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NAVIGATING ESG COMPLEXITY: THE CYNEFIN® FRAMEWORK AS A STRATEGIC TOOL FOR SUSTAINABLE DECISION-MAKING

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ABSTRACT:

PURPOSE - Despite the inherent heterogeneity of ESG challenges, existing sustainability governance models frequently apply uniform strategic responses regardless of contextual complexity. This study addresses this gap by proposing a conceptual model mapping ESG challenges onto the updated Cynefin® framework, encompassing five domains — clear, complicated, complex, chaotic, and aporetic/confused — alongside their liminal transition zones, thereby offering a context-sensitive alternative to one-size-fits-all ESG strategies.

METHODS – Drawing on Complex Adaptive Systems theory and the Cynefin sense-making framework, this study employs qualitative content analysis of primary EU and international sustainability frameworks — including CSRD, ESRS, EU Taxonomy Regulation, TCFD, and GRI standards — classifying ESG challenges according to domain-specific sense-making logics and constraint types: fixed constraints with best practice (clear), governing constraints with good practice (complicated), and enabling constraints with exaptive practice (complex).

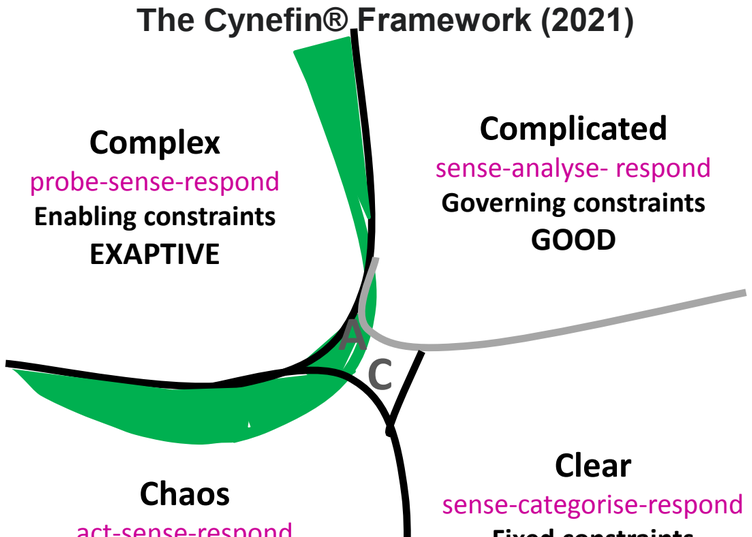
RESULTS – The analysis maps ESG challenges across all five domains and their liminal zones. Mandatory disclosures under CSRD populate the clear domain; climate scenario modeling and supply chain audits occupy the complicated domain; evolving DEI expectations and ethical sourcing reflect complex, emergent dynamics requiring exaptive experimentation; acute environmental disasters define the chaotic domain. Governance scandals, frequently misclassified as chaotic, are more accurately situated in the complex domain given their gradual socially embedded escalation. Profound regulatory ambiguity — such as concurrent CSRD and ESRS implementation — exemplifies the aporetic subdomain, requiring deliberate decomposition before domain assignment. Three critical liminal inflection points are identified: the CO-CO zone (complex↔complicated), enabling iterative crystallization of emergent ESG practices into standardized frameworks; the catastrophic fold (clear→chaotic), representing cliff-edge collapse through ESG complacency rather than gradual transition; and the aporetic liminal zone (chaotic→aporetic), constituting the essential first stage of ESG crisis recovery.

CONCLUSIONS – Effective ESG governance requires a dynamic repertoire of context-dependent approaches calibrated to domain-specific sense-making logics and sensitive to liminal transitions. This study contributes a transition-aware, complexity-informed model situated within the current EU regulatory architecture, demonstrating that sustainability management must move beyond compliance-oriented frameworks toward adaptive governance grounded in the full architecture of the Cynefin framework.

LIMITATIONS - This study is conceptual and lacks empirical validation, limiting its real-world applicability.

KEY WORDS: Cynefin® framework, ESG management, decision-making, sustainability strategy

The Cynefin® Framework (2021)



DOMAIN DESCRIPTION

APPLYING the Cynefin® DOMAINS TO ESG CHALLENGES (examples)

CLEAR:

It describes a situation where the relationship between cause and effect is obvious to everyone in the organization. Cause and effect are directly connected. Processes are predictable and repeatable. Improvements in processes (e.g., technique improvement, kaizen, lean) and standard operating procedures are used to increase efficiency. In this domain, the recommended decision-making and action pattern is "sense-categorize-respond." (assess the facts, categorize them, respond in a predetermined way and according to established (best) practices).

- Reporting Greenhouse Gas Emissions Using Standard Protocols.
- Submitting Hazardous Waste Disposal Records.
- Mandatory Anti-Harassment Training Completion Tracking.
- Workplace Accident Reporting via Prescribed Forms
- Non-financial reporting using a standardized template.
- Corporate governance statement according to stock exchange rules.

COMPLICATED:

This domain describes situations where the relationship between cause and effect requires analysis or other forms of investigation and/or the application of expert knowledge. Specialist expertise is often necessary to understand the connections between cause and effect, and the problem needs to be examined thoroughly. Decision-makers must rely on and trust the judgment of experts. In contrast to Domain 1, it is possible to obtain more than one valid answer. Among the tools used are, for example, experiments and scenario analyses. The recommended approach in this domain is: "sense–analyze–respond" assess the facts, analyze using expert knowledge, respond in a defined way according to recommended (good) practices, not necessarily only the best practices.)

- Developing and implementing a decarbonization roadmap aligned with Science-Based Targets
- Assessing climate-related financial risks according to TCFD (Task Force on Climate-related Financial Disclosures) recommendations
- Designing a global supplier diversity and human rights due diligence program
- Developing and implementing a global remote work policy to address mental health, work-life balance, and regulatory compliance across multiple jurisdictions
- Evaluating and enhancing anti-bribery and corruption controls in emerging markets

COMPLEX:

This is the domain of so-called "unknown unknowns." Cause and effect do not repeat and can only be detected in retrospect. A key feature of complex systems in this domain is nonlinearity. Small changes at the outset can lead to disproportionately large effects. The whole is much greater than the sum of its parts. It is possible to observe patterns of phenomena, but their outcomes cannot be predicted. These patterns depend on the interactions between elements within the system and the system itself. In this domain, the recommended decision-making and action pattern is "probe–sense–respond." Problems found in this domain often require an experimental approach, which may reveal "new practices." Desired patterns can be stabilized and amplified, while undesirable ones can be dampened or suppressed.

- Piloting nature-based carbon removal solutions in multiple geographies.
- Experimenting with circular economy models across a decentralized supply chain.
- Co-creating inclusive workplace practices in response to rapidly shifting employee expectations.
- Managing stakeholder responses during a sudden social or political crisis.
- Implementing dynamic, real-time ESG risk sensing across global operations.
- Evolving codes of conduct through iterative, participatory processes.

CHAOS:

It describes a situation where the relationship between cause and effect is not perceivable. Cause and effect are disconnected and cannot be identified, even in retrospect. The environment is highly unstable and unpredictable, with no observable patterns. There are no rules or constraints, and standard procedures do not apply. The organization is confronted with a novel crisis or extreme disruption.In this domain, the recommended decision-making and action pattern is "act-sense-respond." (take immediate action to establish some order, then observe the results and respond accordingly to move the situation toward stability and a more manageable domain).

- Sudden, large-scale environmental disaster
- Unexpected regulatory ban on a critical material
- Violent incident or threat in the workplace
- Explosive viral backlash in social media
- Sudden leadership vacuum due to simultaneous executive departures
- Major, undetected fraud or corruption uncovered

CONFUSION & APORIA:

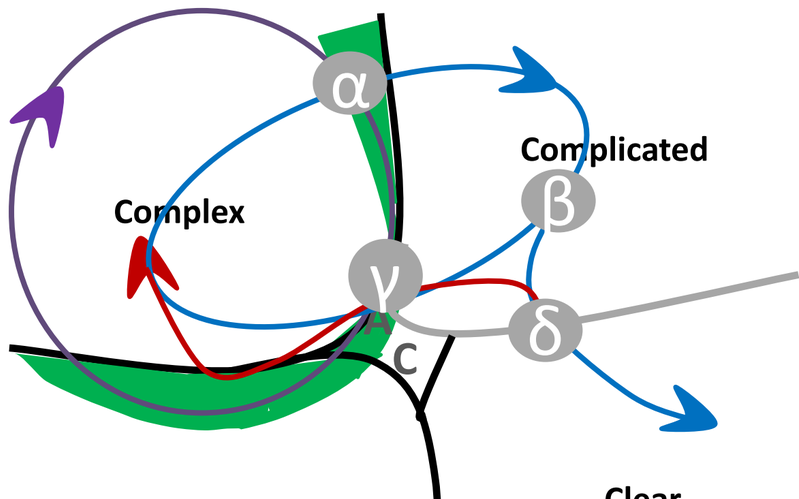
It describes a situation where it is not possible to determine the relationship between cause and effect or to categorize the problem clearly. The context is ambiguous, and it is uncertain which type of system or domain is applicable. There is a lack of clarity regarding the nature of the challenge, and decision-makers may feel disoriented or unable to select an appropriate approach. In this domain, the recommended decision-making and action pattern is to pause and seek further understanding—to explore, gather more information, and clarify the context before taking action. The goal is to move out of confusion and accurately diagnose the situation, so that the problem can be addressed using the right methods from the appropriate Cynefin domain.

- Unclear attribution of ESG incidents in a complex joint venture structure.
- Ambiguity in defining and measuring "just transition" for workforce adaptation
- Interpreting conflicting stakeholder demands regarding biodiversity and land use
- Navigating emerging and ambiguous ESG regulations across multiple jurisdictions
- Integrating ESG factors into mergers and acquisitions due diligence for a target in a controversial sector.

See more:

14th ICSD 2026 Poster

The Cynefin® Dynamics of Liminal



DYNAMICS DESCRIPTION

Blue Line: Progression Toward Stabilization

This is the most stable pattern of transition in Cynefin. It begins in the Complex domain with multiple safe-to-fail probes. As repeatable results emerge, these are narrowed down and iterated within the liminal space. Once it is confirmed that solutions are repeatable and stable, there is a transition to the Complicated domain, and eventually to the Clear domain if stabilization is maintained. Characteristics: based on gradually increasing certainty; oriented toward order and scaling; requires ongoing confirmation that solutions are not just temporary.

Red Line: The Path of Radical Change (Shallow Dive into Chaos)

The red line is activated as a last resort after the Delta inflection point. It appears when it becomes clear that the situation is not stable enough to proceed to the Clear domain. A typical scenario is one where apparent stability is based only on workarounds rather than true order. At this point, radical new thinking is required. The red line passes through aporia (a state of suspension and multiple possibilities), and may also touch the Chaotic domain before reconnecting with the blue line in the Complex domain. Characteristics: indicates crisis, radical change, and deconstruction; allows the organization to dismantle old practices and start anew.

Purple Line: Grazing Dynamics

The purple line represents a cycle that never settles in a single point—it's almost a state of continuous liminality. It begins with probes in the complex domain, but the emerging patterns are always temporary. The cycle passes through aporia, decomposition, recomposition, and shallow dives into the chaotic domain to spark new ideas that feed the cycle once again. Characteristics: typical for innovators, startups, and organizations operating in highly volatile environments; based on continuous experimentation, adaptation, and decentralization of decision-making.

α A turning point between the Complex and Complicated domain (or between two Complex domains).It serves to verify whether true repeatability and certainty of experimental results have been achieved, which allows the transition to the Complicated domain. Significance: A decision point to determine if the experiment is sufficiently stable to begin standardization.

β A turning point at the boundary between the Complicated and Clear domains (or between the Complicated and Complex domains).This is the moment to confirm whether the implemented solution is genuinely stable and suitable for further formalization and automation. Significance: A decision point to determine whether to proceed to the Clear domain or return to the Complex domain for further experimentation. Requires checking whether exceptions or deviations are appearing.

δ A turning point in the aporetic liminal space, serving for redistribution through decomposition or reconfiguration. It offers a state of suspension, where the situation can develop in various ways: disintegration, recomposition, or innovation. Significance: A decision point to initiate a radically new cycle, innovation, or deep transformation.

γ A turning point at the transition between the Complicated and Clear domains, or between the Complicated and aporetic (liminal) domain. If stability of the solution cannot be confirmed at this stage, a radical reconsideration of actions is required (moving to the red line). Significance: The final checkpoint before entering routine operation; if there are doubts, it is time for a thorough review.

APPLYING the Cynefin® LIMINAL DYNAMICS TO ESG CHALLENGES (example):

APPLYING the Cynefin® BLUE LINE TO ESG CHALLENGES

Context: A large manufacturing company is building a comprehensive carbon footprint management system to respond to investor pressure and new EU regulations. The aim is to make carbon management a standard, routine part of the organization.

α
Situation: The company launches several pilot projects, testing various methods for measuring carbon footprint at different sites. Each branch experiments with digital tools, data collection techniques, and reporting formats.
Observed: After months of experimentation, one method stands out: it consistently delivers reliable results across all locations. The ESG team determines this method is robust and suitable for wider deployment.
Decision: Is the solution stable enough to move beyond isolated pilots and start a company-wide rollout?
Action: The team formally selects the best methodology, stops parallel pilots, and begins structured implementation across all branches.

β
Situation: The selected methodology is now used company-wide, with standardized reporting tools and protocols. As the system matures, some outlier data and exceptions are flagged in the new reports.
Observed: The team investigates: Are these exceptions rare anomalies, or do they reveal deeper flaws? In a few locations, local regulations and unique operations present challenges the system wasn't designed for.
Decision: Should the company start automating and formalizing the process for all, or pause and address these exceptions first?
Action: Procedures are updated to accommodate local variations. The system is adjusted before moving to full automation, ensuring broader robustness and compliance.

δ
Situation: With refinements in place, the carbon footprint reporting process now operates smoothly and reliably company-wide. Automation tools collect, aggregate, and report data with minimal human intervention.
Observed: The ESG team no longer needs to supervise the process manually. Annual ESG reports are produced efficiently, and internal audits verify data quality.
Decision: Is the system mature and routine enough to require less expert oversight and become an organizational standard?
Action: Expert involvement is reduced. The company documents and shares the system as a "best practice" internally and with partners, supporting wider adoption.

γ
Situation: Just before declaring the system a complete, worry-free routine, an internal audit reveals a persistent issue: in one country, local teams have been systematically underreporting data to improve ESG performance metrics.
Observed: The risk of greenwashing and data manipulation is real; the supposed routine system has a critical flaw.
Decision: Should the organization proceed with routine operation, or halt and rethink the overall system to address the integrity risks?
Action: Management suspends full automation and initiates a comprehensive review. Experiments and process redesign are restarted to strengthen controls and prevent future manipulation, ensuring the system's long-term credibility.