**Implementation Considerations for FSFVI Framework**

**1. Performance Gap Calculation & Technical Boundaries**

**Issue:** As defined in Section 2 (p. 2), the performance gap formula (δᵢ = |xᵢ - x̄ᵢ| / xᵢ) risks division-by-zero instability when xᵢ approaches zero.

**Questions:**

In the performance gap calculation (δᵢ = |xᵢ-x̄ᵢ|/xᵢ), how should we handle scenarios where the current performance (xᵢ) approaches zero? Should we implement a minimum threshold to prevent division issues, and if so, what would be a reasonable threshold based on your research?

1. Should a minimum threshold (e.g., 1% of system-wide performance baselines) be implemented to avoid computational issues?
2. How would such thresholds align with observed data ranges in your case studies (e.g., Malawi, Ethiopia)?

**2. Sensitivity Parameter (αᵢ) Calibration**

**Issue:** The parameter αᵢ governs resource-to-performance efficiency (Section 2, p. 2), but calibration guidance is needed for heterogeneous components.

**Questions:**

The sensitivity parameter (αᵢ) is crucial for the vulnerability function. Could you provide guidance on how this parameter should be calibrated for different types of food system components? For instance, would production components have fundamentally different sensitivity ranges compared to distribution components?

1. Should production components (e.g., crop yields) have higher/lower sensitivity ranges than distribution/retail components, given their differing exposure to climatic vs. logistical risks?
2. Could CAADP/ReSAKSS datasets provide empirical ranges for regional αᵢ values?

**3. Weight Assignment (ωᵢ) Methodologies**

**Issue:** Weights are tied to criticality (Section 5, p. 5), but interdependencies complicate static assignments.

**Questions:**

The paper specifies weight assignments (ωᵢ) based on component criticality. Have you developed any specific methodologies or metrics for determining these weights that we should incorporate into the system? Particularly, how should these weights be adjusted when components have strong interdependencies?

1. Have you developed metrics (e.g., network centrality scores) to dynamically adjust ωᵢ for interdependent components?
2. How should weights account for cascading failures (e.g., production shocks amplifying distribution vulnerabilities)?

**4. Real-Time Monitoring Intervals**

**Issue:** Temporal benchmarking requires update frequencies (Section 6, p. 5–6), but component volatility varies.

**Questions:**

Regarding real-time monitoring, what would you consider appropriate time intervals for recalculating the FSFVI? Should different components have different update frequencies based on their volatility or importance?

1. Should high-volatility components (e.g., retail prices) update hourly/daily, while stable ones (e.g., infrastructure) update monthly?
2. How did monitoring intervals in your African case studies balance data latency and decision urgency?

**5. Threshold Flexibility & Contextualization**

**Issue:** Fixed benchmarks (low ≤0.1, high >0.3) may not reflect regional disparities (Section 6, p. 5).

**Questions:**

The paper presents benchmark categories (low FSFVI ≤ 0.1, moderate 0.1-0.3, high > 0.3). In implementing alerts and monitoring systems, should these thresholds be absolute or should they be contextual based on the specific food system's characteristics? How much flexibility should we build into these threshold definitions?

1. Should Rwanda’s thresholds differ from Niger’s due to baseline infrastructure or resilience disparities?
2. How much deviation from absolute thresholds is permissible when contextualizing alerts?

**6. Optimization Trade-Offs**

**Issue:** Strict adherence to δᵢ-driven prioritization (Section 4, p. 4) may conflict with system-wide vulnerability minimization.

**Questions:**

For the optimization algorithm, how should we handle competing constraints when the prioritization rule (fᵢ ≥ fⱼ if δᵢ ≥ δⱼ) conflicts with achieving the minimum overall system vulnerability? Should we implement strict adherence to the rule or allow for some deviation if it significantly improves overall system performance?

1. Should the algorithm allow temporary rule deviations if overall FSFVI improves by >X%?
2. How did your African case studies balance localized vs. systemic interventions?

**7. Non-Financial Data Integration**

**Issue:** The framework focuses on financial metrics, but climate/social data (e.g., Food Systems Dashboard indicators) correlate with vulnerability (Section 1, p. 1).

**Questions:**

The paper focuses on financial vulnerability, but modern systems generate substantial non-financial data. Should we design the system architecture to incorporate other types of vulnerability indicators (like climate data, social metrics, or market volatility) that might influence or correlate with financial vulnerability? If so, how would you suggest integrating these into the FSFVI calculation?

1. Should FSFVI architecture modularize non-financial indicators (e.g., drought indices) as parallel inputs or embed them into δᵢ/αᵢ calculations?
2. How might hybrid models (financial + climate) improve predictive power in regions like Ghana or Ethiopia?

**Key Cross-Cutting Themes**

Empirical Grounding: Leverage CAADP/ReSAKSS datasets and regional case studies to resolve ambiguities.

Dynamic Adjustments: Implement thresholds/weights as adjustable parameters, not fixed values.

System Complexity: Formalize interdependencies (e.g., via causal graphs) to avoid oversimplification.