

Volume I - PCTM Core™

The 7 Dimensions of Territorial Sovereignty

Integration of the Operational Scoring Guide

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TABLE OF CONTENTS

1. INTRODUCTION TO THE PCTM MODEL
2. THE 7 DIMENSIONS OF TERRITORIAL SOVEREIGNTY
 - 2.1 Territorial Sovereignty
 - 2.2 Energy Sovereignty
 - 2.3 Digital and Computational Sovereignty
 - 2.4 Economic and Financial Sovereignty
 - 2.5 Regulatory and Cyber Sovereignty
 - 2.6 Human Capital and Knowledge Sovereignty
 - 2.7 Geopolitical Sovereignty
3. PRINCIPLE OF SYSTEMIC RESILIENCE
4. POTENTIAL APPLICATIONS OF THE PCTM
 - 4.1 For Evaluators and Consultants
 - 4.2 For Public Decision-Makers
 - 4.3 For Framework Researchers and Developers
5. CONCLUSION
6. APPENDIX A: GLOSSARY OF KEY TERMS
 - APPENDIX B: GLOSSARY OF KEY TERMS APPENDIX
 - APPENDIX C: QUICK SCORING FORM

1. INTRODUCTION TO THE PCTM MODEL

1.1 What is the PCTM?

The Pasarela Connected Territories Model (PCTM) is a strategic framework designed to assess, plan, and develop sustainable, resilient, and connected territories. Unlike traditional approaches that analyze infrastructure projects independently, the PCTM views a territory as an integrated ecosystem in which geography, energy, infrastructure, technology, finance, human capital, and governance interact continuously. The model rests on a fundamental distinction: • **INFRASTRUCTURE** explains what a territory **POSSESSES**

- **SOVEREIGNTY** explains what a territory **CONTROLS** The 7 dimensions below measure the second question: to what extent can a territory direct its own long-term transformation, rather than merely hosting infrastructure controlled elsewhere?

1.2 Why 7 Dimensions?

The choice of the 7 dimensions of territorial sovereignty is neither arbitrary nor the result of a simple sectoral classification. It stems from a fundamental observation: a territory's performance and resilience never rest on a single factor, but on the interaction of several interdependent strategic capacities.

Traditional territorial assessment models often favor a particular domain — economic growth, infrastructure quality, governance, innovation, or human development — treating other dimensions as secondary. This sectoral approach can no longer explain the vulnerabilities observed in a context where infrastructure, supply chains, digital networks, financial flows, and geopolitical balances are deeply interconnected.

The PCTM instead adopts a systemic approach. It holds that a territory can only be described as sovereign if it possesses a sufficient level of mastery across 7 complementary strategic capacities, each fulfilling a specific function within the territorial system.

- **Territorial sovereignty forms the physical foundation of the model.** It concerns control over spaces, resources, access points, and critical infrastructure that enable a territory to exercise its authority and ensure its strategic continuity.
- **Energy sovereignty ensures the availability and security of the energy resources essential to the functioning of the economy, infrastructure, and essential services.**
- **Digital and computational sovereignty measures a territory's capacity to master the connectivity infrastructure, computing capacity, data, and digital technologies that now underpin the whole of economic and institutional activity.**
- **Economic and financial sovereignty assesses the capacity to mobilize, control, and direct the financial resources needed for development while limiting critical dependencies on external capital or financial infrastructure.**
- **Regulatory and cyber sovereignty represents a territory's capacity to define, enforce, and evolve its own rules, standards, and governance mechanisms, while ensuring the protection of its digital systems and strategic data.**
- **Human capital and knowledge sovereignty measures the capacity to train, attract, retain, and renew the skills, knowledge, and innovation capabilities that turn investment into durable competitive advantage.**

- **Geopolitical sovereignty**, finally, reflects a territory's ability to preserve its freedom of action in a complex international environment through the diversification of its partnerships, its diplomatic influence, and its capacity to adapt to geopolitical developments.

These 7 dimensions are not independent. They form a system in which each component influences the others. High digital capacity cannot be sustainable without a reliable energy supply. High-performing energy infrastructure loses value in the absence of domestic skills capable of designing and operating it. A dynamic economy remains vulnerable if regulatory frameworks are unstable or if geopolitical dependencies limit freedom of decision.

The number of 7 dimensions thus results from a balance between comprehensiveness and operability. A smaller number would merge domains whose dynamics, timeframes, and levers for action differ. Conversely, a larger number would make the model more complex without significantly improving its explanatory power.

The PCTM therefore treats these 7 dimensions as the fundamental components of contemporary territorial sovereignty. Together, they offer a coherent representation of the main levers that determine a territory's capacity to develop its infrastructure, strengthen its resilience, preserve its strategic autonomy, and sustainably create value in an increasingly interconnected global environment.

The PCTM occupies a position complementary to existing international frameworks. Where these evaluate a specific dimension of territorial performance (governance, innovation, competitiveness, or resilience), the PCTM seeks to articulate these dimensions within a single framework in order to assess territorial sovereignty as a system of interdependencies.

1.3 Context

The rapid acceleration of artificial intelligence, advanced computing, geopolitical fragmentation, cyber warfare, and financial weaponization has fundamentally transformed the conditions under which territories pursue their long-term development. Territorial sovereignty can no longer be assessed solely through ownership of physical assets. It must now assess a territory's capacity to preserve its strategic autonomy while remaining integrated within global economic, technological, and financial systems. This methodological addendum updates the operational scoring grids of the Connected Territories Sovereignty Index (CTSI) while preserving the original architecture of the PCTM model.

1.4 Architecture of the 7 Dimensions

No.	Dimension	Temporal Profile	Reassessment	Buffer Dimensions
1	Territorial Sovereignty	Structural (10-20 years)	3-5 years	—
2	Energy Sovereignty	Mixed (3-5 years for generation)	2-3 years	—
3	Digital and Computational Sovereignty	Fast (1-2 years)	Annual + quarterly alerts	Regulatory, Human Capital
4	Economic and Financial Sovereignty	Mixed (fast flows, slow structures)	2-3 years	—
5	Regulatory and Cyber	Slow (5-10 years)	3-5 years	—
6	Human Capital and Knowledge Sovereignty	Generational (10-20 years)	5 years	—
7	Geopolitical Sovereignty	Volatile (months)	Annual + quarterly alerts	Energy, Regulatory

Table 1: The 7 Dimensions of Territorial Sovereignty and Their Temporal Characteristics

2. THE 7 DIMENSIONS OF TERRITORIAL SOVEREIGNTY

2.1 Territorial Sovereignty

Land, Physical Assets & Strategic Access Points

Temporal profile: Structural — evolves over 10-20 years Reassessment: Every 3-5 years

Territorial sovereignty measures the degree of control a territory exercises over its physical space, natural resources, and strategic access points — the land, corridors, and access points through which people, goods, and resources circulate. This dimension consolidates the geographic and physical infrastructure components that give a territory its materiality.

This dimension includes:

- Strategic land availability
- Geographic location
- Natural resources
- Water resources
- Climate conditions
- Maritime access
- Ports and airports
- Roads, highways, and railways
- Pipelines (oil, gas, hydrogen)
- Logistics platforms and corridors
- Industrial zones
- Strategic maritime chokepoints

A territory is no longer simply a place; it is a strategic asset whose physical characteristics and access points determine the extent to which it can direct its own development.

0-10 Scoring Grid

Score	Level	Guiding Indicators
0-2	Highly Dependent	Land, access points, and corridors largely controlled by external actors; limited domestic access to strategic sites.
3-4	Structurally Vulnerable	Some domestic control of land and ports, but key corridors or access points depend on foreign operators or concessions.
5-6	In Transition	Balanced ownership structure; domestic and foreign operators coexist under a national strategic plan.
7-8	Strategically Sovereign	Majority domestic or state control of strategic land, ports, and corridors, with selective foreign partnerships.
9-10	Highly Autonomous	Complete strategic control over territorial access points, land-use planning, and corridor governance, with foreign participation on the territory's own terms.

Cross-check: Does control of access points and corridors translate into real leverage — or is it undermined by weak regulatory sovereignty (concessions signed away) or weak geopolitical sovereignty (transit rights dependent on a single partner)?

2.2 Energy Sovereignty

Electricity Generation, Grids & Energy Security

Temporal profile: Mixed – generation capacity can evolve in 3-5 years, grid resilience takes longer
Reassessment: Every 2-3 years

Energy sovereignty measures a territory's capacity to generate, store, distribute, and secure the energy on which its economy depends, without being structurally exposed to external supply or price shocks. Reliable, affordable, and increasingly decarbonized energy underpins all other dimensions of sovereignty.

This dimension includes:

- Electricity generation
- Transmission networks and electrical grids
- Energy storage
- Renewable energy
- Nuclear energy
- Natural gas
- Hydrogen
- Smart grids
- Energy resilience and strategic reserves
- Energy affordability

The rapid expansion of artificial intelligence and digital infrastructure is turning electricity into one of the most strategic – and most contested – resources in the world.

0-10 Scoring Grid

Score	Level	Guiding Indicators
0-2	Highly Dependent	Heavy dependence on energy imports; limited generation diversity; frequent supply or price shocks.
3-4	Structurally Vulnerable	Some domestic generation capacity, but grid resilience and storage remain underdeveloped.
5-6	In Transition	Diversified generation mix with growing renewables; grid broadly stable; moderate import dependence.
7-8	Strategically Sovereign	Strong domestic generation and storage capacity; renewables integrated at scale; resilient grid.
9-10	Highly Autonomous	Energy self-sufficiency or net exporter position, with a diversified, resilient, and affordable supply.

Cross-check: Does generation capacity actually reach industry and data centers — or is it bottlenecked by weak transmission (Territorial Sovereignty) or disproportionately absorbed by foreign-owned facilities (Economic Sovereignty)?

2.3 Digital and Computational Sovereignty

Digital and Computational Sovereignty – Networks, Advanced Computing & Artificial Intelligence

Temporal profile: Fast — computing and network capacity can evolve in 1-2 years **Reassessment:** Annual assessment + quarterly alerts on shock indicators **Shock absorption:** A shock in this volatile dimension is best absorbed by strength in Regulatory Sovereignty (data governance capacity) and Human Capital Sovereignty (talent to operate the technology stack)

Digital and computational sovereignty measures control over the technology layers that carry, process, and govern data — from physical network infrastructure to computing capacity and the software and AI platforms built on top of them. It consolidates both the digital technology stack and the physical digital assets (cables, landing stations, data centers) that underpin it.

This dimension includes:

Network Layer:

- Internet backbone, BGP routing, DNS
- Internet Exchange Points (IXPs)
- Submarine cables and landing stations
- Satellite infrastructure

Compute Layer:

- Data centers, servers, CPUs, GPUs
- Semiconductor technologies
- High-performance computing (HPC)
- Storage systems

Software Layer:

- Cloud platforms, operating systems, virtualization
- AI platforms, large language models (LLMs)
- Cybersecurity, data governance
- Sovereign AI models

The integration of the network, compute, and software layers determines a territory's capacity to build a sovereign and competitive digital economy — rather than depending entirely on foreign platforms and infrastructure hosted abroad.

0-10 Scoring Grid (2026 Version)

Score	Level	Operational Indicators
0-2	Highly Dependent	No domestic advanced computing capacity. Critical AI services entirely dependent on foreign cloud providers. Immediate exposure to sanctions or service interruptions.
3-4	Structurally Vulnerable	Local connectivity and storage exist, but strategic AI training and deployment rely almost exclusively on external infrastructure.
5-6	In Transition	Operational domestic advanced computing infrastructure. Sovereign deployment of open-source foundation models within hosted national data centers.
7-8	Strategically Sovereign	Capacity to train sovereign foundation models. Diversified and secure access to global semiconductor and advanced computing supply chains. National AI ecosystem operating at scale.
9-10	Highly Autonomous	Complete control of strategic computing capacity. Participation in next-generation computing technologies. Internationally competitive AI platforms and export of advanced computational capacity.

Suggested key assessment indicators

- National backbone
- Internet Exchange Points (IXPs)
- Diversity of international cables
- Advanced computing infrastructure (GPUs, AI accelerators, HPC)
- National cloud
- Sovereign AI models
- Cybersecurity maturity
- Data governance
- Digital resilience
- Strategic software ecosystem

Cross-check: Does advanced computing infrastructure benefit from guaranteed priority power supply during periods of grid stress? **MANDATORY RULE:** If Energy Sovereignty is below 5/10, computational sovereignty must automatically receive a High Exposure Framework™ flag.

2.4 Economic & Financial Sovereignty

Economic and Financial Sovereignty – Capital, Strategic Assets & Financial Infrastructure

Temporal profile: Mixed – capital flows evolve rapidly, ownership structures entrench slowly
Reassessment: Every 2-3 years, and after each major acquisition of strategic assets

Economic and financial sovereignty measures the diversification, resilience, and financing autonomy of a territory's economy – its capacity to attract, mobilize, and retain capital without becoming structurally dependent on a single external source of financing or demand. Crucially, this is a matter of control, not merely volume: a deep and diversified capital market can still represent weak sovereignty if the underlying capital is concentrated in the hands of a small number of foreign owners. Scoring this dimension requires looking beyond financing structures to their ultimate ownership, rather than simply counting sources.

This dimension includes:

- Sovereign wealth funds
- Private equity and infrastructure funds
- Development finance institutions
- Public-private partnerships (PPPs)
- Capital markets
- International investors
- Industrial value chains and diversification
- Export capacity and investment attractiveness
- Ultimate ownership and control of strategic capital
- Payment infrastructure
- Financial resilience
- Control of strategic investments
- Currency and monetary stability

Financial capital determines not only what can be built, but also who ultimately influences a territory's strategic decision-making – which is why the volume and diversification of financing are necessary but not sufficient to prove economic sovereignty.

0-10 Scoring Grid (2026 Version)

Score	Level	Operational Indicators
0-2	Highly Dependent	Critical assets controlled by foreign investors. Complete dependence on external payment and settlement systems.
3-4	Structurally Vulnerable	Apparent diversification, but financing of strategic infrastructure and bank settlement remain externally dependent.
5-6	In Transition	Established sovereign wealth fund. Solid domestic banking sector. National payment switch protecting domestic transactions.
7-8	Strategically Sovereign	Domestic capital holds majority interests in strategic sectors. Independent payment infrastructure capable of operating during an external financial disruption.
9-10	Highly Autonomous	Self-financing economy. Strong regional financial influence. Capacity to set investment terms independently. National currency or Central Bank Digital Currency (CBDC) recognized as a regional benchmark.

Suggested key assessment indicators

- Sovereign Wealth Fund
- Domestic ownership ratio
- Financial diversification
- National payment infrastructure
- Clearing independence
- Capital markets
- Control of strategic investments
- Banking resilience
- Monetary stability
- Resilience to financial sanctions

Cross-check: If international financial connectivity were cut off, could the domestic financial system continue to clear internal transactions without major disruption?

2.5 Regulatory and Cyber Sovereignty

Regulatory and Cyber Sovereignty – Institutions, Standards, Data & Cybersecurity

Temporal profile: Slow – institutions and legal frameworks evolve over 5-10 years Reassess-

ment: Every 3-5 years, or after a major legislative or institutional reform

Regulatory and cyber sovereignty measures the strength, coherence, and independence of the institutions and rules that govern a territory – its capacity to set its own standards, enforce them, and plan strategically rather than simply adopting frameworks designed elsewhere. This dimension also assesses cyber resilience and technology governance.

This dimension includes:

- Public institutions
- Regulatory frameworks
- National standards
- Public policy and strategic planning capacity
- Artificial intelligence governance
- Cybersecurity governance
- Data protection and data sovereignty
- Environmental regulations
- Legal stability and investment framework
- Institutional effectiveness

Effective governance is what turns infrastructure and capital into investor confidence and long-term strategic planning.

0-10 Scoring Grid (2026 Version)

Score	Level	Operational Indicators
0-2	Highly Dependent	Weak or fragmented institutions; regulation largely imported or imposed by external standard-setting bodies.
3-4	Structurally Vulnerable	Basic regulatory framework in place, but enforcement is inconsistent and standards are mostly adopted from abroad.
5-6	In Transition	Functional institutions and a stable legal framework; national standards emerging alongside international ones. AI governance and cybersecurity under development.
7-8	Strategically Sovereign	Strong, coherent regulatory framework with credible enforcement and consistent long-term strategic planning. Established cyber and data governance capacity.
9-10	Highly Autonomous	Regulatory frameworks and standards drafted domestically, respected internationally, and actively shaping regional standards. Leadership in AI governance and cybersecurity.

Cross-check: Do regulatory frameworks simultaneously protect strategic assets while enabling innovation, investment, and technological competitiveness? Do regulations actually allow the territory to use its own infrastructure at scale – or do they unintentionally shield incumbent players and prevent domestic companies from leveraging strong Digital or Energy Sovereignty scores?

2.6 Human Capital & Knowledge Sovereignty

Human Capital and Knowledge Sovereignty – Talent, Research, Innovation & Technology Transfer

Temporal profile: Generational – building a domestic talent base takes 10-20 years
Reassessment: Every 5 years

Human capital and knowledge sovereignty measures a territory's capacity to educate, train, retain, and continuously renew the talent its economy needs – the multiplier that determines whether infrastructure and capital actually translate into productivity and competitiveness.

This dimension includes:

- Universities and higher education
- Research centers
- Innovation ecosystems
- Engineering capabilities
- Vocational training
- Technology transfer
- Intellectual property and patents
- Entrepreneurship and skilled workforce
- Artificial intelligence research
- Cybersecurity expertise
- Energy engineering
- Scientific excellence and leadership

Technology alone cannot create sustainable development. Human capital is the engine that powers all other dimensions.

0-10 Scoring Grid (2026 Version)

Score	Level	Operational Indicators
0-2	Highly Dependent	Heavy reliance on expatriate expertise; limited domestic research or technical training capacity.
3-4	Structurally Vulnerable	Growing higher-education base, but skilled talent frequently emigrates and technology transfer remains limited.
5-6	In Transition	Solid university and vocational training network; talent retention improving; emerging innovation ecosystem. AI and cybersecurity research under development.
7-8	Strategically Sovereign	Solid research and engineering base; competitive innovation ecosystem attracting and retaining skilled talent. Recognized scientific excellence.
9-10	Highly Autonomous	Internationally recognized hub for research and talent, exporting expertise and setting the terms of technology transfer. Scientific leadership and cutting-edge innovation.

Suggested key assessment indicators

- STEM graduates
- AI researchers
- Patent generation
- Research spending
- Technology transfer
- Brain retention
- Innovation ecosystem
- International attractiveness
- Scientific publications
- Engineering capacity

Cross-check: Can domestic engineers independently design, operate, and maintain advanced computing infrastructure and critical energy systems without sustained foreign technical assistance? **WARNING:** This is the slowest-moving of the 7 dimensions — a rapid rise elsewhere (for example in Digital Sovereignty following a wave of data center investment) can outpace the territory's ability to staff and operate them domestically. Watch the gap, not just the two scores.

2.7 Geopolitical Sovereignty

Geopolitical Sovereignty – International Positioning & Strategic Alliances

Temporal profile: Volatile – can shift within months around a single event (sanctions, conflict, change of alliance) Reassessment: Full annual review + quarterly alerts; continuous monitoring for acute events Shock absorption: A shock in this volatile dimension is best absorbed by strength in Energy Sovereignty and Regulatory Sovereignty – a territory with a solid domestic energy supply and stable institutions can absorb a diplomatic or sanctions shock that would destabilize a weaker territory, even at the same geopolitical score.

Geopolitical sovereignty measures a territory's capacity to position itself within international systems – by building partnerships, market access, and strategic alliances – while retaining freedom of action in the face of sanctions, extraterritorial regulations, and global geopolitical shifts.

This dimension includes:

- International partnerships
- Regional integration
- Trade agreements
- Economic diplomacy
- Strategic alliances
- Sanctions exposure and management
- Extraterritorial regulations
- National security and geopolitical resilience

Geography alone no longer determines influence. Connectivity – diplomatic, commercial, and digital – is what matters.

0-10 Scoring Grid

Score	Level	Guiding Indicators
0-2	Highly Dependent	Limited diplomatic leverage; market access and alliances dependent on a single external power.
3-4	Structurally Vulnerable	Some regional integration and trade agreements, but strategic alignment is largely dictated by external partners.
5-6	In Transition	Balanced portfolio of partnerships and trade agreements; moderate exposure to sanctions or extraterritorial rules.
7-8	Strategically Sovereign	Diversified alliances and strong regional integration; able to absorb geopolitical shocks without major disruption.
9-10	Highly Autonomous	Recognized as a strategic hub with broad market access, diversified alliances, and genuine geopolitical freedom of action.

Cross-check: Does diplomatic diversification actually reduce exposure – or do formally diversified partnerships still run through the same critical dependency in Energy or Digital Sovereignty (for example, a single supplier behind several “different” partners)?

3. PRINCIPLE OF SYSTEMIC RESILIENCE

The strength of a connected territory does not depend on excellence in a single dimension. It depends on the balance and interaction among the 7 strategic dimensions of sovereignty.

Weakness in one dimension inevitably affects the others.

Sustainable territorial development therefore requires a systemic approach in which territorial control, energy, digital capabilities, economic strength, regulatory quality, human capital, and geopolitical positioning reinforce one another to create resilient, competitive, and future-ready territories.

The goal is not complete independence, but strategic control over critical capabilities – measured consistently, dimension by dimension, in every application of the model.⁴ Potential Applications of the PCTM

This section offers practical recommendations for the optimal use of the PCTM framework in territorial assessment contexts.

4 . POTENTIAL APPLICATIONS OF THE PCTM

4.1 For Evaluators and Consultants

1. **NEVER INTERPRET THE CTSI™ ALONE:** The High Exposure Framework™ is mandatory. A territory with a CTSI™ of 65 may be more vulnerable than a territory with a CTSI™ of 55, depending on the composition of scores and exposure flags.
2. **DOCUMENT JUDGMENTS:** Since the 0-10 grids rest on informed judgment rather than mechanical checklists, documenting the rationale behind each score is essential for traceability and replicability.
3. **RESPECT TEMPORAL PROFILES:** Do not reassess a structural dimension (Territorial, Human Capital) annually unless a major event warrants it. Focus monitoring resources on volatile dimensions (Geopolitical, Digital).

4.2 For Public Decision-Makers

4. **PRIORITIZE BUFFERS:** Before investing in a volatile dimension (for example, data centers for digital sovereignty), ensure that the corresponding buffer dimensions (energy, regulation, human capital) are strong enough to absorb shocks.
5. **MONITOR INTER-DIMENSIONAL GAPS:** A widening gap between a fast dimension (Digital) and a slow dimension (Human Capital) is an early warning sign. The territory may possess the infrastructure without being able to operate it.
6. **ANTICIPATE CRISIS SCENARIOS:** Use the High Exposure Framework™ to simulate scenarios (SWIFT disruption, hyperscaler withdrawal, energy sanctions) and identify vulnerabilities before they materialize.
7. **INVEST IN REGULATORY SOVEREIGNTY:** This is the most underrated dimension. Strong regulatory sovereignty amplifies all other dimensions; weak regulatory sovereignty neutralizes them.

4.3 For Framework Researchers and Developers

8. **TEST INTER-EVALUATOR REPRODUCIBILITY:** Conduct a study in which several independent evaluators score the same territory, to calibrate the subjectivity of the grids and establish confidence intervals.
9. **DEVELOP A SOVEREIGNTY INTERDEPENDENCE MATRIX:** The document notes (v2.1, page 4) that a full Sovereignty Interdependence Matrix is a natural extension. This is a priority research avenue.
10. **STUDY CONTEXTUAL WEIGHTING:** Explore whether weightings differentiated by territory type (island, enclave, logistics hub, technology cluster) would improve the CTSI™'s relevance.

11. **PUBLISH CASE STUDIES:** Concrete territorial assessments (anonymized where necessary) would considerably strengthen the credibility and operability of the framework.

5. CONCLUSION:

The Pasarela Connected Territories Model (PCTM™) offers a systemic framework for analyzing territorial sovereignty suited to the realities of the 21st century. In an environment marked by infrastructure interdependence, geopolitical fragmentation, the energy transition, and accelerating digital transformation, assessing a territory can no longer rest on a single economic or sectoral indicator.

The PCTM rests on a multidimensional approach organized around 7 dimensions of sovereignty: territorial, energy, digital and computational, economic and financial, regulatory and cyber, human capital and knowledge, and geopolitical. These dimensions are not independent; they interact continuously and collectively determine a territory's capacity to preserve its strategic autonomy, absorb shocks, and sustainably create value.

One of the model's essential contributions is to treat sovereignty as a dynamic balance rather than an absolute state. A territory's resilience depends less on the isolated excellence of a single dimension than on the coherence of the system as a whole and the quality of the interactions among its components.

The PCTM thus constitutes a conceptual framework that can be applied to analyze states, regions, metropolitan areas, strategic corridors, or cooperation between territories. It offers a common language for structuring analysis, comparing situations, and informing public and private decisions in fields such as infrastructure, energy, digital technology, investment, spatial planning, and international cooperation.

The methodological assessment tools associated with the model — notably the Connected Territories Sovereignty Index (CTSI™), assessment protocols, and operational analysis frameworks — are deliberately presented in complementary documents in order to preserve the stability of this document, which is devoted to the conceptual foundations of the PCTM.

The PCTM is intended as a methodological foundation open to future applications, case studies, and research. Its ambition is to provide a coherent, evolving, and operational framework for analyzing new forms of territorial sovereignty in a global economy where value lies as much in strategic connections as in resources themselves.

APPENDIX A: GLOSSARY OF KEY TERMS

BGP (Border Gateway Protocol): Routing protocol used to exchange routing information between autonomous networks on the Internet.

CBDC (Central Bank Digital Currency): Digital currency issued by a central bank, as an alternative or complement to physical currency.

CTSI (Connected Territories Sovereignty Index): Index of connected territories' sovereignty, calculated on the basis of the PCTM's 7 dimensions.

Backbone: a high-capacity core network that links multiple local networks together.

DNS (Domain Name System): Hierarchical, distributed naming system that translates domain names into IP addresses.

GPU (Graphics Processing Unit): A graphics processor that has become essential for training AI models and for parallel computing.

HPC (High-Performance Computing): High-performance computing, used for complex simulations, scientific modeling, and AI.

High Exposure Flag: A high-exposure flag signaling a systemic vulnerability not captured by the aggregated CTSI™.

IXP (Internet Exchange Point): Physical infrastructure enabling the direct interconnection of networks.

LLM (Large Language Model): A type of generative AI that processes natural language (e.g., GPT, Claude).

PCTM (Pasarela Connected Territories Model): A strategic framework for territorial assessment.

PPP (Public-Private Partnership): A financing and management arrangement for infrastructure.

SWIFT: Society for Worldwide Interbank Financial Telecommunication, an international financial messaging system.

APPENDIX B: THEORETICAL FOUNDATIONS AND LITERATURE REVIEW

B.1 Existing Frameworks

The PCTM belongs to a family of established territorial and institutional assessment frameworks, from which it borrows certain methodological principles:

Worldwide Governance Indicators (WGI), World Bank: a benchmark for assessing institutional quality at the state level, structured around six governance dimensions. The PCTM borrows from the WGI its logic of scoring by independent, aggregated dimensions, as well as its principles of methodological transparency and periodic updating.

Sovereign rating methodologies (S&P, Moody's, Fitch): these agencies assess sovereign risk by combining quantitative criteria (debt, reserves, trade balance) with qualitative criteria (institutional stability, regulatory predictability). The PCTM draws on this quantitative/qualitative hybridization, as well as the inter-evaluator arbitration mechanisms reflected in the Volume II reproducibility protocol.

Fragile States Index and territorial resilience frameworks: these references informed the structure of Section 3 (Principle of Systemic Resilience) of this volume, particularly regarding the interdependence between sectoral capacities.

Literature on digital sovereignty: recent work on data sovereignty, computational autonomy, and control of critical infrastructure (2023-2026) directly informed dimension 2.3 (Digital and Computational Sovereignty) of the model.

B.2 Positioning of the PCTM

The PCTM does not replace any of these frameworks and does not claim statistical validation equivalent to that of long-established indices. It positions itself as a structured qualitative diagnostic tool, intended for decision-makers and consultants, articulating dimensions usually treated separately (governance, energy, digital, finance, human capital, geopolitics) within a single, actionable analytical framework.

B.3 Recognized Methodological Limitations

Unlike aggregated indices produced by institutions with long time series and large validation teams, the PCTM rests on expert scoring, subject to inter-evaluator variability — hence the reproducibility protocol detailed in Volume II. The model should be regarded as a decision-support framework, not as a statistically validated measurement instrument in the academic sense.

APPENDIX C: QUICK SCORING FORM

Territory assessed: _____ Assessment date: _____
 _____ Evaluator: _____

Dimension	Score (0–10)	Source Reliability	High Exposure Flag Level	Notes
1. Territorial Sovereignty			☐	
2. Energy Sovereignty			☐	
3. Digital & Computational Sovereignty			☐	
4. Economic & Financial Sovereignty			☐	
5. Regulatory & Cyber Sovereignty			☐	
6. Human Capital & Knowledge Sovereignty			☐	
7. Geopolitical Sovereignty			☐	
TOTAL SCORE				
CTSI ($\Sigma/70 \times 100$)				
OVERALL LEVEL				

Source reliability: High / Medium / Low – in line with the practice introduced in Volume IV (§2.2) and consistent with the A/B/C evidence levels defined in 2.5.3.

PCTM™ Collection

- Volume I - PCTM Core™ (published)
- Volume II - PCTM Assessment Handbook™ (published)
- Volume III - PCTM Implementation Guide™ (published)
- Volume IV - PCTM Case Studies™ (published)