COMPONENT 1
POLICIES AND MARKET INCENTIVES IN SUPPORT OF NATURAL CAPITAL

THE INTEGRATION OF NATURAL CAPITAL ACCOUNTING IN PUBLIC AND PRIVATE SECTOR POLICY AND DECISION-MAKING FOR SUSTAINABLE LANDSCAPES

NATURAL CAPITAL

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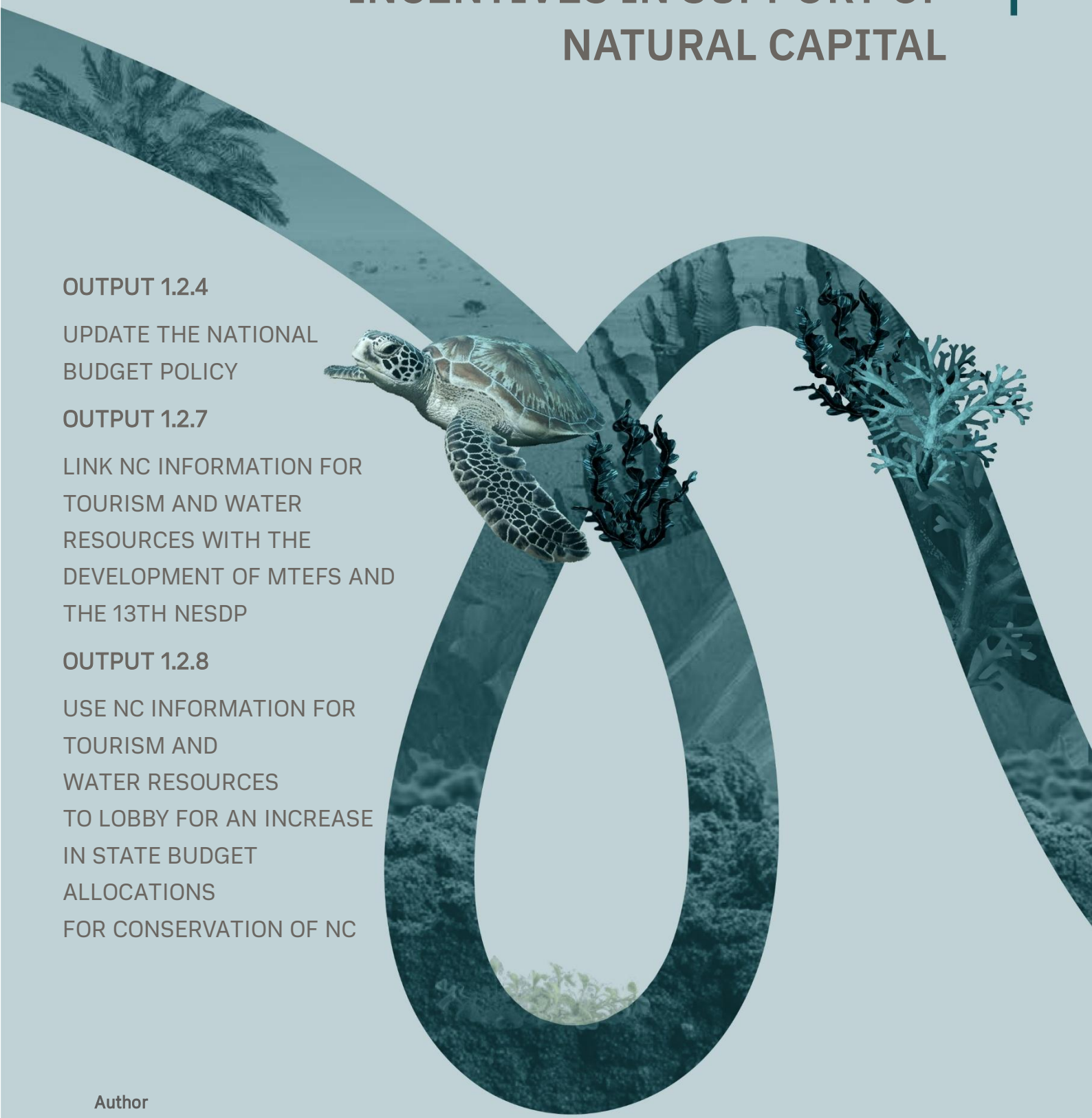

OUTPUT 1.2.4

UPDATE THE NATIONAL BUDGET POLICY

OUTPUT 1.2.7

LINK NC INFORMATION FOR TOURISM AND WATER RESOURCES WITH THE DEVELOPMENT OF MTEFS AND THE 13TH NESDP

OUTPUT 1.2.8

USE NC INFORMATION FOR TOURISM AND WATER RESOURCES TO LOBBY FOR AN INCREASE IN STATE BUDGET ALLOCATIONS FOR CONSERVATION OF NC

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Acknowledgment

The research team wishes to express its profound gratitude to the distinguished government agencies and experts who generously provided their time, knowledge, and perspectives through interviews and focus group discussions. Their invaluable contributions have been instrumental in advancing the integration of natural capital accounts on tourism and water resources into Krabi Province's development planning and Medium-Term Expenditure Framework (MTEF), as well as in supporting the formulation of proposals for enhanced budget allocations toward the conservation of upstream, coastal, and nearshore marine ecosystems.

We extend our sincere appreciation to the following institutions for their participation in the **Expert Focus Group Meeting on 31 March 2026**:

- Office of the Permanent Secretary, Ministry of Tourism and Sports
- National Statistical Office (NSO)
- Fiscal Policy Office, Ministry of Finance (FPO)
- Office of Natural Resources and Environmental Policy and Planning (ONEP)
- Office of the National Economic and Social Development Council (NESDC)
- Hydro-Informatics Institute
- Office of the National Water Resources
- Department of Water Resources
- Budget Bureau

We also gratefully acknowledge the kind cooperation of agencies that provided **in-depth interviews**, which yielded critical insights for this study:

- National Statistical Office (NSO), 7 April 2026
- Budget Bureau, 29 April 2026
- Office of the National Economic and Social Development Council (NESDC), 5 May 2026
- Office of the Permanent Secretary, Ministry of Tourism and Sports, 8 May 2026
- Office of the National Water Resources (ONWR), 19 May 2026

The generosity and commitment of these agencies have significantly enriched the research process, strengthened the integration of natural capital accounting into provincial and national planning frameworks, and provided a foundation for evidence-based policy development.

Contents

Figures

page

Executive Summary

Natural resources and ecosystems constitute fundamental capital for Thailand's economic and social development, particularly in tourism and water resource sectors that underpin income generation, employment, and long-term stability. Yet, increasing pressures from climate change, urban expansion, and resource demand have led to degradation of natural assets, threatening their capacity to sustain future growth. To address these challenges, the establishment of Natural Capital Accounting (NCA) under the United Nations' System of Environmental-Economic Accounting (SEEA) framework provides a vital instrument for linking ecosystem services with economic and social data, thereby strengthening evidence-based policy formulation and resource allocation.

In Thailand, the integration of NCA into national planning mechanisms such as the Medium-Term Expenditure Framework (MTEF) and the 14th National Economic and Social Development Plan is essential to ensure that development strategies are aligned with the capacities and constraints of natural capital. This study implemented a series of expert consultations, focus group meetings, and in-depth interviews with key agencies—including the Ministry of Tourism and Sports, the National Statistical Office, the Fiscal Policy Office, the Office of Natural Resources and Environmental Policy and Planning, the Office of the National Economic and Social Development Council, and the Bureau of the Budget—to examine pathways for mainstreaming NCA data into fiscal and policy processes.

The findings highlight several critical insights. First, agencies emphasized the importance of updating and disaggregating datasets, ensuring consistency with national statistical standards, and avoiding risks of double counting. Second, the integration of NCA into budget allocation frameworks was seen as a means to improve equity and efficiency, particularly for tourism-dependent provinces such as Krabi, where infrastructure burdens exceed those reflected by resident populations. Third, innovative mechanisms such as ecological fiscal transfers and the incorporation of opportunity cost concepts were identified as promising approaches to strengthen conservation incentives and enhance transparency in resource management. Finally, the study underscored the need for inter-agency collaboration, methodological consistency, and alignment with national accounts to ensure credibility and policy relevance.

Overall, the research demonstrates that systematic integration of natural capital accounts into Thailand's fiscal and development planning can enhance the precision of budget allocation, safeguard ecosystem sustainability, and promote balanced growth. By embedding SEEA-based ecosystem accounts into the MTEF and the 14th National Plan, Thailand can advance toward a development trajectory that harmonizes economic expansion with natural resource conservation and long-term social well-being.

1. Introduction

Natural resources and ecosystems constitute fundamental capital for the economic and social development of the nation, particularly in the tourism and water resource sectors, which play a crucial role in generating income, employment, and long-term economic and social stability. However, increasing utilization of natural resources, coupled with challenges arising from climate change, urban expansion, and heightened resource demand, has led to degradation of natural assets and ecosystem services, thereby posing risks to their capacity to support future development.

The establishment of Natural Capital Accounting (NCA) under the United Nations' System of Environmental-Economic Accounting (SEEA) framework is a vital instrument for linking information on natural resources and ecosystem services with economic and social data. This integration highlights the role and value of natural capital as assets that underpin sustainable development, while also providing an empirical evidence base for policy formulation, development planning, and more efficient allocation of public resources.

In the context of Thailand, enhancing the application of NCA data for tangible policy use requires systematic integration into national planning and resource allocation mechanisms. In particular, the Medium-Term Expenditure Framework (MTEF) serves as a critical tool for aligning government expenditure with medium-term development objectives, while the 14th National Economic and Social Development Plan provides the overarching policy framework for driving national development in the coming period.

Integrating natural capital accounts for tourism and water resources into the MTEF and the 14th Plan will ensure that national goals, strategies, and resource allocations are consistent with the capacities and constraints of natural capital. This approach enables comprehensive reflection of both the costs and benefits of resource utilization, promotes budget allocations that safeguard resource sustainability, and enhances the efficiency of public investment. Ultimately, it fosters a balance between economic growth, natural resource conservation, and improvements in the quality of life of the population.

Accordingly, activities have been undertaken to examine mechanisms and pathways for linking natural capital accounts in tourism and water resources to the processes of MTEF preparation and the formulation of the 14th National Economic and Social Development Plan. These activities included consultations and in-depth interviews with relevant agencies to gather perspectives and recommendations for developing systematic and effective approaches to utilizing NCA data in national policy and planning. This will provide a critical foundation for steering Thailand's economic and social development toward long-term sustainability.

2. Implementation of Activities

To advance the integration of natural capital accounting data on tourism and water resources into the formulation of the Medium-Term Expenditure Framework (MTEF) and the 14th National Economic and Social Development Plan, the research team implemented six key activities designed to collect expert opinions, recommendations, and practical approaches for mainstreaming natural capital accounting into national policy and planning processes. The details are as follows:

2.1 Expert Focus Group Meeting on 31 March 2026

An expert focus group meeting was convened to gather insights on strategies for linking natural capital accounting data on tourism and water resources with the preparation of the MTEF and the 14th National Economic and Social Development Plan. This meeting was held at the Pullman King Power Hotel, Bangkok (Rangnam).

The meeting commenced with a presentation on natural capital accounting for the tourism sector and water resources in Krabi Province, developed in accordance with the SEEA EA (System of Environmental-Economic Accounting – Ecosystem Accounting. The presentation was delivered by Associate Professor Dr. Adis Israngkura, the project lead. This was followed by a presentation on the Water Resources Satellite Account (WRSA) by Dr. Winai Chaowiwat, representing the Hydro-Informatics Institute. Subsequently, group discussions were conducted to gather additional input and data. The key points can be summarized as follows:

Office of the Permanent Secretary, Ministry of Tourism and Sports

The Office expressed its appreciation to the research team for presenting a systematic and well-structured overview of natural capital accounting and its linkages with the tourism sector. In particular, the selection of the case study area was commended for aligning well with the research questions, enabling a clearer and more accessible assessment of the value of natural resources.

Regarding the Tourism Satellite Account (TSA) data used in the study, the Office noted that more recent data — up to 2025 — are now available and recommended that the research team update the dataset accordingly. It also suggested further consideration of the use of TSA data at the regional or provincial level to ensure that the findings more accurately reflect spatial contexts. For example, in estimating the value of rail transport at approximately THB 15 million, the figures may not be consistent with the reality of Krabi Province, which does not have a rail transport system. This could lead to analytical results that do not fully reflect local conditions. The Office further recommended increasing the collection of primary data, as the current analysis relies largely on secondary data. Additional field data would enhance the robustness and credibility of the study.

The Office also observed that the definition of tourism applied in the study differs from the operational definition used by the Ministry. However, this discrepancy stems from data limitations in Thailand, which do not yet allow for full adherence to the Ministry's definition. For instance, in the case of domestic tourism in Krabi Province, the Ministry defines this as residents of Krabi traveling within the province. In practice, however, such disaggregated data are not available. As a result, the research team has had to rely on data representing Thai tourists traveling to Krabi instead.

Finally, with regard to the findings on natural capital asset accounts for terrestrial ecosystems, the Office agreed with the conclusion that the value of natural capital declined over the study period. This trend was considered consistent with the tourism dynamics of the area, which experienced high levels of activity in 2019, followed by a significant downturn due to the COVID-19 pandemic.

Figure 1 Expert Focus Group Meeting: Office of the Permanent Secretary, Ministry of Tourism and Sports

Source: Photograph by the author, 2026

National Statistical Office (NSO)

The NSO expressed its appreciation to the research team for initiating the application of the System of Environmental-Economic Accounting (SEEA) framework in the study. This approach was recognized as instrumental in systematically capturing the existence, utilization, and valuation of natural resources.

Regarding the Water Resources Satellite Account (WRSA), the NSO noted that the study design allows for a clear disaggregation of data into supply and use components, in line with analytical needs. The accounting process can also be aligned with the fiscal year framework, as the underlying data are available on a monthly basis. In practice, water accounts are often compiled in reference to the hydrological cycle used in water allocation planning by the Royal Irrigation Department, which typically begins in November each year.

The NSO further shared its prior experience in developing tourism accounts under the TSA-SEEA framework, following the guidelines of the United Nations World Tourism Organization (UNWTO), in collaboration with the National Science and Technology Development Agency (NSTDA) for the Andaman Tourism Development Cluster prior to the COVID-19 pandemic. In addition, the NSO has collaborated with the Department of Tourism, NSTDA, and experts from ESCAP to develop natural capital accounts for tourism in the form of Ocean Accounts for the same cluster, also under the SEEA framework. These studies examined the types of resources utilized by tourism activities and developed related satellite accounts, including water, energy, waste, and greenhouse gas accounts, supported by five core accounts under the SEEA framework.

On data usage, the NSO emphasized the importance of ensuring consistency in data sources, definitions, and temporal coverage to enable accurate linkage with Gross Domestic Product (GDP) calculations. For example, the TSA compiled by the NSO is fully aligned with the national TSA framework. The NSO also suggested that the research team may consider constructing accounts at a “cluster” or multi-province level for areas with similar characteristics. Defining the unit of analysis at an excessively granular level may limit the applicability of the results for policy formulation and management purposes.

Figure 2 Expert Focus Group Meeting: National Statistical Office (NSO)

Source: Photograph by the author, 2026

Fiscal Policy Office (FPO)

Krabi Province generates significant economic value from the tourism sector, which has led to increasing pressure on natural capital and the degradation of local resources. However, during the COVID-19 pandemic, tax revenues declined markedly. This reflects an inherent trade-off between the utilization of natural resources for economic gains and the long-term sustainability of the resource base. From the agency's perspective, natural capital accounting should be integrated into the project appraisal and approval process—particularly for tourism-related infrastructure projects in provinces that are highly dependent on tourism revenues, such as Krabi, Phuket, and Phang Nga. In this regard, data from natural capital accounts should be used in conjunction with Gross Provincial Product (GPP) to support more comprehensive and balanced policy decision-making.

The FPO also noted that it has conducted studies on the valuation of natural capital loss, which could be highly relevant to this line of research. In particular, the use of satellite imagery was highlighted as a valuable tool for analyzing economic activities linked to changes in natural resources. For example, nighttime light data can be used to identify areas with high light intensity, which may serve as a proxy for concentrated economic activity during nighttime—particularly in tourism areas. Similarly, data on nitrogen emissions from heavy industrial activities can indicate the spatial concentration of industrial operations. These approaches can be further extended to other dimensions, such as changes in natural water bodies, to better capture spatial dynamics.

Regarding budget allocation, current criteria are largely based on population size at the provincial level. This approach may not be suitable for tourism-dependent provinces such as Krabi, which, despite having relatively small resident populations, experience high volumes of tourists. As a result, the burden on infrastructure and public services is significantly higher than what is reflected by official population figures. The existing allocation mechanism may therefore not adequately capture the true fiscal and service demands of such

areas. The FPO suggested that alternative data and emerging technologies should be incorporated to improve the allocation framework. While some alternative data have begun to be utilized, tourist numbers are not yet included in the calculation, partly due to the view that tourists are not direct taxpayers. However, tourists do contribute to tax revenues indirectly through consumption of goods and services. Therefore, the budget allocation criteria should be revisited to better reflect the economic and social burdens faced by tourism-intensive provinces.

Figure 3 Expert Focus Group Meeting: Fiscal Policy Office (FPO)

Source: Photograph by the author, 2026

Office of Natural Resources and Environmental Policy and Planning (ONEP)

The Office of Natural Resources and Environmental Policy and Planning highlighted an approach implemented in Malaysia known as the Ecological Fiscal Transfer (EFT) mechanism. This approach allocates higher budgetary resources to states or areas that maintain a high proportion of forest cover, using forest area as a key indicator in determining budget allocation for natural resource conservation.

From the agency's perspective, the System of Environmental-Economic Accounting (SEEA) framework—given its emphasis on the valuation of natural capital—could be adapted to support the design of such budget allocation mechanisms. This approach would not only enable budget allocation to better reflect the value of natural resources, but also serve as an incentive for local areas to prioritize the conservation and sustainable management of forest resources on a continuous basis.

Figure 4 Expert Focus Group Meeting: Office of Natural Resources and Environmental Policy and Planning (ONEP)

Source: Photograph by the author, 2026

Office of the National Economic and Social Development Council (NESDC)

The NESDC noted that the compilation of accounts under the System of National Accounts (SNA) framework must take into account issues of hidden populations and labor mobility. At present, three key agencies are involved in producing such data: the NESDC, the Bank of Thailand, and the National Statistical Office. Given that population mobility cannot be accurately captured using household registration data alone, estimation techniques are required. In this regard, tourists exhibit similar characteristics, and their measurement also requires supplementary tools and data. For example, tourism surveys conducted by the Ministry of Tourism and Sports—such as those capturing travel purposes and motivations (e.g., attraction to the unique qualities of destinations)—can help improve data accuracy.

In the context of the System of Environmental-Economic Accounting (SEEA), the NESDC emphasized the need to consider both economic and environmental dimensions in tandem. On the economic side, attention should be given to income generation and value creation, while on the environmental side, the costs of conservation, restoration, and resource management must be incorporated. A comprehensive assessment therefore requires accounting for all relevant environmental factors. The inclusion of forest accounts was also recommended, as it would enhance the completeness of SEEA-based analyses.

The NESDC further suggested that reporting should clearly specify the components of data, particularly distinguishing cost elements and providing greater clarity on the sources of resources—for example, identifying the originating river basins of water resources. This would improve transparency and facilitate more effective

policy use. In addition, the application of opportunity cost concepts was recommended to ensure a more comprehensive evaluation of costs and returns.

From a policy perspective, the NESDC advised that, given its mandate to adopt a national-level perspective, recommendations should avoid prescriptive language such as mandating the integration of SEEA principles directly into provincial plans. Instead, more appropriate phrasing would be to encourage the promotion or adoption of SEEA principles as guiding practices within the framework of the 14th National Economic and Social Development Plan.

Regarding biodiversity, the NESDC observed that while domestic funding for biodiversity conservation has declined, international funding has increased. This suggests the need to explore alternative financing mechanisms linked to conservation efforts, such as sustainability funds or instruments including green bonds and blue bonds, which are specifically designed to support conservation-related activities. The NESDC considered this to be an area that could be advanced and incorporated into the 14th National Economic and Social Development Plan.

Finally, the NESDC noted that SEEA-related initiatives in Thailand have progressed steadily since 2012, with several agencies already undertaking relevant activities. For instance, the agricultural sector has developed concepts such as Green GDP, while in the services sector, the Ministry of Tourism and Sports is currently the only agency implementing such approaches in a concrete manner. Other sectors have yet to develop comparable accounting systems. The NESDC also cautioned that certain activities may pose risks of double counting, and emphasized the importance of carefully verifying data to avoid duplication before using the results for reporting or policy reference.

Figure 5 Expert Focus Group Meeting: Office of the National Economic and Social Development Council (NESDC)

Source: Photograph by the author, 2026

2.2 In-depth Interview with the National Statistical Office on 7 April 2026

An in-depth interview was conducted with the National Statistical Office to gather opinions and recommendations on approaches for compiling natural capital accounting data related to tourism and water resources.

The meeting commenced with a presentation on natural capital accounting for the tourism sector and water resources in Krabi Province, developed in accordance with the SEEA EA (System of Environmental-Economic Accounting – Ecosystem Accounting. The presentation was delivered by Associate Professor Dr. Adis Israngkura, the project lead. This was followed by a consultation session to gather feedback on the Water Resources Satellite Account (WRSA) by representatives from the National Statistical Office (NSO). The key points are summarized as follows:

1. Classification of "Other" Water Resources

The category of "other" water resources should be further disaggregated into more clearly defined subcategories. The current aggregation contains a relatively large volume of water resources, and more detailed classification would improve the accuracy and interpretability of the data.

2. Consistency of Internal Water Flows

Flows between inland water resources—representing transfers from one water body to another—should exhibit balanced inflows and outflows. However, the current accounts display inconsistencies, indicating an imbalance in recorded figures.

3. Recording of Precipitation Inputs

Increases in water resources from precipitation are currently recorded as equal additions to both rivers/streams and groundwater, which does not reflect hydrological reality. Moreover, precipitation should not be directly attributed to groundwater, as infiltration through soil layers is required before recharge occurs, typically over an extended period.

4. Structure of Water Use Tables

In line with the SEEA-Water framework, water use tables should be separated into (i) Supply table, indicating sources of water, and (ii) Demand table, reflecting water use across different purposes. This separation would enhance analytical clarity.

5. Treatment of Missing Data in Accounting Tables

Cells with unavailable data should be recorded as n/a rather than zero, as the two carry distinct meanings in interpretation. For example, cases such as inflows from external territories or newly discovered aquifers should not be represented as zero values.

In addition, the NSO has prior experience in developing National Ocean Accounts, which are classified as satellite accounts. This experience has played an important role in supporting relevant agencies in establishing systematic and comprehensive approaches to national accounting. Currently, the NSO seeks to initiate a

collaborative framework with relevant agencies to promote data integration across multiple dimensions of national accounts. For instance, the NSO has presented the National Ocean Accounts framework to the Office of National Water Resources (ONWR) to enhance clarity and methodological consistency, as well as to support inter-agency data linkage.

Figure 6 In-depth Interview with the National Statistical Office on 7 April 2026

Source: Photograph by the author, 2026

2.3 In-depth Interview with the Budget Bureau on 29 April 2026

An in-depth interview was conducted with the Bureau of the Budget to gather opinions and recommendations on approaches for integrating natural capital accounting (NCA) data on tourism and water resources into the Medium-Term Expenditure Framework (MTEF). The meeting began with a presentation on NCA for tourism and water resources in Krabi Province, developed in accordance with the SEEA-EA (System of Environmental-Economic Accounting – Ecosystem Accounting), delivered by Associate Professor Dr. Adis Israngkura, the project lead.

The Bureau emphasized that the data generated under the study are highly valuable for informing budget allocation decisions. Expansion of such studies to other geographical areas would further strengthen the evidence base for area-based budgeting. Since the Bureau must review budget requests from all provinces, empirical data that reflect local problems, potentials, and impacts can improve precision in allocation and ensure responsiveness to policy priorities.

Environmental dimensions were highlighted as critical considerations. The Bureau noted that environmental data can support budget allocation in ways that align with agency mandates. However, allocation decisions cannot rely solely on environmental factors; they must also consider project readiness, urgency, cost-effectiveness, agency capacity to mobilize revenue, and expected benefits. Importantly, the Bureau stressed that data carry greater weight when missions or projects are formally incorporated into the official plans of responsible agencies. Without such formal linkage, supporting data alone may not suffice to justify allocation.

At the local level, certain projects may be initiated directly by local administrative organizations, provided they demonstrate readiness in terms of location, design, and tangible benefits. Risks of duplication are mitigated

through pre-allocation verification and committee-level forums that review implementation plans before budget requests are submitted.

In terms of allocation criteria, project readiness remains paramount, particularly for investment or construction projects. Agencies must demonstrate land availability, clarity of design, intended use, and expected outcomes. Budget allocation must also reflect equity and appropriateness, balancing fairness with the specific capacities and constraints of each locality.

In addition, the Bureau emphasized that budget allocation should also take into account population density and the actual number of tourists in each area, together with the essential infrastructure required to support them, such as wastewater treatment systems, solid waste management facilities, and adequate water resources. This consideration ensures that provinces with high tourist inflows or significant “floating populations” receive budgetary support commensurate with the pressures placed on their infrastructure and public services.

For agencies with revenue-generating capacity, co-financing approaches may be adopted to enhance efficiency. Spatial and contextual data, such as drought maps and severity indicators, are increasingly used to guide targeted allocation under fiscal constraints. This reflects the Bureau’s shift toward demand-driven budgeting supported by data analytics, particularly for fiscal year 2027.

The Bureau further noted that NCA data can concretely demonstrate local economic activities and potentials, such as niche tourism in Krabi (e.g., diving, birdwatching), thereby helping agencies like the Ministry of Tourism and Sports or the Tourism Authority of Thailand to design support measures aligned with local strengths. Budget requests should remain necessary, focused, and problem-oriented, avoiding excessive demands beyond the fiscal framework.

The budget process involves agency submissions, Bureau review, Cabinet approval, and parliamentary scrutiny. Throughout, the Bureau acts as a technical advisor, ensuring allocations are consistent with fiscal ceilings and national priorities. Monitoring and evaluation are integral, requiring agencies to prepare MTEFs at the output and project levels. Transparency is also emphasized, with public disclosure of budget information to enhance accountability and evidence-based policy analysis.

In conclusion, the Bureau underscored that spatial and empirical data, including NCA, can significantly improve budget allocation. However, for such data to have concrete impact, they must be formally linked to agency mandates and plans, supported by evidence of necessity, cost-effectiveness, and expected outcomes, and accompanied by systems for monitoring, evaluation, and transparency. If these conditions are met, budget allocation can become more precise, equitable, efficient, and responsive to local needs, thereby strengthening the integration of natural capital into national fiscal policy.

Figure 7 In-depth Interview with the Budget Bureau on 29 April 2026

Source: Photograph by the author, 2026

2.4 In-depth Interview with the Office of the National Economic and Social Development Council (NESDC) on 5 May 2026

An in-depth interview was conducted with the Office of the National Economic and Social Development Council (NESDC) to obtain opinions and recommendations on approaches for integrating natural capital accounting data on tourism and water resources into the preparation of the 14th National Economic and Social Development Plan.

The meeting commenced with a presentation on natural capital accounting for the tourism sector and water resources in Krabi Province, developed in accordance with the SEEA EA (System of Environmental-Economic Accounting – Ecosystem Accounting). The presentation was delivered by Associate Professor Dr. Adis Israngkura, the project manager. The key points are summarized as follows:

The NESDC team explains that NESDC looks at the big picture (national level plans and policies) and is responsible for monitoring national indicators such as GDP. There are many groups responsible for ecosystem accounts, including the department of National Accounts that can provide relevant data and/or recommendations. For the context of SEEA, NESDC advises that the data (used in the 5 accounts) be consolidated with other government agencies to certify the credibility of the data, otherwise the data can be deemed unreliable. It was mentioned that one of the pain points for developing statistical data (such as this project) is whether the data was collected using the National Statistical Office's data collection standards. If the data collection method is not aligned with the NSO's standards, its' credibility may be disputed.

There was a discussion on the challenges of double counting of assets and not seeing the clear link between the ecosystem accounts and the economy. Due to limited experts in ecosystem accounting, some assets may be double counted (different methodologies). Since environmental (ecosystem) data was recently collected, there was a gap in environmental data to construct complete accounts. However, to consider the project's SEEA accounts into the planning of the 14th NESDP, the links between ecosystem accounting and the economy should

be clear (i.e. the opportunity costs for investing in ecosystem conservation and/or restoration), along with consolidation of the collected data. And since the SEEA is done on a provincial level, the boundaries of the Krabi's Gross Provincial Product (GPP) is unclear. The NESDC team explained that NESDC's GPP is used as a tool to quantify value from provincial assets. GPP of all provinces are then used for national planning.

The TDRI team mentioned that Krabi Province faces issues of water shortages that impact tourist businesses, to the extent that hotels and resorts must refund their guests because they do not have sufficient water. The province also has a wastewater management issue that is affecting its valuable ecosystems (as demonstrated in the Ecosystem Services Flow Accounts). Data from Krabi's SEEA could be used as a cost-benefit analysis to assess the impacts of land use. The developed SEEA is aimed to support sectorial policy, specifically for the tourism sector and the water resources sector.

On the topic of requesting budget allocations, it was advised that NESDC is responsible for the National Development Plan (that is the master plan for Provincial Development Plans), which is not the same as Sub-district Administrative Organization Plans (under the jurisdiction of the Ministry of Interior). Before requesting allocations, it must be defined which plan the project or activity will be included in, to determine which budget group to make the request. TDRI shared that the Budget Bureau also advised this point.

In terms of recommendations for the SEEA, the NESDC team suggests changing the units (of land) from hectare to "rai", to be more contextually appropriate for Thailand.

Figure 8 In-depth Interview with the Office of the National Economic and Social Development Council (NESDC) on 5 May 2026

Source: Photograph by the author, 2026

2.5 In-depth Interview with the Office of the Permanent Secretary, Ministry of Tourism and Sports on 8 May 2026.

An in-depth interview was conducted with the Office of the Permanent Secretary, Ministry of Tourism and Sports (MOTS) to gather opinions and recommendations on approaches for utilizing natural capital accounting (NCA) data on tourism and water resources to support the formulation of tourism-related policies and measures. The meeting began with a presentation on NCA for the tourism sector and water resources in Krabi Province, developed in accordance with the SEEA-EA (System of Environmental-Economic Accounting – Ecosystem Accounting), delivered by Associate Professor Dr. Adis Israngkura, the project lead.

The MOTS representatives explained that they are planning to introduce “Measure Sustainable Tourism” as an indicator to assess the sustainability of tourism activities, and they believe that NCA information can be highly useful for this initiative. Dr. Adis presented examples of project activities, including a youth camp initiative to train local youth in Krabi as tour guides for migratory bird watching in Khlong Prasong, aimed at instilling environmental awareness and appreciation of ecosystems. Collaboration with “GreenFins” on sustainable diving practices was also highlighted as a model for promoting environmentally friendly tourism.

The MOTS team referred to the “Thailand Tourism Standard,” overseen by the Department of Tourism, which certifies eco-friendly tourism goods and services to ensure quality, safety, hygiene, fairness, and uniqueness. They advised the project team to consult the Department of Tourism for further details, particularly regarding certification for the migratory bird watching activity. The TDRI team shared videos from the GreenFins initiative and the Jib Jib Youth Conservation Camp to illustrate ongoing efforts in sustainable tourism and youth engagement.

Challenges in Krabi were also discussed, including wastewater management in Ao Nang Subdistrict, where untreated wastewater from Klong Chak has flowed into Ao Nang Beach, negatively affecting tourist perceptions and diverting visitors to other beaches such as Nopparat Thara. NCA findings further revealed that while tourism-related businesses consume only 5–10 percent of the water supply, they are disproportionately impacted during droughts. Another issue raised was the improper handling of physical tickets by park officials, which compromises visitor counts and revenue accuracy. E-ticketing was proposed as a solution to enhance transparency and track tourism-related data, such as visitor origins and attraction preferences. However, concerns were noted regarding compliance with personal data protection laws (PDPA).

From these discussions, several policy directions emerged. MOTS emphasized the importance of allocating budgets for investment and maintenance of tourism infrastructure, including the regulation of island visits similar to the Maya Bay case, and investment in wastewater treatment and integrated solid waste management in collaboration with provinces, local administrative organizations, the Royal Irrigation Department, the Department of Water Resources, and the Pollution Control Department. Seasonal and periodic closure of islands was recommended to allow ecosystems to recover naturally, while maritime zoning was proposed to separate local and commercial fisheries from conservation areas such as coral reefs, seagrass beds, and dugong habitats. Environmentally friendly diving practices under the GreenFins initiative were highlighted as a model for training

and certification, supported by accredited organizations such as PADI and the Reef World Foundation in collaboration with the Department of Marine and Coastal Resources. Birdwatching and conservation initiatives were also emphasized, including capacity building for local personnel and the protection of natural habitats along migratory bird flyways, supported by activities such as the Jib Jib Youth Conservation Camp.

In conclusion, the Office of the Permanent Secretary underscored that integrating NCA data into tourism policy and planning provides a robust evidence base for promoting sustainable tourism. Linking NCA findings with national standards, infrastructure investment, ecosystem management, and community-based conservation initiatives will strengthen Thailand's capacity to balance tourism growth with environmental sustainability, ensuring that the tourism sector continues to generate economic benefits while safeguarding the natural capital upon which it depends.

Figure 9 In-depth Interview with the Office of the Permanent Secretary, Ministry of Tourism and Sports on 8 May 2026.

Source: Photograph by the author, 2026

2.6 In-depth Interview with the Office of the National Water Resources (ONWR) on 19 May 2026

An in-depth interview was conducted with the Office of the National Water Resources (ONWR) to gather opinions and recommendations on approaches for utilizing natural capital accounting data on tourism and water resources to support the formulation of water resource policies and measures.

The meeting commenced with a presentation on natural capital accounting for the tourism sector and water resources in Krabi Province, developed in accordance with the SEEA EA (System of Environmental-Economic Accounting – Ecosystem Accounting). The presentation was delivered by Ms. Prinyarat Leangcharoen and Mr. Peerawat Suriyaburaphakul. The key points are summarized as follows:

The study further indicates that the current water pricing structure does not adequately reflect the true costs and the opportunity costs associated with comprehensive water resource management. The ONWR representatives mentioned that It has therefore been recommended that the tariff structure be revised to incorporate the costs of wastewater management, thereby covering expenditures across the entire water

management chain—from water sourcing, production, and service expansion to wastewater treatment and disposal. Such an integrated pricing framework would promote more efficient utilization of water resources while ensuring that the actual costs of management are transparently reflected.

In order to enhance the policy relevance of data derived from natural capital accounts and water resource accounts, representatives from the Office of the National Water Resources (ONWR) emphasized that addressing seasonal water shortages should not rely solely on the development of new water sources, as this mandate is already undertaken by responsible agencies. Instead, greater emphasis should be placed on demand-side management, particularly through measures that support adaptation in the agricultural sector. This includes encouraging farmers to shift towards cultivating crops that require less water yet generate higher economic value, thereby reducing pressure on water resources and improving long-term efficiency in water use.

Furthermore, it was proposed that the compilation of water resource accounts should prioritize the river basin level rather than the provincial level. Provincial boundaries often fail to capture the dynamics of water inflows and outflows, whereas basin-level analysis allows for clearer assessment and linkage of water circulation across provinces and basins. This approach would enable water resource accounts to more accurately reflect the realities of water use and management.

At the national scale, a key recommendation is to integrate data from natural capital accounts and water resource accounts into the planning and budgeting processes. In particular, coordination with the Office of the National Economic and Social Development Council (NESDC) and the Bureau of the Budget is essential to ensure that such data serve as empirical evidence for project prioritization and budget allocation frameworks. This integration would align provincial development budgets with ecosystem conservation and restoration objectives, thereby contributing to balanced and sustainable environmental and economic development in the long term.

Figure 10 In-depth Interview with the Office of the National Water Resources (ONWR) on 19 May 2026

Source: Photograph by the author, 2026

3. Policy recommendations

The current trajectory of national development faces the challenge of maintaining a balance between economic growth and the sustainability of natural resource bases. Integrating Natural Capital Accounting (NCA), particularly in the tourism and water resource sectors, into the Medium-Term Expenditure Framework (MTEF) and the 14th National Economic and Social Development Plan represents a critical step in elevating national policy formulation. This policy conclusion consolidates recommendations from key agencies to provide a comprehensive, clear, and actionable framework across four principal dimensions.

3.1 Reforming Budget Allocation Systems and Fiscal Instruments

The prevailing budget allocation mechanism, which is largely based on registered population size, does not adequately reflect reality—especially in tourism provinces with large numbers of "floating populations" and visitors that impose significant burdens on infrastructure and public services. The government should revise budget allocation criteria to account for tourist volumes and indirect consumption-related revenues, thereby aligning allocations with actual economic and social pressures. Furthermore, ecological fiscal transfers (EFT), as practiced in Malaysia, should be introduced to provide additional budgetary incentives for areas that conserve forests or natural resources. For budget approval, the Budget Bureau should emphasize demand-driven budgeting, considering spatial data, cost-effectiveness, opportunity costs, and project readiness, while encouraging co-financing for agencies or areas with revenue-generating capacity. Importantly, projects must be formally included in the operational plans of host agencies to minimize duplication and ensure tangible implementation.

3.2 Integrated Water Resource Management

Water resources are fundamental to both agriculture and tourism. National policy should restructure water pricing to reflect true costs and opportunity costs, including wastewater management across the entire chain—from sourcing and production to treatment—in order to promote efficient water use. At the spatial level, water resource accounts should be compiled at the river basin scale rather than provincial boundaries, to reflect actual hydrological flows that transcend administrative divisions. Moreover, the government should shift its paradigm from seeking new water sources to demand-side management, particularly by encouraging agriculture to transition toward crops that require less water but yield higher economic value, thereby reducing pressure on water resources during dry seasons.

3.3 Advancing Sustainable Tourism and Spatial Analysis

To prevent resource degradation from tourism, NCA data should be incorporated into the evaluation and approval processes for tourism infrastructure projects. Modern technologies, such as satellite imagery (e.g., nighttime lights or nitrogen emissions), should be applied to analyze economic activity and spatial concentration. Sustainable tourism measurement should be promoted through the Thailand Tourism Standard and data collection via electronic ticketing systems (e-ticketing), ensuring transparency and enabling improvements in visitor experience, while adhering to personal data protection laws (PDPA). For analytical purposes, accounts

should be compiled at the cluster level to provide a broader perspective that is more useful for policy management than overly localized data.

3.4 Establishing Data Standards and Financial Mechanisms for Conservation

Data credibility is central to effective policy. NCA must employ data collection standards consistent with the National Statistical Office (NSO) to avoid disputes over reliability, prevent double counting, and ensure full integration with Gross Provincial Product (GPP) and Gross Domestic Product (GDP). Measurement units should also be adapted to Thai contexts, such as using “rai” instead of hectares. Beyond state budgets, alternative financing mechanisms should be explored and developed, including sustainability funds, green bonds, and blue bonds, to provide dedicated resources for biodiversity conservation.

In summary, the advancement of national-level NCA policy should not be framed as rigidly mandatory, but rather as a process of promotion and support, encouraging the adoption of SEEA principles as practical guidelines under the 14th National Economic and Social Development Plan. If the government can concretely integrate natural resource data into economic frameworks and budgetary decision-making, it will enhance transparency, foster balanced and equitable decisions, ensure cost-effectiveness, and respond more precisely to local challenges. This will establish a critical foundation for truly sustainable national development.

THE INTEGRATION OF NATURAL CAPITAL ACCOUNTING IN PUBLIC AND PRIVATE SECTOR POLICY AND DECISION-MAKING FOR SUSTAINABLE LANDSCAPES

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