



Water Risk Assessment Report 2026

Water Risk Assessment of BCPG's Portfolio

Insights from ENCORE, the WWF Risk Filter Suite, and GIS Spatial Analysis



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The Corporate Imperative for Nature

Why Biodiversity & Water Risk Assessments are now a fundamental requirement for enterprises.

Resource Dependency

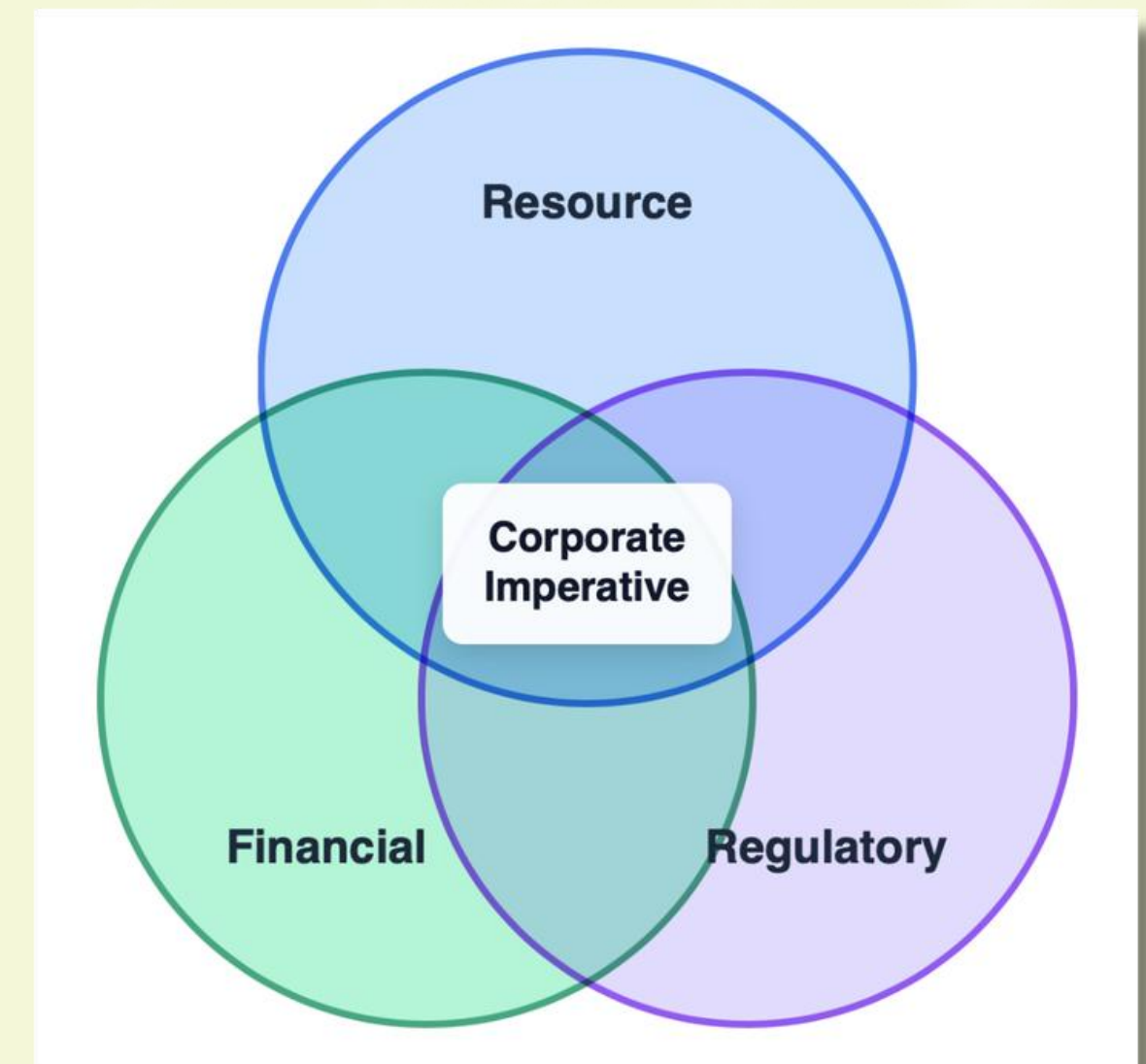
Operations inherently rely on critical ecosystem services. Assessing dependencies—especially water availability and quality—is vital to prevent operational bottlenecks and safeguard supply chains.

Financial Mitigation

Ecological degradation translates directly into financial risk. Proactive assessment mitigates the risk of stranded assets and meets the growing demands of ESG-focused investors.

Regulatory Alignment

With the rise of frameworks like TNFD and CSRD, nature-related financial disclosures are shifting from voluntary to mandatory. Early assessment ensures compliance and protects brand reputation.



METHODOLOGY & FRAMEWORK INTEGRATION

Global Assessment Tools



ENCORE (EXPLORING NATURAL CAPITAL OPPORTUNITIES, RISKS AND EXPOSURE)



Exploring Natural Capital Opportunities, Risks and Exposure. Maps BCPG's production processes (e.g., solar, wind, ALT) to dependencies and impacts on ecosystem services.



WWF RISK FILTER SUITE (VERSION 3.0)



- **Water Risk Filter (WRF)** Assesses basin-related and operational water risks. Evaluates physical (scarcity, quality), regulatory, and reputational water risks specific to BCPG site locations.
- **Biodiversity Risk Filter (BRF)** Analyzes spatial proximity of operations to key biodiversity areas, protected areas, and regions with high species richness or ecological fragility.

Water Risk Assessment

Objective

Assess water-related risks, dependencies, and operational impacts across BCPG operations in Thailand to support CSA, ESG disclosures, and long-term water resilience management

Coverage

Power generation assets (21 site) and ALT

Key Assessment Areas

- Water stress & scarcity
- Physical water risks (drought, flood, water availability)
- Water dependency & operational impact
- Watershed sensitivity
- Regulatory & reputational water risks

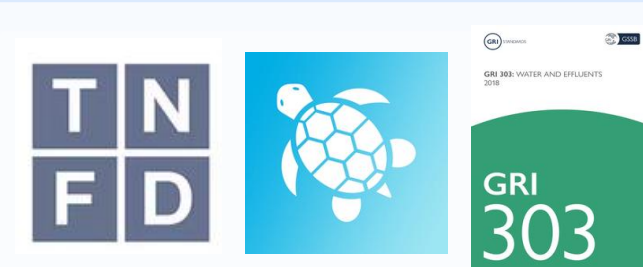
Assessment Tools

- WWF Water Risk Filter
- GIS Spatial Analysis



Reference Standards

- S&P Global CSA
- TNFD
- GRI 303 Water & Effluents
- CEO Water Mandate



Deliverables

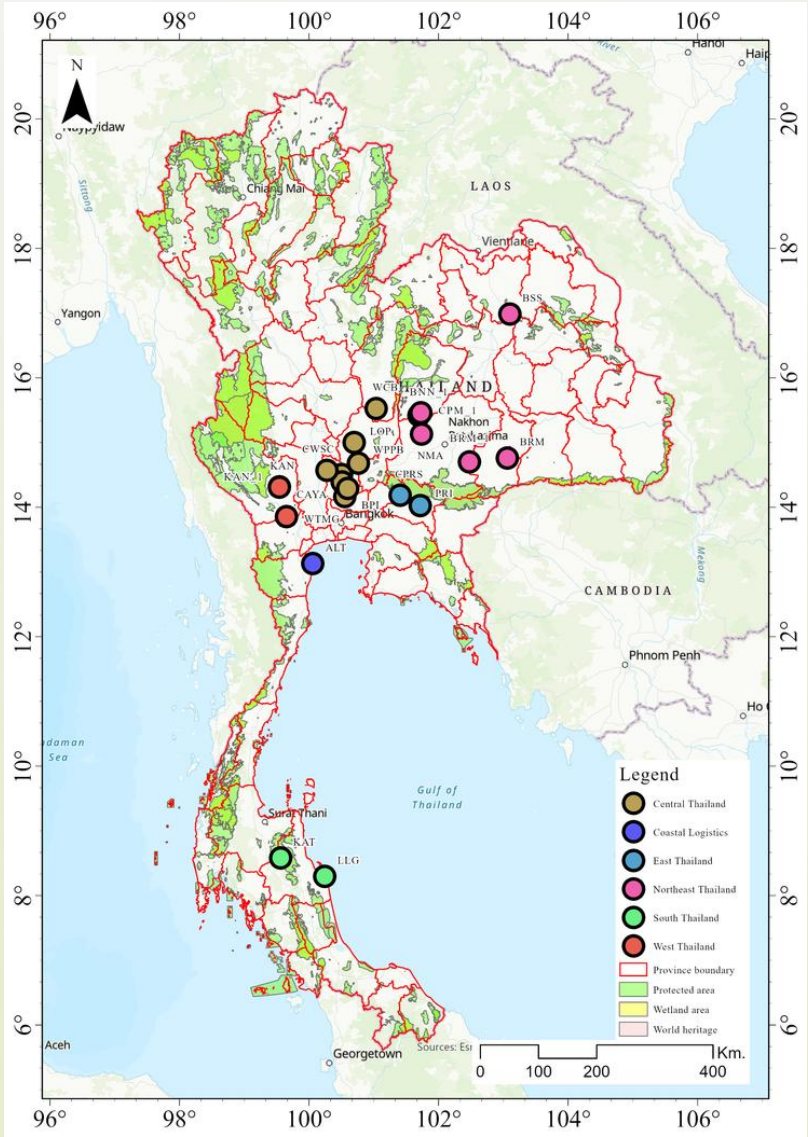
- Water Risk Screening
- Site-Level Water Stress Mapping
- Water Dependency & Impact Assessment
- High-Risk Site Prioritization
- Water Risk Management Recommendations

Expected Outcomes

Identify water-stressed and high-risk operational sites, prioritize mitigation and water efficiency actions, and strengthen long-term water resilience.

SCOPE OF ASSESSMENT

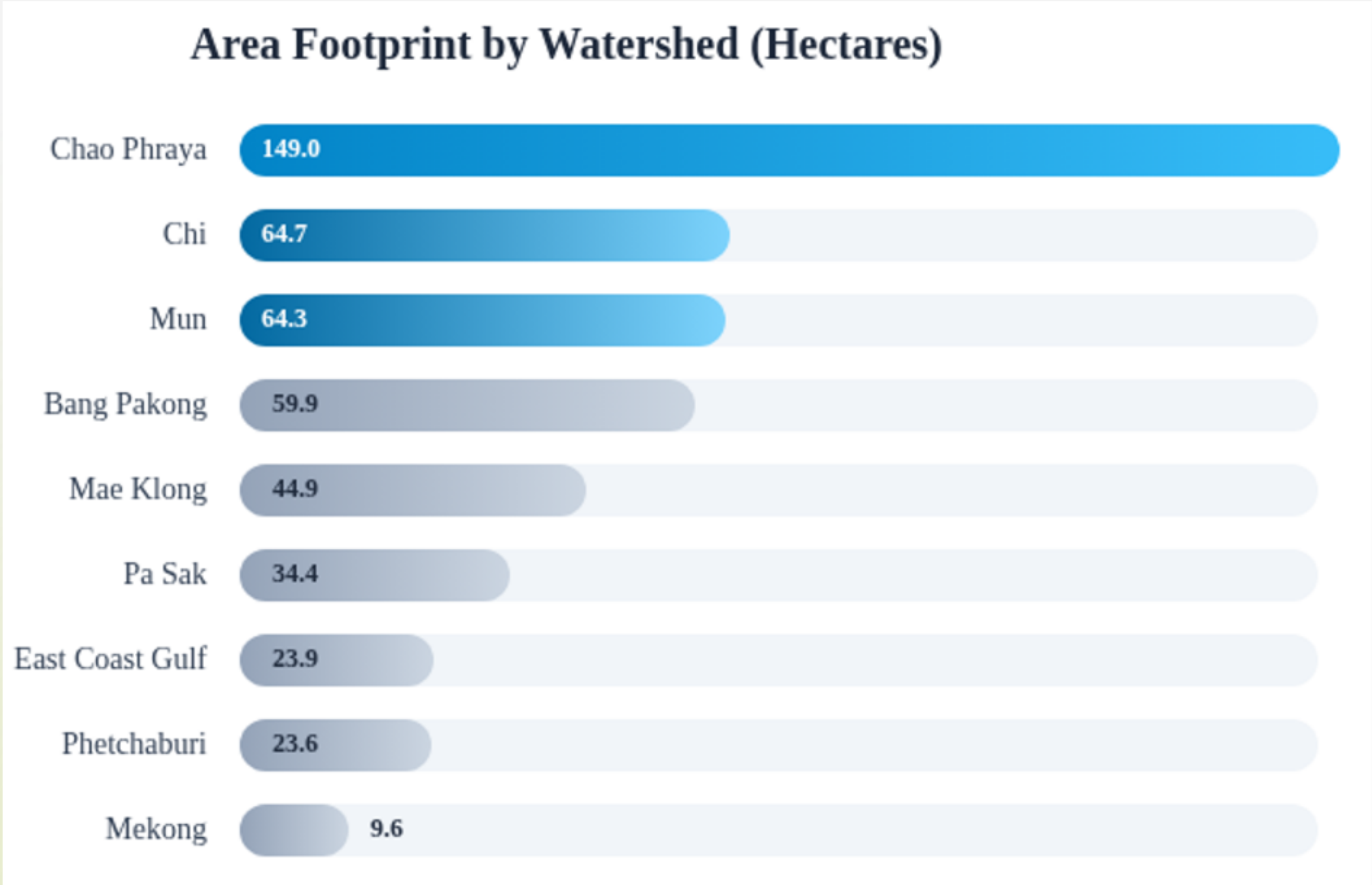
Power generation assets (21 sites and Oil terminal project)



No.	BCPG's Sites	Business Activities	Location	Watershed	Area (Hectares)
1	BPI	Solar Farm	Phra Nakhon Si Ayutthaya, Thailand	Chao Phraya	83.1372
2	BPH_1	Solar Farm	Phra Nakhon Si Ayutthaya, Thailand	Chao Phraya	42.514
3	CAYA	Solar Farm	Phra Nakhon Si Ayutthaya, Thailand	Chao Phraya	2.8288
4	CBPI	Solar Farm	Phra Nakhon Si Ayutthaya, Thailand	Chao Phraya	11.0564
5	CWSC	Solar Farm	Ang Thong, Thailand	Chao Phraya	9.4604
6	LOP	Solar Farm	Lopburi, Thailand	Pa Sak	21.7604
7	WCB	Solar Farm	Phetchabun, Thailand	Pa Sak	3.6092
8	WPPB	Solar Farm	Saraburi, Thailand	Pa Sak	9.0612
9	BNN_1	Solar Farm	Chaiyaphum, Thailand	Chi	40.858
10	CPM_1	Solar Farm	Chaiyaphum, Thailand	Chi	23.8864
11	BRM	Solar Farm	Buri Ram, Thailand	Mun	22.0188
12	BRM_1	Solar Farm	Buri Ram, Thailand	Mun	18.6848
13	NMA	Solar Farm	Nakhon Ratchasima, Thailand	Mun	23.6124
14	BSS	Solar Farm	Udon Thani, Thailand	Mekong	9.6
15	KAN	Solar Farm	Kanchanaburi, Thailand	Mae Klong	19.1808
16	KAN_1	Solar Farm	Kanchanaburi, Thailand	Mae Klong	19.102
17	WTMG	Solar Farm	Kanchanaburi, Thailand	Mae Klong	6.6304
18	CPRS	Solar Farm	Prachin Buri, Thailand	Bang Pakong	11.5492
19	PRI	Solar Farm	Prachin Buri, Thailand	Bang Pakong	48.3704
20	ALT	Oil Terminal and Storage Services	Phetchaburi, Thailand	Phetchaburi	23.5671
21	KAT	Solar Farm	Nakhon Si Thammarat, Thailand	Peninsula	1.8276
22	LLG	Wind Farm	Nakhon Si Thammarat, Thailand	Peninsula	22.0321

OPERATIONAL FOOTPRINT & WATERSHED DISTRIBUTION

Scope of Assessment: Distribution of BCPG's 22 operational sites across Thailand's major river basins.



474.3

Total Hectares

22 Sites

9 Watersheds

High Exposure Zone

Over 31% of the operational footprint is concentrated in the Chao Phraya basin, highlighting a critical area for both water stress and flood risk assessments.

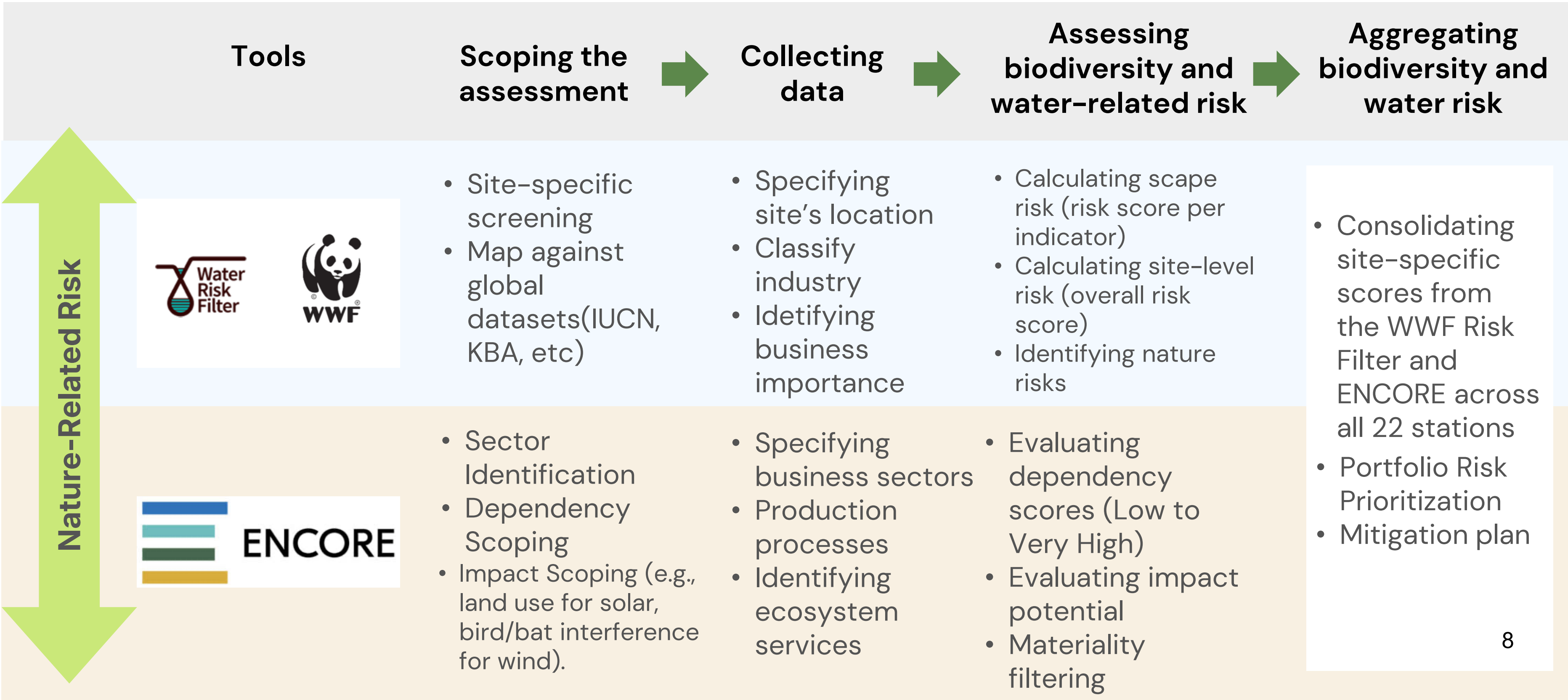
Northeastern Footprint

The Chi and Mun basins account for a combined 129 hectares, areas typically susceptible to seasonal drought risks impacting operational water dependency.

Water Risk Assessment Process



Methodology and Framework



Water Risk Mitigation Hierarchy



Assessment Results



GIS Spatial analysis

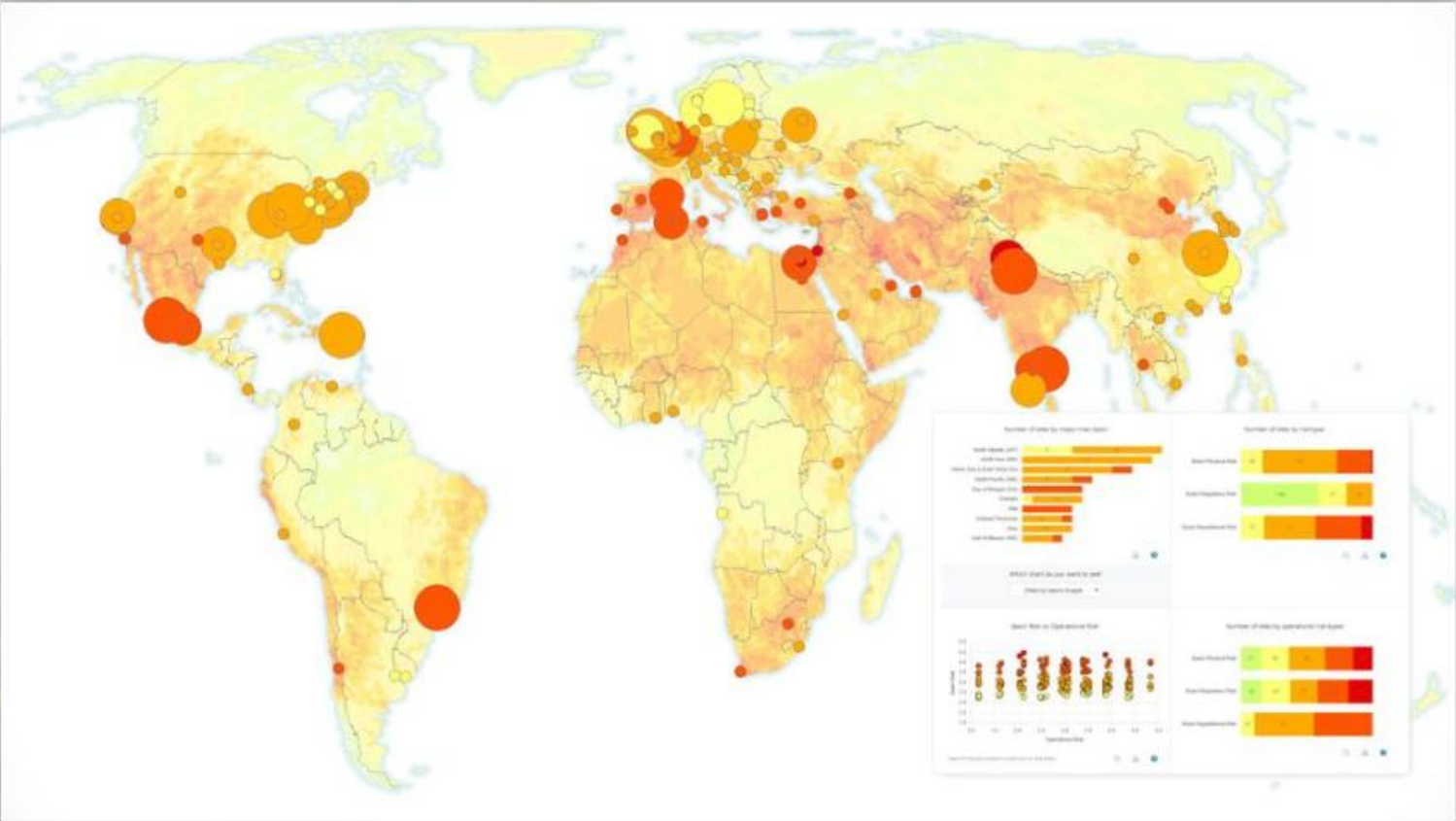
THE WWF RISK FILTER SUITE



WWF Risk Filter Suite

Biodiversity Risk Filter

Water Risk Filter



WWF Risk Filter Suite v3.0



Biodiversity Risk Filter

INFORM

EXPLORE

ASSESS

PORTFOLIO
MANAGER



Water Risk Filter

EXPLORE

ASSESS



Biodiversity Risk Filter



Water Risk Filter

Overview of implementation steps to run the WWF Risk Filter Suite

Step 0: Scoping the Assessment

The WWF Risk Filter Inform and Explore Modules help focus the scope of the assessment on priority industries and geographies, aligning with the recommendations of the TNFD and SBTN frameworks.

Step 0A: Identifying Industry Materiality

The Inform Module provides information about the level of dependencies on ecosystem services and impacts on biodiversity and water across major industry sectors.

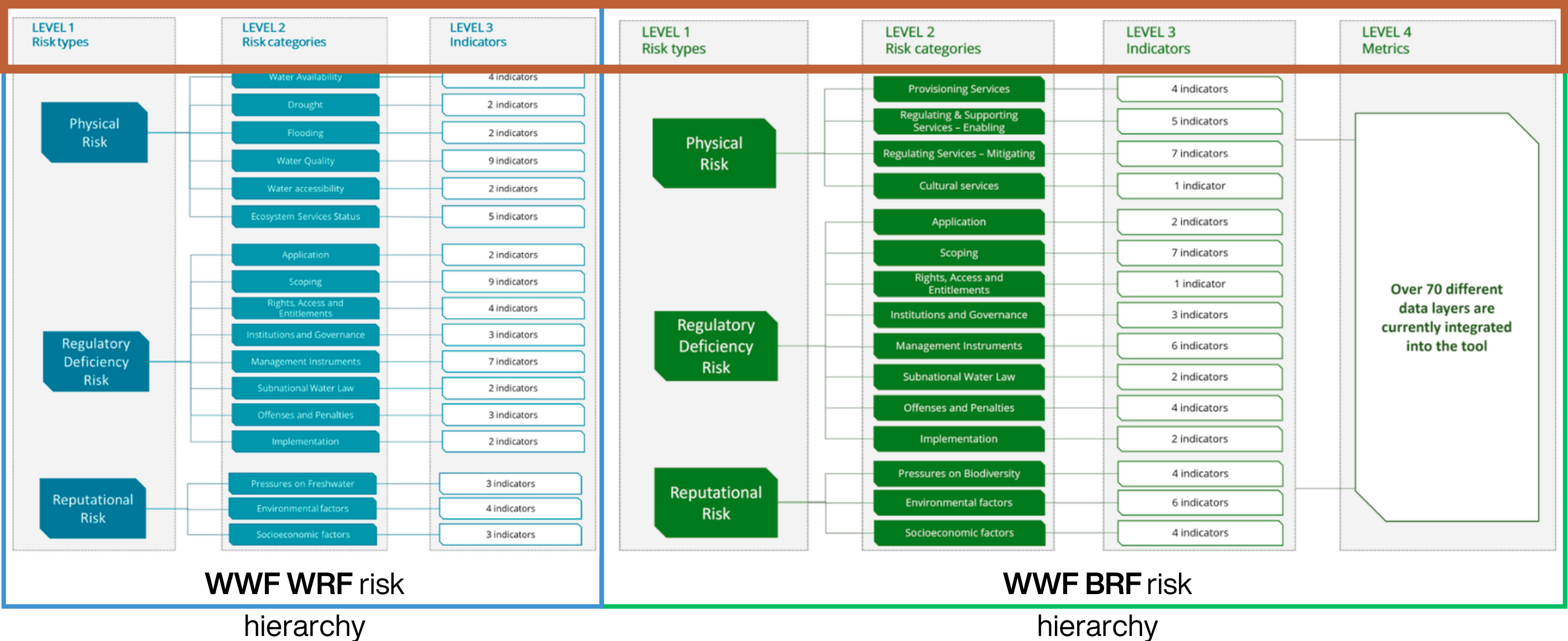
Step 0B: Exploring Landscape & Basin Risks

The Explore Module provides global maps showing risk levels based on a total of **58 biodiversity risk indicators** and **32 water risk indicators**.

Step 1: Collecting Location-specific Company and Supply Chain Data

After refining the scope of the assessment in Step 0, collect location-specific data on the portfolio's operational and supply chain sites. Essential input data (e.g., precise coordinates, industry activity) is required to run the Assess Modules.

RISK HIERARCHY & DEFINITIONS



LEVEL 1: This top level combines individual risk categories into three overarching classifications: Physical, Regulatory, and Reputational risks.

LEVEL 2: This level groups indicators into higher-level risk clusters directly relevant to companies and financial institutions. It encompasses 15 biodiversity risk categories and 17 water risk categories.

LEVEL 3: This level comprises spatial data reflecting the importance and local integrity of biodiversity and water aspects. The data is spatially aggregated into specific assessment units and translated into standardized risk scores across 58 biodiversity risk indicators and 32 water risk indicators.

LEVEL 4: Metrics comprises the raw global geospatial datasets that measure specific environmental, hydrological, and socioeconomic conditions at a given location. These underlying data layers feed directly into the indicators to evaluate location-specific operational vulnerabilities.

- **Physical Risks** arise from the business and its supply chain's dependence on natural conditions and ecosystems. The loss of ecosystem services can reduce productivity or increase input costs.
- **Regulatory Risks** stem from changes in national or local environmental policies and regulations, which can result in higher compliance costs or operational restrictions.
- **Reputational Risks** resulting from the organization's negative impacts on ecosystems and communities. This can damage the brand image, increase investor scrutiny, or diminish public trust.

RISK TYPES, RISK CATEGORIES, AND INDICATORS



Risk Type	Risk Category	Key	Indicator name
PHYSICAL	1. Provisioning Services	S1_1	Water Availability
		S1_2	Forest Productivity and Distance to Markets
		S1_3	Marine Fish Availability
		S1_4	Wild Flora & Fauna Availability
	2. Regulating & Supporting Services - Enabling	S2_1	Soil Condition
		S2_2	Water Quality
		S2_3	Air Quality
		S2_4	Ecosystem Condition (degraded)
		S2_5	Pollination
	3. Regulating Services - Mitigating	S3_1	Landslides
		S3_2	Wildfires
		S3_3	Disease
		S3_4	Herbicide Resistance
		S3_5	Extreme Heat
		S3_6	Tropical Cyclones
		S3_7	Flooding
	4. Cultural Services	S4_1	Natural & Cultural Resources
REGULATORY	5. Application	S5_1	Status of National Biodiversity Strategies and Action Plans (NBSAP)
		S5_2	Biodiversity Conservation Policy Statement in Law
	6. Scoping	S6_1	Definition of Biodiversity
		S6_2	Definition of Wild Fauna
		S6_3	Definition of Wild Flora
		S6_4	Definition of Protected Areas
		S6_5	Definition of Ecological Corridors and Networks
		S6_6	Definition of Invasive Alien species
		S6_7	Definition of a Threatened Species
	7. Rights, Access and Entitlements	S7_1	State's Duty to Protect and Conserve Biodiversity
	8. Institutions and Governance	S8_1	Biodiversity Management Authority
		S8_2	Coordination among National Government Authorities
		S8_3	Public Participation
	9. Management Instruments	S9_1	Monitoring of Biodiversity
		S9_2	Data Compilation and Sharing - National Level
		S9_3	Environmental Impact Assessments (EIA) and Strategic Environmental Assessments (SEA)
		S9_4	Offset Requirements
		S9_5	Protected Areas
		S9_6	Protected Species Management
	10. Subnational Water Law	S10_1	Requirement to Meet National Standards
		S10_2	Coordination Among Local and National Authorities
	11. Offenses and Penalties	S11_1	Pollution Crimes
		S11_2	Habitat Destruction
		S11_3	Violation of invasive species prohibitions
		S11_4	Violation of EIA requirements
	12. Implementation Risk	S12_1	Effective Policy Formulation
		S12_2	Respect for Institutions
REPUTATIONAL	13. Pressures on Biodiversity	S13_1	Land, Freshwater and Sea Use Change
		S13_2	Forest Canopy Loss
		S13_3	Invasives
		S13_4	Pollution
	14. Environmental Factors	S14_1	Protected/Conserved Areas
		S14_2	Key Biodiversity Areas
		S14_3	Wetlands of International Importance
		S14_4	Other Important Delineated Areas
		S14_5	Ecosystem Condition (Intact)
		S14_6	Range Rarity
	15. Socioeconomic Factors	S15_1	Indigenous Peoples & Local Communities
		S15_2	Resource Scarcity
		S15_3	Labor/Human Rights
		S15_4	Financial Inequality



Risk Type	Risk Category	Key	Indicator name
PHYSICAL	1. Water Availability	B1_1	Water Depletion
		B1_2	Baseline Water Stress
		B1_3	Freshwater Quantity Target
		B1_4	Groundwater
	2. Drought	B2_1	Meteorological Drought
		B2_2	Agricultural Drought
		B2_3	Hydrological Drought
	3. Flooding	B3_1	Flood Occurrence
		B3_2	Flood Hazard
	4. Water Quality	B4_1	Coastal Eutrophication Potential
		B4_2	Nitrate-Nitrite Concentration
		B4_3	Periphyton Growth Potential
		B4_4	Biological Oxygen Demand
		B4_5	Pathogens
		B4_6	Pesticides
		B4_7	Chemicals
		B4_8	Plastics
		B4_9	Salinity
	5. Water Accessibility	B5_1	Access to Basic Safe Drinking Water
		B5_2	Access to Basic Sanitation
	6. Ecosystem Services Status	B6_1	Forest Canopy Loss
		B6_2	Landslides
		B6_3	Invasive Species
		B6_4	Desertification
		B6_5	River Fragmentation
REGULATORY	7. Application	B7_1	Status of IWRM Water Policy
		B7_2	IWRM Policy Statement in Law
	8. Scoping	B8_1	Definition of Freshwater Resources
		B8_2	Definition of Groundwater
		B8_3	Definition of Wastewater
		B8_4	Definition of Environmental Water
		B8_5	Definition of Wetlands
		B8_6	Definition of Basin, Watershed, or Catchment
		B8_7	Definition of Riparian Zone
		B8_8	Definition of Potable Water
		B8_9	Definition of Water Pollution
	9. Rights, Access and Entitlements	B9_1	Constitutional Right to Clean and Healthy Environment
		B9_2	Access to Water Supply and Sanitation Infrastructure
		B9_3	Water Register
		B9_4	Infrastructure and Management
	10. Institutions and Governance	B10_1	Water Resource Authority
		B10_2	Coordination among National Government Authorities
		B10_3	Public Participation
	11. Management Instruments	B11_1	Monitoring Environmental Water Quality
		B11_2	Monitoring of Environmental Water Status
		B11_3	Water Catchment Management
		B11_4	Water Resource Management Plans
		B11_5	Enforceability of Water Resource Management Plans
		B11_6	Water-Related Disasters
		B11_7	Data Compilation and Sharing - National Level
	12. Subnational Water Law	B12_1	Requirement to Meet National Standards
		B12_2	Coordination Among Local and National Authorities
	13. Offenses and Penalties	B13_1	Violation of Clean Water Standards
		B13_2	Violation of Wastewater Standards
		B13_3	Harm to Wetlands
	14. Implementation Risk	B14_1	Effective Policy Formulation
		B14_2	Respect for Institutions
REPUTATIONAL	15. Pressures on Freshwater	B15_1	Freshwater Exploitation
		B15_2	Freshwater Habitat Degradation
		B15_3	Pollution
	16. Environmental Factors	B16_1	Freshwater Biodiversity
		B16_2	Wetlands of International Importance
		B16_3	Ecosystem Condition
		B16_4	Free Flowing Rivers
	17. Socioeconomic Factors	B17_1	Water Conflicts
		B17_2	Labour/Human Rights
		B17_3	Financial Inequality



Introduction to WWF Water Risk Filter



WWF Risk Filter Suite

Biodiversity Risk Filter

Water Risk Filter



WATER RISK FILTER

Understand, assess and respond to your water risks for enhancing resilience

Corporate and portfolio-level screening tool to help companies and investors to prioritise action on what and where it matters the most to address water risks for enhancing business resilience and contributing to a sustainable future

Source: © WWF



The **WWF Water Risk Filter** is a spatial tool developed by the World Wide Fund for Nature (WWF) to assess water-related risks, supporting sustainable business operations.

- ✓ It overlays actual project locations with the WWF Water Risk Filter spatial database.
- ✓ Integrates comprehensive hydrological, environmental, and water management databases to assess risks at the river basin level (Basin Risk).
- ✓ Thailand is currently divided into **22 main river basins** within this assessment framework.

A high assessment score does not imply that the project itself causes a high impact on water resources. **It indicates that the project operates in a river basin environment with high intrinsic water risks, potentially affecting future operational continuity and compliance.**



Core Risk Assessment Categories



Physical Risk

Assesses risks arising from **water quantity and quality issues**. This includes vulnerability to natural hazards related to water, such as severe **water scarcity, flooding events, droughts, and overall water quality degradation**.

Regulatory Risk

Evaluates risks stemming from **laws, policies, and governance**. It scrutinizes water rights, the efficiency of institutions, and the strict enforcement of water resource regulations at the respective basin level.

Reputational Risk

Assesses risks related to stakeholder acceptance and social dynamics. This includes conflicts over **water usage, impacts on local communities, threats to biodiversity**, and the resulting corporate reputation.



Global Database Integration



The WWF database does not rely on a single localized source. It is a robust integration of data from internationally recognized agencies and scientific research bodies.

✓ Hydrological Boundaries

Utilizes boundary and river network data from **HydroSHEDS** and **HydroBASINS** (Global Watershed and Sub-basin Database).

✓ Environmental Metrics

Incorporates advanced hydrological, climate change projections, and land-use data from leading global databases.

✓ Governance Data

Sources legal and institutional effectiveness data from international organizations such as the World Bank, the United Nations (UN), and official government repositories.

All data is strictly standardized to a uniform spatial unit (HydroBASINS Level 7) prior to calculating comprehensive risk scores on a scale of 1 to 5 (Low to Very High).

5-Level Risk Assessment Scale





Water Risk Assessment Methodology



2. Input Data into System

Input the compiled datasets into the WWF Water Risk Filter utilizing Global 2024 database standards.

4. Interpretation

Rank critical areas, identify prominent risk drivers, and formulate strategic management recommendations.

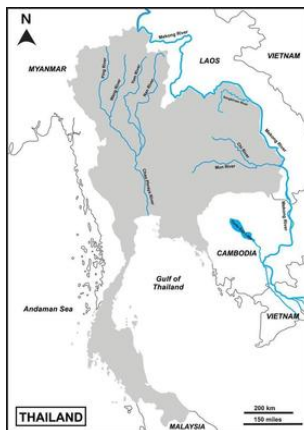
1. Data Preparation

Collect site coordinates, project types (activities), and operational context for all 22 BCPG locations.

3. Risk Assessment

Execute spatial analysis for Physical Risk, Regulatory Deficiency Risk, and Reputational Risk.

Data Components



22 Sites
Thailand

4 Major River Basins

Global 2024 Database

Basins Covered

Chao Phraya Basin
8 Sites

Mekong Basin
7 Sites

Malay Peninsula
6 Sites

Gulf of Thailand Coast
1 Sites (ALT)



Water Risk Assessment Methodology



Water Use and Water-Related Risk Assessment

Project Type	Main Water Uses	Water Source	Water Use Level	Risk to Water Resources	Rationale for Risk Level
Solar Power Plants (Solar Farms) (20 sites)	• Solar panel cleaning • Landscape irrigation and dust control within the project area • Office and sanitation use	Groundwater, with regular water quality monitoring	Low	Low, Potential contamination of a treatment pond from seepage originating from a nearby poultry farm was identified at one project site.	Solar power generation does not require water for electricity production. Water is used mainly for supporting activities, including panel cleaning and office use; therefore, water consumption and wastewater generation are relatively low. Potential impacts are mainly associated with excessive groundwater abstraction or stormwater runoff.



Water Risk Assessment Methodology



Water Use and Water-Related Risk Assessment

Project Type	Main Water Uses	Water Source	Water Use Level	Risk to Water Resources	Rationale for Risk Level
Wind Power Plant (1 site)	- Office and sanitation use - Occasional equipment cleaning and maintenance	Groundwater, with regular water quality monitoring	Very Low	Very Low	Wind power generation requires virtually no water for electricity production. Water is used only for general operations and occasional maintenance; therefore, no process wastewater is generated and impacts on water resources are very low.



Water Risk Assessment Methodology



Water Use and Water-Related Risk Assessment

Project Type	Main Water Uses	Water Source	Water Use Level	Risk to Water Resources	Rationale for Risk Level
Tank Terminal for Third-Party Leasing (1 site)	• Tank and equipment cleaning • Firefighting system and emergency water storage • System and tank hydrostatic testing (Hydrotest) • Office and sanitation use	Groundwater, with regular water quality monitoring	Moderate	Moderate to High	Oil storage does not require water in the core process; however, water is used for tank cleaning, maintenance, and firefighting. Potential risks include oil- or chemical-contaminated wastewater and accidental spills or leaks that may affect surface water and groundwater.



WWF Water Risk Filter Assessment Results

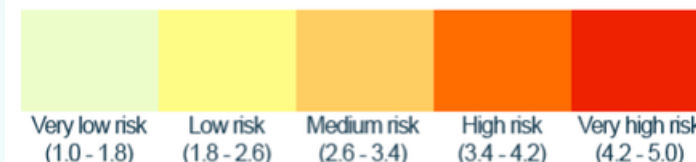
Evaluating 22 BCPG's Sites in Thailand using the WWF Water Risk Filter.
Focusing on Basin-level Physical, Regulatory, and Reputational Risks.



Site Distribution (22 Total Sites)

- ✓ 10 Sites: High Risk
- ✓ 10 Sites: Medium Risk
- ✓ 2 Sites: Low Risk

A high assessment score does not imply that the project itself causes a high impact on water resources. It indicates that **the project operates in a river basin environment with high intrinsic water risks, potentially affecting future operational continuity and compliance.**





Physical Risk Dashboard



3.21

MODERATE RISK

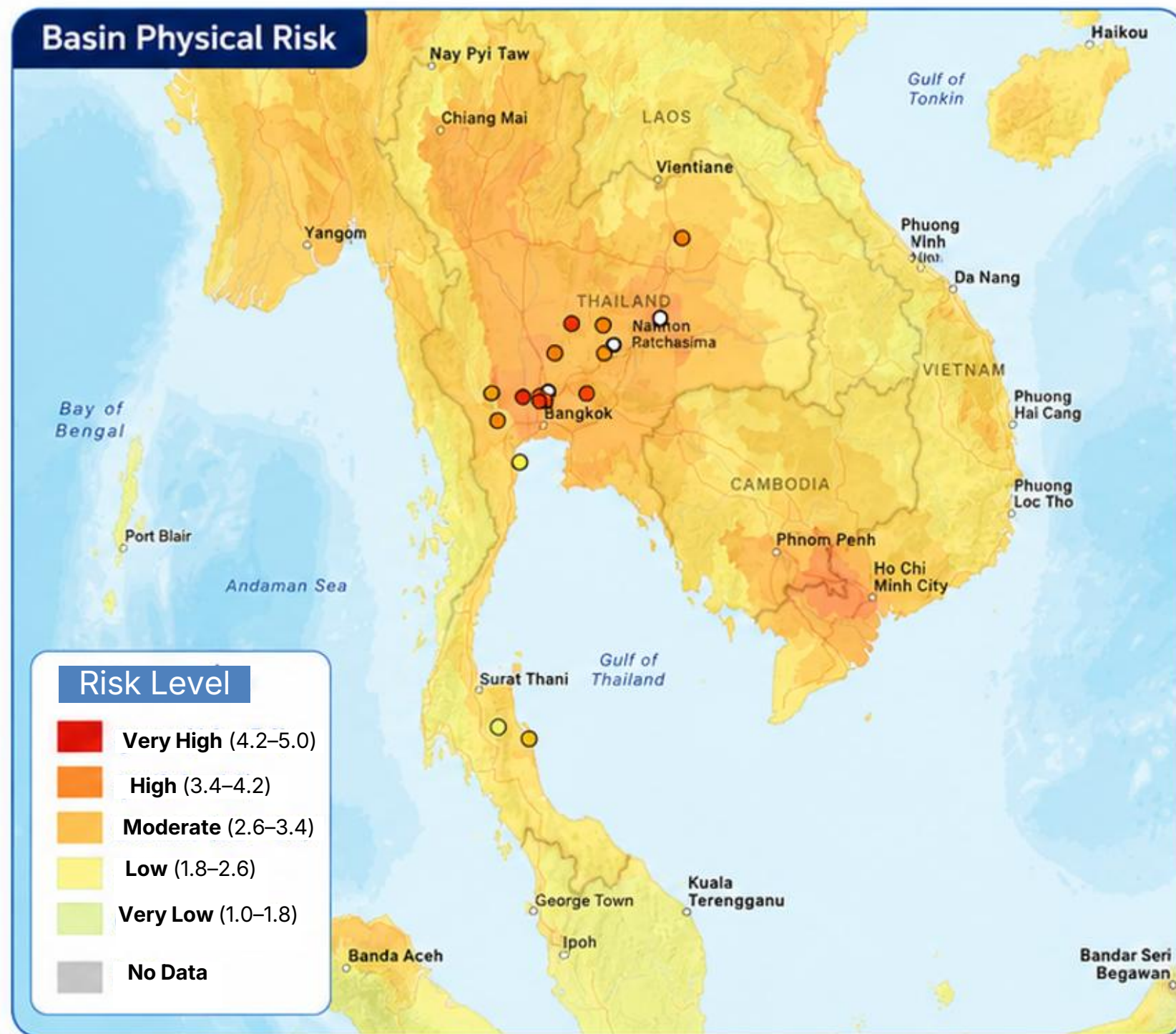
An assessment score does not imply that the projects themselves cause moderate impacts on water resources. It indicates that the projects operate in river basin environments with moderate intrinsic water risks, potentially affecting their future operational continuity and compliance.

Key Physical Insights

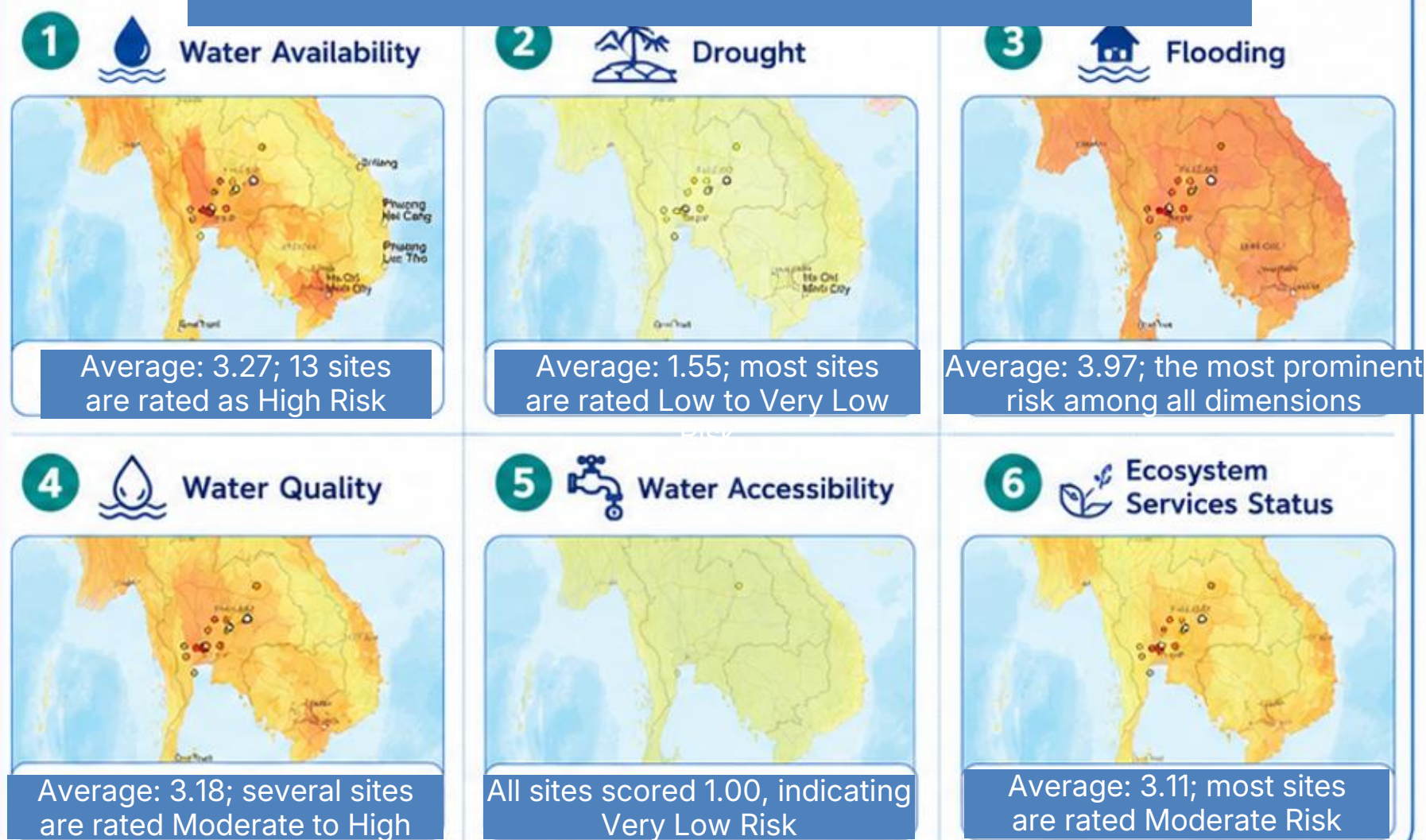
While the overall average rests at a **'Moderate' risk level**, the distribution reveals significant vulnerabilities that demand engineered resilience.

- ✓ **Flooding:** Identified as the most prominent physical threat across the portfolio.
- ✓ **Water Availability:** The second highest risk driver, showing potential seasonal stress.
- ✓ **Water Quality:** Ranked third, indicating concerns over source degradation.

WWF Water Risk Filter Assessment Results



Assessment Results by Sub-Indicator (6 Dimensions)



Overall Average Score: 3.21 | Moderate Risk

High Risk: 10 sites | Moderate Risk: 10 sites | Low Risk: 2 sites

Key High-Risk Sites: BPH 1, CWSC, WPPB, CAYA, BRM 1a, BRM1



Physical Risk Factors



1. Flooding HIGH	This is the highest scoring factor. It reflects that many areas face significant flood risks from heavy rainfall, rapid runoff, and extreme weather events.
	Impact: This could severely impact BCPG's infrastructure, electrical systems, substations, and access roads. Mitigation to prevent operational disruption from flooding must be prioritized above all other physical risks.
2. Water Availability MODERATE to HIGH	Scored at a Moderate-High level. Alarmingly, 13 specific sites face high risk, indicating a strong potential for severe water stress during certain seasonal periods.
	Impact: Although renewable projects consume relatively little water, it remains essential for solar panel cleaning and general maintenance. Shortages could impact these operations and escalate water sourcing costs.



Physical Risk Factors



3. Water Quality MODERATE	Scored at moderate risk. This indicates potential degradation of water sources (such as high sediment, nutrient overload, salinity, or chemical pollution) in several operational areas.
	Impact: Poor water quality could significantly increase internal water management and filtration costs for the projects.
4. Ecosystems & Drought MODERATE	Ecosystem Services: Scored Moderate. Ecosystem integrity indicates that some areas are important for water storage, flood control, and maintaining water quality. If these ecosystems deteriorate, the watershed's ability to cope with extreme events will decline.
	Drought & Accessibility: Scored Low. Overall, project locations do not face severe drought risks compared to flooding , and most areas have excellent infrastructure access to water sources.



Basin Regulatory Deficiency Risk Overview

This category assesses water governance at the national level. It evaluates **legal effectiveness, water management zoning, water rights allocation**, and overall **management tools** based on the 22 project locations.

This does not mean the specific areas lack water or have direct quality issues today. The watershed where the project is located has **institutional limitations in water governance and management**, including **gaps in legal frameworks, overlapping responsibilities among water management agencies, limited water-use rights, and insufficient water management tools** that could pose compliance challenges in the future.



Regulatory Risk Dashboard



3.50

HIGH RISK

An assessment score does not imply that the projects themselves cause high impacts on water resources. It indicates that the projects operate in river basin environments with high intrinsic water risks, potentially affecting their future operational continuity and compliance.

Systemic Structural Risk

100% of the evaluated sites (22 out of 22) fall into the High Risk category for Regulatory Deficiency.

Although **the project has relatively low water demand** compared with other industries, it should **continuously monitor changes in water regulations, water-use permits, and environmental requirements**, while **coordinating with relevant agencies to ensure compliance with watershed-specific requirements**.

Basin Regulatory Deficiency Risk



Source: WWF Water Risk Filter (2026)



Overall Score: 3.50 | High Risk



All **22** sites are rated as **High Risk**



This category is assessed at the national level and therefore reflects structural risks related to the legal and governance framework.

Summary of Assessment by Category



Application and Scoping: **Moderate Risk**



Rights, Access, and Management Instruments: **Moderate Risk**



Institutions and Governance: **Low to Moderate Risk**



Implementation and Enforcement: **Requires Ongoing Monitoring**

Assessment Results by Sub-Category

7

Application



8

Scoping



9

Rights, Access and Entitlements



10

Institutions and Governance



11

Management Instruments



14

Implementation and Enforcement



Implications for the Organization:

Continuously monitor regulations related to water use, drainage, wastewater discharge, permitting requirements, and local regulatory measures.



Regulatory Risk Factors



Application of Laws

Moderate

Evaluates how much laws and policies are actually applied on the ground.

While Thailand possesses **clear national frameworks** like the Water Resources Act. **The implementation of laws varies across areas and agencies**, which may require additional time for project coordination or obtaining permits in some cases.

Scoping & Zoning/watershed management boundaries

Moderate

Assesses the appropriateness of watershed management boundaries and designated responsible agencies.

Thailand has relatively clear, but coordination across agencies and between watersheds could be further improved. This may affect **project coordination when multiple agencies are involved in the same area**.



Regulatory Risk Factors



Water-use rights and access to water, water management tool Moderate	Evaluates the clarity of water rights and the permitting systems.
	Thailand has a water-use rights system, but enforcement and management consistency remain limited in some areas. Although the project requires only a small amount of water, it must still comply with water-use and water-discharge requirements.
Institutions and Governance Low to Moderate	Assesses the efficiency of government agencies, transparency, and stakeholder participation.
	This indicator assesses the effectiveness of government agencies, transparency, and stakeholder participation. The score is low to moderate, indicating that Thailand has a relatively clear water governance structure, but challenges remain in data integration and coordination among agencies.



Regulatory Risk Factors



Implementation & Enforcement

HIGH

Critical. This factor has the greatest negative impact on the overall risk score.

This indicator assesses law enforcement, monitoring, and the performance of relevant agencies. **It has the greatest influence on the overall risk score.** Although Thailand has a relatively complete water governance framework, **enforcement and monitoring vary across areas**, resulting in high regulatory risk. For the project, this may **affect permit approval, changes in requirements, environmental monitoring, and project continuity.**



Basin Reputational Risk Overview



Water-related reputational risk refers to the vulnerability that **an organization's brand image, organizational credibility, and stakeholder acceptance** may be negatively impacted due to operating in sensitive, highly competitive, or problematic river basins.

Key assessment factors include

- ✓ **Pressures on Freshwater:** Competition among multiple sectors (agriculture, industry, domestic).
- ✓ **Environmental Factors:** Ecosystem sensitivity and proximity to protected natural areas.
- ✓ **Socioeconomic Factors:** Community reliance on local water sources and stakeholder expectations.



Reputational Risk Dashboard



3.02

MODERATE RISK

An assessment score does not imply that the projects themselves cause moderate impacts on water resources. It indicates that the projects operate in river basin environments with moderate intrinsic water risks, potentially affecting their future operational continuity and compliance.

Risk Distribution Across 22 Sites The portfolio reveals: 1 site at High Risk, 19 sites at Moderate Risk, and 2 sites at Low Risk.

Summary Conclusion Reputational risks primarily stem from **intense existing pressures on freshwater resources and localized ecosystem sensitivities**, especially observed in the southern and coastal regions.



Reputational Risk



Basin Reputational Risk

Basin Reputational Risk Map (Basin Level)



Overall



Overall Average Score: 3.02 | Moderate Risk



High Risk: 1 site | Moderate Risk: 19 sites | Low Risk: 2 sites



Notable Sites: LLG (3.55), ALT (3.38), WTMG (3.34), CPRS (3.26)

Analysis by Risk



Pressures on Freshwater

Pressures on Freshwater: **Average 3.78**
the highest-scoring component



Environmental Factors

Environmental Factors: **Average: 2.41**
LLG and ALT show relatively high sensitivity



Socioeconomic Factors

Socioeconomic Factors: **Score 2.75**
indicating Moderate Risk



Summary: Reputational risk is primarily driven by pressures on freshwater resources and ecosystem sensitivity in certain areas, particularly in southern and coastal regions.



Reputational Risk



Pressures on Freshwater **HIGH**

The highest scoring component. Many sites sit in basins with high multi-sector water competition (e.g., Northeast).

This indicator assesses **water demand across sectors, drought risk, competition for water, and water quality**. It has the highest score, indicating **strong pressure on water resources** in several areas, **particularly the northeastern watersheds**. Although the project uses relatively little water, **operating in water-stressed areas may attract attention from local communities and regulators**.

Environmental Factors

LOW TO MODERATE

Overall Low to Medium level. **Most sites are not highly ecologically fragile.**

However, specific sites like LLG (Nakhon Si Thammarat) and ALT (Phetchaburi) have higher sensitivity scores and mandate **strict measures to prevent any impacts on surrounding ecosystems**.



Reputational Risk



Socioeconomic Factors

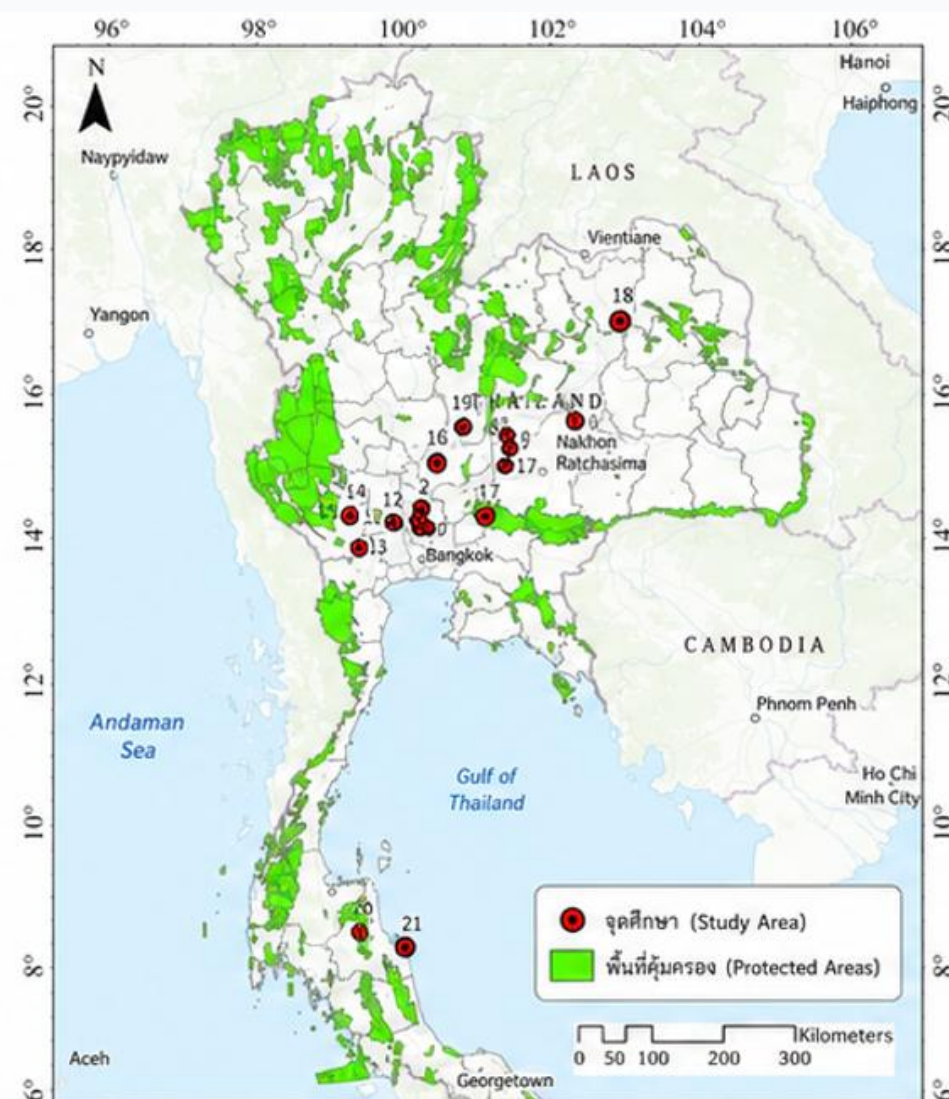
MODERATE

Scored at a Moderate level.

This indicator assesses **community dependence on water resources, stakeholder expectations, and water governance**. The score is moderate, indicating that **some areas may be socially sensitive, which could create reputational risks if concerns arise about the project's water use.**

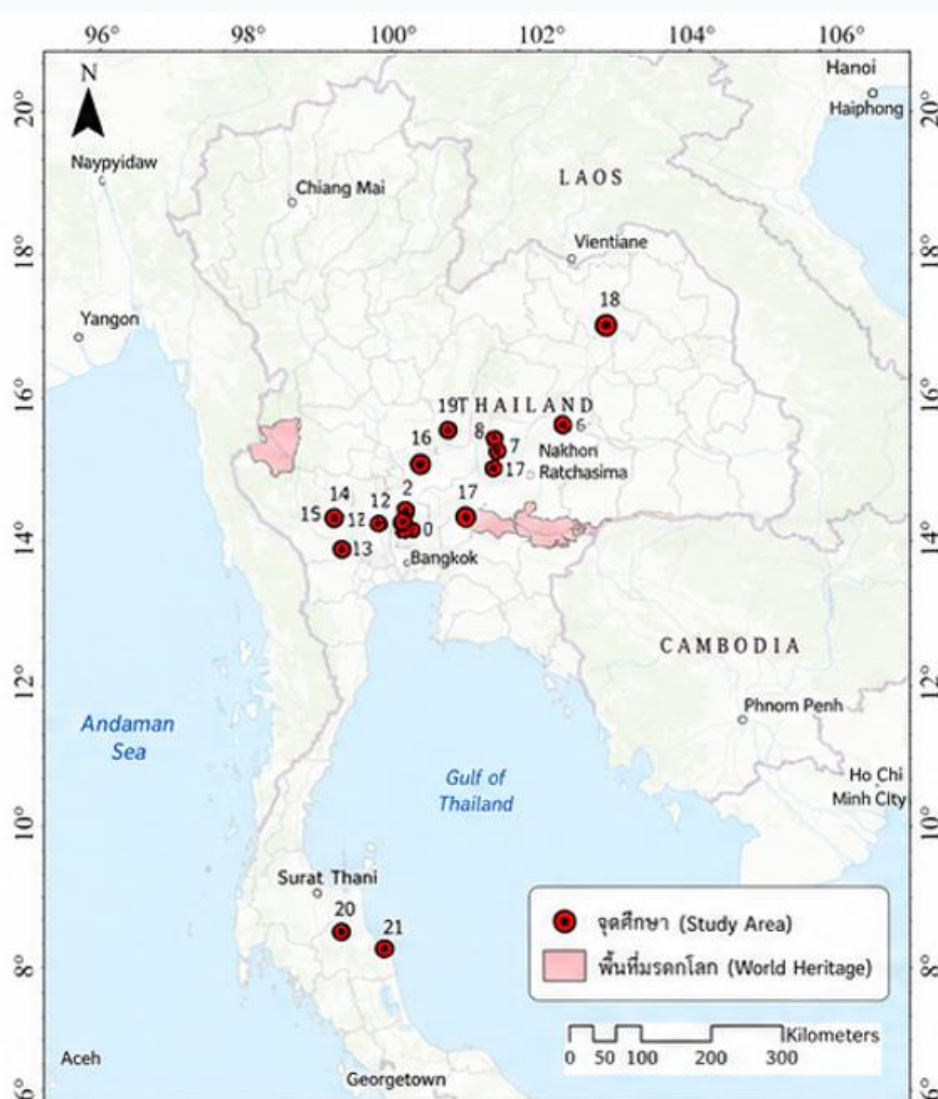
Spatial Overlay Analysis (Conservation Areas)

Protected Areas



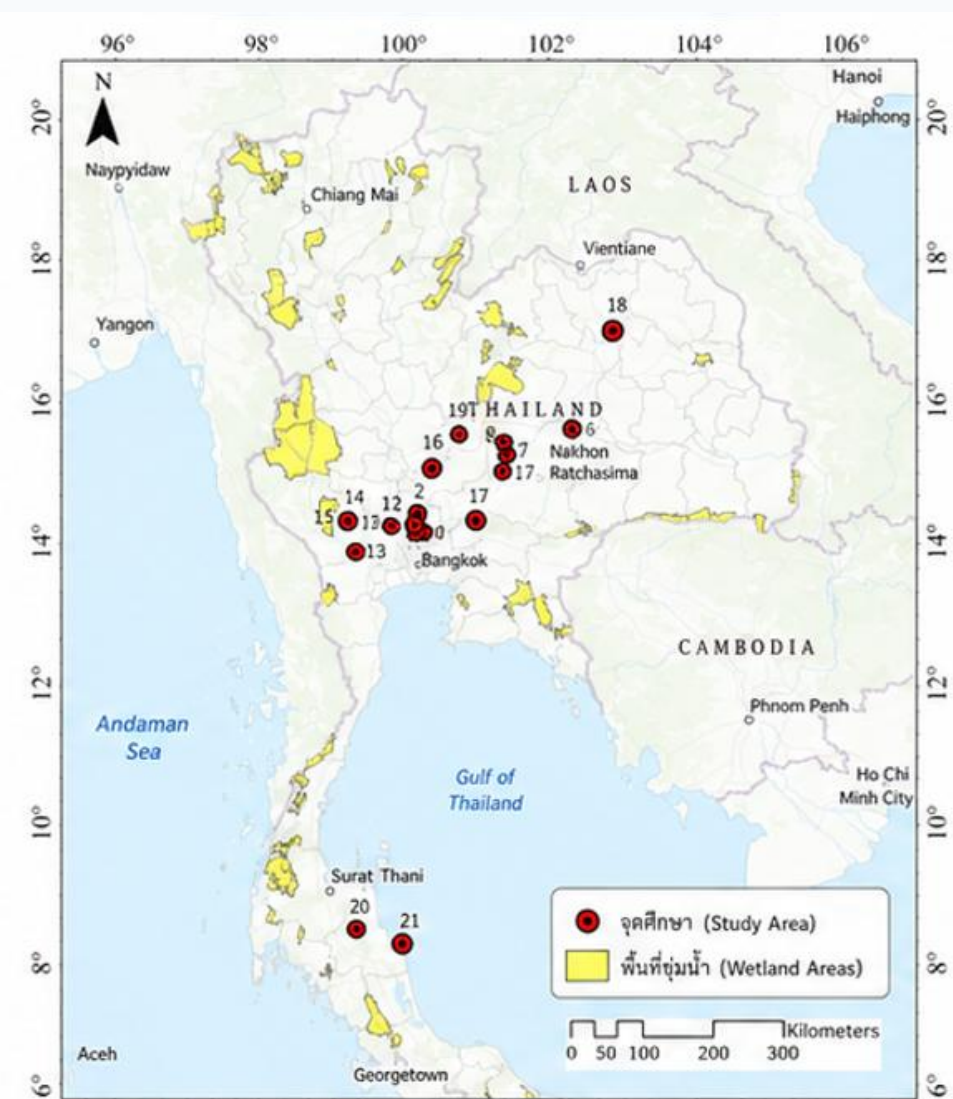
None of the project sites overlap with designated national protected areas.

World Heritage Sites



None of the project sites overlap with World Heritage boundaries.

Wetland Areas



None of the project sites overlap with wetland conservation zones.

Conclusion

The assessment of 22 BCPG sites indicates moderate (score 3.21) overall physical water risk, with flooding identified as the main priority, followed by water availability and water quality. These risks may affect future operational continuity and should be addressed through improved flood resilience, water-source security, and water-quality management.

Regulatory deficiency risk was high (score 3.50) across all sites, highlighting the importance of corporate-level regulatory monitoring, coordination, and compliance management.

Reputational risk was moderate (score 3.02), particularly due to pressure on freshwater resources.

No project sites overlap with designated protected or conservation areas, but site-specific environmental management remains important due to potential hydrological connectivity and ecosystem sensitivity.

References

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