CHAPTER 7: Conclusion

7.1 Meeting the TDA objectives

The 2025 National Transboundary Diagnostic Analysis has successfully met its primary objectives as set out in the inception phase. It has established a scientifically grounded 2024–2025 baseline for fisheries stock health, pollution loads, and ecosystem coverage, effectively updating the data from the previous 2000 assessment. The analysis has verified the causal chains linking land-based activities—specifically industrialization in the Eastern Economic Corridor (EEC) and intensive agriculture—to the degradation of marine resources in the Gulf of Thailand. Furthermore, it has identified the "implementation gap" between legislation and enforcement as the critical governance weakness.

Crucially, the validation of these findings was solidified during the TDA Review Meeting convened by the Department of Marine and Coastal Resources (DMCR) on **November 17, 2025**. The objective of this meeting was to collaboratively review and discuss the results of the 2025 Transboundary Diagnostic Analysis and the draft preliminary report. This updated report underscores that it will play a critical role in supporting the formulation of the next phase of the SAP, ensuring that future projects are actionable and continuous. Additionally, the analysis results are intended to be applied to improve national environmental databases and development processes, ensuring that Thailand's marine management is data-driven and aligned with regional goals .

7.2 Key conclusions and crosscutting interactions

The assessment reveals a complex web of interactions where **climate change acts as a threat multiplier** for existing local stressors:

- **Climate-Pollution Nexus:** Eutrophic waters in the Upper Gulf reduce the thermal tolerance of coral reefs, making them more susceptible to mass bleaching during marine heatwaves. Pollution control is therefore a key climate adaptation strategy.
- **Socio-Economic Vulnerability:** There is a stark divergence in resilience. The wealthy industrial East faces financial risks to infrastructure, while the agrarian South faces livelihood risks due to resource depletion and poverty.
- **Land-Sea Integration**: The analysis underscores the critical need for Land-Sea Integration. The "Land-Sea Disconnect" remains a primary driver of degradation, where terrestrial activities (nutrient runoff, sediment loading) undermine marine ecosystem health. Future management must bridge this gap by treating watersheds and coastal zones as a single continuum.
- **Fisheries Threats and Management:**
    - **Ecosystem Approach**: There is an urgent need to shift towards an Ecosystem Approach to Fisheries Management (EAFM), particularly in vulnerable areas where single-species management has failed to prevent degradation.
    - **Gear Selectivity and Catch Efficiency:** The prevalence of non-selective fishing gears (e.g., trawlers with high catch efficiency but poor

selectivity) continues to capture high volumes of juvenile fish and "trash fish" compared to selective gears. This unsustainable Fishing Effort directly impacts stock recruitment and ecosystem balance.
    - **Governance and Legal Contradictions:** A critical governance finding is the practical contradiction between legal sections regarding by-catch reduction. Specifically, tensions exist between Section 57 (which prohibits the catch of juvenile aquatic animals below a prescribed size) and Section 69 (which regulates fishing gear specifications, such as mesh sizes). In practice, fishers operating "legal" gear under Section 69 often still catch undersized fish prohibited by Section 57, creating an enforcement loophole. The TDA recommends resolving this legal ambiguity to effectively reduce by-catch.
- **Transboundary Species Management**: The report highlights the necessity of regional cooperation for Transboundary Species. Joint management initiatives must be strengthened, building on frameworks like the GOT Fish Project led by SEAFDEC, to ensure harmonized regulations across the Gulf of Thailand.

Note on Methodological Constraints: It is important to note that **Ocean Accounts** were not utilized in this assessment. This decision was due to current limitations in isolating marine-specific data within national statistics and the necessity to maintain consistency with the project's original indicator framework to ensure comparability with historical data.

7.3 Patterns of risk among spatial units of analyses and at country scale

Risk is not evenly distributed across Thailand's maritime domain. The TDA identifies three distinct risk typologies:

1) **The Industrial Hotspot (Upper Gulf & EEC):** Characterized by **High Environmental Risk** (hypoxia, hazardous waste, microplastics) but **High Adaptive Capacity** (wealthy provinces). The priority here is regulation and technological mitigation.
2) **The Livelihood Trap (Lower Gulf/Deep South):** Characterized by **Moderate Environmental Risk** but **High Social Vulnerability** (poverty >20%). Climate shocks here directly translate to human suffering due to high dependence on nature.
3) **The Ecological Refugia (Offshore Islands):** Sites like Koh Losin and the Chumphon Pinnacles represent **Low Risk/High Value** assets. They act as the "biological insurance" for the Gulf and require strict protection from physical damage to maintain larval connectivity.

7.4 Target audience

This report targets five distinct groups to drive change:

- **National Policymakers (NESDC, MONRE):** To integrate "Blue Carbon" and marine spatial planning into the National Economic and Social Development Plan.
- **Provincial Administrations (PAOs):** Specifically in the EEC and Southern

provinces, to guide zoning and waste management investments.

- **Private Sector Investors:** To highlight the financial risks of operating in degraded ecosystems and the opportunities in "Nature-based Solutions" (e.g., mangrove carbon credits).
- **Local Actors and Communities:** To align policy with local realities, frameworks such as the Fisheries Action Plan must be adapted to the specific context of small-scale (artisanal) fisheries. Recognizing that regulations designed for large commercial fleets are often inapplicable at the community level, this approach prioritizes differentiated management measures that secure local livelihoods while ensuring long-term resource sustainability.
- **International Partners (GEF, UNEP):** To demonstrate Thailand's readiness for regional cooperation on transboundary issues like marine plastics and migratory fish stocks.

7.5 Future indicator-based environmental assessments

Moving forward, Thailand must evolve its assessment framework from "Status Monitoring" to "Resilience Monitoring":

- **Process Indicators:** Shift from measuring just "forest area" to measuring "carbon sequestration rates" and "seedling survival".
- **Integrated Monitoring:** Collate water quality data (PCD) with coral health data (DMCR) in real-time to predict and mitigate bleaching events.
- **Socio-Economic Metrics:** Regularly track the "Ocean Health Index" and "Coastal Livelihood Vulnerability" to ensure that governance interventions are socially equitable.
- **Ocean Literacy and Blue Curriculum:** Future assessments and development strategies should consider **Ocean Literacy** and the **Blue Curriculum** as fundamental drivers for socio-economic development. Aligning national education with the **UNESCO/WESTPAC** framework will build a citizenry capable of understanding and protecting marine resources, ensuring the long-term success of technical interventions.