

# The Climate-Smart Governance Dashboard and AI Agent: Operationalizing Adaptation Finance through Data-Driven Prioritization

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# The Climate-Smart Governance Dashboard and AI Agent: Operationalizing Adaptation Finance through Data-Driven Prioritization

## Summary

The acceleration of global climate change necessitates a fundamental shift in how vulnerable nations approach adaptation planning and resource allocation. The existing global framework is characterized by a critical financial disparity; the Adaptation Gap Report 2025 estimates that developing countries require between US\$310 and US\$365 billion annually by 2035, yet international finance flows remain drastically low, recorded at only US\$26 billion in 2023 (Amarnath et al., 2023). This resource scarcity is compounded by an efficiency crisis, wherein limited funds are often misallocated due to fragmented data ecosystems, institutional silos, and weak analytical capacity within governance structures (Amarnath et al., 2023).

For countries like Sri Lanka, this context translates into profound economic vulnerability. Climate-related damages are estimated to exceed LKR 50 billion, equivalent to approximately US\$300 million, annually (Amarnath et al., 2023). Addressing this mounting cost of inaction requires a massive, coordinated financial effort. The nation's Nationally Determined Contributions (NDCs) specify a requirement of US\$10.85 billion by 2030 to implement climate resilience measures (IB-CSG).

The Climate Smart Governance (CSG) Dashboard, developed by the International Water Management Institute (IWMI), and its recent evolution through the integration of an Artificial Intelligence (AI) Agent, provide a transformative solution. The platform is designed to resolve the institutional challenges that plague adaptation efforts, specifically by creating a centralized, evidence-based system for coordinated planning, investment, and progress evaluation (Amarnath et al., 2023). The AI Agent functions as a "Conversational Analyst," bridging the "last-mile gap" by transforming complex climate data into accessible, decision-ready intelligence for policymakers (Amarnath et al., 2023).

The critical outputs of this system are the Water Adaptation Finance Index (WAFI) and the Agriculture Adaptation Finance Index (AAFI). These indices move beyond simple risk assessment; they analytically quantify the adaptation gap—the deficiency in institutional and financial response relative to acute climate risk and socio-economic vulnerability (Amarnath et al., 2023). The analysis consistently identifies districts in Sri Lanka's Northern Dry Zone, notably Mullaitivu, Kilinochchi, and Mannar, as the highest priority areas. These regions exhibit extreme vulnerability coupled with critically low existing investment, demanding a rigorous, tiered investment allocation strategy based on objective, data-backed gap scores. The inherent design of the platform, focused on integrating data and enforcing accountability, elevates the CSG system beyond a simple risk mitigation tool into a necessary instrument for governance transformation (Amarnath et al., 2023).

# Sri Lanka's Policy Framework and the Need for Data Coherence

## A. The Global Adaptation Finance Gap and Governance Challenge

The global shortfall in adaptation finance demands that development choices integrate risk considerations to prevent locking nations into unsustainable trajectories (Amarnath et al., 2023). The disparity between required adaptation capital and available public funding is stark, reinforcing the need for mechanisms that ensure maximum impact from every resource allocated (Kohli & Yusuke, 2025). Historically, a lack of consolidated, high-quality data regarding climate risk, existing project spending, and verifiable impact has been a primary barrier, hindering climate-vulnerable countries from effectively articulating their finance needs or demonstrating fiduciary responsibility to donors (Amarnath et al., 2023). This absence of a shared analytical foundation prevents the creation of "bankable climate investment pathways," a prerequisite for attracting sustained international finance (GCF). The CSG Dashboard's function is to address this institutional and financial deficit by synthesizing data from critical external sources, including the Coalition for Disaster Resilient Infrastructure (CDRI), the World Bank, and UN SDG indicators, thereby immediately enhancing the financial readiness capacity of the host nations (Gillian Murphy, 2025).

## B. Sri Lanka's Policy Landscape: NDCs and the National Climate Finance Strategy

Sri Lanka is highly vulnerable to climate change, consistently ranking among the top ten countries at risk of extreme weather events (FAO). Recognizing this urgency, the government has established comprehensive policy frameworks to guide national response and mobilize finance:

- **Nationally Determined Contributions (NDCs):** Sri Lanka's updated NDCs (NDC 3.0, covering 2026–2035) commit the country to an economy-wide GHG emission reduction target and aim to achieve carbon neutrality by 2050 (UNDP). The NDCs set a cross-sectoral framework for mitigation, adaptation, and Loss & Damage, establishing a critical financial envelope, requiring **US\$10.85 billion by 2030** to implement climate resilience measures (IB-CSG). The adaptation components span nine vital sectors, including Agriculture, Fisheries, Water, Biodiversity, and Health. Successful implementation relies on a comprehensive **NDC Investment Plan** to clearly outline priority areas and eliminate policy and regulatory bottlenecks that hinder investment flows (Ministry of Environment, Sri Lanka).
- **National Climate Finance Strategy (NCFS) (2025–2030):** Launched in October 2025, the NCFS is a major policy milestone designed to integrate climate priorities into fiscal planning, investment decisions, and national development programs. It provides a comprehensive framework for mobilizing and managing financial resources and recommends investing approximately **US\$500 million annually** in climate-resilient infrastructure. The Strategy identifies twelve key financial instruments to attract both domestic and international investment into priority sectors like climate-resilient infrastructure and sustainable agriculture.

## C. The Challenge of Policy Coherence and Implementation

Despite the existence of these high-level frameworks, Sri Lanka faces a persistent challenge in operationalizing them. Studies indicate significant climate finance readiness gaps<sup>8</sup>, compounded by institutional weaknesses:

- **Data Fragmentation:** There is a lack of a proper system to consolidate scattered information on climate issues and disseminate them to relevant stakeholders (FAO).
- **Policy Disconnects:** There is limited practical coordination (horizontal coherence) among ministries and a significant disconnect (vertical coherence) between national policies and local implementation (CGIAR). Ministries develop policies, but district and provincial authorities often lack the financial and technical resources to execute them effectively (CGIAR).

The CSG Dashboard and its AI Agent are strategically positioned to resolve these policy and implementation challenges by creating a single, verifiable source of truth and an intelligent platform for data-driven allocation, directly supporting the goals of the NDCs and the NCFS (Amarnath et al., 2023). The National Planning Department (NPD) and the Climate Change Secretariat (CCS) are key national partners in implementing the CSG Dashboard to strengthen evidence-based climate planning (CGIAR).

## The Climate Smart Governance (CSG) Dashboard Foundation

The CSG Dashboard is the first tool of its kind designed to gather comprehensive data on climate and societal variables, combining this intelligence with planning tools for monitoring, reporting, and evaluating progress towards global development goals (Amarnath et al., 2023). Developed as part of the CGIAR Initiative on Climate Resilience (ClimBeR), it is being implemented across focus countries highly vulnerable to climate change but possessing low resilience, including Kenya, Morocco, Senegal, Zambia, Guatemala, the Philippines, and Sri Lanka, with initial operational rollouts completed in Senegal, Zambia, and Sri Lanka (Amarnath et al., 2023).

### A. Core Functionality and Institutional Relevance

The platform's design is inherently a governance intervention, facilitating a holistic approach by integrating public-sector departments (e.g., water, agriculture, finance) with private-sector organizations (e.g., funding bodies, NGOs) (Amarnath et al., 2023). This mandated coordination addresses the foundational challenge of uncoordinated national-level initiatives and duplicative effort that often characterize adaptation efforts in developing nations (Amarnath et al., 2023).

Crucially, the CSG Dashboard is built to align with the iterative National Adaptation Plan (NAP) process of the United Nations Framework Convention on Climate Change (UNFCCC) (Amarnath et al., 2023). This alignment ensures that national adaptation strategies are integrated into existing national, sectoral, and local policies. Furthermore, the dashboard complements the CGIAR AWARE Platform, which focuses on early warning systems for short-term climate risks, positioning CSG as the essential tool for coordinated mid- to long-term adaptation planning (Amarnath et al., 2023).

### B. Detailed Analysis of the Nine Modules

The nine modules within the dashboard comprise a comprehensive analytical engine, providing the structured data necessary for the advanced AI Agent to function <sup>1</sup>:

#### Module 1 - Country Overview

This module provides an initial snapshot of a nation's vulnerability by detailing water resources, agriculture, ecosystems, health, and specific climate hazards such as flood, drought, tsunami, landslide, and cyclone (IB-CSG).

## **Module 2 - Climate Outlook**

This module utilizes the UNFCCC Shared Socioeconomic Pathways (SSPs) to model and display how a nation's climate risk exposure may evolve under different future climate policies and scenarios, allowing users to explore forecast predictions for key variables like temperature and precipitation (Amarnath et al., 2023).

## **Module 3 - Project Tracker**

The Project Tracker serves as the central registry, collecting structured data on climate mitigation and adaptation projects dating back five years (IB-CSG). Information categorized includes the project name, duration, donor, scale (basin, subnational), type of hazard addressed, and specific theme (e.g., climate resilience, disaster risk reduction) (IB-CSG). The centralization of this data is vital for preventing the duplication of effort frequently seen in fragmented national systems (Amarnath et al., 2023).

## **Module 4 - Geospatial Tools**

This powerful analytical module enables high-precision policy targeting (Amarnath et al., 2023). Policymakers can overlay various layers of information—such as infrastructure (roads, schools, hospitals), hazard exposure (floods, droughts), and critical socio-economic indicators (male/female literacy, access to sanitation/hygiene levels)—onto a map (Amarnath et al., 2023). This capability allows users to identify locations with the greatest confluence of unmet need and exposure, thereby directing development projects and financial support to regions most in need (IB-CSG).

## **Module 5 - Monitoring and Evaluation (M&E)**

By mapping the spatial distribution of adaptation activities and collecting updates from project managers, this module assesses collective project outcomes against national adaptation objectives (Amarnath et al., 2023). This function transforms the dashboard from a passive registry into an active accountability tool. As the number of projects grows, the M&E module facilitates the long-term assessment of transformational change, providing verifiable evidence of progress necessary for accountability and transparency (Amarnath et al., 2023).

## **Module 6 - Development Indicators**

This module facilitates the assessment of a country's progress toward the UN Sustainable Development Goals (SDGs) (Amarnath et al., 2023). When projects are listed, users must specify the SDGs targeted (Amarnath et al., 2023). This ensures that resilience efforts are holistically integrated into broader development planning. For instance, a project aiming to reduce poverty (Target 1-1) can be monitored by surveying participants on changes in the indicator relating to the number of people living on less than USD\$1.25 (Amarnath et al., 2023). By forcing project managers to define and measure these specific development outcomes, the platform generates the longitudinal data required to measure the real-world impact of adaptation strategies and demonstrate effectiveness to global partners.

## **Module 7 - Adaptation Catalogue**

Acting as a public repository, this module showcases projects from around the world that have been uploaded to the Project Tracker (Amarnath et al., 2023). It allows system users to visualize project clusters and identify gaps in initiative coverage, promoting knowledge sharing and transparency (Amarnath et al., 2023).

## **Module 8 - Investment Portfolio Planning**

This module provides a robust financial overview, detailing a country's economic mainstays and the specific risks posed by climate change (Amarnath et al., 2023). It features a climate-risk rank based on data from SwissRe, outlining potential impacts on GDP under different temperature-rise scenarios (Amarnath et al., 2023). This evidence base is essential for policymakers seeking to analyze the potential financial impacts of climate change within their country and, critically, to structure proposals designed to attract investment from international donors (Amarnath et al., 2023).

## **Module 9 - How-to Guide**

This module provides the necessary operational capacity support through an in-depth guide, ensuring that users can effectively utilize the dashboard for climate-adaptation planning (Amarnath et al., 2023).

# **Advanced Analytics: The CSG AI Agent and the Last-Mile Gap**

## **A. The Conversational Analyst and Cognitive Load Reduction**

The inherent complexity of multi-layered climate and financial data often creates a "last-mile challenge," wherein high-value data assets remain underutilized because senior officials, planners, and development partners lack the time or technical expertise required to navigate or interpret complex statistical outputs (Amarnath et al., 2023). The CSG AI Agent was introduced as a transformative evolution of the dashboard, directly addressing this deficiency (Amarnath et al., 2023).

The AI Agent functions as an intelligent, conversational layer—the "Conversational Analyst"—that democratizes access to sophisticated analytics (Amarnath et al., 2023). It allows users, regardless of their technical background, to query data, run simulations, and generate insights using plain language (Amarnath et al., 2023). The Agent interprets user intent, synthesizes data from the nine core CSG modules and external sources, and produces clear, context-rich outputs such as maps, reports, and strategic summaries (Amarnath et al., 2023). This capability transforms the data system into an active partner in decision-making (Amarnath et al., 2023).

Technically, the system operates on a layered architecture utilizing a hybrid model ensemble, combining large language models like GPT-o (Omni) for complex reasoning with complementary models such as LLAMA for data sovereignty and operational efficiency (Amarnath et al., 2023). Crucially, the system employs a Retrieval-Augmented Generation (RAG) mechanism. This process ensures that the AI's narrative synthesis and recommendations are rigorously grounded in the real CSG data, guaranteeing traceability and accuracy, thereby preventing the hallucinations or inaccuracies sometimes associated with pure generative models (Amarnath et al., 2023).

## **B. The Three-Tiered Decision-Support Architecture**

The AI Agent's functionality is structured into three tiers, reflecting increasing levels of analytical sophistication and strategic value <sup>1</sup>:

## 1. Data Concierge (First Tier)

This tier handles simple and intermediate queries, retrieving summary statistics or generating baseline charts. This function minimizes the need for technical staff to fulfill basic information requests, enabling users to receive immediate visual outputs (Amarnath et al., 2023). A user might ask, for example, "Show me a pie chart of average annual loss by hazard," and receive the relevant data visualization within seconds (Amarnath et al., 2023).

## 2. Scenario Modeler (Second Tier)

The Scenario Modeler enables interactive, conversational "what-if" analyses by drawing on the Climate Outlook module (Module 2) (Amarnath et al., 2023). This function allows policymakers to stress-test policies and infrastructure under hypothetical futures (Amarnath et al., 2023). A user can request, "Model the impact of a 20 percent increase in flood risk combined with a 10 percent rise in cyclone risk," and the AI simulates the resultant exposure and displays the findings (Amarnath et al., 2023). This capability is vital for integrating proactive, anticipatory planning into flood-preparedness action plans (Amarnath et al., 2023).

## 3. Strategic Advisor (Third Tier)

This is the highest level of analytical support. The Strategic Advisor synthesizes multi-source data (hazard, vulnerability, finance) to provide high-level insights and actionable recommendations (Amarnath et al., 2023). For example, in response to the query, "Which provinces need more funding based on their climate risk profile?", the AI combines complex risk metrics, vulnerability data, and project finance information to identify underfunded high-risk areas and recommend strategic investments (Amarnath et al., 2023). This tier directly supports critical fiduciary functions, including budget allocation, project design, and high-stakes donor coordination, by providing the evidence required for international funding proposals (Gillian Murphy, 2025).

# Financial Prioritization Frameworks: WAFI and AAFI Indices

The true utility of the CSG AI Agent is realized through the development of consolidated indices that translate complex data into transparent, actionable metrics for resource allocation. The Water Adaptation Finance Index (WAFI) and the Agriculture Adaptation Finance Index (AAFI) operationalize the analytical outputs of the dashboard to prioritize where limited adaptation funds should flow, based on relative urgency and the scale of the financial gap (Amarnath et al., 2023).

## A. The Water Adaptation Finance Index (WAFI): Guiding Water Resilience Investment

The WAFI was created to provide a unified metric for prioritizing investments in the water sector, consolidating risk, vulnerability, and financial gap data into a single, comparable score for each district (Amarnath et al., 2023). The index is built on three pillars:

**Pillar 1: Climate and Hydrological Risk:** Quantifies acute and chronic water threats using metrics such as Annual Expected Water Criticality Index and Average Annual Loss (AAL) from floods and droughts (IB-CSG).

**Pillar 2: Socio-Economic Vulnerability:** Measures the degree of economic exposure to water-sensitive sectors, particularly agriculture, demonstrating the fragility of local livelihoods (IB-CSG).

**Pillar 3: Adaptation Gap:** This is the defining component, capturing the institutional and financial deficits. Indicators include the inverse of active project density (Project Implementation Gap) and the funding deficit relative to actual water-related losses (Funding Gap) (Amarnath et al., 2023).

Regions with high WAFI scores demonstrate the greatest unmet need. The analysis reveals that the Northern districts are the highest priority.

**Table 1.** Water Adaptation Finance Index (WAFI) District Prioritization

District	Pillar 1 Score (Risk)	Pillar 2 Score (Vulnerability)	Pillar 3 Score (Adaptation Gap)	Final WAFI Index	Rank
Mullaitivu	0.47	1.00	1.00	0.82	1
Kilinochchi	0.48	0.96	0.77	0.74	2
Mannar	0.44	0.89	0.70	0.68	3
Monaragala	0.50	0.94	0.61	0.68	4
Jaffna	0.60	0.75	0.59	0.64	5
Ratnapura	0.42	0.28	0.17	0.29	21
Colombo	0.50	0.00	0.00	0.17	25

The top ranks (Mullaitivu, Kilinochchi, Mannar) indicate the most severe combination of high water stress and extreme socio-economic exposure, paired with the most critical funding shortfalls (IB-CSG).

## B. The Agriculture Adaptation Finance Index (AAFI): Mapping the Sectoral Finance Deficit

The AAFI focuses specifically on Sri Lanka’s agriculture sector, which is critical for food security and livelihoods but highly climate-sensitive (Amarnath et al., 2023). The index provides a composite, district-level diagnostic by comparing two counter-balancing pillars: Pillar A (Demand) and Pillar B (Response). The resulting AAFI Gap Score, calculated as the difference between Demand and Response, signals where the financing deficit is most acute (Amarnath et al., 2023).

**Pillar A (Climate Risk and Financial Demand)** measures the severity of need, incorporating metrics such as Agricultural Dependency, Smallholder Prevalence, Poverty and Food Insecurity, Multi-Hazard Exposure, and estimated Adaptation Cost (Amarnath et al., 2023).

**Pillar B (Climate Finance and Implementation Response)** assesses the scale and quality of the existing financial and institutional support, including Total Adaptation Finance, Finance Intensity, Insurance Penetration, and Smallholder Access to finance (Amarnath et al., 2023).

**Table 2.** Agriculture Adaptation Finance Index (AAFI) Gap Score Analysis

District	Pillar A Score (Demand)	Pillar B Score (Response)	AAFI Gap Score	Rank
Mullaitivu	1.00	0.38	0.62	1
Mannar	0.96	0.40	0.56	2
Kilinochchi	0.93	0.42	0.51	3
Vavuniya	0.87	0.52	0.35	4
Monaragala	0.82	0.48	0.34	5
Ratnapura	0.52	0.18	0.34	6

Anuradhapura	0.82	0.70	0.12	19
Kurunegala	0.83	0.76	0.07	22
Colombo	0.05	0.60	-0.55	25

The data confirms that Mullaitivu, Mannar, and Kilinochchi hold the top three ranks, consistently demonstrating maximal demand (Pillar A scores near 1) but critically weak response scores (Pillar B around 0.4) (Amarnath et al., 2023). A closer examination of the underlying data for these high-gap districts reveals that institutional mechanisms for risk management are highly deficient; specifically, these areas show extremely low insurance penetration (ranging from 2% to 4%) and high smallholder dependence (Amarnath et al., 2023). This outcome confirms that the calculated financial gap is driven not only by physical risk but by institutional failure to provide financial safety nets and inclusive financing mechanisms.

It is important to note the case of Ratnapura (Rank 6), a wet-zone district. While its agricultural demand score (Pillar A, 0.52) is moderate compared to the Northern Dry Zone, its financial response score (Pillar B, 0.18) is critically low, resulting in a significant, urgent gap (Amarnath et al., 2023). This underscores the need for targeted investment in specific regional hazards, such as the flood and landslide resilience required in that area.

## Strategic Investment Roadmap: Connecting Analytics to Budget Allocation

The WAFI and AAFI indices are not intended as absolute cost-estimation tools but rather as indispensable governance instruments for the strategic, proportional allocation of defined financial resources (Amarnath et al., 2023). They provide the objective data necessary to ensure that Sri Lanka's US\$10.85 billion adaptation requirement, as outlined in the NDCs, is distributed efficiently and equitably (Amarnath et al., 2023). The integration of the CSG Dashboard, used by national planning institutions like the National Planning Department (NPD) to prioritize investments, directly supports the financial planning and resource mobilization goals of the National Climate Finance Strategy (NCFS).

### A. Managing the National Financial Envelope

National assessments define the necessary financial commitment. Sri Lanka's National Climate Finance Strategy (2025–2030) recommends investing approximately US\$500 million annually in climate-resilient infrastructure. The acute nature of the challenge is highlighted by the sectoral needs: the water supply and sanitation sector alone faces a staggering 526 percent financing gap (Amarnath et al., 2023). While the CSG Dashboard currently tracks adaptation projects valued at US\$4.27 billion in water and agriculture, this demonstrates existing progress but also confirms the immense distance remaining before the overall deficit is closed. The CSG Project Tracker (Module 3) is key to transparently monitoring this progress.

### B. The Multi-Tiered Investment Allocation Strategy

The following tiered allocation strategy is derived from the AAFI and WAFI Gap Scores, ensuring that resource flow is weighted by verifiable, quantified need:

## **Tier 1: Highest Priority Districts (The Resilience Foundation)**

**Basis:** Districts ranking highest in the AAFI and WAFI Gap Scores, characterized by maximal vulnerability, high agricultural dependence, and minimal existing financial response. This tier includes Mullaitivu, Mannar, and Kilinochchi (Amarnath et al., 2023).

**Allocation Focus:** These districts must receive the first and largest tranche of new adaptation funds (e.g., 50–60% of national agricultural and water adaptation budgets). The strategic approach here must be highly synergistic, recognizing that the consistent identification of these areas at the top of both the WAFI and AAFI rankings represents a significant nexus investment opportunity. Investment in resilient water infrastructure in these districts will simultaneously stabilize agricultural livelihoods, reduce poverty, and maximize the overall resilience impact per dollar invested. Investment must prioritize foundational needs, including comprehensive water security measures to address the 526% water gap, climate-smart agriculture technologies, and institution-building focused on financial inclusion (e.g., enhancing insurance schemes and smallholder access to concessional finance) (Amarnath et al., 2023).

## **Tier 2: Secondary Priority Districts (Targeted Hazard Response)**

**Basis:** Districts exhibiting urgent but geographically distinct risks, such as Vavuniya, Monaragala, and Ratnapura (Amarnath et al., 2023).

**Allocation Focus:** Targeted financing is required for specific high-risk profiles that require specialized interventions. For example, Ratnapura's high flood and landslide exposure necessitates a focus on structural protection and anticipatory planning. This requires intensive use of the CSG's Geospatial Tools (Module 4) to overlay hazard risks onto critical infrastructure layers (schools, hospitals) and implement protective measures, thus moving resources from reactive disaster relief to anticipatory planning (Amarnath et al., 2023).

## **Tier 3: Targeted Investment Districts (Monitoring and Future-Proofing)**

**Basis:** Districts such as Anuradhapura and Polonnaruwa, which exhibit high climate vulnerability but also benefit from significant ongoing investments, resulting in lower calculated Gap Scores (Amarnath et al., 2023).

**Allocation Focus:** Funding in these areas should primarily emphasize long-term sustainability and accountability. This requires prioritizing rigorous Monitoring and Evaluation (Module 5) to assess the effectiveness of existing projects and using the AI Scenario Modeler (Tier 2) to stress-test existing infrastructure under extreme future climate projections (e.g., SSP-8.5 in 2050) (Amarnath et al., 2023). This ensures that existing adaptation gains are maintained and future-proofed against evolving climate threats.

By using the WAFI and AAFI Gap Scores as objective weights, this strategy acts as a crucial governance mechanism to enforce equitable distribution and guard against the political capture of essential resources.

# **Transformative Impact on Climate Governance and Resilience**

The deployment of the CSG Dashboard and AI Agent offers transformative potential for Sri Lanka's climate governance structure and resilience outcomes by directly supporting the implementation of NDCs and the NCFS.

## A. Enhancing Accountability and Donor Confidence

The platform systematically enhances accountability by linking capital expenditure to verifiable impact. Project investments entered via the Project Tracker (Module 3) are directly correlated with measurable changes in SDG indicators (Module 6) and against national objectives (Module 5) (Amarnath et al., 2023). This ensures transparency and provides the necessary empirical traceability for assessing long-term transformational change (Amarnath et al., 2023). Furthermore, the system's ability to align its analytical output with internationally recognized standards, such as the World Bank Resilience Rating System, allows Sri Lanka to frame its adaptation proposals in the language of multilateral financing institutions (Amarnath et al., 2023). The Strategic Advisor tier (Tier 3) significantly accelerates the financial negotiation process by providing instant, data-backed justifications for investment, thereby boosting donor confidence in the fiduciary responsibility and efficiency of the resource allocation strategy (Amarnath et al., 2023).

## B. Fostering Institutional Coherence

A primary challenge identified in national adaptation efforts is the fragmentation of data and a lack of coordination between government bodies (Amarnath et al., 2023). The CSG Dashboard directly resolves this issue by establishing a single source of verified truth, thereby enforcing horizontal coherence across sectoral ministries (Water, Agriculture, Finance) (Amarnath et al., 2023). Simultaneously, the Project Tracker and M&E modules facilitate vertical coherence, ensuring that national-level strategic planning (NAP/NDC) is effectively executed and monitored at the district and ground levels, overcoming the frequent disconnect between high-level policy and local implementation capacity (Amarnath et al., 2023).

By utilizing the AI Agent's conversational interface, the system successfully integrates climate intelligence into mainstream policy and budget decisions (Amarnath et al., 2023). This capability empowers non-technical leaders to interact with complex data, ask critical strategic questions, and receive actionable, evidence-based answers, thereby transforming climate governance into a streamlined, results-oriented process (Amarnath et al., 2023).

# Conclusions and Recommendations

The Climate Smart Governance Dashboard and its AI Agent represent a significant evolution in operationalizing data-driven climate governance. By integrating artificial intelligence, geospatial analytics, and proprietary finance indices, the platform converts complex, fragmented data into strategic foresight, making it an essential tool for implementing Sri Lanka's NDCs and National Climate Finance Strategy.

The analysis of the Water Adaptation Finance Index (WAFI) and the Agriculture Adaptation Finance Index (AAFI) leads to the following expert conclusions:

- 1. Policy Operationalization:** The CSG system operationalizes Sri Lanka's national climate policies by providing the missing link between high-level financial goals (US\$10.85 billion NDC requirement) and local-level allocation decisions. The AI Agent's Strategic Advisor tier (Tier 3) specifically provides the data-backed recommendations necessary for ministries to align budgets with the NCFS.
- 2. Prioritization Mandate:** The indices unequivocally identify the Northern Dry Zone districts of Mullaitivu, Mannar, and Kilinochchi as the highest priority for adaptation investment. These areas suffer from maximum climate risk and vulnerability scores coupled with minimal financial response, demanding immediate and disproportionately large resource allocations to bridge the significant AAFI Gap Scores (0.62, 0.56, and 0.51, respectively) (IB-CSG).

3. **Nexus Investment Strategy:** The convergence of high WAFI and AAFI gaps in the same districts presents an optimal opportunity for multi-sectoral investments. It is recommended that financial packages for these Tier 1 districts are synergistic, focusing on climate-resilient water resource management to stabilize agricultural productivity and simultaneously reduce poverty exposure.
4. **Institutional Finance Reform:** The indices reveal that a key component of the adaptation deficit is the weak institutional and financial response, especially concerning financial inclusion (e.g., low insurance penetration and smallholder access) (Amarnath et al., 2023). Investment must therefore be directed not only toward physical infrastructure but also toward strengthening the financial ecosystem for adaptation through concessional finance schemes and expanded climate insurance mechanisms, particularly in high-risk zones like Ratnapura.
5. **Governance Accountability:** The platform's M&E and Development Indicators modules must be utilized rigorously to track outcomes against the US\$10.85 billion NDC goal (Amarnath et al., 2023). This sustained focus on accountability, enabled by the tracing of project inputs to measurable SDG outcomes, is essential for securing the long-term financial support required from global partners.

The CSG system offers a replicable and scalable model for the Global South, demonstrating how sophisticated digital tools can enhance governance, enforce equity, and ensure that every dollar invested maximizes resilience impact.

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