

COMPONENT 2

INTEGRATION OF NATURAL CAPITAL ACCOUNTS  
INTO LOCAL DEVELOPMENT PLANNING  
AND OPERATIONS



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

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# INTEGRATION OF NATURAL CAPITAL ACCOUNTING INTO LOCAL DEVELOPMENT PLANNING AND OPERATIONS

## OUTPUT 2.1.1

ESTABLISH AND MAINTAIN THE  
INTER-AGENCY PROVINCIAL  
WORKING GROUP FOR KRABI  
PROVINCE

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## Acknowledgement

The Meeting Minutes of the Project Steering Committee on “Natural Capital Accounting for Tourism and Water Management Sectors of Krabi Province” have been prepared under the oversight of the Provincial Working Group on the Development of a Natural Capital Accounting System for the Tourism and Water Management Sectors in Krabi Province. The Working Group is mandated to coordinate project implementation and foster collaborative partnerships among relevant stakeholders, including public sector agencies, private sector entities, and civil society organizations. In addition, the Working Group provides technical inputs, academic recommendations, and relevant data, while overseeing and monitoring the progress of the development of the Natural Capital Accounting (NCA) system for the tourism and water management sectors in Krabi Province, ensuring its effective and efficient implementation.

The Project Team extends its sincere appreciation to the Chair, members, Secretary, and Assistant Secretary of the Provincial Working Group for their valuable contributions in reviewing and monitoring project progress. Their technical guidance, expert advice, and constructive recommendations have been instrumental in addressing implementation challenges and overcoming operational constraints, thereby ensuring the efficient delivery of project activities. Their continued support in promoting inter-agency collaboration and stakeholder engagement in biodiversity management has significantly enhanced project effectiveness and maximized the benefits derived from project implementation.

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The Project Team would like to express its sincere gratitude to all individuals and organizations involved for their commitment and contributions in supporting the Project Steering Committee and advancing the project’s objective of integrating Natural Capital Accounting into public and private sector policy and decision-making processes for sustainable landscapes.

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## Executive Summary

The working group for developing a natural capital accounting system for the tourism and water management sectors in Krabi Province, under the project "Integrating Natural Capital Accounting in Public and Private Sector Policy and Decision-Making for Sustainable Landscapes," coordinates operations and builds a network of collaboration among relevant agencies in the public, private, and civil society sectors. It oversees and monitors the progress of establishing a natural capital accounting system for the tourism and water management sectors in Krabi Province. This project is jointly implemented by the Office of Natural Resources and Environmental Policy and Planning (ONEP), the United Nations Environment Programme (UNEP), and the Thailand Development Research Institute (TDRI), with financial support from the Global Environment Fund (GEF). The project aims to integrate natural capital considerations into policy-making, planning, and budgeting processes, particularly in the tourism and water management sectors. These sectors are critical to Krabi's economy, while also exerting significant pressure on ecosystems and natural resources. A multi-stakeholder governance mechanism has been established, including a Project Steering Committee (PSC) and a Provincial Working Group (PWG), comprising representatives from over 30 agencies across government, private sector, and civil society. This structure ensures coordinated implementation, technical guidance, and monitoring of NCA development at the provincial level.

## Key Findings

The project has successfully established a comprehensive **Natural Capital Accounting (NCA)** system for Krabi Province in accordance with the **United Nations System of Environmental-Economic Accounting – Ecosystem Accounting (UN SEEA-EA)** framework. The accounts encompass ecosystem extent, ecosystem condition, ecosystem service flows, and ecosystem asset values, providing an integrated evidence base that links environmental conditions with socio-economic development. The findings demonstrate the critical contribution of natural capital to the provincial economy while highlighting the growing environmental pressures facing Krabi, including declining forest cover, seasonal water scarcity, increasing wastewater generation, and ecosystem degradation associated with tourism expansion and land-use change. Given that tourism contributes approximately **THB 100 billion annually** to the provincial economy, maintaining healthy ecosystems is essential to sustaining economic growth, livelihoods, and long-term environmental resilience.

The meeting further highlighted significant progress in translating Natural Capital Accounting into practical policy applications. NCA information has been incorporated into provincial planning processes through the development of the Tourism Satellite Account and Water Satellite Account, thereby strengthening evidence-based planning, budgeting, and decision-making. In addition, the project has advanced several pilot interventions to operationalize NCA, including sustainable tourism initiatives, wastewater management measures, and the design of market-based instruments such as a **Payment for Ecosystem Services (PES)** mechanism supported by a conservation trust fund. These initiatives are expected to enhance sustainable financing for ecosystem conservation while strengthening institutional capacity and promoting the long-term integration of natural capital considerations into provincial development policies and investment decisions.

## Key Recommendations

The project has successfully established a comprehensive Natural Capital Accounting (NCA) system for Krabi Province in accordance with the United Nations System of Environmental-Economic Accounting – Ecosystem Accounting (UN SEEA-EA) framework. The accounts encompass ecosystem extent, ecosystem condition, ecosystem service flows, and ecosystem asset values, providing an integrated evidence base that links environmental conditions with socio-economic development. The findings demonstrate the critical contribution of natural capital to the provincial economy while highlighting the growing environmental pressures facing Krabi, including declining forest cover, seasonal water scarcity, increasing wastewater generation, and ecosystem degradation associated with tourism expansion and land-use change. Given that tourism contributes approximately THB 100 billion annually to the provincial economy, maintaining healthy ecosystems is essential to sustaining economic growth, livelihoods, and long-term environmental resilience.

The meeting further highlighted significant progress in translating Natural Capital Accounting into practical policy applications. NCA information has been incorporated into provincial planning processes through the development of the Tourism Satellite Account and Water Satellite Account, thereby strengthening evidence-based planning, budgeting, and decision-making. In addition, the project has advanced several pilot interventions to operationalize NCA, including sustainable tourism initiatives, wastewater management measures, and the design of market-based instruments such as a Payment for Ecosystem Services (PES) mechanism supported by a conservation trust fund. These initiatives are expected to enhance sustainable financing for ecosystem conservation while strengthening institutional capacity and promoting the long-term integration of natural capital considerations into provincial development policies and investment decisions.

In summary, the NCA project demonstrates that integrating natural capital into development planning enhances decision-making efficiency, improves resource allocation, and supports sustainable economic growth. Establishing institutional systems, securing funding, and fostering ongoing stakeholder collaboration are crucial for building long-term environmental sustainability and resilience in Krabi province.

## **1. Background of the appointment of the inter-agency provincial working group for Krabi province (PWG): Project Steering Committee “Natural Capital Accounting for Tourism and Water Management Sectors of Krabi Province”**

The Office of Natural Resources and Environmental Policy and Planning (ONEP) issued a letter, No. 1002.2/8018, dated April 25, 2023, presenting a (draft) appointment order for the working group to develop a natural capital accounting system for the tourism sector and water management in Krabi Province. The Krabi Provincial Office of Natural Resources and Environment will submit this request to the Krabi Provincial Governor for consideration.

The Krabi Provincial Governor (Mr. Phasakon Bunyalak) signed Krabi Provincial Order No. 1827/2023, dated May 8, 2023, appointing a working group to develop a natural capital accounting system for the tourism and water management sectors in Krabi Province. The working group will be chaired by the Governor or Deputy Governor of Krabi Province. Representatives from 30 relevant agencies will also be on the working group, along with officials from the Biodiversity Management Division, the Office of Natural Resources and Environmental Policy and Planning, and the Thailand Development Research Institute Foundation. (Project Manager) Accompanying the secretariat, the committee comprises 33 members. Their responsibilities include coordinating operations and building collaborative networks, providing academic opinions and suggestions, technical information, and useful data. They also oversee and monitor progress in developing a natural capital accounting system for the tourism and water management sectors in Krabi Province to ensure efficiency. (Appendix 1).

## **2. Summary of Key Discussion Points from the Project Steering Committee meeting “Natural Capital Accounting for Tourism and Water Management Sectors of Krabi Province” No. 1/2023**

Meeting Minutes Provincial Working on the development of a natural capital account system for the tourism and water management sectors Krabi province No.1/2023 **on 3 July 2023**, 09.30 a.m.– 12.00 p.m. at the Pineapple Hotel Krabi, Krabi Thailand.

### **1. Background**

The meeting marked the formal establishment of the **Project Steering Committee (PSC)** for the implementation of the project “*Natural Capital Accounting (NCA) for Tourism and Water Management Sectors in Krabi Province*”, under the broader UNEP-supported GEF initiative on integrating natural capital into policy and decision-making. The PSC comprises representatives from over 30 agencies across national, provincial, and local levels, as well as the private sector, to ensure coordinated implementation, knowledge sharing, and oversight of NCA development in Krabi Province.

The project adopts the **United Nations System of Environmental-Economic Accounting (UN SEEA)** framework, integrating both the Central Framework and Ecosystem Accounting to link ecosystem conditions, services, and economic benefits in both physical and monetary terms.

## 2. Key Outcomes

### 2.1 Establishment of Institutional Framework

The PSC was formally established to:

- Oversee implementation of NCA at the provincial level
- Facilitate coordination among relevant agencies
- Support data collection, validation, and dissemination
- Provide strategic guidance for integrating NCA into policy and planning

This institutional arrangement is critical to ensure a **multi-sectoral and integrated approach** to natural capital management.

### 2.2 Agreement on Conceptual Framework for NCA

The meeting endorsed the adoption of the UN SEEA framework, which:

- Defines **natural capital as ecosystem stocks**
- Measures **ecosystem services as flows**
- Quantifies both **biophysical and monetary values**
- Assesses the impacts of economic activities on natural resources

This provides a robust analytical basis for linking environmental sustainability with economic development.

### 2.3 Identification of Priority Data and Analytical Areas

The PSC emphasized priority areas for data collection and analysis, including:

- Tourism-related data (visitor numbers, carrying capacity)
- Water resources (surface water, groundwater, and supply systems)
- Ecosystem data (e.g., forests, seagrass, coastal and marine ecosystems)
- Socio-economic data (agriculture, industry, population dynamics)

Integration of datasets from multiple agencies (e.g., statistical offices, GBDi, and sectoral departments) was identified as essential for comprehensive NCA development.

### 2.4 Key Sectoral Findings

#### (a) Tourism Sector

- Rapid growth in tourism has exceeded the **carrying capacity** of key destinations
- Resulting environmental degradation threatens long-term sustainability
- Accurate and integrated data are required to assess the **true economic value of ecosystems** supporting tourism

#### (b) Water Resource Management

- Several areas, particularly islands (e.g., Phi Phi), face **limited freshwater availability**

- Heavy reliance on **groundwater and imported water** increases costs and vulnerability
- Seasonal droughts exacerbate water scarcity and affect tourism operations

The meeting highlighted the need to **assess the full economic value of water resources** and explore long-term infrastructure solutions.

### 3. Key Issues and Recommendations

#### 3.1 Strengthening Data Integration and Accessibility

- Utilize **existing datasets** from relevant government agencies and prior studies
- Enhance collaboration with the **Provincial Statistical Office and Government Big Data Institute (GBDi)**
- Develop a **comprehensive and harmonized data system** for NCA

#### 3.2 Addressing Ecosystem Degradation from Tourism Pressure

- Incorporate **carrying capacity analysis** into tourism planning
- Integrate ecosystem data (e.g., seagrass, coral reefs) into valuation models
- Use NCA as a tool to balance economic benefits with environmental limits

#### 3.3 Improving Water Resource Planning and Management

- Expand data coverage on:
  - Groundwater resources
  - Public water supply systems
  - Water use across sectors (tourism, agriculture)
- Evaluate **cost-effectiveness of infrastructure investments**, such as water transfer systems to islands
- Strengthen resilience to **drought and climate variability**

#### 3.4 Enhancing Policy Relevance of NCA

- Ensure NCA outputs directly support:
  - Provincial planning and zoning decisions
  - Budget allocation and investment prioritization
  - Environmental protection and conservation strategies

### 4. Follow-up Actions

#### 4.1 Immediate Actions

##### 1. Data Collection and Compilation

- Collect and consolidate data on ecosystems, tourism, and water resources from relevant agencies
- Coordinate with statistical and data institutions for validation and integration

##### 2. Development of Conceptual Framework Outputs

- Prepare NCA conceptual framework and preliminary accounts for presentation at the next meeting

#### 4.2 Short- to Medium-Term Actions

##### 1. Strengthening Technical Analysis

- Develop ecosystem valuation models (biophysical and monetary)
- Conduct assessments of tourism carrying capacity and water resource availability

## **2. Stakeholder Engagement**

- Facilitate continuous consultation among public sector, private sector, and local communities
- Promote awareness and understanding of NCA methodologies

## **3. Policy Integration**

- Align NCA findings with provincial development planning processes
- Support evidence-based decision-making for land use and infrastructure development

### **4.3 Long-Term Strategic Actions**

#### **1. Institutionalization of NCA**

- Embed NCA into regular provincial planning and monitoring systems
- Strengthen inter-agency coordination mechanisms

#### **2. Sustainable Resource Management**

- Implement policies that address:
  - Tourism pressure
  - Water scarcity
  - Ecosystem degradation

#### **3. Investment Planning and Financing**

- Use NCA data to justify investments in:
  - Water infrastructure
  - Ecosystem restoration
  - Sustainable tourism development

### **5. Conclusion**

The meeting successfully established the institutional and conceptual foundations for implementing Natural Capital Accounting in Krabi Province. It highlighted the urgency of balancing economic growth—particularly tourism—with environmental sustainability. Moving forward, the effective integration of NCA into policy and planning processes will be essential to support resilient, inclusive, and sustainable development in the province

[See Appendix 2](#)

Figure 1 Project Steering Committee “Natural Capital Accounting for Tourism and Water Management Sectors of Krabi Province” No. 1/2023 (3 July 2023)



### **3. Summary of Key Discussion Points from the Project Steering Committee meeting “Natural Capital Accounting for Tourism and Water Management Sectors of Krabi Province” No. 1/2025**

Meeting Minutes Provincial Working on the development of a natural capital account system for the tourism and water management sectors Krabi province No.1/2025 on **24 July 2025**, 09.30 a.m.– 12.00 p.m. at Centara Ao Nang Beach Resort & Spa Krabi, Krabi Thailand.

#### **1. Background**

The meeting was convened under the project “Integration of Natural Capital Accounting (NCA) in Public and Private Sector Policy and Decision-making for Sustainable Landscapes”, supported by GEF and implemented by UNEP, with ONEP as the executing agency and TDRI as the technical partner.

The objective is to integrate natural capital into policy-making, planning, and budgeting processes in key sectors—particularly tourism and water management—while strengthening biodiversity conservation and ecosystem service sustainability.

#### **2. Key Outcomes**

##### **2.1 Recognition of Environmental Challenges**

The meeting highlighted critical environmental and resource management challenges in Krabi, including:

- Declining forest cover (approximately 7.19%) and expansion of monoculture crops
- Insufficient water storage due to geographic conditions
- Seasonal water shortages and increasing wastewater generation
- Limited acceptance of wastewater treatment infrastructure by local communities

These challenges underline the need for integrated resource management and stronger community engagement.

##### **2.2 Progress in Natural Capital Accounting (NCA) Development**

The Working Group acknowledged progress in developing an NCA system aligned with the UN SEEA framework, including:

- Ecosystem extent and condition assessments
- Valuation of ecosystem services in both physical and monetary terms
- Development of ecosystem asset accounts
- Analysis of ecosystem changes using satellite data (2016–2020), showing declining natural ecosystems

The study demonstrated the significant economic value of ecosystem services, particularly tourism-related services (e.g., marine tourism, diving activities).

## 2.3 Integration into Planning and Budgeting

The meeting emphasized the importance of integrating NCA into:

- Provincial development plans
- Tourism and water management plans
- National-level planning and budgeting processes (e.g., NESDC, Budget Bureau)

NCA is expected to help shift policy priorities by quantifying environmental value in monetary terms, thereby improving resource allocation efficiency.

## 2.4 Development of Supporting Analytical Tools

Key analytical tools under development include:

- Tourism Satellite Account (TSA): linking tourism revenue with ecosystem values
- Water Satellite Account: capturing water supply, demand, and wastewater dynamics

These tools provide a stronger evidence base for managing tourism growth and water resource sustainability.

## 2.5 Ecosystem Conservation and Restoration Efforts

The meeting noted collaboration with partners (e.g., Enlive Foundation) to:

- Restore degraded ecosystems (approx. 40,000 hectares)
- Support coral reef and seagrass conservation
- Promote community participation in resource management

## 2.6 Consideration of Market-Based Instruments (MBIs)

The meeting discussed potential market-based mechanisms to support sustainable financing, including:

- Pay-as-you-throw waste systems
- Beachfront land tax or environmental fees
- Subsidies for small-scale wastewater treatment systems
- Tourist donation or environmental contribution schemes

However, implementation constraints were identified, particularly legal limitations and potential impacts on the private sector.

# 3. Key Issues and Recommendations

## 3.1 Strengthening Water and Wastewater Management

- Develop integrated wastewater management systems across the value chain (collection–treatment–reuse)
- Address gaps between infrastructure availability and actual utilization
- Improve acceptance of wastewater treatment systems through community outreach and awareness

### 3.2 Enhancing Policy Integration and Use of Data

- Ensure NCA data is accessible, standardized, and usable at the provincial level
- Integrate NCA into budget justification and decision-making processes
- Translate technical outputs into user-friendly formats (e.g., local language reports)

### 3.3 Improving Market-Based Instruments Design

- Ensure legal feasibility and regulatory compliance
- Design incentive-based mechanisms rather than punitive measures
- Promote private sector participation, including cost-sharing and co-investment

### 3.4 Strengthening Private Sector and Stakeholder Engagement

- Enhance collaboration with hotel operators and business associations
- Address inefficiencies in waste collection and management systems
- Establish clear communication channels between public and private sectors

### 3.5 Promoting Sustainable Tourism Practices

- Encourage resource efficiency measures (e.g., wastewater reuse, zero waste practices)
- Align tourism growth with ecosystem carrying capacity
- Ensure that tourism revenues contribute to environmental management and conservation

## 4. Follow-up Actions

### 4.1 Immediate Actions

#### 1. Refinement of NCA Outputs

- Improve clarity, accessibility, and localization (e.g., Thai-language outputs)
- Finalize ecosystem accounts and valuation results

#### 2. Revision of Market-Based Instruments (MBIs)

- TDRI to incorporate stakeholder feedback and reassess feasibility
- Ensure mechanisms are legally compliant and economically viable

### 4.2 Short- to Medium-Term Actions

#### 1. Strengthen Wastewater and Waste Management Systems

- Improve integration between collection, treatment, and disposal systems
- Expand support for decentralized wastewater treatment solutions
- Explore reuse of treated wastewater to enhance resource efficiency

#### 2. Capacity Building and Awareness Raising

- Conduct community engagement to improve acceptance of infrastructure projects
- Provide training for local authorities and private sector operators

### 3. Enhance Data Integration and Policy Linkages

- Link NCA data with provincial planning tools (TSA, water accounts)
- Support evidence-based budgeting and investment planning

## 4.3 Long-Term Strategic Actions

### 1. Institutionalization of NCA

- Embed NCA into formal planning and budgeting systems at provincial and national levels
- Establish long-term data governance and coordination mechanisms

### 2. Development of Sustainable Financing Mechanisms

- Scale up MBIs and environmental financing tools
- Ensure revenues from tourism are reinvested into ecosystem conservation

### 3. Integrated Natural Resource Management

- Restore degraded ecosystems and improve watershed management
- Balance economic activities (e.g., agriculture, tourism) with ecological sustainability

## 5. Conclusion

The meeting reaffirmed that Natural Capital Accounting is a critical tool for supporting sustainable development in Krabi Province. By linking environmental assets with economic value, NCA enables more informed policy decisions, improved resource allocation, and stronger collaboration among stakeholders.

Effective implementation will require continued efforts to strengthen data systems, institutional coordination, stakeholder engagement, and sustainable financing mechanisms to ensure long-term environmental and economic resilience.

See Appendix 3

Figure 2 Project Steering Committee “Natural Capital Accounting for Tourism and Water Management Sectors of Krabi Province” No. 1/2025 (24 July 2025)



## **4. Summary of Key Discussion Points from the Project Steering Committee meeting “Natural Capital Accounting for Tourism and Water Management Sectors of Krabi Province” No. 1/2026**

Meeting Minutes Provincial Working on the development of a natural capital account system for the tourism and water management sectors Krabi province No.1/2026 on **20 January 2026**, 09.30 a.m.– 13.00 p.m. at Deevana Plaza Krabi Aonang, Krabi, Thailand.

### **1. Background**

The meeting was convened under the GEF-6 supported project “Integration of Natural Capital Accounting (NCA) in Public and Private Sector Policy and Decision-making for Sustainable Landscapes”, implemented by UNEP, with the Office of Natural Resources and Environmental Policy and Planning (ONEP) as the executing agency and the Thailand Development Research Institute (TDRI) as the technical partner.

The project aims to integrate natural capital considerations into policy-making, planning, and investment decisions, particularly in the tourism and water resource sectors, to reduce pressures on biodiversity and ecosystem services while supporting sustainable economic growth.

### **2. Key Outcomes**

#### **2.1 Institutional and Technical Progress**

The Working Group acknowledged substantial progress in establishing Natural Capital Accounts (NCA) aligned with the UN SEEA-EA framework, including:

- Ecosystem Extent Account
- Ecosystem Condition Account
- Ecosystem Services Flow Accounts (physical and monetary)
- Ecosystem Asset Account

These accounts provide an integrated evidence base linking ecosystem conditions with economic performance, particularly tourism revenues and water resource sustainability.

#### **2.2 Integration into Policy, Planning, and Budgeting**

Significant progress was noted in embedding NCA into:

- Tourism Satellite Accounts (TSA) and Water Resource Accounts (WRSA)
- Provincial development plans and budget allocation processes
- Strategic policy instruments, including Environmental Impact Assessment (EIA) and broader planning frameworks

The analysis demonstrated that:

Krabi generates approximately THB 100 billion annually from tourism, while Environmental management costs (e.g., wastewater management) remain relatively low (~THB 150 million/year), highlighting the economic rationale for investing in ecosystem protection.

### **2.3 Development of Market-Based Instruments (MBIs)**

The meeting discussed options for market-based instruments and agreed to prioritize a Payment for Ecosystem Services (PES) model, specifically:

- A bird-watching ecotourism initiative in Khlong Prasong Subdistrict
- Establishment of a Trust Fund to channel revenues toward conservation and community development
- Development of a digital platform for booking, data collection, and managing carrying capacity

This model aims to generate sustainable financing while promoting community participation and environmental stewardship.

### **2.4 Environmental Management and Capacity Building**

The meeting highlighted ongoing and planned efforts, including:

- Strengthening wastewater management systems in key tourism areas (Ao Nang, Phi Phi, Koh Lanta)
- Reviving and enhancing the provincial taskforce on waste and wastewater management
- Providing technical support and training to tourism operators, particularly small-scale enterprises
- Conducting water quality monitoring and ecosystem assessments.

## **3. Key Issues and Recommendations**

### **3.1 Strengthening Data and Scope of NCA**

- Expand NCA coverage to include groundwater and reservoir systems, which are critical for tourism and drought resilience
- Improve representation of watershed degradation and land-use impacts (e.g., monoculture agriculture)
- Enhance data integration for long-term resource planning

### **3.2 Enhancing Private Sector Engagement**

- Strengthen collaboration with hotel associations and tourism operators
- Introduce incentive mechanisms (e.g., environmental certification, recognition schemes)
- Combine regulatory enforcement with capacity-building measures

### **3.3 Improving Design of Market-Based Instruments**

- Ensure clear governance, transparency, and accountability in Trust Fund management
- Define allocation of revenues for conservation purposes
- Address legal and institutional constraints affecting implementation
- Assess tourism carrying capacity and environmental limits

### **3.4 Promoting Community Participation and Inclusiveness**

- Integrate existing community enterprises and local initiatives into new interventions
- Strengthen youth engagement through training, education, and alternative roles (e.g., citizen science)
- Ensure safety, continuity, and intergenerational knowledge transfer

### **3.5 Ensuring Balanced Development**

- Reinforce that tourism development must not exceed ecological limits
- Promote ecosystem-based approaches to planning and investment
- Strengthen protection of critical ecosystems (e.g., watersheds, coastal zones, bird habitats)

## **4. Follow-up Actions**

Revision of MBI Proposal, TDRI to revise the bird-watching PES model based on stakeholder feedback

See Appendix 4

**Figure 3 Project Steering Committee “Natural Capital Accounting for Tourism and Water Management Sectors of Krabi Province” No. 1/2026 (20 January 2026)**



## **5. Summary of Key Discussion Points from the Project Steering Committee meeting “Natural Capital Accounting for Tourism and Water Management Sectors of Krabi Province” No. 2/2026**

Meeting Minutes Provincial Working on the development of a natural capital account system for the tourism and water management sectors Krabi province No.2/2026 on **11 June 2026**, 11.00 a.m.– 16.00 p.m. at VEE Room, Varana Hotel, Krabi, Thailand.

### **1. Progress on the Development of Pilot Project Proposals for Krabi Province**

The Project Working Group (PWG) reviewed the draft pilot project proposals developed under the Integration of Natural Capital Accounting in Public and Private Sector Policy and Decision-making for Sustainable Landscapes (NCA) project. The proposals were prepared following the resolution of the first PWG meeting, which requested the project consultant to develop practical project templates that provincial authorities could incorporate into future annual budget planning.

#### **Five pilot projects were presented under two strategic themes:**

- Development of accessible nature-based tourism infrastructure through Universal Design principles;
- Environmental management and wastewater treatment in environmentally sensitive tourism areas.

The proposed projects aim to demonstrate how Natural Capital Accounting (NCA) information can be translated into practical investment projects that simultaneously strengthen biodiversity conservation, ecosystem restoration, sustainable tourism, and local economic development.

#### **Key Recommendations**

- The Chair encouraged all relevant agencies to proactively explore additional financing opportunities beyond the current project budget. Potential funding sources include local government budgets, environmental funds, and other national financing mechanisms to ensure continuity of project implementation after the completion of the NCA project.
- Representatives from the Krabi Hotel Association further recommended strengthening technical capacity by organizing regular training programmes for hotel owners and maintenance technicians on wastewater treatment systems. They also proposed conducting environmental compliance inspections twice annually to improve long-term operational standards among tourism operators.

#### **Follow-up Actions**

- TDRI will finalize the pilot project proposals for consideration by provincial authorities.
- The Provincial Office will consider integrating the proposed projects into future provincial annual budget plans.
- Relevant agencies will jointly identify complementary funding opportunities to support long-term implementation.
- Capacity-building programmes and periodic environmental inspections will be further explored in collaboration with local authorities and the private sector.

## 2. Progress of Component 2: Integration of Natural Capital Accounting into Provincial Planning

The Project Manager presented the overall implementation progress under Component 2 of the NCA project, highlighting significant achievements under the three project outputs.

For **Output 2.1**, the project successfully established the Provincial Working Group (PWG) and developed five Natural Capital Accounts for the tourism and water sectors following the SEEA-EA framework. These accounts provide an evidence-based foundation for assessing ecosystem extent, ecosystem condition, ecosystem services, and ecosystem asset values.

For **Output 2.2**, Natural Capital Accounting information has been integrated into provincial planning processes by linking ecosystem accounts with the Tourism Satellite Account (TSA) and Water Resources Satellite Account (WRSA). The information has also been introduced into provincial planning discussions through the Provincial Joint Public-Private Consultative Committee (นพว.) and technical focus group meetings. Furthermore, five pilot investment projects have been formulated to demonstrate practical applications of NCA information in provincial development planning.

For **Output 2.3**, the project has implemented several pilot initiatives aimed at mitigating environmental impacts and strengthening ecosystem conservation. These include piloting Market-Based Instruments (MBIs), supporting Green Fins environmental standards, organizing biodiversity conservation activities, providing technical guidance on small-scale wastewater treatment systems, and conducting field assessments of wastewater treatment facilities in Ao Nang and Phi Phi Island.

### Key Recommendations

The representative of the Krabi Hotel Association proposed adopting an integrated wastewater reuse model similar to the successful experience of Patong Municipality. Rather than relying solely on wastewater treatment fees, treated wastewater could be further purified through Reverse Osmosis (RO) technology and sold back to tourism operators.

The meeting acknowledged that such an approach could simultaneously:

- improve water security during peak tourism seasons;
- reduce operational costs for tourism businesses;
- generate sustainable revenue for wastewater treatment facilities; and
- strengthen circular economy practices while improving environmental performance.

The Patong experience was highlighted as a practical model demonstrating that wastewater management can evolve from a cost-recovery mechanism into a financially sustainable environmental service.

### Follow-up Actions

- TDRI will submit the final project completion report together with all technical outputs.
- ONEP, as the national executing agency, will circulate the final study results to Krabi Province and relevant government agencies for future policy application.

- Provincial agencies are encouraged to utilize the Natural Capital Accounting results as evidence to support provincial development planning, budgeting processes, Strategic Environmental Assessment (SEA), Environmental Impact Assessment (EIA), and future investment decision-making.
- Relevant authorities will further examine the feasibility of wastewater reuse and circular water management models for application in Krabi Province.

### **Overall Meeting Conclusions**


The Project Working Group acknowledged the substantial progress achieved under the NCA project and recognized Natural Capital Accounting as an effective evidence-based tool for supporting sustainable policy and investment decisions. Members agreed that the project has successfully translated ecosystem accounting information into practical policy recommendations and investment proposals, providing a solid foundation for integrating biodiversity conservation, sustainable tourism, water resource management, and provincial development planning.

The meeting concluded by requesting TDRI to submit the final study report and requesting ONEP to disseminate the project outputs to provincial agencies to facilitate their practical application in future planning, budgeting, and sustainable development initiatives.

Figure 4 Project Steering Committee “Natural Capital Accounting for Tourism and Water Management Sectors of Krabi Province” No. 2/2026 (5 June 2026)



**Appendix 1 Appointment of the inter-agency provincial working group for Krabi province (PWG): Project Steering Committee “Natural Capital Accounting for Tourism and Water Management Sectors of Krabi Province”**



ที่ กบ ๐๐๑๔.๒/ว ๒๑๑๐๕

ศาลากลางจังหวัดกระบี่  
๙/๑๐ ถนนอุตรกิจ กบ ๘๑๐๐๐

๘ พฤษภาคม ๒๕๖๖

เรื่อง แต่งตั้งคณะกรรมการจัดทำระบบบัญชีต้นทุนทางธรรมชาติภาคการท่องเที่ยวและภาคการจัดการน้ำ จังหวัดกระบี่  
เรียน รายชื่อตามบัญชีแนบท้าย


สิ่งที่ส่งมาด้วย สำเนาคำสั่งจังหวัดกระบี่ ที่ ๑๘๒๗ /๒๕๖๖  
ลงวันที่ ๙ พฤษภาคม พ.ศ. ๒๕๖๖

จำนวน ๓ แผ่น

จังหวัดกระบี่ ขอส่งสำเนาคำสั่งจังหวัดกระบี่ ที่ ๑๘๒๗ /๒๕๖๖ ลงวันที่ ๙ พฤษภาคม พ.ศ. ๒๕๖๖ เรื่อง แต่งตั้งคณะกรรมการจัดทำระบบบัญชีต้นทุนทางธรรมชาติภาคการท่องเที่ยวและภาคการจัดการน้ำ จังหวัดกระบี่ มาเพื่อทราบและปฏิบัติ ทั้งนี้ จะเชิญประชุมคณะกรรมการฯ อีกครั้งในโอกาสต่อไป

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ

  
(นายสมชาย หาญภักติปฐิตินา)  
รองผู้ว่าราชการจังหวัด ปฏิบัติราชการแทน  
ผู้ว่าราชการจังหวัดกระบี่

สำนักงานทรัพยากรธรรมชาติและสิ่งแวดล้อมจังหวัด  
โทร/โทรสาร ๐ ๗๕๖๒ ๒๗๘๗ ต่อ ๑๓

บัญชีแนบท้าย หนังสือที่ กบ ๐๐๑๔.๒/๖๒๑๙ ลงวันที่ ๘ พฤษภาคม ๒๕๖๖

๑. ผู้ว่าราชการจังหวัดกระบี่หรือรองผู้ว่าราชการจังหวัดกระบี่ที่ได้รับมอบหมาย
๒. หัวหน้าสำนักงานจังหวัดกระบี่
๓. ผู้อำนวยการสำนักงานทรัพยากรธรรมชาติและสิ่งแวดล้อมจังหวัดกระบี่
๔. พัฒนาการจังหวัดกระบี่
๕. ท้องเที่ยวและกีฬาจังหวัดกระบี่
๖. ท้องถิ่นจังหวัดกระบี่
๗. อุตสาหกรรมจังหวัดกระบี่
๘. โยธาธิการและผังเมืองจังหวัดกระบี่
๙. เกษตรและสหกรณ์จังหวัดกระบี่
๑๐. ประมงจังหวัดกระบี่
๑๑. เกษตรจังหวัดกระบี่
๑๒. พลังงานจังหวัดกระบี่
๑๓. สถิติจังหวัดกระบี่
๑๔. ผู้อำนวยการสำนักงานสิ่งแวดล้อมและควบคุมมลพิษที่ ๑๕ (ภูเก็ต)
๑๕. ผู้อำนวยการสำนักบริหารพื้นที่อนุรักษ์ที่ ๕ (นครศรีธรรมราช)
๑๖. ผู้อำนวยการโครงการชลประทานกระบี่
๑๗. ผู้อำนวยการสำนักจัดการทรัพยากรป่าไม้ที่ ๑๒ สาขากระบี่
๑๘. ผู้อำนวยการสำนักงานทรัพยากรทางทะเลและชายฝั่งที่ ๑๐ (กระบี่)
๑๙. ผู้อำนวยการสถานีพัฒนาที่ดินกระบี่
๒๐. รองผู้อำนวยการฝ่ายวิชาการ (วิชาอุตสาหกรรมท่องเที่ยว) วิทยาลัยเทคนิคกระบี่
๒๑. ผู้อำนวยการการท่องเที่ยวแห่งประเทศไทยสำนักงานกระบี่
๒๒. ผู้จัดการการประปาส่วนภูมิภาคสาขากระบี่
๒๓. ผู้จัดการการประปาส่วนภูมิภาคอำเภอคลองท่อม
๒๔. ผู้จัดการการประปาส่วนภูมิภาคอำเภออ่าวลึก
๒๕. นายกองค์การบริหารจังหวัดกระบี่
๒๖. นายกเทศมนตรีเมืองกระบี่
๒๗. ประธานสภาอุตสาหกรรมจังหวัดกระบี่
๒๘. ประธานคณะกรรมการบริหารหอการค้าจังหวัดกระบี่
๒๙. นายกสมาคมธุรกิจการท่องเที่ยวจังหวัดกระบี่
๓๐. นายกสมาคมโรงแรมจังหวัดกระบี่
๓๑. ประธานเครือข่ายอาสาสมัครพิทักษ์ทรัพยากรธรรมชาติและสิ่งแวดล้อมหมู่บ้านจังหวัดกระบี่
๓๒. ผู้อำนวยการกองจัดการความหลากหลายทางชีวภาพ สำนักงานนโยบายและแผนทรัพยากรธรรมชาติและสิ่งแวดล้อม
๓๓. ผู้จัดการโครงการมูลนิธิสถาบันวิจัยเพื่อการพัฒนาประเทศไทย



คำสั่งจังหวัดกระบี่  
ที่ ๑๗๒๗ / ๒๕๖๖

เรื่อง แต่งตั้งคณะกรรมการจัดทำระบบบัญชีต้นทุนทางธรรมชาติ ภาคการท่องเที่ยวและภาคการจัดการน้ำ  
จังหวัดกระบี่

ด้วยจังหวัดกระบี่ได้รับคัดเลือกเป็นพื้นที่นำร่องดำเนินโครงการ Integration of Natural Capital Accounting in public and private sector policy and decision-making for sustainable landscapes ซึ่งได้รับการสนับสนุนงบประมาณจากกองทุนสิ่งแวดล้อมโลก และมีสำนักงานนโยบายและแผนทรัพยากรธรรมชาติและสิ่งแวดล้อม หรือ สผ. เป็นหน่วยงานเจ้าของโครงการ (Executing Agency) และมีโครงการสิ่งแวดล้อมแห่งสหประชาชาติ (United Nations Environment Programme หรือ UNEP) เป็นหน่วยงานบริหารโครงการ (Implementing Agency) เพื่อสนับสนุนการนำระบบบัญชีต้นทุนทางธรรมชาติ ซึ่งเป็นกลไกการประเมินมูลค่าทรัพยากรความหลากหลายทางชีวภาพและระบบนิเวศมาใช้ในประเทศไทย โดยมุ่งเน้นในภาคการท่องเที่ยวและการจัดการน้ำ และนำไปบูรณาการสู่การจัดทำนโยบาย มาตรการ ทั้งในระดับชาติและระดับท้องถิ่น เพื่อส่งเสริมการใช้ประโยชน์ทรัพยากรความหลากหลายทางชีวภาพและบริการจากระบบนิเวศอย่างยั่งยืน

เพื่อให้การดำเนินโครงการ Integration of Natural Capital Accounting in public and private sector policy and decision-making for sustainable landscapes ในระดับจังหวัดดำเนินไปด้วยความเรียบร้อยและมีประสิทธิภาพ จึงแต่งตั้งคณะกรรมการจัดทำระบบบัญชีต้นทุนทางธรรมชาติภาคการท่องเที่ยวและภาคการจัดการน้ำ จังหวัดกระบี่ เพื่อจัดทำระบบบัญชีต้นทุนทางธรรมชาติ จังหวัดกระบี่ โดยมีองค์ประกอบหน้าที่และอำนาจ ดังนี้

๑. องค์ประกอบ

- |   |                  |
|---|------------------|
| (๑) ผู้ว่าราชการจังหวัดกระบี่<br>หรือรองผู้ว่าราชการจังหวัดกระบี่ที่ได้รับมอบหมาย | ประธานคณะกรรมการ |
| (๒) หัวหน้าสำนักงานจังหวัดกระบี่ หรือผู้แทน                                       | คณะกรรมการ       |
| (๓) ผู้อำนวยการสำนักงานทรัพยากรธรรมชาติและ<br>สิ่งแวดล้อมจังหวัดกระบี่ หรือผู้แทน | คณะกรรมการ       |
| (๔) พัฒนาการจังหวัดกระบี่ หรือผู้แทน  | คณะกรรมการ       |
| (๕) ท่องเที่ยวและกีฬาจังหวัดกระบี่ หรือผู้แทน                                     | คณะกรรมการ       |
| (๖) ท้องถิ่นจังหวัดกระบี่ หรือผู้แทน  | คณะกรรมการ       |
| (๗) อุตสาหกรรมจังหวัดกระบี่ หรือผู้แทน  | คณะกรรมการ       |
| (๘) โยธาธิการและผังเมืองจังหวัดกระบี่ หรือผู้แทน                                  | คณะกรรมการ       |
| (๙) เกษตรและสหกรณ์จังหวัดกระบี่ หรือผู้แทน  | คณะกรรมการ       |
| (๑๐) ประมงจังหวัดกระบี่ หรือผู้แทน  | คณะกรรมการ       |
| (๑๑) เกษตรจังหวัดกระบี่ หรือผู้แทน  | คณะกรรมการ       |
| (๑๒) ปลัดงานจังหวัดกระบี่ หรือผู้แทน  | คณะกรรมการ       |

(๑๓) สนิติ...

(๑๓) สติติจังหวัดกระบี่ หรือผู้แทน	คณะทำงาน
(๑๔) ผู้อำนวยการสำนักงานสิ่งแวดล้อม และควบคุมมลพิษที่ ๑๕ (ภูเก็ต) หรือผู้แทน	คณะทำงาน
(๑๕) ผู้อำนวยการสำนักบริหารพื้นที่อนุรักษ์ที่ ๕ (นครศรีธรรมราช) หรือผู้แทน	คณะทำงาน
(๑๖) ผู้อำนวยการโครงการชลประทานกระบี่ หรือผู้แทน	คณะทำงาน
(๑๗) ผู้อำนวยการสำนักจัดการทรัพยากรป่าไม้ที่ ๑๒ สาขากระบี่ หรือผู้แทน	คณะทำงาน
(๑๘) ผู้อำนวยการสำนักงานทรัพยากรทางทะเล และชายฝั่งที่ ๑๐ (กระบี่) หรือผู้แทน	คณะทำงาน
(๑๙) ผู้อำนวยการสถานีพัฒนาที่ดินกระบี่ หรือผู้แทน	คณะทำงาน
(๒๐) รองผู้อำนวยการฝ่ายวิชาการ (วิชาอุตสาหกรรม ท่องเที่ยว) วิทยาลัยเทคนิคกระบี่ หรือผู้แทน	คณะทำงาน
(๒๑) ผู้อำนวยการการท่องเที่ยวแห่งประเทศไทย สำนักงานกระบี่ หรือผู้แทน	คณะทำงาน
(๒๒) ผู้จัดการการประปาส่วนภูมิภาคสาขากระบี่ หรือผู้แทน	คณะทำงาน
(๒๓) ผู้จัดการการประปาส่วนภูมิภาคอำเภอคลองท่อม หรือผู้แทน	คณะทำงาน
(๒๔) ผู้จัดการการประปาส่วนภูมิภาคอำเภออ่าวลึก หรือผู้แทน	คณะทำงาน
(๒๕) นายองค์การบริหารส่วนจังหวัดกระบี่ หรือผู้แทน	คณะทำงาน
(๒๖) นายกเทศมนตรีเมืองกระบี่ หรือผู้แทน	คณะทำงาน
(๒๗) ประธานสภาอุตสาหกรรมจังหวัดกระบี่ หรือผู้แทน	คณะทำงาน
(๒๘) ประธานคณะกรรมการบริหารหอการค้า จังหวัดกระบี่ หรือผู้แทน	คณะทำงาน
(๒๙) นายสมาคมธุรกิจการท่องเที่ยวจังหวัดกระบี่ หรือผู้แทน	คณะทำงาน
(๓๐) นายสมาคมโรงแรมจังหวัดกระบี่ หรือผู้แทน	คณะทำงาน
(๓๑) ประธานเครือข่ายอาสาสมัครพิทักษ์ทรัพยากร ธรรมชาติและสิ่งแวดล้อมหมู่บ้านจังหวัดกระบี่ หรือผู้แทน	คณะทำงาน
(๓๒) ผู้อำนวยการกองจัดการความหลากหลายทางชีวภาพ สำนักงานนโยบายและแผนทรัพยากรธรรมชาติและ สิ่งแวดล้อม	คณะทำงาน และเลขานุการ
(๓๓) ผู้จัดการโครงการ มูลนิธิสถาบันวิจัยเพื่อการพัฒนาประเทศไทย	คณะทำงานและ เลขานุการ

๗๓. อำนาจหน้าที่...

## ๒. อำนาจหน้าที่

๑. ประสานการดำเนินงานและสร้างเครือข่ายความร่วมมือ รวมถึงการสื่อสารที่ถูกต้องระหว่างหน่วยงานที่เกี่ยวข้อง ทั้งภาครัฐ ภาคเอกชน และภาคประชาสังคม เพื่อดำเนินการจัดทำระบบบัญชีต้นทุนทางธรรมชาติสำหรับภาคการท่องเที่ยวและภาคการจัดการน้ำ จังหวัดกระบี่ ให้เป็นไปอย่างมีประสิทธิภาพ

๒. ให้ข้อคิดเห็นและข้อเสนอแนะเชิงวิชาการ ข้อมูลด้านเทคนิค รวมทั้งข้อมูลที่เป็นประโยชน์ในการจัดทำระบบบัญชีต้นทุนทางธรรมชาติสำหรับภาคการท่องเที่ยวและภาคการจัดการน้ำ จังหวัดกระบี่

๓. กำกับดูแล และติดตามความก้าวหน้าการจัดทำระบบบัญชีต้นทุนทางธรรมชาติสำหรับภาคการท่องเที่ยวและภาคการจัดการน้ำจังหวัดกระบี่ และการดำเนินงานที่เกี่ยวข้องให้เป็นไปอย่างมีประสิทธิภาพ รวมถึงให้คำแนะนำในการปฏิบัติให้ถูกต้องตามกฎหมาย ระเบียบ และข้อบังคับของทางราชการที่เกี่ยวข้อง

๔. กำกับดูแลการดำเนินความร่วมมือหรือความตกลงระหว่างภาครัฐและภาคเอกชนเพื่อบรรลุเป้าหมายการฟื้นฟูต้นทุนทางธรรมชาติ (Natural Capital) ในจังหวัดกระบี่

๕. ปฏิบัติหน้าที่อื่นตามที่ผู้ว่าราชการจังหวัดกระบี่มอบหมาย

ทั้งนี้ ตั้งแต่บัดนี้เป็นต้นไป

สั่ง ณ วันที่ ๕ พฤษภาคม พ.ศ. ๒๕๖๖

  
(นายภาสกร บุญญลักษม์)  
ผู้ว่าราชการจังหวัดกระบี่

## **Appendix 2 Meeting Minutes Project Steering Committee “Natural Capital Accounting for Tourism and Water Management Sectors of Krabi Province” No. 1/2023**

Meeting Minutes Provincial Working on the development of a natural capital account system for the tourism and water management sectors Krabi province No.1/2023 on 3 July 2023, 09.30 a.m.– 12.00 p.m. at the Pineapple Hotel Krabi, Krabi Thailand.

### **Working group attending the meeting**

1. Mr.Somchai Harnpakdeepatima Chairman of the Project Steering Committee Deputy Governor of Krabi Province
2. Mr.Wirujathep Ratchakarnwong Committee Member  
Director of Provincial Strategy and Development Group  
Representative from Office of Krabi Province
3. Mr.Paktipong Soontornworn Committee Member  
Director of Krabi Provincial Office of Natural Resources and Environment  
Representative from Krabi Provincial Office of Natural Resources and Environment
4. Mr.Pratin Kheiwput Committee Member  
Director of Community Strategy and Development Group  
Representative from Office of Krabi Community Development
5. Miss Nittida Kao-kum Committee Member  
Representative from Office of Provincial Tourism and Sports
6. Mr.Sivakorn Sukthong Committee Member  
Policy and Planning Analyst and Specialist  
Representative from Office of Provincial Industry
7. Mrs.Rutairat Jaisuk Committee Member  
City Planning Specialist  
Representative from Office of Public Works and City Planning
8. Mr.Pairat Singhakom Committee Member  
City Planning Staff  
Representative from Office of Public Works and City Planning
9. Mrs.Kanyanee Sitthipaisarn Committee Member  
Policy and Planning Analyst and Specialist  
Representative from Krabi Provincial Agricultural and Cooperatives Office
10. Mrs.Jeerawan Sritong Committee Member  
Fisheries Specialist  
Representative from Krabi Provincial Fisheries Office
11. Miss Katewarin Suwanrit Committee Member  
Agricultural Operation Promotion Specialist  
Representative from Krabi Provincial Agriculture Office

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| <p>12. Mr.Nattapong Peandee<br/>Energy Specialist<br/>Representative from Krabi Provincial Energy Office</p>   | <p>Committee Member</p> |
| <p>13. Mrs.Anchalika Wangwiset<br/>Statistical Operation Specialist<br/>Representative from Office of Krabi Provincial Statistics</p>  | <p>Committee Member</p> |
| <p>14. Mr.Anuchart Art-harn<br/>Assistant Head of Lanta Archipelago National Park<br/>Representative from Office of Conservation Management Area 5 (Nakhon Srithammarat)</p> | <p>Committee Member</p> |
| <p>15. Mr.Theerapong Eng-Chung<br/>Irrigational Operation Engineer<br/>Representative from Krabi Irrigational Project</p>  | <p>Committee Member</p> |
| <p>16. Miss Patcharamai Sommalon<br/>Forestry Operation Specialist<br/>Representative from Office of Forestry Resources Management Area 12 (Krabi Branch)</p>                | <p>Committee Member</p> |
| <p>17. Mr.Paiboon Hoybang<br/>Forestry Specialist<br/>Representative from Office of Marine and Coastal Resources Area 10 (Krabi)</p>   | <p>Committee Member</p> |
| <p>18. Mr.Wanchai Suparp<br/>Agricultural Specialist<br/>Representative from Krabi Land Development Station</p>  | <p>Committee Member</p> |
| <p>19. Miss Sukesorn Choosawat<br/>Deputy Director of Academic (Tourism Industry)<br/>Representative from Krabi Technical College</p>  | <p>Committee Member</p> |
| <p>20. Mr.Armarn Mad-adam<br/>Director of Tourism Authority of Thailand Krabi Office<br/>Representative from Tourism Authority of Thailand Krabi Office</p>                  | <p>Committee Member</p> |
| <p>21. Mrs.Nujnapa Pinthong<br/>Manager of Krabi Provincial Water Authority<br/>Representative from Krabi Provincial Water Authority</p>                                     | <p>Committee Member</p> |
| <p>22. Mrs.Pensri Chatipanee<br/>Manager of Khlong Thom Provincial Water Authority<br/>Representative from Khlong Thom District Provincial Water Authority</p>               | <p>Committee Member</p> |
| <p>23. Mrs.Puangpet Suko<br/>Manager of Ao Luek Provincial Water Authority<br/>Representative from Ao Luek District Provincial Water Authority</p>                           | <p>Committee Member</p> |

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| <p>24. Mrs.Kanlaya Chailake<br/>Head of Tourism Promotion<br/>Representative of Krabi Provincial Local Administrative Organization</p>   | <p>Committee Member</p>   |
| <p>25. Mr.Sootchai Tien-gingkaew<br/>Civil Engineering Specialist<br/>Representative from Krabi Municipal</p>  | <p>Committee Member</p>   |
| <p>26. Mr.Weerapas Chan-tarow<br/>Deputy Chairman of Krabi Chamber of Commerce<br/>Representative from Krabi Chamber of Commerce Committee</p>   | <p>Committee Member</p>   |
| <p>27. Miss Wichupun Poo-kao-luan<br/>President of Krabi Hotel Association<br/>Representative of Krabi Hotel Association</p>   | <p>Committee Member</p>   |
| <p>28. Major Dr.Jehason Yala<br/>President of Krabi Provincial “Natural Resources and Environmental<br/>Protection Volunteer (NEV)”<br/>Representative from Krabi Provincial NEV Network</p> | <p>Committee Member</p>   |
| <p>29. Mr.Weewrapas Chan-tarow<br/>Vice President of Krabi Hotel Association<br/>Representative of Krabi Hotel Association</p>   | <p>Committee Member</p>   |
| <p>30. Miss Wichupun Poo-kao-luan<br/>President of Krabi Hotel Association<br/>Representative of Krabi Hotel Association</p>   | <p>Committee Member</p>   |
| <p>31. Miss Jittinun Ruengveerayudh<br/>Director of Biodiversity Management Division and Secretariat of Office<br/>of Natural Resources and Environmental Policy and Planning</p>            | <p>Committee Member</p>   |
| <p>32. Miss Benjamaporn Wattanatongchai<br/>Environmentalist - Senior Professional Level<br/>Office of Natural Resources and Environmental Policy and Planning</p>                           | <p>Committee Member<br/>and Assistant Secretary</p>                   |
| <p>33. Associate Professor Adis Isrankura</p>  | <p>Committee Member<br/>Project Manager and Assistant Secretariat</p> |

**Meeting Participants**

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| <p>1. Mr.Chakis Pitak-rattanasakul</p>   | <p>GISTDA</p> |
| <p>2. Mrs.Thippawan Keawmesri</p>  | <p>TDRI</p>   |
| <p>3. Miss Karnjana Yasen</p>  | <p>TDRI</p>   |
| <p>Officials from Office of Natural Resources and Environment Policy and Planning (ONEP)</p> |               |
| <p>1. Miss Somwan Sukprasert</p>   |               |
| <p>2. Mr. Ratchanon Chaba</p>  |               |
| <p>Meeting starts 09.30 a.m.</p>   |               |

The objectives of the meeting for the Project Steering Committee (PSC) of “Natural Capital Accounting in Tourism and Water Management Sectors, Krabi Province” 1/2023 are to announce the appointment of Project Steering Committee for Natural Capital Accounting in Tourism and Water Management Sectors of Krabi Province, presenting the big picture of Integration of Natural Capital Accounting in Public and Private Sector Policy and Decision-making for Sustainable Landscapes (NCA) and examining the conceptual framework for Natural Capital Accounting which in the meeting Mr. Somchai Harnpakdeepatima, the Deputy Governor of Krabi Province has been assigned by the Governor of Krabi Province to be the Chairman of the Project Steering Committee, and representatives from the related 32 agencies attending as PSC, and with representatives from Office of the Natural Resources and Environmental Policy and Planning (ONEP) and Thailand Development Research Institute (TDRI) as PSC Secretariat.

In summary the result of the PWG meeting are as follows:

NCA has the objective of integration of natural capital accounting into the policy preparation and implementation of the main economic sectors both at the local and the national levels, and to enhance the protection and mitigation the impact of the production sector on the biodiversity and ecosystem service with ONEP as the Executing Agency, United Nations Environment Programme (UNEP) as the GEF Agency, and TDRI as the Lead Service Provider.

The implementation of NCA Project at the local level has prepared the study of natural capital for the tourism and water management sectors of Krabi Province because it is a significant area as the head water covering onto the marine and coastal areas which is crucial for the livelihood of the local population, and also a major tourism destination of the country. Hence on 15th November 2022, ONEP has consulted with the Deputy Governor of Krabi (Mr.Anuwat Modepring) and Krabi ONEP on the set up of PSC for Natural Capital Accounting of Tourism and Water Management locally to coordinate the implementation, technical information dissemination, and monitoring the progress in the preparation of natural capital accounting for the tourism and water management sector in the province which was endorsed and signed by the Governor of Krabi for the set up of the PSC on 8th May 2023.

The conceptual framework of the natural capital accounting is the conceptual framework derived from The United Nations System of Environmental-Economic Accounting (UN SEEA) which comprises of (1) Central Framework (CF) or UN SEEA CF, and (2) Ecosystem Accounting (EA) or UN SEEA EA; of which the UN SEEA CF is the framework to study the benefits of each natural resource on the economic unit (the economic unit samples are household, communities, shops, factories, firms, and governmental agencies, etc.) both in the form of non-monetary benefits and in monetary value, including the relationship between the natural resources and the economic units. On the other hand, The UN SEEA EA shall view the entire ecosystem holistically and focuses on the study of services from the ecosystems on the economic units, both in the forms of non-monetary benefits and in monetary value, which this framework emphasises the study and preparation of information on location and quality of the ecosystem understudied. The conceptual framework of natural capital accounting shall employ the concept of both framework integratedly, by defining each natural resource, each ecosystem and natural process as the “Natural Capital” or “Stock”, benefits from the natural resources, ecosystem services, and benefits

from the natural process as “Flow”, and then use the economic tools to calculate such benefits to the economic unit into the monetary term. This conceptual framework shall also take into account the impacts from the economic activities on the natural capital.

PSC in the first meeting of 2023 on the 3rd of July 2023 reviewed the conceptual framework of the natural capital accounting of Krabi province, both in tourism and water management sectors by exchanging information and opinion, especially the information on the use of municipal water supply, economic crops, tourism, disguised population, as well as the information of significant ecosystems such as seagrasses. In addition, the PSC has recommendations, opinions, and presentation of problems and obstacles as follows:

4.1) Opinion on the natural capital in tourism sector : PSC has conferred about the problem of overwhelming numbers of tourists beyond the travel destination capacity causing the degradation of its ecosystem, which the data of tourist number from public and private sectors in the tourism sector of Krabi together with the real-time data from Government Big Data Institute (GBDi) shall be the basic information for assessing the economic value of the ecosystem in the travel destination. In addition PSC recommend that NCA project should consider the data of major ecosystem in the travel destination as well, e.g. data of seagrasses from the Department of Marine and Coastal Resources in assessing the economic value of marine and coastal ecosystem in Krabi with detail as follows:

4.1.1) The project should also utilise the information from the similar projects undertaken in the Krabi Province area, e.g. projects of Department of Groundwater Resources, and Department of Marine and Coastal Resources to assess the ecosystem value, etc.

4.1.2) In addition to collaborating to obtain data from the concerned agency, the project should mainly obtain information from Office of Statistics in Krabi (OSK) and GBDi as OSK has the mission in compiling the various and diverse data for the provincial development planning while the GBDi has compiled various data in real-time which shall be beneficial to the project implementation.

4.1.3) The completion of this project shall be beneficial significantly to Krabi Province as the data on value of natural resources in Krabi would support the decision making of the province, especially the option to conserve or develop the area. For area development, if the assessment deem appropriate for economic and social development, the province could prepare for city planning before its transformation into a densely populated community, to be an orderly community in the future.

4.2) Opinion on the natural capital in the water management sector : PSC has conferred about the inadequate fresh water sources in some areas of Krabi Province, e.g. Phi Phi Islands which do not have public water supply. The public and enterprises have to utilise water from the private basin and groundwater source. During drought periods, water purchase from the mainland is required and costly. PSC therefore would like NCA to compile data on sources and quantity of groundwater, public water supply and water utilisation of economic crops to assess the economic value of fresh water resources in the province with details as follows:

4.2.1) Some areas in Krabi Province, especially in the island areas, e.g. Phi Phi Islands, have no public water supply except groundwater and private water basins which are quite costly. During the drought period,

several enterprises on the island need to purchase water from the mainland which is also costly. Therefore upon the project completion, data of natural resources in monetary value shall be used to assess the feasibility of water piping from the mainland connecting various islands similar to laying underwater-cable for high-voltage power supply connecting various islands in the southern region and the mainland.

4.2.2) The Director of Biodiversity Management, ONEP as the secretariat of the PSC has addressed various projects undertaken by ONEP in the Krabi area, e.g. the migration birds project, projects with support from the Environmental Fund, implementation of environmental protection areas, and the climate change project, all have interconnecting effect and shall create the conservation and sustainable development in the Krabi Province comprehensively and effectively.

Hence, NCA project is under data compiling period as suggested by the PSC and expected to present the data compilation in the form of conceptual framework for natural capital accounting during the kick-off meeting tentatively on the 18th August 2023 at the Marriott Bangkok Hotel Sukhumvit.

Meeting ends 12.00 PM

### **Appendix 3 Meeting Minutes Project Steering Committee “Natural Capital Accounting for Tourism and Water Management Sectors of Krabi Province” No. 1/2025**

Meeting Minutes Provincial Working on the development of a natural capital account system for the tourism and water management sectors Krabi province No.1/2025 on **24 July 2025**, 09.30 a.m.– 12.00 p.m. at Centara Ao Nang Beach Resort & Spa Krabi, Krabi Thailand.

#### **Working group attending the meeting**

1. Mr.Nithiwut Raviwan Chairman of the Working Group  
Director of Provincial Office of Natural Resources and Environment Krabi  
Representative of the Governor of Krabi Province
2. Ms. Harinloj Songbandit Working Group  
Director of Strategic planning subdivision  
Representative of Krabi Governor’s Office
3. Mr.Surachai Kulthong Working Group  
Director of Environmental Division  
Representative of the Director of Provincial Office of Natural Resources and Environment Krabi
4. Mr. Chaninthorn Saradit Working Group  
Community Development Specialist  
Representative of the Provincial Community Development Office of Krabi
5. Mr. Sadit Chitchaeng Working Group  
Plan and Policy Analyst, Practitioner Level  
Representative of the Krabi Provincial Office of Tourism and Sports
6. Ms. Sukanya Sornsarun Working Group  
Industrial Analyst  
Representative of the Krabi Provincial Industry Office
7. Mrs. Benchawan Saengsrichan Working Group  
Plan and Policy Analyst, Professional Level  
Representative of the Krabi Provincial Agriculture and Cooperatives Office
8. Ms. Thanitha Buama Working Group  
Agricultural Extensionist, Professional Level  
Representative of the Krabi Provincial Agriculture and Cooperatives Office
9. Ms. Anchanlika Wangwiset Working Group  
Statistician, Professional Level  
Representative of the Krabi Provincial Statistical Office
10. Mr. Warawit Chitrua Working Group  
Forestry Technical Officer, Practitioner Level Hat Noppharat Thara–Mu Ko Phi Phi National Park  
Representative of Director of the Regional Environment and Conservation Office V (Nakhon Si Thammarat)

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| <p>11. Mr. Theera Chayajet<br/>Irrigation Technician, Senior Level<br/>Representative of Director of Krabi Irrigation Project</p>   | <p>Working Group</p> |
| <p>12. Mr. Somsak Senee<br/>Senior Forestry Officer<br/>Representative of Director of Forest Resource Management Office 12, Krabi Branch</p>  | <p>Working Group</p> |
| <p>13. Ms. Piyawan Homsa<br/>General Administration Officer<br/>Representative of Director of Marine and Coastal Resources Office 10.</p>   | <p>Working Group</p> |
| <p>14. Ms. Supa Omchit<br/>Agricultural Research Officer, Professional Level.<br/>Representative of Director of Krabi Land Development Station.</p>                                     | <p>Working Group</p> |
| <p>15. Mr. Phongsak Limkrueyan<br/>Head of Tourism Department<br/>Representative of Deputy Director of Academic Affairs (Tourism Industry) Krabi Technical College</p>                  | <p>Working Group</p> |
| <p>16. Ms. Soraya Homchuen<br/>Director of the Tourism Authority of Thailand (TAT), Krabi Office</p>  | <p>Working Group</p> |
| <p>17. Mr. Charoen Sesal<br/>Water Production Supervisor 7<br/>Representative of the Manager of Provincial Waterworks Authority, Klong Thom Branch</p>                                  | <p>Working Group</p> |
| <p>18. Ms. Orrawan Chuthong<br/>Representative of Mayor of the Krabi Provincial Administrative Organization</p>   | <p>Working Group</p> |
| <p>19. Ms. Watcharawalee Kaewpaksa<br/>Tourism Development Officer. Tourism and Sports Division<br/>Representative of Mayor of Krabi City Municipality</p>                              | <p>Working Group</p> |
| <p>20. Mr. Prasan Lohajareekun<br/>Vice Chairman of the Krabi Provincial Chamber of Commerce<br/>Representative of Chairman of the Executive Board of the Krabi Chamber of Commerce</p> | <p>Working Group</p> |
| <p>21. Mr. Akara Sriraksa<br/>Vice President of the Krabi Hotel Association<br/>Representative of President of the Krabi Hotel Association</p>  | <p>Working Group</p> |
| <p>22. Mrs. Katunchalee Thammakul<br/>Director of Biodiversity Management Division and secretariat<br/>Office of Natural Resources and Environmental Policy and Planning</p>            | <p>Working Group</p> |
| <p>23. Mr. Adis Israngkura<br/>Project Manager and secretariat assistant<br/>Thailand Development Research Institute</p>  | <p>Working Group</p> |

### **Non-attendance**

1. Provincial Office for Local Administration, Krabi Working Group
2. Krabi Office of Public Works and Town & Country Planning Working Group
3. Krabi Provincial Energy Office Working Group
4. Krabi Provincial Fisheries Office Working Group
5. Manager of the Provincial Waterworks Authority, Krabi Branch Working Group
6. Manager of the Provincial Waterworks Authority, Ao Luek Branch Working Group
7. President of Krabi Provincial Industry Office Working Group
8. Director of Pollution Control Office Region 15 (Phuket) Working Group
9. President of the Volunteer Network for the Protection of Natural Resources and Environment Krabi Province Village Working Group
10. President of the Krabi Provincial Tourism Business Association Working Group

### **Meeting participants**

1. Ms. Benchamaporn Wattanatongchai Office of Natural Resources and Environmental Policy and Planning
2. Mr. Phongwarut Thirawat Office of Natural Resources and Environmental Policy and Planning
3. Ms. Wannapa Maneekul Office of Natural Resources and Environmental Policy and Planning
4. Ms. Suprawee Kuhatanasatian Office of Natural Resources and Environmental Policy and Planning
5. Ms. Kanokporn Phokhaonon Provincial Office of Natural Resources and Environment Krabi
6. Mr. Sorawit Chanphrom Provincial Office of Natural Resources and Environment Krabi
7. Mrs. Thippawan Keawmesri Thailand Development Research Institute
8. Ms. Prinyarat Leangcharoen Thailand Development Research Institute
9. Ms. Kanjana Yasen Thailand Development Research Institute
10. Ms. Panida Phranphanat Thailand Development Research Institute
11. Mr. Khemmapat Trisadikoon Thailand Development Research Institute
12. Mr. Peerawat Suriyaburaphakul Thailand Development Research Institute
13. Ms. Pichamon Keakij Thailand Development Research Institute

Meeting starts 09.30 AM

### **Agenda 1 The chairman informed the meeting**

The chairman informed the meeting that the Krabi Governor was busy with other duties and therefore assigned the Director of the Provincial Office of Natural Resources and Environment Krabi to chair the 1/2025 meeting of the Krabi Provincial Working Group on project "Integration of Natural Capital Accounting in Public and Private Sector Policy and Decision-making for Sustainable Landscapes". He stated that Krabi Province, despite its high tourism revenue and good air quality, still faces numerous natural resources and environmental challenges. For example, lacking an effective water and resource management system, with only 7.19% of its forest area remaining. A significant portion of the area is used for growing economic crops such as oil palm and rubber, resulting in ecological fragility. Furthermore, water management remains a significant challenge due to Krabi's

topography, which causes rapid water flow to the sea, resulting in insufficient water storage. This leads to water shortages during the dry season and a high risk of wastewater generation, potentially impacting tourism. Some villagers refuse to allow the construction of wastewater treatment systems near their communities, leading to the allocation of allocated funds being used elsewhere. He emphasized the need to expedite community understanding to ensure sustainable implementation of the project and address the wastewater problem.

**Meeting Resolution** Acknowledged.

## **Agenda 2 Approval of the minutes of the meeting No. 1/2023 on February 9 2023**

The Working Group and secretariat (Mrs.Katunchalee) informed the meeting of the minutes of the 1/2023 Working Group on the Development of a Natural Capital Accounting System for the Tourism and Water Management Sectors in Krabi Province held on July 3, 2023. The Working Group provided comments on natural capital accounting for the tourism sector regarding the problem of the number of tourists visiting Krabi Province during the high season exceeding the capacity of various tourist attractions, resulting in deterioration of the ecosystems within the tourist attractions.

The number of tourists will serve as basic data for evaluating the economic value of the ecosystems within tourist attractions. Furthermore, the Working Group provided comments on natural capital accounting for water management regarding the insufficient freshwater resources in some areas of Krabi Province. Therefore, the project consultant was requested to gather data on groundwater sources and quantities, tap water volumes, and water consumption from economic crops to assess the economic value of the province's freshwater resources.

**Meeting Resolution** Acknowledged.

## **Agenda 3 Matters for your information**

### **3.1 Overview project “Integration of Natural Capital Accounting in Public and Private Sector Policy and Decision-making for Sustainable Landscapes”**

The working group and secretariat (Mrs. Katanchalee) informed the meeting about the overall picture of the Integration of Natural Capital Accounting in Public and Private Sector Policy and Decision-making for Sustainable Landscapes (NCA) project as follows:

1. The NCA project, funded by the Global Environment Fund (GEF) in Round 6, has a 54-month implementation period. Its objectives are to integrate natural capital into policy formulation and operations of key economic sectors, namely tourism and water management, at both the local and national levels. It also promotes the protection and mitigation of impacts from the production sector on biodiversity and ecosystem services. The project is implemented collaboratively by three parties: the Office of Natural Resources and Environmental Policy and Planning (ONEP) as the project's executing agency; the United Nations Environment Programme (UNEP) as the project's implementing agency; and the Thailand Development Research Institute Foundation (TDRI) as the project's lead service provider. A governance mechanism has been established,

appointing an NCA project steering committee chaired by the Secretary-General of the ONEP and comprised of 22 representatives from 19 agencies.

The committee is responsible for reviewing and approving project plans, providing academic feedback and recommendations for project implementation, overseeing, monitoring, and tracking project progress, and promoting collaboration between relevant agencies and Krabi Province. A working group has also been established to develop a natural capital accounting system in tourism and water management Sector. The Krabi Governor or his assigned Deputy Governor serves as the chairman of the working group, which comprises 33 representatives from 30 agencies. The committee is responsible for coordinating operations and building a collaborative network among relevant government, private, and civil society agencies to develop a natural capital accounting system. The committee will provide academic feedback and suggestions, provide guidance on compliance with relevant laws, regulations, and governmental rules, and provide technical information. The project will also oversee and monitor progress and ensure efficiency in related operations. The project operates through three main components: Component 1: Policies and incentives to support natural capital integration; Component 2: Integrating natural capital accounting into provincial and local development plans, with Krabi Province selected as the pilot province; and Component 3: Information exchange, awareness raising, and networking for natural capital accounting integration. The project comprises:

## 2. Project implementation monitoring includes:

1) the Project Implementation Review (PIR), which reports on the expenses of implementing the NCA project within the specified activity framework and timeframe, and reports on the progress of the project implementation.

2) the Project Implementation Progress Report; 3) the UNEP Project Mid-Term Review, which was completed in December 2024; and 4) the Terminal Evaluation (TE) report, which examines the project's consistency, effectiveness, and efficiency, as well as assesses the project's impact and sustainability.

## 3. Benefits to Krabi Province from the NCA Project

3.1 The development and establishment of a natural capital accounting system for the tourism and water management sectors in Krabi Province. This system provides a database of ecosystem health status, a database of flow accounting of physical and monetary ecosystem services, and a database of monetary ecosystem assets accounting for Krabi Province. This database serves as a tool for planning holistic natural resource and environmental management, taking into account economic value for efficient use of natural resources.

The value of ecosystems and biodiversity has been integrated into the provincial and local development planning process, taking into account the true value of Krabi Province's natural resources.

3.2 Establish partnerships and communicate a collaborative network between the government, private sector, private organizations, and local communities in Krabi Province. Partners serve as a source of information and knowledge for developing a natural capital accounting system for the tourism and water management sectors in Krabi Province. Key recommendations within Krabi Province will also be acknowledged to

jointly drive the implementation of the NCA project to achieve the goal of restoring natural capital in Krabi Province.

### **Meeting Opinions**

The Chairman noted that projects related to carbon credit assessment in some areas have numerous measures, but when transferred to relevant agencies, there is no clear responsible agency. This has resulted in plans being unable to be implemented and budgets being inefficiently used. He also questioned whether the data obtained from this natural capital accounting project will be permanently stored in the province and whether it will serve as an indicator or compass for Krabi Province to truly use in natural resource and environmental planning.

The working group and secretariat assistant (Mr. Adis) announced that the natural capital accounting system consists of 5 accounts: ecosystem extent accounts, ecosystem condition accounts, physical ecosystem service flow accounts (physical terms), monetary ecosystem service flow accounts (monetary terms), and monetary ecosystem asset accounts. Provinces can utilize this ecosystem data to conduct economic valuations to demonstrate the amount of natural resources used and the quantitative benefits derived from nature.

The working group and secretary (Mrs. Katunchalee) provided additional information that the primary objective of the project is to develop a tool to assess the value of natural resources, biodiversity, and ecosystems, in the form of economic costs, known as the Natural Capital Account. Once the account is established, the project's ultimate goal is to promote the integration of the Natural Capital Account into planning processes at both the national and provincial levels. Currently, coordination is underway with the Office of the National Economic and Social Development Council (NESDC) and the Budget Bureau to discuss approaches to systematically integrating the Natural Capital Account into planning and budget allocation processes. At the provincial level, discussions are underway with provincial and local government agencies to jointly establish mechanisms or guidelines for using data from the Natural Capital Account to inform future provincial development plans, tourism plans, and other related plans.

The Chairman thanked relevant agencies, particularly the Natural Resources and Environmental Policy and Planning and the Thailand Development Research Institute Foundation, for implementing the project in Krabi Province. This will support the province's quantitative data to support future central budget requests, particularly on environmental issues that are often perceived as unimportant in terms of concrete significance. He emphasized that having natural capital data will increase the private and public sectors' awareness of the importance of local resource management, such as the issue of excessive water use in palm plantations, which has led to the drying up of public water sources.

**Meeting Resolution** Acknowledged.

### 3.2 Implementation of the Integration of Natural Capital Accounting in Public and Private Sector Policy and Decision-making for Sustainable Landscapes Project in Krabi Province, 2025

The working group and secretariat assistant (Mr. Adis) presented a presentation on the project's progress according to Component 2: Integrating Natural Capital Accounting into Provincial and Local Development Plans, as follows:

Study the extent of Krabi's ecosystems, comprising both terrestrial and marine areas, covering key ecosystems: terrestrial, freshwater, marine, and mangrove forests. Assess the province's water resource situation by studying data on water resources, tap water status, water supply plans and demand, as well as the minimum amount of water needed to maintain the ecosystem in the target area. This includes assessing the current water resource status and the costs of preventing, restoring, or mitigating the impacts of human activities on wetlands and water catchments in Krabi Province.

Study of ecosystem changes through satellite imagery analysis from 2016-2020, which reveals a decreasing trend in natural ecosystem areas. These areas have been converted to horticultural crops, such as oil palm plantations and rubber plantations, or developed into residential areas.

Evaluate ecosystem values in various aspects, covering the value of economic crops, fisheries, the ecosystem's role in filtering air pollution, and cultural values, such as natural tourism, scenic views, and important islands such as Phi Phi Island and Maya Bay, as well as diving businesses, and diving equipment. This information is used to prepare a natural capital stock to reflect the importance of ecosystems and natural resources in terms of economic value, which is beneficial for appropriate and sustainable development planning and provincial budget allocation.

Study of cultural services by assessing the value derived from natural resources in the form of tourism activities in Krabi Province. This was based on four main aspects: natural scenery, such as sea views and islands; diving businesses; and diving equipment. The economic value of diving activities was calculated and found to be approximately 1.3 billion baht per year for Thailand overall, with Krabi Province in particular estimated at 100-500 million baht per year. This figure was derived from a study of diving business operators. Additional economic value also comes from diving equipment, which accounts for approximately 50 percent of the total diving business value, based on current relevant studies.

Integrate natural capital accounting data into the planning and budget allocation process. The ultimate goal is to integrate natural capital accounting into the planning process at the national level, such as the Office of the National Economic and Social Development Council (NESDC) and the Budget Bureau, and at the provincial level, provincial development plans, water plans, and tourism plans. Currently, government agencies tend to prioritize budget allocation in economic sectors with clear financial figures, such as exports and tourism. Meanwhile, the Ministry of Natural Resources and Environment often lacks financial data, resulting in less importance. Integrating natural capital accounting will help change government thinking and decision-making, demonstrating the value of natural resources in monetary terms and leading to efficient and sustainable resources and budget allocation.

Develop a Tourism Satellite Account (TSA) for Krabi Province to measure the number of tourists and details of income from various sectors such as hotels and restaurants. The data will be linked to the economic value of natural resources in the province to support sustainable planning and development in the area.

Develop a Water Satellite Account, a supplementary account that studies water supply and use. This data will serve as key indicators of water scarcity and wastewater volume for effective water resource management in Krabi Province.

Report on the joint operation with the Enlive Foundation in conservation activities, mitigation of impacts, and restoration of degraded habitats in wetland forests and marine and coastal ecosystems, covering a total area of approximately 40,000 hectares or approximately 250,000 rai in Krabi Province. This includes supporting the conservation of coral reefs, seagrass, and promoting community participation in marine resource management. The report also collaborates with the Department of Marine and Coastal Resources (DMCR) to improve forest areas in Krabi Town (Khao Khanap Nam), including changing signage and repairing facilities to promote sustainable tourism and area conservation.

### **Meeting Opinions**

The Chairman stated that the study data is extremely useful, but for maximum effectiveness and accurate understanding at the provincial level, he requested that the data be provided in Thai.

**Meeting Resolution** Acknowledged.

## **Agenda 4 Matters for consideration**

### **4.1 Selection of market-based instruments (MBIs) and development of business cases in Krabi province**

The working group and secretariat assistant (Mr. Adis) proposed market-based instruments (MBIs) for pilot testing in Krabi Province. Details are as follows:

1) Municipal disposal fees. Currently, many places, including Krabi, charge a fixed monthly disposal fee (e.g., 40-50 baht per household), which does not reflect the actual amount of waste produced. A new proposed approach is: "Pay-as-you-throw" (PAYT), whereby citizens purchase municipal garbage bags (approximately 4-5 baht per bag) for disposal. This approach creates incentives for waste reduction and separation. Examples of this practice exist internationally, including in Thailand, such as Nong Hoi Municipality in Chiang Mai Province. The Ao Nang Subdistrict Administrative Organization in Krabi Province planned to implement this approach but discontinued it due to legal limitations, particularly regarding the authority of local governments to produce or sell their own waste bags, which could be considered competitive trade with the private sector. Alternative options include offering waste bags as "donations" instead of sales, to avoid legal issues.

2) Beach Land Tax: propose local authorities, such as Ao Nang Subdistrict Administrative Organization, to consider collecting additional land taxes or fees from hotels or accommodations located on the beach, particularly those with sea views, which have the potential to generate higher revenue than standard rooms. The proposed

tax rate is between 10 and 20 percent of room rates to ensure fairness based on the potential for coastal resource utilization. If tangible results can be demonstrated, such as a clear change in beach environmental quality, hotel operators may be willing to participate and accept the tax or fee collection. This could be piloted in areas with a high concentration of hotels and many sea-view rooms. Since it only impacts a target group with high economic potential, it may be easier to implement than conventional tax collection approaches.

3) Support coastal communities in installing small-scale wastewater treatment systems. Three types of wastewater treatment systems are being studied and proposed, each suitable for households and small to medium-sized businesses in areas where there are no wastewater treatment systems. Each type of system has different operating costs. Municipalities or local authorities should play a role in providing budgetary support or partial subsidies to enable residents and businesses to install efficient wastewater treatment systems. However, requiring residents to bear all the costs could hinder implementation.

4) A donation or fee system for tourists. This system aims to raise funds through donations or fees from tourists. This could be developed into a mechanism that allows tourists to donate money to government agencies, such as the Department of National Parks, Wildlife and Plant Conservation, or local administrative organizations. The revenue will be used to care for and restore the environment in tourist areas. It is proposed that such donation systems be transparent, such as the creation of e-receipts and verifiable spending reports, to build confidence for donors.

### **Meeting Comments**

Mr. Khemmapat Trisadikoon, Thailand Development Research Institute Foundation, provided additional information regarding the law regarding waste management, particularly the collection of fees and policy guidelines for local administrative organizations. He pointed out that although local governments have constitutional authority to provide public services, fee collection schemes, such as municipal garbage bag monopolies or the enforcement of a specific type of bag, without alternatives, may violate competition and civil liberties laws. He proposed an alternative approach, replacing "fees" with "voluntary donations," which could include additional benefits, such as service discounts or the right to participate in conservation activities. This approach not only avoids the law but also creates social incentives. He also suggested that local governments allow the private sector to participate in providing certain public services, such as waste or wastewater treatment systems, within a clear framework of controls and standards.

The Vice President of the Krabi Provincial Hotel Association, representing the President of the Krabi Provincial Hotel Association, provided information on the impact of land and building taxes, which currently overestimate land values in tourist areas. He cited the example of beachfront hotels in Krabi Province, which have had to pay taxes that increased from 1.9 million baht per year during the COVID-19 pandemic to more than 7 million baht, a rise of over 300% within a few years. This has a significant impact on small and medium-sized businesses, especially during a time when the tourism industry has yet to fully recover. Therefore, he proposed changing the land valuation method from the Treasury Department's centralized system to a per-plot system or using local market data that reflects reality. He also suggested considering the use of economic mechanisms such as cross-subsidization to enable high-potential businesses to reduce the burden on vulnerable groups and distribute public

costs more fairly. Regarding environmental management, many hotels already have internal waste sorting and management systems in place, but face challenges due to the municipal waste transportation system, which fails to support separation, resulting in inconsistent waste management at the source. He suggested developing an efficient waste management system at all levels if the developed system is deemed practical and enforceable.

The working group and secretariat assistant (Mr. Adis) commented that the tax rate framework will be set centrally, while actual collection will be at the discretion of local administrative organizations. However, many local governments have begun adopting approaches, such as reducing waste collection fees for hotels or operators with effective waste management systems, waste separation, or standard wastewater treatment systems, which are considered effective positive incentives. Similarly, some areas have reduced wastewater treatment fees for hotels that demonstrate legally compliant water quality data. This not only reduces costs for operators but also supports long-term environmental operation.

Vice President of the Krabi Hotel Association, representing the President of the Krabi Hotel Association, commented that: Sustainable environmental management approaches emphasize the importance of addressing problems at the source, such as promoting the Zero Waste concept and developing an efficient on-site wastewater treatment system. He also proposed reclaiming treated wastewater for appropriate activities to conserve resources and reduce environmental burdens. He cited the example of using salt which obtained from an RO system instead of chlorine in a swimming pool on Phi Phi Island, which demonstrates the efficient use of renewable resources. Furthermore, the current economic outlook does not justify tax increases or increased expenditure on people. Further comments were made regarding revenue from tourist fees and taxes, and local resources, such as national parks and hotels, which are often not reused for development or necessary local environmental solutions, such as wastewater management or CCTV security systems. This is despite the fact that the revenue should directly support the costs of maintaining natural resources and the environment within the area. Furthermore, they proposed budget allocation with participation from local residents and a greater role for independent administrative systems or local organizations in managing revenue for genuine public benefit.

The Vice President of the Krabi Chamber of Commerce, representing the Chairman of the Krabi Chamber of Commerce Executive Committee, stated that hotels systematically separate waste using fully separated bins. However, in practice, the separated waste is often consolidated at destinations such as municipalities, waste processing plants, or markets. This results in ineffective waste management. Hotels are required to pay a collection fee of approximately 45 baht per room, which includes collection and transportation. However, the municipality and related agencies have been found to be ineffective in their waste collection system, such as collecting waste at inappropriate time or not covering the actual area. Furthermore, the government lacks communication and information linkages with the private sector, leaving the private sector unaware of wastewater and waste management plans or budgets. Therefore, it is recommended that effective communication channels be established and private sector groups be formed to jointly address local resource and environmental issues in a concrete manner.

The Director of the Environmental Division, representing the Director of the Provincial Office of Natural Resources and Environment Krabi, provided information on waste and wastewater management systems in the area. He

stated that infrastructure systems in some areas, such as Phi Phi Island, already have large-scale integrated wastewater treatment systems. However, they are not yet connected to the system by any buildings or establishments due to a lack of funding and clear incentives. This has resulted in the system being ineffective. Regarding waste separation, although some private sectors, particularly hotels, already separate waste at the source, the municipal collection system lacks systematic waste classification. This results in a problem of waste being collected and unable to be properly managed. Therefore, he called for integration of the system from upstream to downstream and encouraged the central government or agencies with budgets to support the implementation of such infrastructure to ensure connectivity and practicality.

#### **Meeting Resolution**

TDRI, as project consultant, was assigned to receive comments and suggestions from the working group on the development of a natural capital accounting system for the tourism sector and water management in Krabi Province. The committee will conduct a comprehensive study of marketing tools/mechanisms and ensure they cover all stakeholders before submitting them to the working group for consideration.

#### **Agenda 5 Others**

None

Meeting end 12.00 PM

## **Appendix 4 Meeting Minutes Project Steering Committee “Natural Capital Accounting for Tourism and Water Management Sectors of Krabi Province” No. 1/2026**

Meeting Minutes Provincial Working on the development of a natural capital account system for the tourism and water management sectors Krabi province No.1/2026 on 20 January 2026, 09.30 a.m.– 13.00 p.m. at Deevana Plaza Krabi Aonang, Krabi, Thailand.

### **Working group attending the meeting**

1. Mr. Angkul Seelatewakul Chairman of the Working Group  
Governor of Krabi Province
2. Mr. Anuchit Watrujeekrit Working Group  
Plan and Policy Analyst, Practitioner Level  
Representative of Krabi Governor’s Office
3. Mr. Surachai Kulthong Working Group  
Director of Environmental Division  
Representative of the Director of Provincial Office of Natural Resources and Environment Krabi
4. Mr. Sadit Chitchaeng Working Group  
Plan and Policy Analyst, Practitioner Level  
Representative of the Krabi Provincial Office of Tourism and Sports
5. Mr. Thamrath Mengbhud Working Group  
Community Development Specialist  
Representative of the Provincial Community Development Office of Krabi
6. Ms. Prisana Wongnhoi Working Group  
Plan and Policy Analyst, Senior Professional Level  
Representative of the Krabi Provincial Industry Office
7. Mr. Kulphat Ruekjunong Working Group  
Urban Planning Analyst, Senior Professional Level  
Representative of the Department of Public Works and Town & Country Planning Krabi
8. Ms. Kulayanee Sittipaisankul Working Group  
Plan and Policy Analyst, Professional Level  
Representative of the Krabi Provincial Agriculture and Cooperatives Office
9. Mr. Karnrath Ruengchom Working Group  
Head of Fisheries Administration and Management Group  
Representative of the Krabi Provincial Fisheries Office
10. Ms. Pranee Faithai Working Group  
Head of Strategy and Information Group  
Representative of Krabi Provincial Agricultural Extension Office

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|---|---------------|
| 11. Ms. Sirikarn Kongthong<br>Energy Technician Officer, Senior Professional Level<br>Representative of Krabi Provincial Energy Office  | Working Group |
| 12. Ms. Juthamat Sangnhoi<br>Statistician, Professional Level<br>Representative of the Krabi Provincial Statistical Office  | Working Group |
| 13. Mr. Nathawat Limsunthorn<br>Forestry Technical Officer, Practitioner Level Hat Noppharat Thara–Mu Ko Phi Phi National Park<br>Representative of Director of the Regional Environment and Conservation Office V (Nakhon Si Thammarat)        | Working Group |
| 14. Mr. Natawat Senchu<br>Irrigation Technician, Senior Level<br>Representative of Director of Krabi Irrigation Project   | Working Group |
| 15. Mr. Wanchai Supharb<br>Agricultural Officer, Senior Level<br>Representative of Krabi Land Development Station   | Working Group |
| 16. Mr. Phongsak Limkrueyan<br>Head of Tourism Department<br>Representative of Deputy Director of Academic Affairs (Tourism Industry) Krabi Technical College   | Working Group |
| 17. Ms. Nathaya Ornniem<br>Director of the Tourism Authority of Thailand (TAT), Krabi Office  | Working Group |
| 18. Mr. Ananthaphong Phramaem<br>Civil Engineer 7<br>Representative of the Provincial Waterworks Authority, Klong Thom Branch   | Working Group |
| 19. Ms. Orrawan Chuthong<br>General Administrative Officer, Professional Level<br>Representative of Mayor of the Krabi Provincial Administrative Organization   | Working Group |
| 20. Mr. Prasan Lohajareekun<br>Executive Board Member of the Krabi Provincial Chamber of Commerce<br>Representative of the Executive Board of the Krabi Chamber of Commerce   | Working Group |
| 21. Mr. Akara Sriraksa<br>Vice President of the Krabi Hotel Association<br>Representative of President of the Krabi Hotel Association   | Working Group |
| 22. Major Johhasan Yala<br>President of the Volunteer Network for the Protection of Natural Resources and Environment Krabi Province Village  | Working Group |
| 23. Ms. Benchamaporn Wattanatongchai<br>Director of Conventions Coordinating Section and secretariat<br>Representative of the Director of Biodiversity Management Division<br>Office of Natural Resources and Environmental Policy and Planning | Working Group |

24. Mr. Adis Israngkura	Working Group
Project Manager and secretariat assistant	
Thailand Development Research Institute	

**Non-attendance**

- |   |               |
|---|---------------|
| 1. Provincial Community Development Office of Krabi                     | Working Group |
| 2. Director of Pollution Control Office Region 15 (Phuket)              | Working Group |
| 3. Representative of Forest Resource Management Office 12, Krabi Branch | Working Group |
| 4. Representative of Director of Marine and Coastal Resources Office 10 | Working Group |
| 5. Provincial Waterworks Authority, Krabi Branch                        | Working Group |
| 6. Provincial Waterworks Authority, Ao Luek Branch                      | Working Group |
| 7. Representative of the Krabi Town Municipality Office                 | Working Group |
| 8. Krabi Provincial Federation of Industries                            | Working Group |
| 9. President of the Krabi Provincial Tourism Business Association       | Working Group |

**Meeting participants**

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|-----------------------------------|---|
| 1. Mr. Amornchai Hiranrath        | Wastewater Management Authority                                   |
| 2. Mr. Aphisit Suknui             | Aonang Subdistrict Administrative Organization                    |
| 3. Ms. Marisa Sribuathong         | Aonang Subdistrict Administrative Organization                    |
| 4. Ms. Piyaporn Kasipol           | Krabi Provincial Industry Office                                  |
| 5. Mr. Wanmongkhol Kaewyod        | Krabi Provincial Energy Office                                    |
| 6. Ms. Chantima Aengchuan         | Krabi Provincial Administrative Organization                      |
| 7. Ms. Wilaiwan Kanjanatin        | Krabi Provincial Agriculture and Cooperatives Office              |
| 8. Mr. Kritsada Mahammad          | Tourism Authority of Thailand (TAT), Krabi Office                 |
| 9. Mr. Withawuth Chaiboon         | Krabi Provincial Fisheries Office                                 |
| 10. Ms. Sriwilai Thongkhao        | Wastewater Management Authority, Krabi Branch                     |
| 11. Mr. Jirawat Chairit           | Provincial Office for Local Administration, Krabi                 |
| 12. Mr. Wanlhob Prichamart        | Office of Natural Resources and Environmental Policy and Planning |
| 13. Mr. Phongwarut Thirawat       | Office of Natural Resources and Environmental Policy and Planning |
| 14. Ms. Wannapa Maneekul          | Office of Natural Resources and Environmental Policy and Planning |
| 15. Ms. Suprawee Kuhatanasatian   | Office of Natural Resources and Environmental Policy and Planning |
| 16. Mrs. Thippawan Keawmesri      | Thailand Development Research Institute                           |
| 17. Ms. Prinyarat Leangcharoen    | Thailand Development Research Institute                           |
| 18. Ms. Kanjana Yasen             | Thailand Development Research Institute                           |
| 19. Ms. Panida Phranphanat        | Thailand Development Research Institute                           |
| 20. Mr. Promphat Bhumiwat         | Thailand Development Research Institute                           |
| 21. Mr. Peerawat Suriyaburaphakul | Thailand Development Research Institute                           |
| 22. Ms. Pichamon Keakij           | Thailand Development Research Institute                           |
| 23. Ms. Ramida Hansaward          | Thailand Development Research Institute                           |

**Meeting starts** 09.30 AM

### **Agenda 1 The Chairman informed the meeting**

The Chairman welcomed the working group to the meeting on integrating natural capital accounting into Krabi's tourism and water resources sector and informed that the Integration of Natural Capital Accounting in Public and Private Sector Policy and Decision-making for Sustainable Landscapes (NCA) Project, which is under the Ministry of Natural Resource and Environment, received funding from the Global Environment Facility (GEF). The aim of this project is to provide data for local and national policy making as well as resource management, focusing on protecting and mitigating impacts on ecosystems. The duration of the project began August 2022 and will end June 2026. It is anticipated that this project will be beneficial for Krabi Province.

### **Agenda 2 Approval of the minutes of the meeting No. 1/2025 on July 24, 2025**

The Director of Conventions Coordinating Section, as a working group committee member and secretariat informed the meeting of the minutes of the NCA Project Working Group Meeting No. 1/2025 on 24 July 2025, which was circulated to the Committee for approval on 22 August 2025. The working group Committee approved the report with no revisions.

**Resolution of the meeting** Approved the NCA Project Working Group Meeting Minutes No. 1/2025 on 24 July 2025 again.

### **Agenda 3 Matter for Report**

#### **3.1 Progress of the Integration of Natural Capital Accounting in Public and Private Sector Policy and Decision-making for Sustainable Landscapes Project in Krabi Province in 2025**

The Director of Conventions Coordinating Section, as a working group committee member and secretariat informed the meeting that the NCA Project is funded by the Global Environment Fund (GEF) in Round 6, with 2,000,000 US dollars in funding. The project's implementation period starts from August 2022 until June 2026, with the Office of Natural Resources and Environmental Policy and Planning (ONEP) as the executing agency, the United Nations Environment Programme (UNEP) as the implementing agency, and the Thailand Development Research Institute Foundation (TDRI) as the lead service provider of this project. The project's objectives are to integrate natural capital into policy formulation and operations of key economic sectors, namely tourism and water management, at both the local and national levels to reduce impacts on biodiversity and ecosystem services from the production sector. Implementation is categorized into 3 components as follows, Component 1: Policies and market incentives in support of Natural Capital, Component 2: Integration of Natural Capital Accounts into local development planning and operations, and Component 3: Information-sharing, awareness-raising, and networking to mainstream Natural Capital accounting. The Director of Conventions Coordinating Section requested the Project Manager (Mr. Adis Israngkura) to present the project's progress for 2025

The Project Manager, working group committee member and secretariat presented the NCA project's implementation of Component 2: Integration of Natural Capital Accounts into local development planning and operations, as follows:

Output 2.1 Pilot provincial Natural Capital Accounts for the tourism sector and water resources in Krabi Province, the implementation to date:

1. Conducted a tourism assessment and a water resources situation assessment for Krabi Province which analyzed the quantitative and qualitative data of the impacts on marine ecosystems and watersheds from the TSA (10 accounts) and WRSA (5 main components) to demonstrate the economic value of nature and to use as a data base for policy planning and budget allocation.

2. Develop and maintain a comprehensive provincial NCA (tourism sector and water resources sector) following the UN SEEA framework, covering 5 main accounts as follows, 1) Ecosystem Extent Account, 2) Ecosystem Condition Account, 3) Ecosystem Services flow Accounts – physical terms 4) Ecosystem Services flow Accounts – monetary terms, and 5) Monetary Ecosystem Asset Account, to reflect the natural resource changes in the area.

Output 2.2 Provincial Natural Capital Account information embedded into local government and corporate policies, plans and budgets in Krabi Province, the implementation to date:

1. Integrating NCA into national satellite accounts through the provincial TSA and the WRSA to reflect the interconnections between natural resources and the economy.

2. Aligning provincial NCA with Krabi's Provincial Development Plan and Provincial budget allocation by conducting interviews with executive level provincial officers and executives from the (local) private sector to identify tangible opportunities to integrate NC information into Krabi's provincial development plan and to allocate provincial budgets.

3. Develop a business case to pilot the selected Market-based Instrument (MBI) in which 4 MBIs were reviewed, namely, 1) garbage bag subsidies, 2) sea view land tax, 3) small-scale wastewater treatment subsidy, and 4) tourist donation or environmental fee system. However, due to legal constraints and impacts on the local private sector, a new MBI was proposed. The new MBI proposed uses the Payment for Ecosystem Services (PES) concept in the form of a bird watching tour in Khlong Prasong Subdistrict as a model to raise funds for the conservation of watersheds and marine ecosystems.

4. Examining and identifying Public-Private Partnerships (PPP) for conservation and restoration of ecosystems. An opportunity has been identified in Ao Nang Subdistrict to manage and treat sewage or wastewater, which has been discussed and deliberated among local stakeholder groups to implement and support the taskforce to manage wastewater and trash in Krabi Province.

5. Assessing the water tariff that reflects the true cost of managing watersheds. Water tariff rates in Krabi Province were reviewed and analyzed through marginal cost calculations and the Willingness to Pay of users to cover the full costs of sustainable management and protection of watersheds.

Output 2.3 Mitigating environmental impacts and restoring and protecting Natural Capital in Krabi Province, the implementation to date:

1. Assessing a bird watching tour as an MBI has been done, as well as coordination with Baan Khlong Prasong School to make the necessary preparations to pilot implementation of the MBI.

2. Conserve, mitigate impacts and restore degraded habitats in watershed forests and coastal marine ecosystems in Krabi province has been implemented in collaboration of the public sector (namely the Department of Marine and Coastal Resources), private sector, and non-governmental organizations (NGOs) such as the Enlive Foundation to accommodate and provide financial support (including materials and equipment) in implementing this output.

3. Developed, tested, and implemented sustainable financing mechanisms for the Green Fins program in Krabi Province, in which data has been analyzed from Willingness to Pay the Green Fins standard to further develop sustainable financing mechanisms.

4. Provided technical support to the installation of small- scale wastewater treatment technologies in small-scale tourism enterprises, in which a review has been done of appropriate wastewater treatment systems. This output includes conducting a focus group with local small-scale tourism enterprises to disseminate information and gather feedback on issues in managing wastewater in Ao Nang. This output also includes collecting water samples to measure the water quality in Ao Nang Subdistrict and analyze the connection between tourist activities such as hotels (including resorts and homestays) and laundromat businesses as the source of pollution and the water quality in water storage bodies.

#### **The meeting provided feedback**

The Director of the Environmental Division from the Provincial Office of Natural Resources and Environment Krabi informed the meeting that the taskforce aforementioned is a mechanism to encourage resolving issues of waste and wastewater management in Krabi since 2018 comprising a working group of 24 members with the Deputy Provincial Governor as the Chairman and the Provincial Office of Natural Resources and Environment Krabi as the secretariat. The working group has the authority and duty of supervising, monitoring (and inspecting), planning, and integrating systematic measures in the areas of Phi-Phi Island, Ao Nang, and Koh Lanta Subdistricts. In the past, the working group received the funds from the provincial budget to conduct on-site training sessions providing foundational information on wastewater management systems and installation for local small-scale tourist enterprises. For local businesses that do not follow the wastewater management regulation, in collaboration with the Subdistrict Administration Organization (SAO) of Ao Nang, the law under the Public Cleanliness and Orderliness Act B.E. 2535 (1992) will be enforced. However, this taskforce ceased operations due to the COVID-19 pandemic. Nevertheless, the taskforce's next phase is to update the taskforce's components to include the private sector as well. Currently, coordination requesting information of local businesses in the Ao Nang area are in progress; to formulate an action plan. In the first phase, a meeting will be hosted to clarify and foster understanding with local businesses, then the working group will be grouped into 4 groups to enable adequate coverage of on-site inspections and provide informational guidance. TDRI will provide financial support on the working group's

operations for 2026 and the Provincial Office of Natural Resources and Environment Krabi will proceed to propose budget allocation from the Provincial budget to sustain annual operations of this taskforce.

The Chairman assigned the Provincial Office of Natural Resources and Environment Krabi to proceed revising the provincial order, appointing the working groups of the taskforce on resolving waste and wastewater management in Krabi Province, to integrate close cooperation with the private sector, especially with the Krabi Hotel Association. In doing so, promoting proactive on-site inspections, and providing guidance, in conjunction with creating incentives through symbolic recognition (such as a green sticker), enforcing the law when necessary, and budget allocation from the provincial budget to sustain continuous operations after support from the NCA Project ends.

The Vice President of the Krabi Hotel Association observed that the Ecosystem extent account focuses more on marine ecosystems for tourism and water management. The amount of reserved water for consumption was not clearly covered in the account, this includes the consideration of watershed forests around water reservoirs that are deteriorating, making it impossible to store water to flow into the reservoir as targeted. It was also suggested that information on underground water sources, especially groundwater should be added in the Ecosystem Extent Account and the WRSA as well, given that water sources are crucial in supporting the tourism sector. This is evident during the dry season where issues such as droughts saltwater intrusion arise.

**Resolution of the meeting** Acknowledged the NCA project progress in Krabi

## **Agenda 4 Matter for Report**

### **4.1 Provincial NCA for the tourism and water resources sector for Krabi Province**

The Project Manager, working group committee member and secretariat presented to the meeting, a draft NCA for the tourism and water resources sector for Krabi Province, as follows:

1. Overview of the Provincial NCA for Krabi Province, which follows the UN SEEA-EA (System of Environmental-Economic Accounting – Ecosystem Accounting) framework to demonstrate the connections between natural resource assets and the economy, with the details as follows:

1.1 The Ecosystem Extent Account establishes a geo-spatial data to identify the extent (physical boundary) of crucial ecosystems such as terrestrial forests, mangrove forests, water sources, seagrass meadows, and coral reefs. Geospatial technology was utilized to monitor the yearly changes in areas of study, starting from 2016 to 2020.

1.2 The Ecosystem Condition Account assesses the condition (quality) of resources in the ecosystem. The data was collected using condition indicators (physical and biological) such as forest density, biodiversity, and water quality in natural water sources to categorize each ecosystem from “best condition” to “degraded condition”.

1.3 The Physical Service Flow Account calculates the physical amount services provided by the ecosystem such as the volume of raw water that’s flows into reservoirs, the carbon sequestration capacity of mangrove forests, and the number of aquatic species in natural habitats.

1.4 The Monetary Service Flow Account values the economic value of the services the ecosystem provides, utilizing financial indicators such as the rate of sea view premium rooms, which observed to have an average rate of 2,000 baht per room. This rate may also be seen as the economic value of eco-tourism that connects with the beauty of sandy beaches and coral reefs.

1.5 The Monetary Ecosystem Asset Account assesses the monetary value of all natural resource assets in the long term, to demonstrate that the conservation of natural resources will generate revenue streams for Krabi on a continuous basis.

2. After developing NCA (SEEA) with the 5 accounts, the information reflected includes

2.1 Krabi Province generated an estimate of 100,000 million baht in tourism-related income per year. At the same time, the cost to manage wastewater (that covers the entire province) is approximately 150 million baht per year. This demonstrates that investing in the environment, account to a small proportion when compared to the economic value generated.

2.2 Revising provincial budget allocations using NCA information as suggestions for the Budget Bureau and the Office of the National Economic and Social Development Council (NESDC) to consider providing provincial budget allocations based on the number of resource users (5 million tourists) instead of the number of residents (from the civil registration system).

### **The meeting provided feedback**

The President of the Volunteer Network for the Protection of Natural Resources and Environment Krabi Province Village suggested that Krabi's drought issue mainly stems from encroachment into watershed (forests) for monoculture agriculture for more than 20 years. Resulting in ecosystem degradation to the extent that the reservoir cannot retain water at its full capacity.

The Chairman requested TDRI and the secretariat to prepare a sample (project) proposal, classified by budget amount, so that the Strategy Division of the Provincial Office can utilize the proposal as a reference model for considering the inclusion of projects in the annual budget plan.

The Director of the Environmental Division from the Provincial Office of Natural Resources and Environment Krabi provided the following additional information, since Krabi was announced as an environmental protected area by ONEP, there has been implementation of the Annual Provincial Environmental Quality Management Plan. This includes coordination with local administrative organizations to formulate wastewater and waste management projects. The approved projects will be integrated into the Provincial Environmental Quality Management Plan to serve as a key database to support funding proposals from the environmental fund in the future.

### **Resolution of the meeting**

The committee agreed for TDRI to proceed in preparing a sample project proposal, classified by budget amount, so that the Strategy Division of the Provincial Office can utilize the proposal to be considered for integration into the annual budget plan.

## 4.2 Piloting Market-based Instrument (MBI) in Krabi Province

The Project Manager, working group committee member and secretariat presented to the meeting, a draft MBI to pilot in Krabi Province, as follows:

1. From the feedback from the working group (in the previous PWG meeting on July 24, 2025) about assessing MBIs to pilot in Krabi province, the challenges of the proposed MBIs go as follows, 1) imposing a garbage bag fee had legal constraints as collecting trash is the responsibility of the Ao Nang SAO, which the fee collection may not exceed the rate stipulated by the law. Also, there is no legal clause that allows the SAO to produce or sell garbage bags to collect fees depending on the true amount of garbage, 2) the sea land tax would impact the private sector, as it would be an additional tax burdening local business owners that are still recovering from the impact of COVID-19, 3) supporting small-scale wastewater treatment systems found limitations on the high budget needs for installment, along with issues on find an appropriate location of installing the treatment systems in the community, and 4) tourist donations still lack incentives to motivate tourist to donate and there is an absence of an agency or organization to be responsible in managing the donated funds.

2. TDRI proposed a new MBI, to focus on generating income via a migratory bird watching tour activity in Khlong Prasong Subdistrict using the Payment for Ecosystem Services (PES) concept as a driving mechanism to incentivize those that benefit from natural resources to participate in the systematic protection and maintenance of natural capital. This activity aims to “brand” Khlong Prasong area as an ecotourist attraction that integrates locals’ traditional way of life with environmental conservation. The target group of tourists is clearly defined, along with developing the capacity of youths in the areas (from Baan Khlong Prasong School and Muang Krabi School) to become local tour guides, which creates career path opportunities along with instilling environmental consciousness thorough training sessions on English communication and bird watching knowledge. In addition to this, a digital platform will be developed to manage tour bookings (reservations) and collect data on tourists, which will be utilized as a key database to assess the area’s carrying capacity for tourists. The income generated from this activity will be used to establish a trust fund for environmental conservation and community development. The committee that will be responsible for managing the trust fund will comprise of all stakeholder groups, as follows:

1) Chief Executive of Khlong Prasong SAO	Chairman
2) Representative of Moo 2 in Khlong Prasong Subdistrict	Member
3) Representative of Moo 3 in Khlong Prasong Subdistrict	Member
4) Representative of boat operators in Khlong Prasong Subdistrict	Member
5) Representative of restaurants in Khlong Prasong Subdistrict	Member
6) Local Scholar with bird watching expertise	Member
7) Local Scholar with cultural expertise	Member
8) Representative of Educational Institute in Khlong Prasong Subdistrict	Member

9) Representative of Educational Institute in Mueng Krabi Subdistrict	Member
10) Representative from Enlive Foundation	Member
11) Khlong Prasong SAO officer	Member and Secretariat

### **The meeting provided feedback**

The head of Tourism Department from Krabi Technical College informed the meeting that Krabi Technical College has a curriculum as a joint initiative with the Department of Tourism to produce workers for the tourist industry. After students graduate from this curriculum, they will receive their tour-guide licenses (certification). In which, he would like to request budgetary support for vocational-track youths. Additional activities were proposed, namely, a historical kayaking tour of Na Mueng Krabi area to support distributing tourist-density from Ao Nang area to the city center and to stimulate the local economy as well.

The Vice President of the Krabi Hotel Association raised 3 observations as follows, 1) he would like the project consultant to clearly state the details of the Trust Fund output on how the fund's income from donations and marginal profits would be used and for which dimension (area) under environmental conservation and recovery. For instance, maintaining birds' natural habitats, forests, water sources, or waste management. These details should be defined for transparency and incentivize tourists, 2) Whether there are any legal constraints or limitations on certifying youth tour-guide licenses, and 3) there is concern for the sustainability of this activity since students have a study period of 3 years, there should be a planned budget for training the next generation of students for continuity. Income generated into the Trust Fund could be considered to fund the training for the activity's sustainability in the long-term after the project ends.

The Project Manager, working group committee member and secretariat informed the meeting that youth tour-guides are exempt from needing a tour-guide license. And to ensure sustainability of the activity after the project ends, TDRI collaborated with the Enlive Foundation as a local partner to implement this initiative in the form of senior teacher junior learning (amongst students). This would further become a club or community enterprise to manage the income (net profit) generated from the bird-watching tour. A committee will be formed (including the local community) to consider allocating money into the trust fund to conserve natural resources and natural resources.

The President of the Volunteer Network for the Protection of Natural Resources and Environment Krabi Province Village observed some complexities of the project, mentioning that in 2022, the Biodiversity Management Division of ONEP conducted activities in Khlong Prasong area, collaborating with the OTOP (One Tambon One Product) group and various occupational groups such as the stingless bee group, batik fabric group, and local restaurants. Thus, proposing that provincial agencies should monitor the project's progress. He also proposed that the project consultant should implement activities in parallel with the local's diversity potential, using the existing infrastructures such as the community bridge to promote tourism that covers more than birdwatching. He also emphasized the importance of designating the boundaries of protective areas (for birds) and training local tour guides to build knowledge the correct (appropriate) way for bird watching, to avoid behaviors that would disturb the ecosystem and habitats of migratory birds.

Mr. Wanlhob Prichamart from ONEP offered the following suggestions:

1. The implementation approach in Khlong Prasong area should focus on integrating with the existing community group and community enterprise that is already established with the SAO to create more diverse income opportunities

2. For the bird watching activity, the project consultant should assess the carrying capacity for tourists, since there are seasonal constraints and presently there are limited tour guides with bird watching expertise.

3. When working with youths, there should be consideration of safety in areas (of bird watching) that may have risks. The activity could improvise to promote citizen sciences, for instance, enhance their skills through knowledge building or drawings instead of directly acting as a tour guide, to be more appropriate for their age and build sustainability in sharing knowledge to the next generation.

4. Management of the Trust Fund (with income from tourism), should identify the structure of the groups responsible, along with the planned budget for environmental conservation for clarity and transparency.

The head of Tourism Department from Krabi Technical College provided an example when the College integrated technology into their practical training (learning) process, where students utilized a tide forecast application to plan and manage safety when conducting kayaking activities. Additionally, this activity also fosters public awareness through CSR activities (partnered with the private sector) to rehabilitate the environment and manage waste in tourist attractions. The project consultant could consider this to develop as an example to foster youth participation.

The Director of Conventions Coordinating Section, as a working group committee member and secretariat proposed to consider integrate the Krabi Technical College in the bird watching tour activity and to add the kayaking activity, given that the College has the potential and readiness of tourist industry workers which can contribute skills training for the youth (in communication and tour guide experience). And gave insight of the criteria in selecting the Enlive Foundation as partner in conducting this activity and clarity of the mechanism in managing the Trust Fund to avoid disruption of implementation in the long term.

The Project Manager, working group committee member and secretariat informed that TDRI is willing to collaborate and coordinate with the faculty of Krabi Technical College to develop the activity to achieve the maximum benefit for the local area. As for choosing to work with the Enlive Foundation, they have expertise in conserving coral reefs and seagrass meadows including operating in Krabi Province continuously and they have good relations with the local community.

The Vice President of the Krabi Hotel Association suggested to expand the boundaries of the activity to attract niche tourists, such as adding “photo trip” activities (e.g. taking photos of the sunset at Koh Kai). A partnership could be done with local photographer groups along with finding sponsors from the private sector (such as photography-related businesses). Photo camps could be conducted to generate income and channel more financial resources into the community. The Krabi Hotel Association can assure the Enlive Foundations’ working capacity and transparency as an importance organization in driving sustainability efforts and conserving natural resources in Krabi Province for more than 20 years.

The Director of Conventions Coordinating Section, as a working group committee member and secretariat provided the project consultant suggestions to consider integrating NCA’s information system (i.e. project

website) with systematic information of booking ecotourism activities such as bird watching and other tourism activities that can be conducted all year round.

The Director of the Environmental Division from the Provincial Office of Natural Resources and Environment Krabi proposed to consider establishing the group in the form of a community enterprise and to register with the Department of Agriculture Extension to have a clear legal standing and to receive support from the government. This will add trust in managing the activity and budget.

The President of the Volunteer Network for the Protection of Natural Resources and Environment Krabi Province Village suggested to consider adding representatives from the Department of Marine and Coastal Resources and the Marine Department in the Committee responsible for the Trust Fund management. The reason is to promote participation and fostering the correct understanding on marine ecosystems, especially on the behaviors of migratory birds that often use the existing infrastructure in the sea or the sandbank as a resting area; to avoid anthropogenic impacts on the bird's habitat. Also, he suggested for the province to consider expanding the Ramsar Site area to enhance the protection of natural resources.

The Executive Board Member of the Krabi Provincial Chamber of Commerce suggested that the project consultant adjust the presentation form by using less technical terms, use easy to understand terms to be appropriate with local working contexts, and to present the essential content (slides) for an efficient and productive deliberation, for the committee to make decisions on important matters clearly. He also suggested that there should be a brainstorming session to encourage participation and synthesize shared views between the public sector, private sector and the project consultant. Additionally, a representative from the Ministry of Tourism and Sports in Krabi Province and a representative from the community-based tourism committee should participate in the committee that will manage the Trust Fund and to collaboratively guide and oversee the tourism standard to align with Provincial policies.

The Director of the Environmental Division from the Provincial Office of Natural Resources and Environment Krabi reiterated that the guidelines of developing tourism should be balanced with environmental conservation, not prioritizing tourism development over protecting natural resources, as well as supporting regulations to manage beach areas to preserve the beauty and ecosystems sustainably.

#### **Resolution of the meeting**

Agreed that TDRI as the project consultant will take the suggestions and opinions from the working group (integrating natural capital accounting into Krabi's tourism and water resources sector) to revise the proposed MBI: bird watching tour.

#### **Agenda 5      Others**

None

**Meeting end** 12.00 PM

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

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