- Nagoya Protocol
- Bioprospecting

Conservation Areas
- Expand PA Systems
- Improve PA Management
- Expand landscape conservation
- Improve landscape conservation management

Biodiversity Planning, Finance and Management
- Strategic planning
- Biodiversity policy and management
- Environmental finance planning
- Environmental finance policy and management
- International environmental agreements and conventions
- Environmental laws and regulations
- Environmental law enforcement

APPENDIX IV: List of Participants by Tier

Type of Organisation	Tier	Name
Government agencies	2	Ministry of Natural Resources and Environment (NRE) - Biodiversity and Forestry Management Division (BBP)
	1	Department of Marine Parks (JTLM)
	1	Department of Wildlife and National Parks Peninsular Malaysia (PERHILITAN)
	2	Forest Research Institute Malaysia (FRIM)
	2	Forestry Department of Peninsular Malaysia (JPSM)
	2	Department of Biosafety (JBK)
	2	Ministry of Natural Resources and Environment (NRE) – Water Resources, Drainage and Hydrology Division (BSASH)
	2	National Hydraulic Research Institute of Malaysia (NAHRIM)
	2	Department of Irrigation and Drainage (JPS)
	2	Ministry of Natural Resources and Environment (NRE) – Mineral and Geoscience Division (BMG)
	2	Department of Mineral and Geoscience (JMG)
	2	Ministry of Natural Resources and Environment (NRE) – Environmental Management and Climate Change Division (BPASPI)
	2	Department of Environment (JAS)
	1	Ministry of Agriculture (MOA)
	1	Department of Fisheries (DOF)
	1	Department of Agriculture (DOA)
	1	Department Of Veterinary Services Malaysia (DVS)
	1	Malaysian Agricultural Research and Development Institute (MARDI)
	1	Ministry of Plantation Industries & Commodities (MPIC)
	1	Malaysian Palm Oil Board (MPOB)
	3	Malaysia Cocoa Board (LKM)
	3	National Kenaf and Tobacco Board (LKTN)
	3	Malaysia Rubber Board (LGM)
	3	Malaysia Maritime Enforcement Agency (APMM)
	3	National Landscape Department (JLN)
	3	Federal Department of Town and Country Planning (PLANMalaysia)
NGO	1	Malaysian Nature Society (MNS)
	2	Management & Ecology of Malaysian Elephants (MEME)
	2	WWF-Malaysia
	2	Harimau Selamanya, RIMBA
Private	1	Sime Darby Foundation
	3	Sime Darby Property

APPENDIX V: Examples of organisation profiles used to help relate them to biodiversity

This appendix comprises a collection of 10 examples of organisation profiles that were prepared by the study team for internal reference in preparation of briefing meetings. The standard profile was modelled after PERHILITAN's example which was chosen because the study team was most familiar with the organisation due to their willingness to cooperate and share since BER stage. Examples for their profile were taken from their BER inputs. Profiles for the other organisations were subsequently developed as and when the study team secured top management briefing sessions. Examples were based on secondary data from EPU DE data (BER stage) but mostly from online searches on the organisation's mandate, functions, and activities available on their website. English was largely used although Bahasa Malaysia was mixed into the profiles to aid the team find the right words to use during the briefings. These profiles were shared with the organisations only after their FNA submission to prevent influencing their FNA inputs.

EXAMPLE 1:

Organisation: Department of Wildlife and National Parks (DWNP) / Jabatan Perlindungan Hidupan Liar dan Taman Negara (PERHILITAN)

Role in biodiversity:

- Reduce/ eliminate negative pressures on biodiversity
    - **Mitigate or eliminate threats of human activities on wildlife and their habitats – illegal poaching and trade, nature-based tourism, human-wildlife conflict, sustainable wildlife**
      Guidelines, action plans, monitoring, enforcement, education, research and development – including of related experts, community engagement and collaboration with stakeholders
    - **Prevent extinction of threatened species**
      In-situ and Ex-situ conservation, specific action plans, monitoring, enforcement, education, research and development – including of related experts, community engagement and collaboration with stakeholders
- Increasing positive biodiversity outcome
    - **Strengthen conservation of wildlife and management of their habitats**
      Legal requirements, monitoring, enforcement, implementing and promotion of guidelines, research and development – including of related experts, Protected Areas management, community engagement
    - **Enhance knowledge, awareness and wider stakeholder participation towards wildlife conservation and sustainable wildlife**
      Research, planning or implementation collaborations, education, promotion of conservation values, publications

Scale of operation: Species and PA level

Functions	BIOFIN categories	BIOFIN Sub-categories	NPBD targets	Policy actions	Examples relevant to PERHILITAN
Mitigate or eliminate threats of human activities on wildlife and their habitats – illegal poaching and trade, human-wildlife conflict, sustainable wildlife, nature-based tourism	**Sustainable use**	*Sustainable Wildlife*	Target 10	10.1	Reduce cases of illegal wildlife trade by 50% *(Pengurangan 50% kes perdagangan haram hidupan liar)* Reduce complaints of elephant-human conflict up to 85%
	Sustainable business	*Nature based tourism*	Target 5	5.1, 5.3	Increase entrepreneurial opportunities among local community through existing and new ecotourism activities
	Biodiversity Planning, Finance and Management	*Environmental law enforcement*	Target 10	10.1	100% of enforcement actions based on analysed information Enhancement and improvement of capacity and efficiency of forensic analysis: Human Resource
		Environmental laws and regulations	Target 10	10.1	Creation, review and updating of laws, regulations, guidelines?
Prevent extinction of threatened species	**Targeted species and genetic conservation**	*Ex-situ conservation of endangered species*	Target 9	9.1, 9.2, 9.3	Increase existing caged wildlife populations for purpose of release *(Meningkatkan populasi hidupan liar dalam kurungan/ padok sedia ada bagi tujuan pelepasan)*
		In-situ conservation of endangered species outside PAs	Target 9	9.1, 9.2	Update the population status of seladang and other species in wildlife hotspots outside protected areas *(Kemaskini maklumat status populasi seladang dan spesies lain di kawasan hotspot hidupan liar yang berada di luar kawasan perlindungan)*
		Species extinction threat reduction	Target 9	9.1, 9.2, 9.3	Achieve 100% implementation of National Tiger Conservation Action Plan (NTCAP)

	Ecosystem Management and Restoration	*Restoration of ecosystems*	Target 7, 8	7.1, 8.1	Assessment of needs and effectiveness of habitat enrichment in protected areas *(Satu kajian keperluan dan keberkesanan pengkayaan habitat di PA)*
	Biodiversity Knowledge	*Managerial and technical capacity increased*	Target 2 6 15	2.3 6.4 15.1	Develop at least 6 experts in the field of conserving Kambing Gurun
Strengthen conservation of wildlife and management of their habitats	**Conservation areas**	*Improve PA Management*	Target 3, 4, 6	3.1, 4.1, 6.4	Decrease encroachment in PA by 100% through 1MBEON and SMART Patrolling
	Biodiversity Knowledge	*Biodiversity Education*	Target 1, 10	1.1, 10.2	Undertake national level biodiversity appreciation programmes: 1. World Tapir Day 2. World Tiger Day 3. Ranger Day 4.World Elephant Day 5. World Wildlife Week
		Biodiversity Communication	Target 1, 10	1.1, 10.2	Sponsor engagement programmes (relating to illegal wildlife trade)
	Biodiversity Planning, Finance and Management	*Biodiversity policy and management*	Target 15	15.1, 15.2, 15.5	Attending international conventions or conferences such as CITES
Enhance knowledge, awareness and wider stakeholder participation towards wildlife conservation and sustainable wildlife		*Biodiversity knowledge improved, shared and applied*	Target 16	Target 16.1, 16.2, 16.4	To strengthen the Wildlife Genetic Resources Bank (WGRB) to be a national and regional reference centre.

EXAMPLE 2:

Organisation: Department of Environment (DOE) / Jabatan Alam Sekitar (JAS)

Role in biodiversity:

- Reduce/ eliminate negative pressures on biodiversity
    - **Reduce threats from pollution**
      Guidelines, monitoring, enforcement, education, developing related experts, promote self-regulation
    - **Minimise environmental impacts from development projects**
      Legal requirement, approval of projects, monitoring of EMS, enforcement, promotion of guidelines, developing related experts, preventive management of post-development ecosystems
    - **Mitigate and control environmental contingencies**
      Response team, coordination functions, guidelines and SOPs, monitoring, enforcement, assessing damage
- Increasing positive biodiversity outcome
    - **Promoting environmental awareness and education**

Scale of operation: Ecosystem level

Functions	BIOFIN categories & sub-categories	NPBD targets	Policy actions	Examples relevant to JAS
• Reduce threats from pollution • Minimise environmental impacts from development projects • Mitigate and control environmental contingencies • Promoting environmental awareness and education	**Pollution control**			
	Protection of ambient air and climate	Target 3, 7	3.1, 3.4, 7.3	E.g. industrial emissions, haze from burning peat
	Wastewater management	Target 3	3.1	E.g. effluent and discharge
	Waste management	Target 3	3.1, 3.4	E.g. leachate, solid waste, heavy metals
	Protection and remediation of soil, groundwater and surface water	Target 3	3.1	E.g. soil contamination, water quality, pollution pathways
	Other pollution reduction	Target 3, 15	3.1, 15.2, 15.5	E.g. marine oil spills guidelines, SOP and coordination efforts between response teams
	Biodiversity planning, finance and management			
	Environmental laws and regulations	Target 3	3.1	E.g. develop guidelines for effluent discharge
	Environmental law enforcement	Target 3	3.1	E.g. enforcement of EQA, marine pollution, enforce EIA requirement and EMS
	Biodiversity knowledge			
	Biodiversity education	Target 1, 3	1.1, 1.2, 3.4	E.g. environmental education curriculum
	Biodiversity communication	Target 2,3, 16	2.2, 2.3, 3.4, 16.4	E.g. promote guidelines and self-regulation, partnerships, communicating with decision makers
	Evaluation and monitoring methods	Target 15	15.1	E.g. methods and systems to detect pollution and source, environmental impacts, criteria setting
	Biodiversity knowledge improved, shared and applied	Target 3, 16	3.1, 16.1	E.g. Ecological knowledge that guides guideline development and approval decisions, assessing damage of environmental contingencies
	Managerial and technical capacity increased	Target 15	15.1, 15.2	E.g. developing experts in water modelling, pollution pathways, negotiators for water issues, capacity building, application of latest technology
	Ecosystem management and restoration			
	Reduce or stop loss of valuable habitats	Target 7	7.1, 7.2	E.g. consideration of cumulative impacts in EIA, management of post-development ecosystems

EXAMPLE 3:

Organisation: Malaysian Maritime Enforcement Agency (MMEA)/ Agensi Penguatkuasaan Maritim Malaysia (APMM)

Role in biodiversity:

- Reduce/ eliminate negative pressures on biodiversity
    - **Reduce threats from illegal poaching, harvesting and sale of biodiversity**
      Monitoring, surveillance and intelligence gathering, enforcement, human capital development, developing related experts, communication strategy to prevent offences in the maritime zone, assist in any criminal matters on request by a foreign country, public awareness and education, increasing awareness of environmental crimes among own personnel, facilitate cooperation between internal maritime communities, collaboration with other agencies, database sharing, research facilities and equipment sharing
    - **Reduce threats of pollution**
      Monitoring and surveillance, enforcement, human capital development, collaboration with other agencies, database sharing, research facilities and equipment sharing

Scale of operation: Species, Habitat and Ecosystem level

Functions	BIOFIN categories & sub-categories	NPBD targets	Policy actions	Examples relevant to APMM
• Reduce threats from illegal poaching, harvesting and sale of biodiversity • Reduce threats of pollution	**Biodiversity Planning, Finance and Management**			
	Environmental law enforcement	Target 10, 15	10.1, 15.1	E.g. Monitoring, surveillance and intelligence gathering, mapping of illegal trade routes of threatened species, mapping biodiversity hotspot areas, identifying hotspots with previous offences, Joint patrols with other agencies, collaborations with private sector and civil society, training and awareness raising among own personnel
	Environmental laws and regulations	Target 15	15.4	E.g. Propose enhancements to legislative framework that will better support enforcement of biodiversity-related laws in the maritime zone
	Biodiversity policy and management	Target 15	15.1, 15.2	E.g. Providing feedback on policies and management practices in maritime zones that would ease or complicate enforcement activities
	Biodiversity knowledge			
	Managerial and technical capacity increased	Target 10	10.2	E.g. Enhancing citizen reporting channels and mechanisms, training community partners to identify and respond properly to offences observed, education communities about the laws and regulations
	Biodiversity communication	Target 15	15.1	E.g. Raise the profile of environmental crimes among personnel, national priorities, judiciary, public
	Sustainable use			
	Sustainable Fisheries	Target 4	4.3	E.g. Enforcement of laws relating to fishing permits, gears and zones
	Biosafety			
	Invasive Alien Species	Target 11	11.3	E.g. Strengthening the quarantine inspections of invasive alien species at international borders, detaining illegal imports of IAS
	Pollution control			
	Other pollution reduction	Target 3	3.1	E.g. Curb illegal dumping of pollutants that harm marine biodiversity

APMM being an enforcement agency would possibly have an expenditure that is reactive to the amount of enforcement needs there are. For example, if there are more illegal fishing vessels entering Malaysian waters, then more patrols would be needed and more intelligence gathered and more raids, processing and legal follow up actions needed. Even for the activities they do in terms of fire fighting forest fires, is dependent on the occurrence of such serious conditions that would warrant their participation. This is not planned. In this sense, it is perhaps difficult for them to budget forward how much they will need to enforce these laws.

What could be budgeted would be the number of standard patrols they do. **The patrols they could possibly budget for will be the patrols they have for specific sites where natural resources are at stake**, such as the mangrove forest or around islands where there are forest reserves or marine parks or designated fishing zones. They would therefore need to know how many of these areas and how wide they need to protect across Malaysia's maritime zone, how many patrols they will do and therefore require how many personnel, fuel and equipment to successfully patrol these areas. Joint patrols with other agencies could also be budgeted.

Yet on the other hand, it is useful for them to budget for the **actions they need to take in order to curb such illegal activities relating to biodiversity in the maritime zone.** This may include strategies to promote citizen reporting, intelligence gathering, mapping of illegal trade routes and important natural resources and biodiversity hotspots, coordinating information exchange and joint action with other agencies like JPSM, JTLM, DWNP, DOF, LKIM, JAS etc, improving prosecution of cases, (these would fall under Target 10, 10.1) increasing awareness of wildlife crime and illegal harvesting among their own officers and how to recognise these offences (this would fall under Target 15, 15.1). Should they also have communication strategies to improve awareness and reporting by citizens and private sector? If yes, that would come under Target 2.

If they haven't really explored their role in dealing with environmental crimes, then the BER is a useful exercise to first know what they have actually done so far and how much they have already spent. They can then identify whether there is anything further that they as the maritime enforcement agency can do to achieve Target 10 of the NPBD policy.

If however, they have already thought about these matters and have a strategy on how to deal with this category of crimes, then diving straight into the FNA would be possible.

Gauging this difference in awareness level is important when approaching the officers.

In any case, having their BER data would be just as important as the FNA because we need to understand how much of their expenditures would go to activities that they cannot simply plan for but respond to. That component would need to be accounted for when we assess their FNA because they may need to set aside a contingency amount to just do the reactive work.

EXAMPLE 4:

Organisation: Forest Research Institute of Malaysia (FRIM)

Role in biodiversity:

- Reduce/ eliminate negative pressures on biodiversity
    - **Minimise threats to forest resources**
      Better understand forest resources and their ecosystem via research, identify potential threats and mitigation methods, establish and promote the use of standards and guidelines in forest management and extractive activities, biosafety measures

- Increasing positive biodiversity outcome
    - **Enhance research on forest biodiversity and management**
      Conduct scientific studies on biological resources, ecosystem services, forest management and restoration methods, biosafety, monitoring methods, socioeconomic linkages, identify forest products, values and methods to secure supply, collaborate with other bodies nationally and internationally, document traditional and indigenous knowledge
    - **Disseminate research outcomes**
      Publications of research findings as journal articles, guidelines, standards, policy and management recommendations and conference papers, develop technical services and certification programmes, product development
    - **Develop sustainable use and commercialisation of forest resources**
      Establish forest management standards and guidelines, methods for evaluating and monitoring forest resources use and health, establishing a value for forest products, conduct bio-prospecting, collaboration with forest-related industries, develop business incubators, support product development, and provide technical services
    - **Promoting environmental awareness and education**
      Stakeholder engagements, recreational forests, botanical gardens, library, publications, interactive online portals, hosting and supporting forest research teams, organising and hosting CSR activities

Scale of operation: Sector level

Functions	BIOFIN categories & sub-categories	NPBD targets	Policy actions	Examples relevant to JAS
• Minimise threat to forest resources • Enhance research on forest biodiversity and management • Disseminate research outcomes • Develop sustainable use and commercialisation of forest resources • Promoting environmental awareness and education	**Biodiversity knowledge**			
	Biodiversity knowledge improved, shared and applied	Target 3, 7, 8, 9, 11, 15, 16	3.1, 7.1, 7.2, 8.1, 8.2, 9.1, 11.1, 15.5, 16.1, 16.2, 16.3	E.g. scientific studies and research, use of biotechnology maintain CHM portals
	Biodiversity education	Target 1, 2, 11, 15, 16	1.1, 1.2, 2.2, 11.1, 15.5, 16.1	E.g. research students and teams, stakeholder engagements, recreational forests, library
	Biodiversity communication	Target 1, 2, 11, 16	2.3, 2.4, 11.1, 16.4	E.g. outreach programmes, public-private partnerships, publish articles, statistics, journal papers, standards, policy papers
	Evaluation and monitoring methods	Target 3, 9, 16	3.2, 9.1, 16.1, 16.2	E.g. economic valuation of forest ecosystem services, precision forestry via geospatial and forest engineering technologies
	Managerial and technical capacity increased	Target 2, 8, 15, 16	2.3, 8.1, 8.2, 15.1, 15.5, 16.1	E.g. human resource development programmes to produce scientists that deliver professional and accurate advice and technical services
	Indigenous and local community knowledge	Target 2, 14	2.1, 14.3	E.g. documenting traditional knowledge of biological resources, use and management
	Sustainable use			
	Sustainable forestry	Target 2, 3, 4, 6, 15, 16	2.3, 3.1, 4.1, 6.5, 15.1, 15.5, 16.2	E.g. forest management guidelines, standards, advices and technical services
	Watershed management	Target 3 , 16	3.1, 16.1	E.g. studies on integrated water basin management
	Access benefit sharing			
	Bio prospecting	Target 14	14.2, 14.3	E.g. natural product discovery, drug discovery
	Climate change			
	GHG mitigation	Target 3, 16	3.1, 16.3	E.g. estimation of GHG mitigated or absorbed by forest sinks, management and use methods to ensure optimum GHG mitigation
	Sustainable business			
	Responsible Extractive Industries	Target 2, 16	2.3, 16.4	E.g. technical services, licensing and certification, engagement with industry players to promote sustainable

Functions	BIOFIN categories & sub-categories	NPBD targets	Policy actions	Examples relevant to JAS
				management and use, joint ventures, business incubation
	Green supply chain	Target 2	2.3	E.g. forest and herbal products, herbal technology centre, high-value-added downstream products
	Nature based tourism	Target 1, 5	1.1, 1.2, 5.1, 5.3	E.g. recreational forest, natural heritage, recreational facilities, product and services, educational values and conservation via tourism
	Targeted species and genetic conservation			
	Ex-situ conservation of endangered species	Target 9	9.2	E.g. maintaining the botanical gardens, plant DNA and seed specimens and banks
	Agro biodiversity maintained	Target 13	13.1	E.g. plant improvement for high quality planting material, taking biosafety measures
	Biodiversity planning, finance and management			
	Strategic planning	Target 3, 16	3.2, 16.1	E.g. research policy and planning, economy and strategic analysis
	Biodiversity policy and management	Target 3, 4	3.1, 4.1, 4.4	E.g. research that contributes to policy recommendations for forest resources and management
	Biodiversity finance management	Target 17	17.1, 17.3	E.g. activities to enhance income generation for FRIM through rentals, sales of products, revenue from technical services, royalty and licenses

EXAMPLE 5:

Organisation: Department of Biosafety / Jabatan Biokeselamatan (JBK)

Role in biodiversity:

- Reduce/ eliminate negative pressures on biodiversity
    - **Regulating the release, importation, exportation and contained use of any living modified organism and the release of products of such organisms**
      Guidelines, process applications for the release, importation, exportation and contained use of these organisms, monitoring, enforcement of Biosafety Act 2007, develop strategic partnerships in biosafety – international, national, state levels including government agencies, NGOs and industry,
    - **Promoting biosafety communication and knowledge**
      Technical advisory and consultation, raising public awareness, research and development, educational and training activities, facilitate the collection, storage and dissemination of biosafety data, coordinate activities of national committees (National Biosafety Board; Genetic Modification Advisory Committee)

Scale of operation: Organism level

Functions	BIOFIN categories & sub-categories	NPBD targets	Policy actions	Examples relevant to JBK
• Regulating the release, importation, exportation and contained use of any living modified organism and the release of products of such organisms • Promoting biosafety communication and knowledge	**Biosafety**			
	LMOs & GMOs	Target 12, 15, 16	12.1, 12.2, 12.3, 15.3, 16.2	E.g. evaluate and process applications and monitor the release, importation, exportation and contained use of LMOs and their products
	Invasive Alien species	Target 11, 15, 16	11.2, 15.3, 16.2	
	Biodiversity knowledge			
	Biodiversity knowledge improved, shared and applied	Target 11, 12, 16, 2, 3	11.1, 12.1, 12.2, 16.1, 16.2, 2.2, 2.3, 3.1	E.g. provide technical advisory, studies on the pathways of LMOs, facilitate the collection, storage and dissemination of biosafety data
	Managerial and technical capacity increased	Target 11, 12, 15	11.1, 12.1, 12.3, 15.1	E.g. training, technical advice on biosafety-related policies and guidelines, build emergency response teams
	Evaluation, accounting and monitoring methods	Target 11, 12	11.1, 12.1	E.g. developing mechanisms to monitor LMOs and their products
	Biodiversity communication	Target 11, 1	11.1, 1.1	E.g. public awareness campaigns
	Biodiversity Planning, Finance and Management			
	International environmental agreements and conventions	Target 11, 12, 15	11.3, 12.3, 15.5	E.g. assist the government to formulate stand on biosafety issues at international forums, carry out Cartagena Protocol on Biosafety to the CBD
	Biodiversity policy and management	Target 12, 15, 2, 3	12.1, 12.2, 12.3, 15.1, 15.3, 15.4, 2.2, 2.3, 3.1	E.g. coordinate efforts by federal and state agencies, NGO and industry, technical advice on updating biosafety policies
	Environmental laws enforcement	Target 11, 12, 10	11.2, 11.3, 12.1, 10.1	E.g. implement and enforce Biosafety Act 2007
	Environmental laws and regulation	Target 11, 12, 15	11.3, 12.1, 15.4	E.g. technical advice on biosafety related laws
	Targeted species & genetic conservation			
	Species extinction threat reduction	Target 11, 12	11.2, 11.3, 12.1 12.2, 12.3	E.g. control the release and eradication of accidentally released IAS and LMOs

EXAMPLE 6:

Organisation: Department of Minerals and Geoscience (DMG) / Jabatan Mineral dan Geosains (JMG)

Role in biodiversity:

- Reduce/ eliminate negative pressures on biodiversity
    - **Sustainable extraction of minerals**
      Strategic planning for mineral extraction and the quarry industry, restoration or sustainable use of used mining ponds and quarries, create guidelines, laws, regulations and policies, issue permits, laws and regulations, monitoring, enforcement, participation in Majlis Tanah Negara
    - **Climate change adaptation**
      Provide geoscience knowledge towards the sustainable development and use of natural resources
      Identify and map ground water sources to meet consumption demands, and also in the cases of emergencies such as peat or forest fires, participation in Majlis Sumber Air Negara
      Shift to alternative energy sources (from fossil fuels to geothermal or coal bed methane sources); and other sources for green energy such as silica and other rare earth elements
    - **Disaster risk reduction**
      Provide geoscientific studies and input into development planning to reduce disaster risks and participation in Majlis Perancangan Fizikal Negara for sustainable or planned land use
      Aid in post-disaster relief, participation in Majlis Pengurusan Bantuan Bencana Negara

- Increasing positive biodiversity outcome
    - **Increase awareness of geological treasures and biodiversity through gazettement of geoparks**
      Map and establish geoparks according to UNESCO's criteria, nature-based tourism, education and awareness raising
    - **Increase awareness of geological treasures and biodiversity through publications of studies and guidelines**

Scale of operation: Sector level

Functions	BIOFIN categories & sub-categories	NPBD targets	Policy actions	Examples relevant to JMG
o Sustainable extraction of minerals o Climate change adaptation o Disaster risk reduction o Increase awareness of geological treasures and biodiversity through gazettement of geoparks	**Sustainable business** *Responsible Extractive Industries*	Target 3	3.1	E.g. ensuring safe, environmentally friendly and organised extraction of mineral resources
	Sustainable consumption	Target 3	3.1, 3.4	E.g. calculating the optimal extraction rates to ensure resource sustainability
	Biodiversity knowledge *Managerial and technical capacity increased*	Target 15	15.1	E.g. Develop expertise in geosciences, provide professional advice on mining and exploration work
	Biodiversity knowledge improved, shared and applied	Target 16	16.1, 16.2	E.g. mapping out mineral resources, hazard map, understanding the geological features and developments of natural assets, systematic exploration of geological assets and mineral, testing facilities for minerals and geochemical compounds
	Evaluation, accounting and monitoring methods	Target 15	15.1	E.g. R&D in assessing quantity and quality of underground water resources, mineral resources; bank for all data related to geosciences
	Biodiversity education	Target 1	1.1, 1.2	E.g. setting up geoparks that are open to public visitation to educate them of geological processes and features
	Ecosystem management and restoration *Reduce or stop loss of valuable habitats*	Target 7	7.1, 7.2	E.g. assessing locations of high conservation value and adapting mining guidelines to consider these HCV areas
	Biodiversity Planning, Finance and Management *Environmental law enforcement*	Target 3	3.1, 3.4	E.g. ensuring that mining operations comply with laws and regulations including EIA requirements
	Conservation areas *Expand PA systems*	Target 6	6.1	E.g. gazetting geoparks

EXAMPLE 7:
Organisation: Department of Irrigation and Drainage / Jabatan Pengairan dan Saliran (JPS)
Role in biodiversity:

- Reduce/ eliminate negative pressures on biodiversity
    - **Incorporate ecological and biodiversity considerations into infrastructure planning and design**
      Innovative methods and technologies, biodiversity and ecological asset baseline studies, mapping of biodiversity assets, high value areas and vulnerable areas, collaboration with ecologists, hydrologists and other agencies, research and development, regulations and guidelines for plans and designs, mechanisms for assessing, monitoring and enforcement of standards, technical services and advice
    - **Reduce threats from floods and storm waters**
      Develop storm water management plans, regulate implementation, data collection, forecast and modelling of storm waters and recipient water bodies, monitor water quality and conditions of recipient waster bodies, rehabilitation works including removal of debris and pollutants, awareness and education campaigns, technical services and advice

- Increasing positive biodiversity outcome
    - **River and river basin planning and management** (including dam planning and construction, flood mitigation works, river engineering)
      Mapping and modelling of river basins, develop Integrated River Basin Management (IRBM) plans and guidelines, communicate IRBM to and collaborate with stakeholders, technical services and advice, biodiversity studies and mapping, human capital development, innovative methods and technologies, finance solutions for IRBM, managing water resources and related habitats for water security (including during periods of drought and floods), assessing and commenting on EIA reports
    - **Restoration of river ecosystems**
      Rehabilitation and treatment of rivers, monitoring of water quality, implementation and promotion of guidelines, research and development, consultations with communities, stakeholders and other related agencies, map vulnerable river banks, biodiversity monitoring studies
    - **Coastal zone management**
      Develop coastal management plans, Guidelines, licensing and certification, monitoring, enforcement, education, research and development, assessing and commenting on EIA reports for coastal development, innovative methods and technologies, communication and collaboration with stakeholders, biodiversity assessments and mapping, technical services and advice, human capital development
    - **Education and awareness**
      Awareness campaigns, stakeholder engagements, journal articles, publications, outreach programmes,

Scale of operation: Ecosystem and Landscape level

Functions	BIOFIN categories and sub-categories	NPBD targets	Policy actions	Examples relevant to JPS
• Reduce threats from floods and storm waters • Incorporate ecological and biodiversity considerations into infrastructure planning and design • Education and awareness • Coastal zone management • Restoration of river ecosystems • River and river basin planning and management	**Biodiversity knowledge**			
	Biodiversity education	Target 1, 15, 16	1.1, 15.1, 16.1	E.g. development of expertise in water resource management and hydrology via the Humid Tropics Centre
	Biodiversity communication	Target 1, 2	1.1, 1.2, 2.1, 2.2, 2.3	E.g. River of Life - Public Outreach Programme, community engagement programmes
	Biodiversity knowledge improved, shared and applied	Target 2, 15, 16	2.3, 15.1, 15.5, 16.2	E.g. ASEAN Working Group on water Resources Management, data and information of rivers and river basins, hydrological studies, biodiversity assessments and mapping
	Managerial and technical capacity increased	Target 2, 3, 15	2.3, 3.1, 15.1, 15.2, 15.3	E.g. development of IRBM plans for state agencies, provision of technical expertise and advice on implementation of IRBM, storm water management and coastal management
	Ecosystem management and restoration			
	Restoration of ecosystems	Target 2 , 7	2.1, 2.2, 7.1, 7.2	E.g. river rehabilitation projects, erosion control, replanting of mangroves for coastal protection
	Reduce or stop loss of valuable habitats	Target 2, 3 , 7	2.1, 2.2, 3.1, 3.3, 7.1, 7.2	E.g. river bank habitat conservation projects
	Conservation of valuable ecosystem services	Target 2, 3	2.1, 2.3, 3.1, 3.2	E.g. provision of clean and consistent supply of freshwater, provision of water bodies that are safe for recreational purposes, conserve floodplain areas
	Improve ecosystem connectivity	Target 8	8.1, 8.2	E.g. projects to re-link the network of water bodies to overcome flooding
	Resilient infrastructure			
	Sustainable water systems	Target 2, 3	2.3, 2.4, 3.1, 3.3	E.g. Urban storm water management, dam design, flood mitigation project designs, agriculture irrigation projects
	Pollution control			
	Protection and remediation of soil, groundwater and surface water	Target 3	3.1	E.g. River of Life - river cleaning programme, removal of rubbish and physical debris from water ways
	Other pollution reduction	Target 3	3.1	E.g. removal of rubbish and physical debris from coastal areas, sedimentation control from coastal projects

Functions	BIOFIN categories and sub-categories	NPBD targets	Policy actions	Examples relevant to JPS
	Sustainable use			
	Sustainable marine and coastal management	Target 1, 2, 3, 7	1.1, 2.1, 2.2, 2.3, 3.1, 3.3, 7.1	E.g. river and estuarine rehabilitation, suitable, coastal land developments, controlled number of land reclamation projects
	Watershed management	Target 1, 2, 3, 7	1.1, 2.1, 2.2, 2.3, 3.1, 3.3, 7.1	E.g. community programmes to promote protection of upstream water catchment areas, catchment rehabilitation projects
	Climate Change Mitigation and Adaptation			
	Ecosystem Based Adaptation	Target 3, 7, 16	3.1, 7.2, 16.3	E.g. replanting of mangroves to counter sea level rise, maintenance of fresh water systems to overcome drought and flood periods
	Biodiversity planning, Finance and Management			
	Environmental laws and regulations	Target 1, 15	1.3, 15.3, 15.4	E.g. Review of legislation for IRBM, regulations for development in water shed areas, along river banks, dams, flood mitigation projects, estuarine and coastal developments; assessing and commenting on EIA projects
	Biodiversity policy and management	Target 3, 15	3.1, 15.1, 15.3	E.g. Review of policies to allow IRBM implementation

- JPS has a total of 19 divisions
  - Business sector – 6 divisions
  - Specialist sector – 5 divisions
  - Management Sector – 5 divisions
- Divisions that are would likely **deliver positive biodiversity outcomes** would include:
  - Business sector
    - **River basin management** – IRBM including developing the plans for states to implement, review policies and legislation for IRBM implementation; conducts conservation and rehabilitation of river bank habitats (including river erosion and improving river conditions), river beautification projects, awareness programmes such as One State One River; manages information and data of rivers
    - **Urban storm water -** Manages and regulates storm water plan implementation to reduce impacts of urban storm water on receiving water bodies (urban storm water brings a lot of pollutants and debris into receiving water bodies that can harm biodiversity)
    - **Water Resources management and hydrology** – Manages to national hydrological network that collects data and information for water resource assessments, research and management
  - Specialist sector
    - **Humid Tropical Centre KL** – functions to standardise implementation and cooperation between hydrological and water resource studies, increase scientific and technological knowledge of hydrological cycles, research, education and communication, and international collaboration

- Divisions that **could either deliver positive or negative biodiversity outcomes**:
  - Business sector
    - **Flood management** – main focus if to reduce flooding and damages, and give immediate response to floods; how they do these operations have the potential to harm or benefit biodiversity
    - **Coastal Zone Management** – main focus is to solve coastal erosion to reduce damages to properties, rehabilitation of river mouths is for improving navigational access of fishermen, hence biodiversity is not a main purpose; how they do these operations have the potential to harm or benefit biodiversity, also tasked to prepare the Integrated Shoreline Management Plan by 2020 for sustainable development
    - **Design and Dam –** Mainly focussed on the design of JPS infrastructure, mostly dams; how they design the dams (scale, structural design, etc) can either harm of benefit biodiversity

- Divisions that would play **important supporting roles if wanting to implement more bio-d considerations in JPS operations**
  - Business sector
    - **Special project** – focuses on improving project management expertise, would be important if needing to include biodiversity components, considerations, indexes or monitoring into overall projects
  - Management sector

- **Information Management** – important to store and support all information relating to biodiversity and JPS project areas or plans
- **Human Capital Development** – Controls the in-house training, examinations and career development of JPS staff. Would be useful to include tests of their ecological knowledge
- **Facility and GIS** – The GIS component is probably more relevant as they collect, store and develop geospatial information and maps that would guide planners and engineers

EXAMPLE 8:

Organisation: National Hydraulics Research Institute Malaysia (NAHRIM) / Institut Penyelidikan Hidraulik Kebangsaan Malaysia

Role in biodiversity:

- Reduce/ eliminate negative pressures on biodiversity
- Increasing positive biodiversity outcome
    - **Enhance research on water, river and marine systems and ecosystems, their management and restoration**
      Research and development on hydrology, water quality and environment, river basins, coastal management and oceanography, water resources and climate change, hydraulics
    - **Disseminate research outcomes on river and marine systems and ecosystems, their management and restoration**
      Publications, policy guidelines, research and reference centres, usage of ICT, Consulting and analytical services, awareness, educational and training activities

Scale of operation: Sector level

Functions	BIOFIN categories	BIOFIN Sub-categories	NPBD targets	Policy actions	Examples relevant to NAHRIM
Enhance research on river and marine systems and ecosystems, their management and restoration	Biodiversity knowledge, Resilient infrastructure, Sustainable Use, Climate change mitigation and adaptation, Ecosystem management and restoration, Pollution control, Biodiversity planning, finance and management	*Sustainable water systems, Sustainable marine and coastal management, Watershed management, Ecosystem based adaptation*	Target 1, 7, 8, 15, 16	*Target 1.1, 7.1, 7.2, 8.1, 15.1, 15.3*	Study on eco-friendly waterways in KD, Selangor, Water quality study in Sungai Kinta, R&D on Effects of Development to Coral Reefs and Marine Habitat, Impact of climate change on water resources in Malaysia study
Disseminate research outcomes on river and marine systems and ecosystems, their management and restoration	Biodiversity knowledge, Biodiversity planning, finance and management	*Biodiversity knowledge improved, shared and applied, Strategic planning, biodiversity policy and management*	Target 1, 7, 8, 15, 16	*Target 1.1, 7.1, 7.2, 8.1, 15.1, 15.3*	Physical modelling application on slope stability of breakwater, Tsunami modelling, forecasting and risk assessment

EXAMPLE 9:

Organisation: Jabatan Landskap Nagara (JLN)/ National Landscape Department

Role in biodiversity:

- Reduce/ eliminate negative pressures on biodiversity
    - **Reduce threats from land development**
      Enforcement of legislation, policies execution and guidelines at various stages of landscape planning, implementation and management; Provide established technical expertise for efficient national landscape resources development; Advisor to various government levels, Provide feedback to Local Authority landscape development applications
    - **Reduce threats from alien invasive species**
      Guidelines and awareness of IAS to prevent use and control spread through landscaping work
    - **Enhance human capital in landscape industry**
      Generate development and expansion of landscape industry, implement and coordinate research application programs in various landscape related fields, National Landscape Accreditation Centre, Set and promotes a clear format and guidance to conduct a *Kajian Pelan Induk Landskap* for comprehensive landscape planning at every Local Authority, Directory of landscape service providers including private firms, learning institutions, NGOs, professionals, nurseries, collaborate with MoE to offer the Landscape and Nursery subject at selected schools, training managers and employees to manage urban forests, setting landscape management standards

- Increasing positive biodiversity outcome
    - **Planning and design of landscapes**
      Plan, coordinate, implement and regulate landscape development, open spaces requirement, green areas and national recreational facilities
    - **Choice of the species and ecological assets used in landscaping**
      Promoting the conservation and use of native species and landscapes, act as a living seed bank of rare, endangered and threatened species
    - **Education and awareness**
      Conduct programmes to improve awareness and understanding of landscape resources and their importance, E-landskap, MyUjana phone app to help people find public parks and green spaces

Scale of operation: Landscape level, Public parks level

Relevant policies, laws, plans and publications

- National Landscape Policy
- Tree Preservation Order
- Landscape Architect Profession Act (?)
- Landscape Development Act (?)
- JLN Strategic Plan 2007 – 2016 (there is supposed to be an update every 5 years)
- Manual for conducting a Landscape Master Plan studies by Local Authorities
- National Landscape Guidelines for Parks
- Guidebook for Rehabilitation of Ex-landfill sites into Public Park areas
- National Landscape Guidelines
- Guide to planting shade trees
- Guide to Edible Landscape
- Guide to Abiotic impacts to amenity trees
- Guide to Insect pests of amenity trees
- Guide to Managing Main Pests and Diseases of Amenity Tress through Chemical Controls

EXAMPLE 10:

Organisation: PLAN Malaysia (JPBD)

Role in biodiversity:

- Reduce/ eliminate negative pressures on biodiversity
    - **Reduce threats from land development**
      Federal: Advising the government on planning matters related to the use and development of land including drafting of laws, methodologies, standards, procedures, planning rules, development plans; Secretariat to the National Physical Planning Council; research, monitoring and publish statistics
      State: Advises the state on all planning matters including the use and development of land; secretary to State Planning Committees; advises local authorities on land use and building policies; regulate state development; assist in preparing layout plans, research and studies
      Local: Plan, coordinate and control the use and development of land and buildings in the local authorities' areas; Facilitate and assist in collection, upkeep and publication of statistics, publications

- Increasing positive biodiversity outcome
    - **Plan in pockets of urban biodiversity**
      Federal: Advising the government on planning matters related to the use and development of land including drafting of laws, methodologies, standards, procedures, planning rules, development plans; Secretariat to the National Physical Planning Council; research, monitoring and publish statistics
      State: Advises the state on all planning matters including the use and development of land; secretary to State Planning Committees; advises local authorities on land use and building policies; regulate state development; assist in preparing layout plans, research and studies
      Local: Plan, coordinate and control the use and development of land and buildings in the local authorities' areas; Facilitate and assist in collection, upkeep and publication of statistics, publications

Scale of operation: Ecosystem level

Relevant policies and plans:

- Akta 172
- National Coastal Zone Physical Plan
- National Urbanisation Policy
- National Physical Plan 2
- National Rural Physical Planning Plan 2030

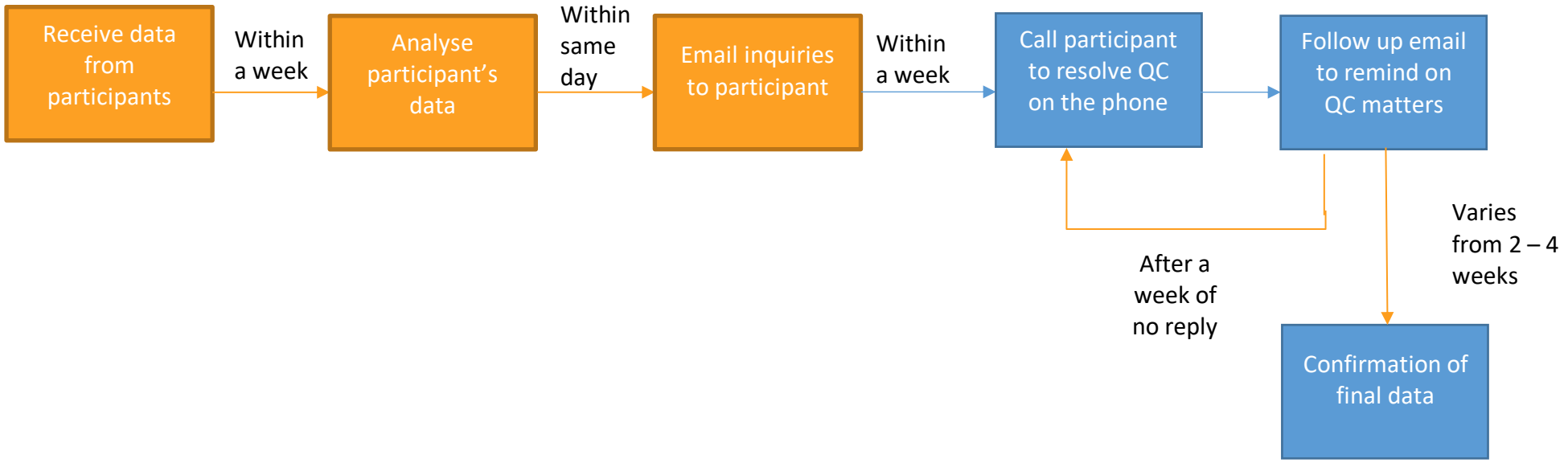
Relevant Planning guidelines:

- Roof-Top Garden Planning Guidelines
- Garis Panduan Pembangunan Fizikal Pulau-pulau dan Taman Laut
- Heavy vehicle Terminals Planning Guidelines
- Garis Panduan Perancangan Chalet Atas Air

- Garis Panduan Perancangan Kejiranan Hijau
- Sistem Pengumpulan dan Penggunaan Semula Air Hujan
- Garis Panduan Peracangan Pembangunan Kebun Kejiranan

- MURNInets Implementation Manual
- Sustainability Assessment' Manual for Preparation of Local Plans
- Laporan Guna Tanah 2012 –
- Risalah Local Agenda 21, Tahukah Anda Pokok Mempunyai Hak?
- MURNInets – Malaysian Urban-Rural National Indicators Network for Sustainable Development – in hope to meningkatkan peranan JPBD sebagai agensi utama yang mengamalkan program penilaiankemampanan bandar

APPENDIX VI: Overall QC Process



APPENDIX VII: Common Questions in regard to FNA

Q: Our organisation has a management plan, how can I use it with the FNA exercise?

Your management plan can act as a reference document in the FNA exercise. The FNA methodology can be used to estimate the cost of implementing the management plan and its various stated actions. However, it is important to ensure that the strategies or actions from the plan are linked to relevant NPBD targets and are quantifiable. As for the actions, an important question to be asked is "How" – to identify specific and quantifiable actions that can be carried out.

Q: What if my management plan ends in the year 2020 but the FNA exercise is to cost the NPBD which in the revised version is until the year 2025?

If your management plans end in 2020, put in what you can from your management plan up to 2020. For the rest of the years, use the same methodology to identify actions to achieve the relevant NPDB targets and policy actions. Quantify them and estimate the required cost as in the first period in order to achieve the intended outcome.

Q: Why do we use results-based budgeting as our basis for the FNA exercise?

Results-based budgeting is the basis for planning our actions in order to achieve our stated outcomes. It is also in line with Malaysia's policy of using outcome-based budgeting. It also helps to build a more convincing case for budgets as the actions planned are based on outcomes to be achieved. As we approach various agencies and organisations in this FNA, it will also be better to use a common methodology for all our participants.

Q: What is meant by rapid- and long-term impact in the Q1 sheet of the data template?

The emphasis here is about the speed of which the action can deliver the desired impact. 'Rapid' refers to actions that deliver the desired impact while 'long-term' refers to actions that have a longer lead time before the desired impact is achieved.

Q: How do we define whether an action is high or low in cost at the prioritisation step?

There are no cut off ranges that determine what can be considered as high or low cost since these labels are relative to your own organisation's budget and size. What may be low cost in your organisation could be high for other organisations. Importantly, the criteria of high or low cost at the prioritisation stage merely acts as a guide since the actual costing still needs to be conducted in Steps 3 to 5.

Q: Do we take into consideration other aspects like risk when choosing which actions to prioritise?

For this FNA, we are only looking at two criteria namely the speed of which the actions deliver the desired impact and the cost. You may utilise other criteria such as risk in your assessment if it better reflects your organisation's needs. Be sure to note down these criteria in the data template so that the next person can understand how and what criteria you used for the prioritisation.

Q: Do we include the overhead charges when building the cost table, i.e. electricity, water, equipment that is shared between departments?

Yes, overhead charges are necessary when building cost tables as in this exercise all cost items needed to carry out the action must be listed. If overhead charges are excluded, then the budget will be under-estimated. At the end of the exercise, your organisation can analyse possible ways for cost or resource sharing. Notes should be included in the "Costing Notes" column.

Q: How do we account for emoluments? What about overtime charges?

Identify the staff (number and occupation) needed to carry out the action. If your action includes a 3-days programme carried out 3 times a year, the unit cost of the staff cost will be per programme. This unit cost is calculated by dividing the monthly emolument by the number of work days in a month and then multiplying it with 3 days. For overtime charges, it is best to recognise it as a separate item as emoluments can have a more accurate analysis. To estimate overtime charges, please follow the labour law (i.e. Employment Act). Any should be included in the "Costing Notes" column.

Q: What is meant by "frequency of use" in the cost table?

In identifying the frequency of use, the approach to be taken is in determining the number of times needed for that cost item per year. For example, if you need 30 staff per training session and each year you hold 3 training session, the frequency of use is 3. Use the "Costing Notes" column to describe your approach and method used.

Q: How do we account for changes to the expenses over the years till the year 2025?

First, estimate the yearly expense for each cost item in the cost table. In this FNA exercise, the intention is to show projected cost over the remaining period till 2025. In this exercise, use available data to derive the annual estimates and then project the expenditures forward based on training provided as well as the guidebook. Use the "Costing Notes" column to describe your approach and method used.

Q: Once the FNA exercise is completed, will the organisation get the funds needed?

The purpose of this FNA exercise is to cost the NPBD and its targets. This exercise will produce information needed by your organisation to build a stronger business case to seek resources from potential funders and sponsors. It however does not guarantee funding. The BIOFIN project in Malaysia has funding opportunities. Please contact any of the following organisations for details: UNDP Malaysia, the Economic Planning Unit (SEASSA) or the Ministry of Water, Land and Natural Resources (KATS).