May, 2026

POLICY BRIEF

Enabling Private-Sector Innovation in Agricultural Storage:

Lessons from the agriGHALA Warehouse Receipt Model in Kenya

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Key Messages

- Kenya's Warehouse Receipt Systems (WRS) Act, the WRS Council's e-registry, and the entry of a private operator have created, for the first time, an end-to-end pathway from smallholder grain to bankable collateral. The legal and institutional pieces are now in place; the binding constraints have shifted to finance, infrastructure density, and farmer-level participation.
- Evidence shows that WRS unlock credit by enabling farmers to borrow up to 70% of stored grain value, while improving yields, resilience, and inclusivity (Mapunda et al., 2018).
- The agriGHALA pilot in Eldoret demonstrates a full end-to-end WRS model in operation, integrating certified storage, electronic receipts, financing, market access, and cooperative aggregation under one operator, anchored in partnerships with key ecosystem actors; early proof of concept includes 29 metric tonnes of cereals stored in Q1 2026 and three receipt-backed loans (KES 300,000) successfully issued and repaid.
- The remaining barriers are concrete and addressable: distance from farms to certified warehouses, exclusion of women, youth, and non-cooperative members from collateralised credit, conservative bank appetite, and uneven farmer awareness of how the receipt works as a financial instrument.
- Government interventions in maize markets remain the single largest scaling risk. Experience in Ghana and Zambia shows that unpredictable public stock releases and above-market state purchases can destroy WRS economics overnight. A predictable, rules-based government posture toward grain markets is a precondition for scale.
- Three priority actions will move the system from pilot to scale: (i) underwrite a national WRS lending facility through AFC and selected commercial banks, with first loss cover; (ii) co-finance a network of certified satellite warehouses anchored on cooperatives; and (iii) embed WRS into county extension services with explicit gender and youth targets.

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1. Introduction

Food security remains a critical challenge in many developing countries, particularly across sub-Saharan Africa, where agriculture is the main livelihood for a large share of the population. In Kenya, smallholder farmers are central to food production, yet they face persistent barriers that undermine sustainable productivity and economic stability.

These challenges include limited market access, inadequate storage facilities, climate change impacts and financial constraints. The situation is especially severe in regions such as Uasin Gishu and Bungoma counties, where reliance on traditional farming methods and restricted access to financial and market systems exacerbate vulnerability. Among smallholder maize farmers, these issues are reflected in high post-harvest losses and income instability; a recent community survey estimates on-farm maize storage losses at approximately 36%, largely due to insect pests, with western Kenya most affected (De Groote et al., 2023). Such losses force farmers into distress sales during harvest periods, as they lack both secure storage and alternative financing options. Compounding this problem, conventional market structures – often dominated by middlemen – offer low and opaque prices, further pressuring farmers to sell prematurely at a loss. Addressing these interconnected challenges is essential for improving food security and promoting agricultural sustainability in Kenya.

A warehouse receipt system (WRS) can transform this dynamic by de-risking storage and linking farmers to finance and markets. WRS are mechanisms that enable farmers to access markets and financial services using their stored grain as collateral (Katunze et al., 2017). In this case, the warehouse receipts are receipts issued to depositors as evidence that standardised agricultural commodities of a certain quality and quantity have been deposited by a specific farmer in a certified warehouse (Aboagye, 2023). Therefore, in a typical WRS, farmers deposit grain in certified warehouses and receive official, negotiable receipts. These receipts become financial instruments: they legally represent the stored commodity (with title and quality assured) and can be used as collateral for loans or traded on markets. In theory, this allows smallholders to store and sell later at higher prices, smoothing their income (Katunze et al., 2017; Mapunda et al., 2018). Crucially, WRS can open access to credit and inputs: for example, one study in Tanzania found that WRS-backed credit significantly boosted coffee yields by enabling the purchase of fertiliser and other inputs (Mapunda et al., 2018).

Kenya recognised those opportunities and enacted the Warehouse Receipt System Act (CAP 350 of the laws of Kenya) and set up a WRS Council to regulate the system. In December 2024, Kenyan agri-innovator agriBORA launched “agriGHALA” – a private-sector WRS platform – unveiling the first certified warehouse under this system in Eldoret. The agriGHALA service combines climate-smart storage (built to national standards) with a digital WRS registry and links to a commodity trading platform.

Earlier WRS efforts in Kenya tended to be either public sector pilots tied to specific commodities (e.g. coffee, maize purchased through state agencies) or single function private warehouses without integrated finance and market access. agriGHALA is the first Kenyan model that combines, under one operator: certified climate smart storage, electronic receipts logged in the national registry, KOMEX linked price discovery, and a satellite aggregation strategy that uses cooperative warehouses as feeder nodes. This integration is what allows the model to address transport, finance, and market access at once, rather than fixing one link in the chain.

Lessons from agriGHALA’s rollout illustrate how the enabling environment (laws, institutions, warehouse infrastructure, commodity standards and quality, finance, markets, digital systems and awareness) shapes outcomes. This brief examines those enablers and remaining bottlenecks. It draws on operational evidence, interviews with farmers and stakeholders and the experience of implementing WRS in similar contexts. Understanding these factors is critical for scaling such models to improve food security and resilience in Kenya and beyond.

2. The agriGHALA Business Model

agriGHALA bundles four functions that have historically been fragmented in Kenya's grain value chain: aggregation, certified storage, receipt-backed finance, and market linkage. These features distinguish it from earlier WRS attempts in Kenya, which were either commodity-specific public schemes or standalone private warehouses without integrated finance (Figure 1).

The agriGHALA model integrates storage, finance, and market access within a single WRS framework. Revenue is generated through storage fees, margins on receipt-backed financing facilitated via partner institutions, and trading commissions linked to structured market access. In addition, cooperatives participate through co-management arrangements, earning lease income from upgraded warehouse infrastructure.

Seasonal price dynamics in Kenya indicate meaningful storage-arbitrage potential for maize. Eastern Africa Grain Council regional agricultural trade intelligence network data and Kenya National Bureau of Statistics figures indicate that 90 kg bag prices typically rise between the harvest window (October to December) and the lean season (May to August). In 2022, for example, prices moved from approximately KES 3,500 per bag in April to KES 6,000 to 6,500 per bag in July (Parliament of Kenya, 2024). Even after accounting for storage, handling, and financing costs, farmers can realise substantially higher net returns by delaying sales. In this specific example, deducting approximately KES 1,100 in associated costs still results in net earnings of around KES 4,900 per bag, equivalent to an estimated 40% increase in farmer income compared to immediate post-harvest sales. While outcomes vary depending on market conditions, timing, and location, this seasonal price differential illustrates the core economic rationale for warehouse receipt systems and similar models that enable smallholders to store produce, access liquidity, and sell into stronger markets later in the season.

At the system level, financial sustainability depends on sufficient throughput and high utilisation of storage facilities. Early operational experience, including at the Eldoret site, indicates that performance is closely linked to consistent volume aggregation and reliable market linkage.

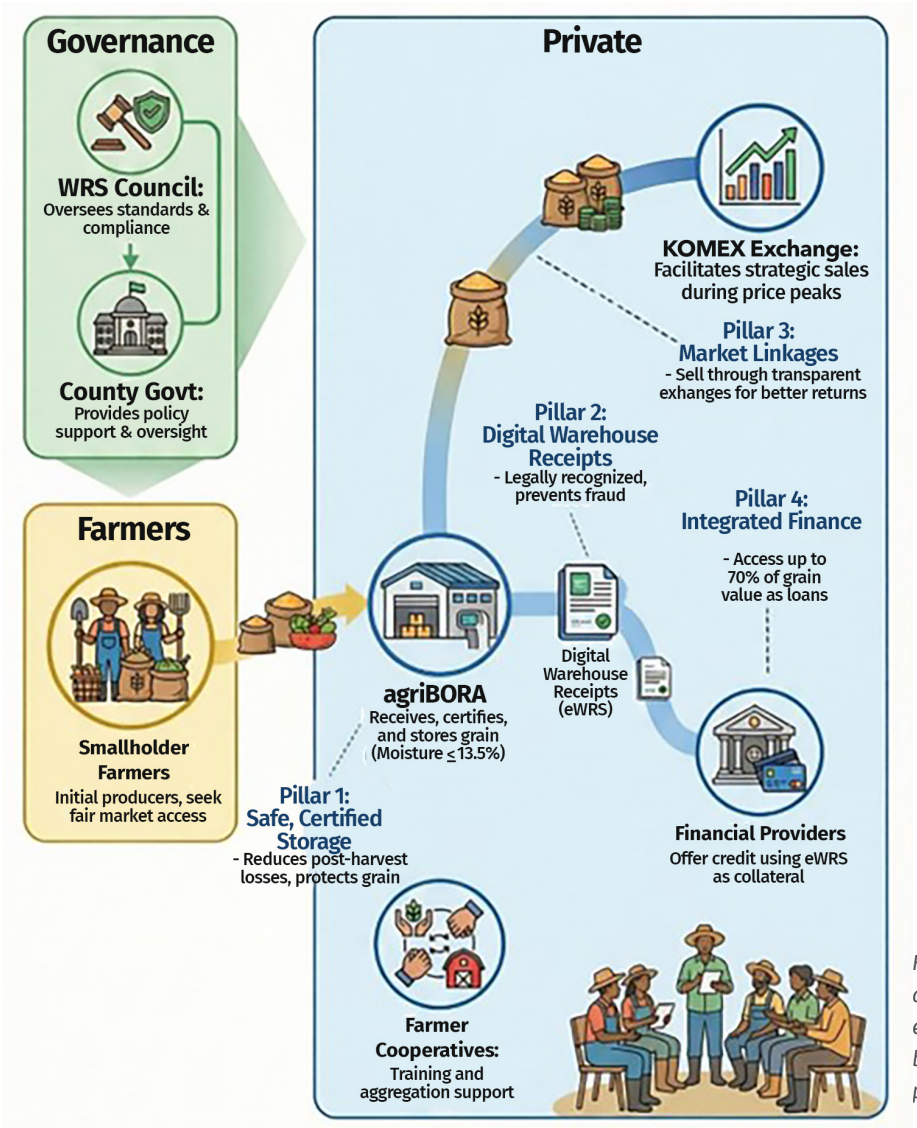

Figure 1: agriGHALA operational model: farmers and aggregators deposit commodities. agriBORA issues eWRS, enabling farmers to access financing on a need basis or offload produce based on market prevailing prices.

2.1 Certified Storage Infrastructure

agriGHALA operates licensed, climate-smart warehouses that meet national standards. Grain is received only if it meets strict quality and grading criteria (e.g. moisture ≤ 13.5% and low aflatoxin levels). Farmers' maize is transferred to jute bags for proper aeration and fumigation, protecting it from rodents, weevils and moisture. By contrast, farmers previously lost substantial grain to pests (e.g. mice and weevils) and spoilage in home granaries (one cooperative chairman noted his family often gave away bags to visitors to reduce storage, instead of safely securing it see Box 1). In agriGHALA warehouses, deposits are insured against loss, giving farmers peace of mind (Box 4).

Box 1: Field observation on agriGHALA storage infrastructure.

The Kuona Mbele cooperative chairman contrasts the certified storage infrastructure with on-farm storage: "Before, I used to lose a lot of maize through pests like rats and weevils."

The vice chairman reinforces: "They store our maize without any worry about destruction by anything like weevils or rats."

2.2 Electronic Warehouse Receipts (eWRS)

Upon deposit, farmers receive an electronic receipt recorded in the national WRS Central Registry. This receipt is a legal document of title: it proves ownership of the grain and can be traded or pledged. The digital platform minimises fraud (e.g. double pledging) and improves transparency. Farmers learn that the receipt itself is a gateway to finance (Box 2).

Box 2: Observations on eWRS.

The Kuona Mbele cooperative vice chairman's perspective on eWRS: "I have stored maize with agriBORA and I have been given a receipt... the goodness of agriBORA is that receipt, even if I want money in a bank, I will get it."

2.3 Commodity-Backed Financing

agriGHALA works with banks and cooperatives to allow farmers to borrow against their stored grain. Financial institutions accept the warehouse receipt as collateral, typically financing up to 70% of the grain's market value. This lets farmers buy inputs (e.g., seed and fertiliser) for the next season without selling their harvest. For example, a depositor recounted taking an agriBORA's loan to purchase seeds and fertiliser before selling his maize, thereby avoiding a distress sale. This is consistent with research showing that credit via WRS leads to higher input use and yields (Katunze et al., 2017; Mapunda et al., 2018; Safo et al., 2023). Notably, the Agricultural Finance Corporation (AFC) is implementing an e-WRS loan product, specifically aimed at inclusive credit (e.g. for women and youth lacking land titles), see Box 3. AFC's pilot is designed to route funds through cooperatives and SACCOs, leveraging agriGHALA's receipts to reach smallholders.

Box 3: Unlocking Credit Access for Youth and Women through WRS

The AFC's branch manager in Eldoret highlighted a fundamental shift enabled by the WRS. The manager noted that, "Access to credit has traditionally relied on title deeds as collateral, with land ownership typically held by male heads of households, thereby limiting opportunities for youth and women. WRS is a solution to break the barriers of financial access, inclusion of youth and women and increase uptake of credit to support their agricultural activities."

2.4 Market Linkages and Price Discovery

Stored grain is connected to formal markets. agriGHALA uses Kenya National Multi-Commodities Exchange Limited (KOMEX) for price benchmarks, giving farmers and lenders a trusted reference. WRS stocks can be held off-market during harvest glut and sold later at better prices, smoothing seasonal volatility.

Figure 2: Graded Commodity in agriGHALA Storage. Photo credit CIAT.

3. The Enabling Environment

agriGHALA's performance is shaped by Kenya's institutional, regulatory, digital and market framework that functions effectively. Key components include:

3.1 Policy and Regulatory Framework

Kenya has a solid legal foundation for WRS. The 2019 WRS Act recognises warehouse receipts as binding negotiable instruments and mandates the WRS Council for oversight. This legal backing builds farmer trust (Box 4).

Vigilance is needed to maintain a stable and predictable policy environment. Ad hoc interventions can quickly undermine WRS credit programmes. In Ghana, inventory credit pilots in the late 1990s were disrupted by a government decision to grant selected firms exemptions on import duties for white maize, based on an anticipated food shortage that did not materialise (Coulter & Onumah, 2002). The resulting surge in imports depressed domestic prices for nearly two years, causing significant losses for actors storing grain under warehouse receipt arrangements. Additional risks arose from the continued operation of a malfunctioning parastatal grain agency, where poor management led to stock losses and quality deterioration. Likewise, in Zambia, early WRS development was weakened by policy uncertainty linked to government plans to import maize and subsidise prices to maintain politically acceptable levels (Coulter & Onumah, 2002). This discouraged private storage, as millers shifted to short-term procurement strategies in anticipation of state intervention. Together, these cases show that WRS viability depends not only on avoiding direct market distortion, but also on minimising policy unpredictability that alters incentives for storage and trade. Building policy consensus across government, the private sector, and development partners is therefore essential to sustain confidence and avoid reversals.

Box 4: Farmer's perspective on agriGHALA's legal supporting framework.

A farmer's perspective: "*If there's theft, if there's a fire or any other calamity (..), the maize is insured. I won't go at a loss.*"

The Kuona Mbele cooperative chairman reinforces this trust: "*Storing maize with agriGHALA is security more than storing maize at home.*"

3.2 Institutional Partnerships

Effective multi-level coordination and partnerships have catalysed agriGHALA's rollout. At the national level, the WRS Council provides core infrastructure: it maintains the e-Registry that prevents double-pledging and ensures transparency. County governments, notably Uasin Gishu, have played a proactive role. The local cooperative development office formed task forces to streamline warehouse licensing and link cooperatives with agriBORA (Masaki, 2025). For instance, Uasin Gishu is facilitating a joint upgrade of Kuona Mbele Cooperative's warehouse (leasing it to agriBORA) and introducing agriGHALA's services to the county's farmers. Such partnerships address "last mile" gaps: cooperatives (trusted community institutions) now serve as liaison points. As one WRS official noted, formalising coordination between national and county bodies, cooperatives and finance institutions is essential. Continued support for cooperative-led training and outreach will help translate regulatory gains into on-ground trust.

Lastly and more importantly, the role of development partners like P4G is instrumental in convening these stakeholders (P4G helped fund agriBORA's pilot and stakeholder workshops). In effect, a public-private-cooperative consortium has emerged: government provides enabling rules and resources, agriBORA builds the physical and digital platform, cooperatives mobilise farmers, and lenders inject finance. Maintaining these partnerships is critical. For instance, the WRS Council continues to expand e-registry features (it is integrating KOMEX links for trading) to ensure receipts are trusted by all.

3.3 Financial Ecosystem

A crucial enabler is the integration of WRS with agricultural finance. agriGHALA's model relies on financial institutions recognising warehouse receipts as viable collateral. AFC, the state agricultural lender, has institutionalised this by developing dedicated WRS loan products. Early feedback from AFC staff suggests that using stored grain instead of land titles is game-changing: it allows women and youth (often excluded from land-based credit) to borrow for inputs Box 3. One branch manager explained that by issuing loans to cooperatives (rather than individual farmers), AFC can scale outreach to smallholders efficiently. The presence of a functioning credit line via agriGHALA receipts breaks the cycle of distress sales; farmers can confidently defer grain sales until prices improve. Academic evidence from Tanzania supports this effect: a study found that coffee farmers with WRS-backed credit

achieved significantly higher yields than those without (Mapunda et al., 2018).

However, commercial banks and SACCOs often remain cautious. Continuous capacity building for bankers (which AFC has already done for its staff) and demonstrating the low default rates of warehouse-backed loans will be needed to attract broader lending. In the meantime, agriGHALA has mitigated risk by sometimes extending its own balance-sheet financing when bank disbursements lag, ensuring depositors can purchase inputs on time. Policymakers should expedite the rollout of the AFC pilot and encourage similar linkage with other banks. Experience in other countries shows that when WRS systems are backed by liquidity (e.g. bank credit and inventory credit programs), uptake increases remarkably (Katunze et al., 2017; Mapunda et al., 2018).

3.4 Market and Digital Infrastructure

Modern trading and information platforms amplify the WRS's impact. agriGHALA's integration with Kenya's national eWRS and the Central Registry is critical for transparency and fraud prevention. Each receipt is logged centrally, and AFC uses the registry to validate loan collateral. Complementing this, access to structured commodity markets (via the KOMEX exchange) provides real-time price signals. This gives farmers and financiers a trusted "source of truth" on maize prices, which helps avoid disputes with traders and brokers. For example, one farmer explained that in the informal market, "middlemen manipulate scales," whereas agriGHALA's documented system "allows us to know our maize should be clean, dry and at 13.5% moisture," reflecting true market standards. By enabling transparent price discovery and trade contracts on KOMEX, WRS stocks help dampen the harvest-time price crash.

As digital capabilities expand, rural connectivity remains a constraint: mobile coverage and digital literacy are uneven. Ensuring that smallholders can reliably access price information and receipt management via simple mobile interfaces will be important. The government and private sector should continue to invest in rural ICT infrastructure and training. Encouragingly, agriGHALA's digital platform has proven robust so far, but additional human-centric engagement (e.g. village-level helpdesks) could bridge remaining trust gaps.

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4. Key Barriers to Scaling

The pilot has surfaced five binding constraints, ordered from most to least binding.

- **Financial Access Gaps:** Even with receipts, some farmers lack access to credit because they are not members of financial cooperatives, or they face high interest rates. Women and youths, in particular, remain underserved. Interviewees stressed that joining cooperatives or groups is a prerequisite for many loans; thus, reaching the unorganised is hard. Expanding cooperative membership and designing group lending, including individual lending against pooled collateral, is a precondition for inclusive scale.
- **Warehouse infrastructure density.** Smallholders with 10 to 20 bags cannot economically transport grain to a single regional facility. agriBORA's satellite aggregation strategy in Uasin Gishu is the right direction but needs to be replicated at county scale across the maize belt. Beyond this, the storage gain is consumed by transport. Policies that support mobile collection points or subsidise transport in the first season could accelerate adoption.
- **Quality and grading capacity at the farm gate.** WRS standards (moisture below 13.5%, low aflatoxin) are non-negotiable for food safety and lender confidence, but most smallholders lack the equipment and training to meet them at first delivery. Rejection at intake is the fastest way to destroy farmer trust. Pre-intake drying, sorting, and testing capacity at the cooperative level is essential.
- **Awareness and financial literacy.** Many farmers conflate warehouse receipts with promissory notes or storage tickets and do not understand that the receipt is a financial instrument they can borrow against. A baseline awareness survey across the maize belt would quantify the gap; in the absence of one, the operational evidence suggests low single-digit awareness outside Uasin Gishu.
- **Gender and social norms.** Women's participation in farmer meetings, access to credit, and ability to make storage decisions independently of their spouses remain limited. Female-specific outreach formats (chama meetings, church-based forums) and product features (spousal co-signing, women-only group lending) have shown early traction and should be scaled.
- **Market and counterparty risk.** The success of WRS depends on reliable and trustworthy market actors. Risks such as off-taker default can undermine confidence in structured trade if buyers fail to honour payments. These risks can be mitigated through diversified buyer networks, payment-on-delivery requirements for new buyers, and stronger contractual enforcement mechanisms.
- **Policy and system stability.** Policy unpredictability remains a critical systemic risk. Government interventions—such as price stabilisation measures or ad hoc grain releases, as observed in Ghana and Zambia—can destabilise market incentives and undermine WRS participation. Sustained policy engagement, inter-agency coordination, and advanced consultation on market interventions are essential to maintain confidence. In addition, system-level risks such as digital platform failure or fraud in the electronic WRS registry must be mitigated through redundancy measures, backup systems, and safeguards against double pledging.

5. Policy and Investment Recommendations

The following five actions, taken together within 18 months, can move Kenya's WRS from a single working pilot to a national system.

- **Recommendation 1: Establish a WRS Lending Facility with a first loss layer.** Treasury, in partnership with AFC and CBK, should establish a dedicated WRS lending facility with a public first loss tranche. The facility would be lent to AFC and to participating commercial banks against eligible warehouse receipts. The first loss layer is the single most effective lever for unlocking commercial bank participation, which is currently the binding constraint on the system.
- **Recommendation 2: Co-finance a network of certified satellite warehouses.** The Ministry of Agriculture and Livestock Development (MoALD), in partnership with county governments and cooperatives, should co-finance the upgrade or construction of 30 to 40 certified satellite warehouses across 8 to 10 counties in the maize and pulse belts over three years, anchored on existing cooperative infrastructure. Public co-financing should target up to 50% of capital expenditure, with private operators or cooperatives covering the balance and assuming operating risk.
- **Recommendation 3: Lock in a predictable government posture toward grain markets.** The WRS Council should chair a standing interagency committee with the Strategic Food Reserve, the National Cereals and Produce Board, MoALD, and Treasury, with a published protocol for advance consultation on any public grain market intervention. This is the single largest scaling risk and the cheapest to mitigate.
- **Recommendation 4: Embed WRS into county extension services with explicit gender and youth targets.** MoALD, working with county departments of agriculture, should integrate WRS modules into the regular extension calendar (pre- and post-harvest), with delivery through cooperatives, chamas, and faith-based forums. Targets of 40% women and 40% youth participation should be set and reported.
- **Recommendation 5: Build out the digital and market backbone.** The WRS Council should complete the integration between the e-registry and KOMEX, publish regular price benchmarks, and support a simplified farmer-facing mobile interface for receipt management. Rural connectivity investments should be coordinated with the Communications Authority of Kenya.

6. Conclusion

Kenya's agriGHALA initiative has demonstrated that private-sector innovation in storage can yield substantial benefits for smallholders – but only if the enabling environment is robust. Early results from Q1 2026 illustrate the potential: 18,669 kg of grain was stored, preventing an estimated 2,800 kg in post-harvest losses and generating a KES 261,914 economic gain for depositing farmers through spoilage protection and price appreciation. Over 170 farmers were reached through training in Q1, 32% of them women and 41% youth. Three Warehouse Receipt Finance loans totalling KES 300,000 were issued with a 100% repayment rate, and KES 36.2 million in commodity value was traded through the platform. The core components are now in place: a supportive legal framework, committed stakeholders, and functioning infrastructure. The next step is to amplify and institutionalise these gains.

Field evidence shows that farmers value the system: as one cooperative chairperson put it, "storing maize is like having cash in the bank." To make this the new normal nationwide, policymakers should build on the platform agriGHALA has created and address the remaining gaps highlighted here. By doing so, Kenya can turn seasonal harvest losses into a strategic advantage, improving farmer incomes and national food security.

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