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"Sri Lanka's Agricultural Data Crisis: The Need for Sustainable Capacity Development and Digital Agriculture"[1]

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Abstract: Sri Lanka's Agricultural Data Crisis

Sri Lanka's agricultural sector is currently trapped in a "poly-crisis" characterized by economic instability, climate volatility, and the lingering effects of abrupt policy shifts, such as the 2021 fertilizer ban. This situation is exacerbated by a critical "Data Crisis," where existing agricultural statistics are fragmented, outdated, and manually collected, creating a dangerous disconnect between national policy and ground realities.

Importance of Addressing the Problem: Addressing this data vacuum is a national security imperative. Without a robust digital framework, the country cannot perform "crisis-sensitive" planning, leaving farmers vulnerable to climate shocks like Cyclone Ditwah and hindering the transition to sustainable practices. Furthermore, the historical politicization of data—driven by the narrative of rice self-sufficiency—has led to distorted reporting, over-reported yields, and under-reported losses, ultimately undermining food security.

Models and Methods: This research utilizes a Gap Analysis Framework to compare the current manual "Data Vacuum" with a desired real-time interoperable state, alongside Rapid Rural Appraisal (RRA) to "ground-truth" field-level reporting pressures and digital literacy gaps. The paper proposes the "Digital Resilience" Hub, a centralized Agricultural Data Clearinghouse model designed to integrate weather, soil, and market data through Digital Public Infrastructure (DPI).

Key Results and Contributions: The presentation will detail the 2026 launch of the CROPIX National Digital Platform, which integrates fragmented crop registries into a unified system for rapid crisis management. Key contributions include a strategic roadmap for "Humanware" development (digital literacy for extension officers) and the implementation of independent verification systems using satellite remote sensing to reduce political bias in reporting. These innovations mark a transition from reactive, evidence-blind politics to a proactive, data-driven, and resilient agricultural future.

Keywords: Digital Agriculture; Agricultural Statistics; Food Security; Capacity Development.

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Sri Lanka's Agricultural Data Crisis: The Need for Sustainable Capacity Development and Digital Agriculture

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(Tentative draft)

Sri Lanka's Agricultural Data Crisis: The Need for Sustainable Capacity Development and Digital Agriculture

1. Introduction: The Anatomy of a Poly-Crisis

Sri Lanka’s agricultural sector is currently ensnared in a "poly-crisis"—a cluster of related global and local risks, such as economic instability, climate volatility (e.g., Cyclone Ditwah in 2025), and the fallout from abrupt policy shifts like the 2021 fertilizer ban. While traditional agricultural crises (pests, water shortages) are usually managed via state intervention, Sri Lanka's response is paralyzed by a secondary Data Crisis.

Agriculture has been the backbone of Sri Lanka’s economy historically, with rice (*paddy*) as the staple crop and central to food security, rural livelihoods, and national politics. Since independence in 1948, governments have pursued policies to achieve *rice self-sufficiency* — often as a political objective, shaping agricultural decision-making, data gathering, and reporting. These goals have sometimes produced positive outcomes but have also distorted official statistics, contributed to policy failures, and deepened crisis conditions.

Current statistics are often fragmented, outdated, or manually collected, creating a disconnect between national policy and ground realities. Without a robust digital framework, the country cannot perform "crisis-sensitive" planning, leaving farmers vulnerable and hindering the transition to sustainable practices.

2. The Political Economy of Agricultural Statistics (1948–Present)

Agriculture, particularly rice (paddy), is the mainstay of Sri Lanka’s economy and a symbol of national sovereignty. Since independence in 1948, governments have prioritized rice self-sufficiency, which has deeply influenced how data is gathered and reported.

- **Early Systems (1950s–1960s):** Sri Lanka established a strong baseline with seasonal complete enumeration of paddy statistics and regular agricultural censuses.
- **Expansion (1970s–1990s):** The Department of Census and Statistics (DCS) was formalized, and large-scale schemes like the Mahaweli Development Programme increased the demand for data.
- **The Structural Gap:** Routine data collection weakened in the 2000s. The last full **Census of Agriculture was conducted in 2002,** leaving a 24-year vacuum regarding farm structure and technology adoption.

2.1. Evolution of Sri Lanka’s Agricultural Data (1948–2026)

This is a visual and descriptive timeline tracing the evolution of Sri Lanka’s agricultural data systems. This timeline moves from the post-independence focus on expansion to the current era of digital public infrastructure (DPI).

I. The Era of Expansion and Manual Records (1948 – 1977)

- **1948:** Sri Lanka (then Ceylon) joins the **FAO** as the 57th member immediately upon independence.

- **1950s:** Establishment of seasonal **Complete Enumeration** for paddy statistics. The first systematic efforts to record "Self-Sufficiency" progress begin.
- **1962:** Conduct of a comprehensive **Census of Agriculture**, identifying the shift from draft animals to four-wheel tractors.
- **1970:** Establishment of **Agrarian Development Centers** to provide a "one-roof" service for farmers, becoming the primary nodes for local data collection.

II. The Large-Scale Schemes & Fragmentation (1978 – 2019)

- **1978:** Launch of the **Accelerated Mahaweli Masterplan**. Data systems during this period are localized within massive irrigation schemes, creating the first "data silos."
- **1987:** The **13th Amendment** devolves agricultural extension to Provincial Councils, leading to a breakdown in standardized data reporting between the central government and provinces.
- **2002:** The last full Census of Agriculture is conducted. For the next two decades, the country relies on projections and fragmented reports.
- **2010s:** Pilot projects for mobile-based advisory (SMS) and IoT sensors begin, but remain restricted to the private sector or NGO-funded pockets.

III. The Crisis as a Catalyst (2021 – 2024)

- **2021:** The **Fertilize**r **Ban** and subsequent organic transition reveal the "Data Vacuum." Policies were implemented without real-time data on soil health or input stocks, leading to a 20% drop in production.
- **2023**: Launch of the **Agriculture Sector Modernization Project (ASMP)** and the first frameworks for "Climate Smart" data collection.
- **2024:** Recovery begins with an **8.3%** growth in the agricultural sector, supported by preliminary digital platforms like **GeoGoviya**.

IV. The Digital Transformation (2025 – 2026)

- **January 2025:** Adoption of the **Inclusive Digital Agriculture Transformation (IDAT)** strategy.
- **2026:** Official launch of the **CROPIX National Digital Platform and the Agricultural Interoperability Framework.**
    - *Significance:* Integrates fragmented crop registries into a single "**Digital Public Infrastructure" (DPI).**
- **February 2026 (Present):** Post-Cyclone Ditwah recovery efforts utilize CROPIX for rapid damage assessment, marking the first-time data-driven "Crisis Management" is used at scale in Sri Lanka.

2.2. Policy Outcomes, Failures, and Crises

Periods of Relative Success: Sri Lanka achieved near self-sufficiency in rice in several periods, particularly from the late 1980s onward, supported by irrigation expansion, improved seed varieties, and fertilizer subsidies. These successes were real but often overstated in public discourse.

2.3. Structural Weaknesses and Long-Term Failures

Despite headline production gains, deeper issues persisted:

- Declining profitability for smallholders
- Fragmentation of land holdings
- Over-dependence on chemical inputs
- Environmental degradation

These structural problems were insufficiently captured by routine production statistics.

3. Politics and Agricultural Data Distortion

The pursuit of rice self-sufficiency as a political narrative has created a complex relationship with statistical accuracy.

- **Pressure to Report Success:** Political incentives often lead to the over-reporting of yields to project policy triumphs and the under-reporting of crop losses to avoid political fallout.
- **Systemic Fragmentation:** Data is scattered across multiple agencies (Agriculture, Irrigation, Mahaweli), leading to conflicting figures and duplication.
- **The 2021 Organic Crisis:** The abrupt shift to organic farming in 2021 exposed these vulnerabilities. Prior statistical indicators failed to warn of the risks, resulting in a 20% drop in production and a surge in rice imports.

3.1. Rice Self-Sufficiency as a Political Objective

Ideological and Policy Foundations: Rice self-sufficiency has been framed as a matter of national security, economic independence, and social justice. Policies supporting this objective included:

- Expansion of irrigated paddy land
- Guaranteed prices and procurement schemes
- Fertilizer subsidies
- Trade restrictions on rice imports

These interventions often delivered tangible gains, especially during periods of favorable weather and strong institutional support. Statistical systems exist, **political influences have shaped both data interpretation and public reporting**, especially regarding rice self-sufficiency:

3.2. Rice Self-Sufficiency as a Political Goal/Political Tool

- Since independence, governments consistently aimed for **rice self-sufficiency**. Policies included land settlement programs, irrigation projects, fertilizer subsidies, price supports, and trade protection to boost production and reduce imports.
- Self-sufficiency became **a *political symbol*** of food security and national pride. This was pursued across regimes, with varying emphasis and interventions depending on ideological and political priorities.

Official announcements (e.g., ministers declaring no rice imports in certain years) often served political narratives and electoral platform achievements.

Successive governments have prioritized rice self-sufficiency, often using it as a political narrative for success. This has led to:

- **Pressure to Report Success:** Incentives to over-report cultivated extent or yields to project policy triumphs.
- **Under-reporting Losses:** Downplaying crop failures from droughts or pests to avoid political fallout.
- **Data Fragmentation:** Despite the Department of Census and Statistics (DCS) being the central agency, data is scattered across multiple ministries (Agriculture, Irrigation, Mahaweli Authority), leading to conflicting figures and repetition.

3.3. Political Incentives and Statistical Narratives

Because rice self-sufficiency carried strong political value, statistical indicators such as total production, cultivated extent, and yield became politically sensitive. Announcements of record harvests or surplus production were frequently used to signal policy success. This created incentives—both explicit and implicit—for optimistic reporting and selective interpretation of data.

3.4. Political Influence on Agricultural Data Collection and Reporting

Overestimation and Underestimation of Key Indicators: Political pressure to demonstrate success sometimes resulted in:

- Over-reporting of cultivated extent to show expansion of paddy land
- Overestimation of yields based on assumed rather than measured productivity
- Under-reporting of crop losses due to droughts, floods, or pest outbreaks

Conversely, in some periods, production shortfalls were downplayed or attributed to temporary shocks rather than structural weaknesses

4. Digital Agricultural Data Collection: Trends and Innovations

Sri Lanka is now moving toward **Digital Public Infrastructure (DPI)** to address these systemic failures.

4.1 Key Digital Platforms (Launched 2025–2026)

- **CROPIX (2026):** A central digital hub integrating crop registers, production forecasts, and real-time field updates (**Crop Resources, Optimizing Operations through Precise Information eXchange).**
- **AIMS (Agricultural Information Management System):** Centralizes farmer registration, irrigation, and weather data.
- **Gergovia:** Uses geospatial analytics for weather forecasting and soil health monitoring.
- **Private Sector (OMNIX[2]):** Utilized by companies like Hayleys to track value chains and input distribution in real-time

[2] **OMNIX: Modernizing Sri Lankan Agriculture:** In alignment with Sri Lanka's national digital economy agenda, **Hayleys Agriculture** has launched **OMNIX**, a pioneering cloud-based farmer management system. Developed in

Feature	Impact on Policy
Interoperability	Breaks down information silos between ministries.
Real-Time Reporting	Enables faster analysis of emerging risks like pest outbreaks.
Big Data/APIs	Promotes innovation by making data accessible to agritech startups.

5. Research Methodology: Addressing the Gap

To evaluate this transition, the research employs a **Gap Analysis Framework and Rapid Rural Appraisal (RRA).**

- **Gap Analysis:** Compares the current "Data Vacuum" (manual/fragmented) with the "Desired State" (real-time/interoperable).
- **RRA Tool:** Used as a "ground-truthing" mechanism to understand why field officers feel pressure to report "good numbers" and to identify digital literacy gaps in rural areas.

6. Challenges and Barriers to Implementation

Despite technological progress, several hurdles remain:

1. **Humanware Gaps**: A lack of human capacity to analyze and act on digital data.
2. **Digital Literacy:** High gaps among rural farmers and lack of device access in remote regions.
3. **Institutional Inertia:** The need for a cultural shift within government agencies to ensure reliable, continuous data entry.

7. Overview of the Agricultural Data Crisis

Sri Lanka's agricultural sector is currently trapped in a poly-crisis where economic instability, climate volatility, and the aftermath of abrupt policy shifts (such as the 2021 fertilizer transition) have converged. While an agricultural crisis—marked by crop diseases, water shortages, and price fluctuations—is traditionally managed through state intervention, Sri Lanka's ability to respond is paralyzed by a secondary "Data Crisis."

Current agricultural statistics are often fragmented, outdated, or manually collected, leading to a disconnect between ground realities and national policy. Without a robust digital framework, the country cannot perform "crisis-sensitive" planning. This lack of reliable data prevents the optimization of resource allocation, leaves farmers vulnerable to market exploitation, and hinders the transition to sustainable digital agriculture. Therefore, the central problem is not merely a lack of resources, but a systemic failure in data capacity that prevents the country from navigating its multifaceted agricultural challenges.

Contemporary research defines a poly-crisis as a cluster of related global risks where the whole is more dangerous than the sum of its parts. In a localized context, studies on Sri Lanka's recent history show that when a global pandemic (health crisis) met a foreign exchange collapse economic crisis), it amplified the existing vulnerability of the food system. This synergy makes traditional, single-sector solutions ineffective.

partnership with **Agrithmics** and launched in July 2025, the platform is designed to modernize farming operations and enhance supply chain transparency.

The global agricultural landscape is increasingly defined by the **"poly-crisis,"** where simultaneous catastrophic events amplify one another. For Sri Lanka, this involves a volatile combination of:

- **Economic Shocks:** The 2022-2024 financial collapse and foreign exchange crisis.
- **Policy Shifts:** The abrupt 2021 chemical fertilizer ban.
- **Climate Volatility:** Increasing frequency of disasters, such as Cyclone Ditwah in 2025.

These factors merge to disrupt national food security. While an agricultural crisis (water shortages, pests, price fluctuations) is traditionally managed through state intervention, Sri Lanka's response is currently paralyzed by a secondary **Data Crisis.**

Sri Lanka's agricultural statistics have developed significantly since 1948, with institutional frameworks capable of systematic data collection. However, political objectives — especially around self-sufficiency in rice — have at times distorted how data are reported and interpreted, leading to policy decisions that have exacerbated food security crises. A more robust, transparent, and evidence-based statistical system is critical for future agricultural and economic resilience.

Sri Lanka's experience demonstrates how agricultural statistics can become intertwined with political objectives, particularly in contexts where food security is highly politicized. While the country has developed relatively strong statistical institutions, the persistent pursuit of rice self-sufficiency as a political symbol has sometimes undermined data accuracy and policy effectiveness. Strengthening the credibility, transparency, and analytical use of agricultural statistics is essential for informed decision-making and long-term economic stability

Presently, Sri Lanka stands at a crossroads. The poly-crisis has exposed the fragility of an agricultural system built on outdated information. An agricultural crisis is inevitable in a changing climate, but a data crisis is preventable. This paper realizes that sustainable capacity development is not merely a technical upgrade but a national security imperative. By integrating digital agriculture into the heart of the agrarian economy, Sri Lanka can move from a reactive "crisis management" mode to a proactive, resilient, and data-driven future

Sri Lanka is new experiencing a significant shift in agricultural data collection — from fragmented, paper-based systems to unified, digital platforms that enable real-time, interoperable information flows. The launch of **CROPIX**[3]**,** interoperability frameworks, and national digital strategies is transforming how agricultural data are structured, shared, and used in planning and policy. While challenges remain, these innovations mark an important step toward a data-driven, resilient, and inclusive agricultural sector.

8. Conclusion and Policy Recommendations

Sustainable recovery for Sri Lanka is a national security imperative. The country must transition from evidence-blind politics to evidence-based decision-making.

Strategic Recommendations:

[3] **CROPIX (Crop Resources, Optimizing Operations through Precise Information eXchange) is Sri Lanka's new national digital platform for agriculture, launched in January 2026 to modernize the sector via real-time data. Supported by the FAO and Gates Foundation, it integrates crop registries, yield forecasting, and damage reporting into a single, farmer-centric, and data-driven system.**

- **National Data Clearinghouse:** Fully integrate **CROPIX** with Meteorological and Census departments to create a "single source of truth".

- **Invest in "Humanware":** Launch nationwide digital literacy programs for extension officers and farmers.
- **Evidence-Based Subsidies:** Move from "blanket" fertilizer subsidies to targeted support based on verified digital soil and farm records.
- **Independent Verification:** Use satellite remote sensing to "ground-truth" reported data, reducing political bias in output figures.

- **Data Governance:** Enact laws treating agricultural data as a "public good" while protecting farmer privacy.

8.1 Proposed Solution Model: The "Digital Resilience" Hub

The methodology proposes the pilot testing of a centralized **Agricultural Data Clearinghouse**. This model involves:

1. **Integration:** Consolidating weather data, soil health records, and market prices into a single platform.
2. **Capacity Building:** A training-the-trainer module for agricultural extension officers to transition from paper-based to tablet-based data entry.
3. **Validation:** Using satellite remote sensing to "ground-truth" the data reported by local officers, ensuring high statistical integrity.

Anticipated Outcomes: By implementing the proposed digital framework and capacity-building initiatives, the following outcomes are expected:

- **Real-Time Crisis Mitigation:** The transition from historical data to real-time analytics will allow for "early warning systems." For example, pest infestations or water shortages can be identified and addressed weeks earlier than under the current manual system.

- **Enhanced Food Security:** Accurate data on crop yields and storage levels will enable the government to manage imports and exports more effectively, preventing the "glut and shortage" cycles that currently plague Sri Lankan markets.

- **Improved Farmer Livelihoods:** Digital transparency ensures that smallholder farmers have access to accurate market prices, reducing their dependency on middle-men and increasing their profit margins.

- **Data-Driven Policy Precision:** Policymakers will no longer rely on "blanket policies" (like the sudden 2021 fertilizer ban). Instead, they can implement site-specific interventions based on soil health data and regional economic conditions.

Sustainable development in Sri Lanka is a national security imperative that depends on a modernized statistical infrastructure. To bridge the data gap, the following actions are recommended:

- **Establish a National Data Clearinghouse:** Fully integrate **CROPIX**[4] with the Meteorological and Census departments to create a "single source of truth".
- **Invest in "Humanware":** Launch a nationwide "Digital Literacy for Agriculture" program to train extension officers in tablet-based data entry and analysis.
- **Evidence-Based Subsidies:** Transition from universal fertilizer subsidies to targeted support based on verified digital records of soil requirements and farm size.
- **Data Governance Legislation:** Enact laws that treat agricultural data as a "public good" while protecting farmer privacy to encourage data sharing.
- **Independent Verification:** Use satellite remote sensing to "ground-truth" reported data, reducing political bias in output figures. An introduction of “early warnings” systems

8.2. Summary of Policy Recommendations for Agricultural Resilience

Recommendations formatted into a professional table. This structure clearly links the identified problems (the "Crisis") with specific, actionable digital and capacity-building solutions.

Category	Strategic Action	Objective
Institutional Reform	**Establish a National Agricultural Data Clearinghouse**	Create a single, unified digital platform to integrate data from the DCS, Ministry of Agriculture, and Meteorological Department to eliminate conflicting figures.
Human Capacity	**Launch "Digital Literacy for Agriculture" Programs**	Invest in "Human ware" by training extension officers and lead farmers to transition from paper-based to tablet-based data entry.
Governance	**Enact Data Governance Legislation**	Develop a legal framework that treats agricultural data as a "public good" while protecting the privacy of individual farmers.
Economic Policy	**Shift to Evidence-Based Subsidies**	Transition from universal subsidies to targeted support programs based on verified digital records of farm size, crop type, and soil requirements.
Technical Validation	**Implement Independent Verification Systems**	Use satellite remote sensing and mobile reporting to "ground-truth" data, reducing political bias and over-reporting of yields.
Innovation	**Incentivize Private-Sector Participation**	Encourage AgTech startups to develop low-cost IoT solutions for soil and weather monitoring through tax breaks or research grants.

[4] **Key Details About CROPIX:**

- **Purpose**: It aims to replace fragmented data systems, eliminate bottlenecks in agriculture, and enhance food security and climate resilience.
- **Key Features:** Provides, for example, recommendations on the best crops to plant, seed development and certification services, extension services, and crop damage/insurance reporting.
- **Target Users:** Connects farmers, agricultural officers, and policymakers through web portals and mobile applications.
- **Development:** It is part of the Digital Public Infrastructure (DPI) for agriculture in Sri Lanka, developed by the Ministry of Agriculture in collaboration with international partners.
- **(agrimin.gov.lk and Department of Agriculture Sri lanka)**

8.3. Strategic Policy Recommendations for Agricultural Data Resilience

The paper concludes that Sri Lanka stands at a crossroads where a data crisis is preventable even if climate risks are inevitable. By integrating digital agriculture into the heart of the agrarian economy, the nation can ensure long-term food security and economic stability.

Policy Recommendations: To achieve this vision, the following actions are recommended:

1. **Establish a National Agricultural Data Clearinghouse:** Create a single, unified digital platform that integrates data from the Department of Census and Statistics, the Department of Agriculture, and the Meteorological Department, and the introduction of "crop forecasting system"
2. **Invest in "Humanware":** Launch a nationwide "Digital Literacy for Agriculture" program. Capacity development must focus on training extension officers and lead farmers to use mobile data collection tools effectively.
3. **Incentivize Private-Sector Participation:** Encourage AgTech startups to develop low-cost IoT solutions for soil and weather monitoring by providing tax breaks or research grants. Improving the "market intelligence, market transparency and use of information
4. **Enact Data Governance Legislation:** Develop a legal framework to ensure that agricultural data is treated as a "public good" while protecting the privacy of individual farmers.
5. **Shift to Evidence-Based Subsidies:** Transition from universal subsidies to targeted support programs based on verified digital records of farm size, crop type, and soil requirements.

To ensure the research paper of the at the international conference in Poland is impactful, the researcher has synthesized the policy recommendations into a professional table. This format directly addresses the "Data Crisis" by linking strategic actions to specific institutional outcomes.

Category	Strategic Action	Objective & Institutional Impact
Framework Institutional	Establish a National Agricultural Data Clearinghouse	Create a unified digital platform to consolidate data from the DCS, Ministry of Agriculture, and Meteorological Department to eliminate conflicting figures and duplication.
Human Capital	Invest in "Humanware" and Digital Literacy	Launch a nationwide program to train extension officers and lead farmers in mobile/tablet-based data collection, ensuring high-quality real-time reporting.
Governance	Enact Data Governance & Transparency Laws	Develop a legal framework that treats agricultural data as a "public good" while protecting farmer privacy and ensuring methodology transparency.
Economic Policy	Transition to Evidence-Based Subsidies	Replace universal "blanket" subsidies with targeted support programs based on verified

		digital records of farm size, soil health, and regional requirements.
Technical Integrity	Implement Independent Verification Systems	Use satellite remote sensing and IoT sensors to "ground-truth" reported data, effectively reducing political bias in yield and production estimates.
Public-Private Partnership	Incentivize AgTech Innovation	Encourage private sector development of low-cost monitoring solutions through tax breaks or research grants to enhance value-chain transparency.

By implementing these recommendations, Sri Lanka can transition from a **reactive "crisis management" mode**—where decisions are based on outdated or politicized figures—to a **proactive, data-driven future**. This transformation is essential for national security and long-term food stability.

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