ANNEX A

Supplement to PHREVO Framework Paper, Version 1.0

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PHREVO-Score Methodological Supplement: Lexicographic Priority Rule and Territorial Arbitration Mechanism

PHREVO-Score v1.1 — Version 1.0 of this Annex

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Abstract

The PHREVO-Score, as formulated in the core framework paper (SSRN 6614438, Section 4), evaluates any economic action across six dimensions of value — Sustainable Depth (SP), Human Dignity (DH), Justice and Autonomy (JA), Care and Wellbeing (CB), Community Impact (IC), and Ethical Technology (TE) — and produces a weighted average with dynamic territorial adjustment. This methodology performs well when dimensions are complementary or independent. However, it encounters a structural limitation in cases of genuine conflict: when maximizing one dimension requires diminishing another, the weighted average can produce an acceptable aggregate score that masks critical damage in a single dimension.

This annex introduces two complementary mechanisms that resolve this limitation while remaining consistent with the philosophical and structural foundations of the PHREVO framework. The Lexicographic Priority Rule (RL-PHREVO) establishes a strict, constitutionally grounded hierarchy among the six dimensions — SP $\succ$ DH $\succ$ JA $\succ$ CB $\succ$ IC $\succ$ TE — that governs conflict resolution without replacing the weighted average calculation. The Territorial Arbitration Mechanism (MAT) provides a structured process by which territorial assemblies may, under defined conditions and with supermajority support, deviate from the standard lexicographic order for specific cases.

Together, these mechanisms constitute a complete decision architecture for the PHREVO-Score: binding thresholds prevent systemic failures; dynamic weighting adjusts for territorial context; lexicographic priority resolves dimensional conflicts; and territorial arbitration handles exceptional cases through democratic deliberation. This annex responds directly to one of the most substantive methodological criticisms of multi-criteria welfare frameworks: the problem of incommensurability between dimensions of value.

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A.1 Foundational Problem: The Limits of Weighted Averaging

The PHREVO-Score v1.0 establishes that no dimension may fall below a binding minimum threshold — a feature that already prevents the most severe form of dimensional trade-off. A project scoring 0.10 on Sustainable Depth cannot enter the PHREVO system regardless of its scores elsewhere. This threshold mechanism is non-negotiable and is preserved without modification in this annex.

However, the threshold mechanism does not resolve all conflict cases. Consider a scenario in which all six dimensions clear their respective thresholds, but the project design creates a genuine trade-off: increasing Community Impact requires accepting ecological compromise that, while above the minimum, trends downward. The weighted average, even with territorial adjustment, may produce an acceptable aggregate score. The project enters the system. The ecological compromise is obscured by community benefit.

This is precisely the failure mode that characterizes mainstream ESG frameworks and impact investing methodologies — the "compensatory" dynamic in which high performance in one domain offsets lower performance in another, producing aggregate scores that satisfy reporting requirements while permitting structural damage. PHREVO commitment to being architecturally distinct from ESG requires a formal solution.

The central insight is this: not all dimensions of value have equal authority when they conflict. The PHREVO framework's own philosophical foundations — the four pillars, the irreversibility principle, the primacy of ecology as condition of possibility for all other value — imply a hierarchy. This annex makes that hierarchy explicit, formal, and operationally binding.

Three structural cases require the lexicographic rule:

- High Community Impact / Low Sustainable Depth — for example, a cooperative factory generating significant local employment but contaminating a water source. The aggregate score may be acceptable; the ecological damage is not.
- High Human Dignity / Low Justice and Autonomy — for example, an assistance program that effectively relieves individual precarity but maintains structural dependency, excluding beneficiaries from governance of the program itself.
- High Care and Wellbeing / Low Sustainable Depth — for example, a community health center providing genuinely excellent care but powered by fossil fuels without a credible transition plan.

In each case, the binding threshold does not catch the problem because the lower-scoring dimension clears its minimum. The lexicographic rule is required.

A.2 The Lexicographic Priority Rule (RL-PHREVO)

A.2.1 Formal Definition

The Lexicographic Priority Rule establishes a strict total order over the six PHREVO-Score dimensions:

SP ≻ DH ≻ JA ≻ CB ≻ IC ≻ TE

where ≻ denotes "has lexicographic priority over"

Operationally, when two or more dimensions are in genuine conflict — defined as the practical impossibility of simultaneously maximizing all involved dimensions given a fixed project design — the following rules apply:

1. The dimension with the highest lexicographic rank takes precedence. Conflicts between SP and any other dimension are resolved in favor of SP.
2. If the higher-ranked dimension clears its binding threshold, evaluation proceeds to the next dimension in the hierarchy.
3. In cases of conflict between non-adjacent dimensions (e.g., DH and IC with JA, CB unaffected), the higher-ranked dimension prevails.
4. Where a project offers multiple design variants, the lexicographic rule selects the variant that maximizes the highest-ranked conflicted dimension, accepting lower performance in lower-ranked dimensions.
5. The rule does not alter the numerical score calculation. It operates as a prior constraint on which project variants are eligible for scoring and, where relevant, on which variant is recommended when the community must choose.

A.2.2 Philosophical Grounding

The lexicographic order is not arbitrary. It reflects a hierarchy of causal dependencies that is internal to the PHREVO framework's own four pillars:

This hierarchy reflects what the core framework calls the "hierarchy of causal dependencies": dignity is not possible without a living planet; justice is not durable without dignity; care is the medium through which justice and dignity are reproduced; community is the scale at which transformation occurs; technology is the instrument. The order is not a value judgment about which dimension matters more in an abstract sense — it is a causal map of what makes what possible.

A.2.3 Operational Implications

The RL-PHREVO operates at a different level from the weighted average and dynamic weighting mechanisms. It does not replace them. The complete decision sequence is:

1. Compute dimension scores for the project.
2. Apply binding threshold conditions — reject if any dimension is below minimum.
3. Check for dimensional conflict — if conflict exists, apply RL-PHREVO.
4. Apply dynamic territorial weighting to the remaining eligible scores.
5. Compute weighted average to produce final PHREVO-Score.

The RL-PHREVO intervenes at Step 3 only when conflict is present. In the majority of projects where dimensions are complementary or independently improvable, it has no effect on the score. Its operational force is in conflict cases — which are precisely the cases where weighted averaging is most likely to produce misleading results.

A.2.4 Worked Examples

Example 1 — SP vs IC: Cooperative Factory

A cooperative factory project generates significant local employment and community governance (IC = 0.85) but operates a production process that, while above the SP threshold, produces measurable water contamination trending downward (SP = 0.38, threshold = 0.30). All other dimensions clear their thresholds comfortably.

Application of RL-PHREVO: *Both SP and IC clear their thresholds. However, the project design creates a genuine conflict: increasing production (which drives IC) increases contamination (which drives SP down). The two dimensions cannot be simultaneously maximized under the current design.*

Resolution: *SP has lexicographic priority over IC. The project is not rejected (SP > threshold), but if the community must choose between two design variants — one that prioritizes employment (higher IC, lower SP) and one that includes water treatment (lower IC, higher SP) — the RL-PHREVO selects the second variant.*

Justification: *Ecological damage to shared water systems is not compensable by community employment benefit. The river does not recover because the cooperative thrives. The causal dependency runs in one direction only.*

Example 2 — JA vs IC: Community Infrastructure

A community infrastructure project scores high on IC (0.80) because it delivers material benefits quickly. However, decision-making was conducted by a non-representative local board (JA = 0.35, above the threshold of 0.30). Maximizing IC requires rapid execution; maximizing JA requires participatory processes that extend the timeline by eight months.

Application of RL-PHREVO: *Both dimensions clear their thresholds. The conflict is genuine: speed serves IC, deliberation serves JA, and the project cannot fully optimize both simultaneously.*

Resolution: *JA has lexicographic priority over IC (DH ≻ JA ≻ CB ≻ IC). The project must prioritize participatory processes. The PHREVO-Score is calculated normally after the participatory variant is selected. If the community invokes the Territorial Arbitration Mechanism, it may choose the rapid variant with 70% supermajority and documented justification.*

Justification: *A community that does not govern its own infrastructure has not been served — it has been administered. Autonomous decision-making is prior to material production, not subsequent to it.*

Example 3 — DH vs JA: Assistance Program

A food assistance program scores very high on Human Dignity (DH = 0.92) through effective nutritional support, but operates with a passive-beneficiary model (JA = 0.34, barely above threshold of 0.30). Two redesign options exist: maintain the current model (DH = 0.92, JA = 0.34) or introduce participatory governance (DH = 0.80, JA = 0.62).

Application of RL-PHREVO: *DH has lexicographic priority over JA (SP ≻ DH ≻ JA). In a conflict between DH and JA, DH prevails — provided JA remains above its binding threshold.*

Resolution: *The program is not required to sacrifice DH to increase JA, as long as JA stays above threshold. The current model is acceptable under RL-PHREVO. However, if the program were redesigned in a way that caused JA to fall below 0.30, the program would be rejected regardless of DH = 0.92. The threshold is absolute.*

Justification: *Immediate hunger relief cannot be sacrificed in the name of participatory ideals. But participation cannot fall below a minimum ethical floor — a program that completely excludes beneficiaries from governance is structurally incompatible with the dignity it claims to produce.*

A.3 The Territorial Arbitration Mechanism (MAT)

The Lexicographic Priority Rule resolves the large majority of dimensional conflicts automatically and transparently. However, the PHREVO framework is constitutionally committed to the principle that territorial communities are the ultimate authority over decisions affecting their territory. The Territorial Arbitration Mechanism gives effect to this principle in the specific domain of lexicographic conflicts.

The MAT does not undermine the RL-PHREVO. It creates a structured, demanding process by which a territorial assembly may, in exceptional circumstances, deviate from the standard lexicographic order for a specific decision — with full transparency, documented deliberation, supermajority approval, and regional audit.

A.3.1 Activation Conditions

The MAT may be activated when:

All six dimensions clear their binding thresholds (if any dimension is below threshold, the project is rejected and no arbitration is possible).

A genuine conflict exists between two or more dimensions in which the RL-PHREVO produces a consequence that the territorial assembly considers contextually unjust.

A simple majority (50%+1) of the territorial assembly votes to activate the mechanism.

The MAT cannot be activated to contest the binding thresholds, to modify the lexicographic order permanently, or to approve a project that would have been rejected on threshold grounds.

A.3.2 Five-Stage Process

Stage 1 — Convocation

A simple majority vote activates the MAT. The convocation document must specify: the project or decision in conflict; the dimensions involved and the nature of the conflict; and the specific consequence of the RL-PHREVO that the assembly considers contextually problematic. Vague or procedurally incomplete convocations are not accepted.

Stage 2 — Documented Deliberation

The assembly deliberates for a minimum of 14 days and a maximum of 45 days. All deliberation sessions are public, recorded, and archived. The process must include explicit efforts to incorporate voices from historically marginalized groups within the community. A formal deliberation record is produced, including: arguments in favor of deviation; arguments against deviation; dissenting voices; and the final vote tally (nominal or anonymous, per assembly decision).

Stage 3 — Supermajority Decision

Deviation from the RL-PHREVO requires 70% of valid votes. Simple majority is insufficient. The decision document must specify: the exact deviation (e.g., "in this case, IC is prioritized over JA"); the temporality of the deviation (maximum 24 months, renewable once with a new vote); and the monitoring conditions that will determine whether the deviation was justified ex post.

Stage 4 — Regional Audit

Every MAT decision is automatically reviewed by the regional governance level (Stakeholders Council panel or DAO-designated arbitrators). The regional level may: confirm the decision (binding, no further appeal); request reconsideration with additional arguments; or annul the decision. Annulment is only possible if 60% of the regional panel concludes that the process was procedurally irregular — deliberation was not public, not inclusive, or not documented. The regional level may not annul on substantive grounds — disagreement with the community's conclusion is not sufficient for annulment.

Stage 5 — Public Registry

Every MAT decision is registered on a public, auditable ledger (blockchain or equivalent). The registry includes: the project and conflict; the deliberation record; the vote result; the final decision and justification; and the regional audit outcome. This registry constitutes a living body of territorial jurisprudence that informs future conflict resolution across the PHREVO network.

A.3.3 Constitutional Limits of Arbitration

The MAT is a democratic instrument, not a democratic veto over the framework's constitutional architecture. The following limits are absolute:

- The MAT cannot modify the lexicographic order permanently. The order SP ≻ DH ≻ JA ≻ CB ≻ IC ≻ TE is constitutional and can only be altered by a PHREVO Global Assembly with 85% supermajority and a minimum 6-month deliberation period.
- The MAT cannot waive binding threshold conditions. No arbitration can approve a project below any dimension's minimum threshold.
- The same territorial assembly cannot activate the MAT for the same project or territory more than twice within a 48-month period without a constitutional review.
- MAT decisions expire automatically at the end of their specified temporal window. Renewal requires a new full process.

A.4 Integration with Existing Score Architecture

A.4.1 Three-Layer Decision Architecture

The RL-PHREVO and MAT integrate with the existing PHREVO-Score mechanisms to produce a complete three-layer decision architecture:

The layers are sequential and non-substitutable. Layer 1 cannot be bypassed by Layer 3b. Layer 3a cannot be bypassed by dynamic weighting alone. The architecture is designed so that each layer addresses a distinct failure mode of multi-criteria evaluation.

A.4.2 Technical Implementation

The following pseudocode illustrates the complete evaluation sequence incorporating the RL-PHREVO and MAT:

```
def evaluate_project(project_data, territory_context, assembly_decisions):
    # LAYER 1 — Binding Threshold Conditions
    scores = compute_dimension_scores(project_data)
    for dimension, score in scores.items():
        if score < THRESHOLDS[dimension]:
            return reject(f"Below threshold: {dimension} = {score}")
    # LAYER 3a — Lexicographic Priority Rule
    LEXICOGRAPHIC_ORDER = ["SP", "DH", "JA", "CB", "IC", "TE"]
    if has_genuine_conflict(scores, project_data):
        conflict_dims = identify_conflict_dimensions(scores, project_data)
        dominant_dim = resolve_by_lexicographic_priority(
            conflict_dims, LEXICOGRAPHIC_ORDER
        )
        # Select project variant that maximizes dominant_dim
        project_data = select_dominant_variant(project_data, dominant_dim)
        scores = recompute_scores(project_data)
    # LAYER 3b — Territorial Arbitration (if invoked)
    if assembly_decisions.has_active_arbitration(project_data.id):
        arbitration = assembly_decisions.get_arbitration(project_data.id)
        if arbitration.valid and arbitration.supermajority >= 0.70:
            project_data = apply_arbitration_variant(
                project_data, arbitration
            )
            scores = recompute_scores(project_data)
```

```
        log_arbitration_to_public_registry(arbitration)
  # LAYER 2 — Dynamic Territorial Weighting
  weights = compute_dynamic_weights(territory_context)
  # LAYER 4 — Weighted Average
  final_score = weighted_average(scores, weights)
  return PHREVOScoreResult(
     score=final_score,
     dimension_scores=scores,
     conflict_detected=has_genuine_conflict(scores, project_data),
     lexicographic_applied=dominant_dim if conflict else None,
     arbitration_applied=arbitration.id if arbitration else None,
     territory_weights=weights
  )
```

A.4.3 User Interface Requirements

When the RL-PHREVO is triggered, the platform must display an explicit notification to the territorial assembly. The notification language must be precise and non-technical:

This project has a conflict between Sustainable Depth (SP = 0.38) and Community Impact (IC = 0.85). Under the PHREVO Lexicographic Priority Rule, Sustainable Depth takes precedence. The project is viable under the design variant that prioritizes ecological protection. If the community wishes to prioritize Community Impact instead, the Territorial Arbitration Mechanism may be activated with a simple majority vote. Arbitration requires a minimum 14-day deliberation period and 70% supermajority to take effect.

When the MAT is activated:

Territorial Arbitration is active for Project X. Deliberation period: [date] to [date] (minimum 14 days). Required supermajority for deviation: 70% of valid votes. All sessions are public and recorded. The decision will be reviewed by the regional panel. [Link to deliberation record] [Link to public registry]

A.5 Relationship to Existing Literature

The lexicographic preference relation formalized in this annex is well-established in decision theory and welfare economics. Rawls's maximin criterion (Rawls, 1971) applies a lexicographic logic to the distribution of primary goods, prioritizing the worst-off position before considering aggregate welfare. Sen's capability approach (Sen, 1999) resists aggregation across capabilities on precisely the grounds that doing so conceals deprivations in specific domains. Lexicographic utility functions appear in consumer theory (Encarnación, 1964) and multi-attribute utility theory (Fishburn, 1974).

The specific application in this annex — lexicographic priority across welfare dimensions in a territorial governance context — is novel in its institutional design but draws on this established theoretical base. The RL-PHREVO extends the lexicographic logic beyond individual welfare functions to collective governance decisions, and pairs it with a democratic arbitration mechanism that reflects the PHREVO framework's commitment to territorial autonomy.

The Territorial Arbitration Mechanism draws on the literature of deliberative democracy (Habermas, 1996; Dryzek, 2000), commons governance (Ostrom, 1990), and transitional justice (specifically the concept of supermajority requirements for constitutional deviation). The requirement that arbitration decisions be time-limited and renewable through fresh deliberation reflects Ostrom's finding that successful commons governance requires regular rule reassessment.

The problem this annex addresses — incommensurability between dimensions of wellbeing in multi-criteria frameworks — is a recognized limitation in the existing "beyond GDP" literature. The Happy Planet Index, the Human Development Index, and the Multidimensional Poverty Index all face variants of this critique. The PHREVO approach of explicit lexicographic ordering, rather than index aggregation, represents a methodological advance that invites direct engagement from welfare economists and political philosophers working in this space.

A.6 Validation Roadmap

This annex is submitted as a proposal for validation. The following steps are required before the RL-PHREVO and MAT are incorporated as official components of the PHREVO-Score:

Internal Review

Review by Andrés Jiménez as framework architect, with particular attention to: consistency between the lexicographic order and the four pillar hierarchy; potential unintended consequences of the MAT supermajority requirement in contexts of political capture; and edge cases not addressed by the three worked examples.

Community Pilot Validation

Application of the RL-PHREVO to at least two to three real cases, beginning with the Dignity Toolkit in New York City as a simulation context. The Dignity Toolkit regularly navigates conflicts between resource allocation efficiency (analogous to IC) and participant autonomy in decision-making (analogous to JA). Documenting how the RL-PHREVO would apply to actual coordination decisions produces the first empirical test of the mechanism.

Academic Peer Review

Invitation to one or two economists or political philosophers with expertise in decision theory, welfare economics, or commons governance to review the formal definition, the worked examples, and the MAT process design. Target reviewers: scholars working on lexicographic welfare functions, the capability approach, or Ostrom-tradition commons governance.

Documentation of Cases

Once operational, every RL-PHREVO activation and every MAT decision is documented in the public registry. After twelve months of operation, an analysis of the case record informs a revised version of this annex. The living jurisprudence principle — that accumulated decisions guide future deliberation — requires systematic documentation from the first activation.

A.7 Conclusion

The PHREVO-Score v1.0 introduced something genuinely novel: a multi-dimensional impact metric with binding threshold conditions that prevent the compensatory trade-offs characteristic of ESG frameworks. The RL-PHREVO and MAT, introduced in this annex, complete that architecture by resolving the remaining methodological gap: what happens when all dimensions clear their thresholds but genuine conflict between them persists.

The answer PHREVO provides is grounded in its own philosophical foundations rather than imported from decision theory. The lexicographic order — SP ≻ DH ≻ JA ≻ CB ≻ IC ≻ TE — is not an external ranking of values. It is a causal map derived from the four pillars: the planet is the condition of possibility for all human dignity; justice is the structural condition for durable dignity; care is the reproductive medium of justice and community; community is the operational scale of transformation; technology is the instrument.

The Territorial Arbitration Mechanism reflects the equal commitment to territorial autonomy. Communities are the ultimate authority over their own territories. When the standard hierarchy produces a contextually unjust consequence, communities have a structured, demanding, transparent, and time-limited path to deviate — not by overriding the framework's logic, but by invoking their constitutional authority within it.

A system that resolves conflict automatically and transparently, that allows democratic deviation through rigorous process, and that records every decision in a public and permanent ledger does not need heroes to be consistent. It needs well-designed rules. This annex is PHREVO's answer to the hardest methodological question in multi-dimensional welfare measurement. The conflict between dimensions is not a failure of the framework. It is the place where the framework does its most important work.

References

Dryzek, J.S. (2000). Deliberative Democracy and Beyond: Liberals, Critics, Contestations. Oxford University Press.

Encarnación, J. (1964). Preference orderings and the labor-leisure choice. Economic Journal, 74(293), 157–160.

Fishburn, P.C. (1974). Lexicographic orders, utilities and decision rules: A survey. Management Science, 20(11), 1442–1471.

Habermas, J. (1996). Between Facts and Norms: Contributions to a Discourse Theory of Law and Democracy. MIT Press.

Jiménez, A. (2026). PHREVO: A Post-Capitalist Economic Architecture for the Global South — Framework, Methodology, and Evaluation System. SSRN Working Paper 6614438. DOI: 10.5281/zenodo.19666941.

Ostrom, E. (1990). Governing the Commons: The Evolution of Institutions for Collective Action. Cambridge University Press.

Rawls, J. (1971). A Theory of Justice. Harvard University Press.

Sen, A. (1999). Development as Freedom. Oxford University Press.

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