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Operation Revitalize Africa-Kenya

The K-IRE Ecosystem: Flagship Project Proposal

Climate-Resilient Solar-Powered Rural Water and Sanitation Infrastructure
Primary Flagship Site: K'olago B Village, Seme Sub-County, Kisumu County, Kenya

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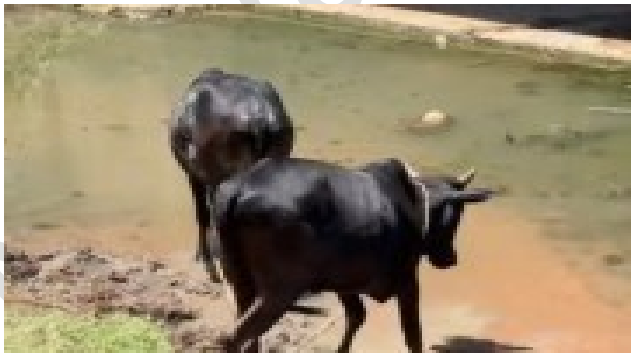
1. EXECUTIVE SUMMARY

K'olago B Village in Seme East faces a dual emergency: unsafe water and escalating climate-driven human-wildlife conflict. The K-IRIE Flagship Project responds through an integrated climate-resilient WASH approach that combines safe water access, foundational sanitation infrastructure, hygiene protection, and livelihood development. Today, approximately 4,500 residents rely on contaminated open ponds shared with livestock. These water points expose families to chronic waterborne diseases. Supporting evidence of water insecurity can be viewed here:

https://youtu.be/8rOY5xbIcqI?si=6Q6MKmEQV0uY9LGA

Figure 1: Primary water source used by residents

Figure 2 – Animals share the same water source



However, water scarcity is not the only challenge; access itself is dangerous. As inland water sources dry due to climate variability, residents are increasingly forced to rely on deeper, unprotected water access points in high-risk, wildlife-prone zones where crocodile habitats overlap with human activity. Areas of Seme Sub-County and the broader Lake Victoria Basin have been identified by the Kenya Wildlife Service (KWS) as critical hotspots for human-wildlife conflict, involving crocodiles, hippos, and snakes.[1]

Local media and KWS reports indicate that habitat changes have significantly increased predatory interactions. In a recent documented tragedy in the neighboring Lake Victoria region, a resident was killed by a crocodile while fetching water—a direct consequence of the lack of safe, inland water points. [2]

For women and girls, the daily 5-kilometer walk to unsafe water constitutes a literal "Distance Penalty," exposing them to contaminated water, physical insecurity, and life-threatening encounters with crocodiles and hippos.

The K-IRE Flagship Project eliminates public safety risks by establishing an inland “Safe Zone” water system. Relocating access to a solar-powered borehole and a protected distribution network permanently separates human activity from hazardous wildlife areas. This is not simply infrastructure; it is protection of life, dignity, and community safety. [3]

2. THE PROBLEM

K’olago B Village residents rely on unsafe surface water sources that are shared with livestock, require long-distance walking (up to 5 km), and are located near high-risk crocodile habitats. As climate variability reduces inland water availability, communities are forced closer to predator-inhabited zones. The recent crocodile fatality in Seme Sub-County highlights the direct link between water insecurity and human-wildlife conflict. [2]

3. THE SOLUTION: K-IRE MODEL

The K-IRE model transitions the community from unsafe, decentralized water collection to a secure, solar-powered, and community-managed utility system delivered through a structured multi-phase approach.

Phase 0: Asset Protection, Governance, and Community Infrastructure

This phase establishes the foundation for secure operations and community ownership through the construction of a Water Committee Building and Multi-Purpose Training Center, installation of perimeter fencing and security lighting, and development of sanitation facilities, including latrines and handwashing stations. The outcome is a secure, community-managed site that protects infrastructure while supporting training, governance, and daily operations.

Phase 1: Water Infrastructure Development

This phase establishes a high-capacity, solar-powered water supply through optimized borehole siting, deep drilling (150–200 meters), and a 100,000-liter elevated storage system, delivering approximately 15,000 liters per hour while eliminating diesel dependence.

Phase 2: Agricultural Production and Livelihood Systems

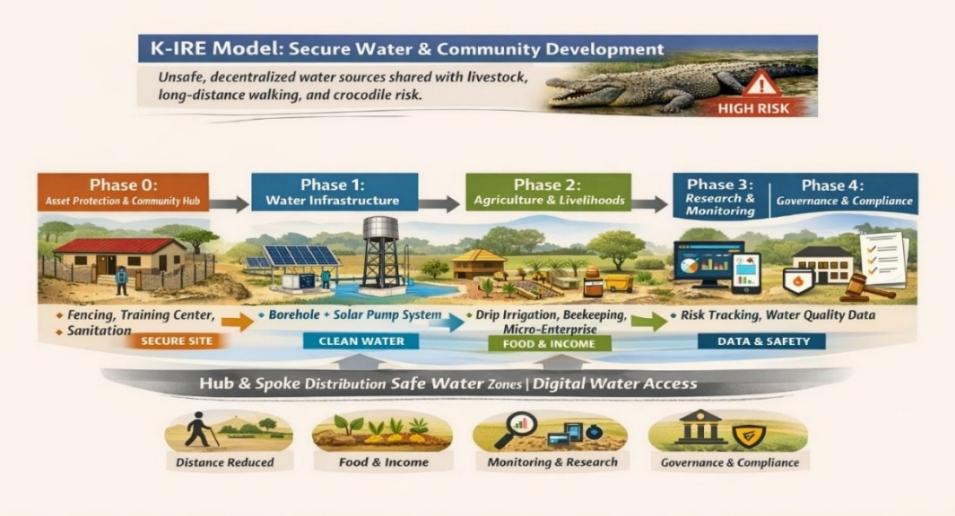
This phase transforms water access into economic opportunity through the development of 15 one-acre drip-irrigation plots, the installation of climate-resilient shade structures **developed in partnership with Grekkon Limited**, the introduction of stingless beekeeping under the “Honey Economy” model, and **small-scale soap and**

candle production. The outcome is increased food production, household income, and community resilience.

Phase 3: Research, Monitoring, and Data Systems

This phase establishes systems to track performance, monitor water quality, and support future scale, including hydrogeological monitoring, wildlife risk tracking, and real-time data systems.

Phase 4: Governance, Compliance, and Institutional Strengthening
This phase ensures long-term sustainability and scalability through legal compliance and advisory services, establishment of CBO/WME governance structures, and implementation of financial accountability systems and regulatory audits.



4. SANITATION INTEGRATION

Sanitation is integrated as a foundational component of the K-IRE ecosystem, delivered in partnership with WASH-certified organizations, including Tigal Water Splash and Fancy Water Drops. The project will implement UNESCO IHP-IX-aligned sanitation protocols, climate-resilient flood-proof latrine systems, greywater reuse for community green spaces, hygiene behavior change training, and school-based WASH standards. Composting latrine systems reduce methane and nitrous oxide emissions while generating organic inputs for agriculture. This creates an integrated WASH system where water, sanitation, and agriculture reinforce one another. Improved sanitation and controlled water access will also help reduce environmental contamination risks affecting local groundwater and surrounding ecosystems.

5. WOMEN'S ECONOMIC EMPOWERMENT

Water security unlocks economic productivity. K-IRE allocates 20% of capital investment to support and sustain women-led enterprises. This includes precision irrigation using solar-powered drip systems to maximize yield, climate-controlled agriculture through shade structures developed in partnership with Grekkon Limited for climate resilience, stingless beekeeping under the Honey Economy to enhance pollination and generate high-value products, and small-scale soap and candle production to diversify household income. Together, these activities help move the community beyond subsistence livelihoods toward a more stable and diversified rural economy. These activities also strengthen household health, hygiene, and community dignity while improving economic resilience.

6. GOVERNANCE STRUCTURE

To ensure long-term sustainability, the project adopts a dual governance model: The Community-Based Organization (CBO) holds legal authority, represents community members, and ensures equitable access to water and services. The Water Management Enterprise (WME) operates the system as a professional utility, manages M-Pesa-based revenue collection, maintains infrastructure, and funds operations, maintenance, and long-term asset replacement. Legal compliance is supported by Owen Onyango & Company Advocates. This model prevents common rural system failures caused by unclear ownership, poor maintenance, and financial leakage.

7. IMPLEMENTATION ROADMAP

The K-IRE Flagship Project will be executed over a structured 9-month period across four phases:

Phase 0 (Months 1–2): Security, Assessment & Engagement — $60,000 Establishes site security, technical accuracy, regulatory compliance, and community alignment before infrastructure deployment. Includes perimeter protection (fencing and site security measures), hydrogeological surveys, site validation, permitting, stakeholder onboarding, and sanitation design integration.

Phase 1 (Months 3–5): Water Infrastructure — $219,000. Represents the primary capital investment in borehole drilling, casing, and development, as well as solar infrastructure installation, water storage, filtration systems, and deployment of a hub-and-spoke distribution network.

Phase 2 (Months 6–7): Sanitation Integration — $93,000 Ensures safe sanitation systems are deployed in parallel with water infrastructure to achieve full WASH

outcomes, including climate-resilient latrine construction and integrated sanitation systems.

Phase 3 (Months 7–8): Agricultural Systems — $46,500 Converts water access into food security and livelihood generation through drip irrigation and climate-smart agriculture.

Phase 4 (Months 9): Sustainability & Scale — $106,500 Secures long-term functionality through governance strengthening, women's enterprise training, M-Pesa-enabled revenue model activation, full system integration, and baseline impact monitoring with ESG data capture.

8. K-IRE BUDGET OVERVIEW & JUSTIFICATION

The K-IRE Flagship Project budget is structured to align directly with phased implementation, ensuring that financial resources correspond to critical technical milestones, risk reduction, and long-term sustainability.

The total project investment of **$525,000** is distributed across five phases as follows:

- **Phase 0 (Assessment & Engagement): $60,000** — Establishes technical accuracy, regulatory compliance, and community alignment before implementation.
- **Phase 1 (Water Infrastructure): $219,000** — Represents the primary capital investment in borehole development, solarization, storage, and distribution systems.
- **Phase 2 (Sanitation Integration): $93,000** — Ensures safe sanitation systems are deployed alongside water access to achieve full WASH outcomes.
- **Phase 3 (Agricultural Systems): $46,500** — Converts water access into food security and livelihood generation through drip irrigation and climate-smart agriculture.
- **Phase 4 (Sustainability & Scale): $106,500** — Secures long-term functionality through training, governance systems, and monitoring frameworks.

Financial Integrity

Costs are informed by regional benchmarks and implementation experience, with

procurement and financial management conducted through transparent and accountable processes.

9. SCALABILITY

The K-IRE model is designed for phased replication across Seme (Flagship), Kisumu East, Kisumu Central, Kisumu West, Muhoroni, Nyando, and Nyakach, with future expansion across the Lake Victoria Basin. The flagship system in Seme Sub-County is designed to serve approximately **4,500 residents**, demonstrating capacity at scale. Future installations will vary based on population density and system design. Boreholes will be spaced at least 800 meters apart, with final siting determined by hydrogeological conditions, population density, and demand patterns.

10. RISK MITIGATION

- Solar-powered systems eliminate exposure to diesel cost volatility
- Stainless steel pump systems reduce corrosion and mechanical failure
- Digital payment systems minimize revenue leakage
- Dual governance structures strengthen accountability and oversight
- Revolving fund mechanisms reduce long-term grant dependency
- Inland water access eliminates exposure to wildlife-related risks

11. EXPECTED IMPACT

- Saving lives and improving safety by eliminating the need for women and children to travel to unsafe, wildlife-prone water sources
- Significant reduction in waterborne diseases through reliable access to safe drinking water
- Enhanced dignity and protection for women and girls, including improved access to water for hygiene and menstrual health, reducing school absenteeism
- Increased school attendance and graduation rates as children spend less time collecting water
- Economic empowerment of households, particularly women, through water-enabled livelihood activities such as stingless bee honey production (in partnership with the International Centre of Insect Physiology and Ecology), soap making, and candle making.
- Increased household income and financial stability, improving the ability to meet education and basic needs

- Strengthened community health, resilience, and overall quality of life

Overall, the project will transform water access in K'olago B Village from a high-risk daily burden into a safe, reliable foundation for health, education, and economic opportunity.

CONCLUSION & CALL TO ACTION

The K-IRE Flagship Project represents a structural shift from temporary water aid to permanent, self-sustaining rural utility development. In addition to addressing immediate water and sanitation needs, the project is designed to serve as a scalable demonstration model for climate-resilient rural WASH infrastructure across the Lake Victoria Basin. By investing in this initiative, stakeholders move beyond short-term relief to establish a durable ecosystem that effectively eliminates:

• Public Health Crisis: Dependency on contaminated and unsafe water sources
• Physical Safety Hazards: Exposure of residents to high-risk, predator-inhabited water zones
• The "Distance Penalty": The burden of long-distance water collection
• Systemic Gaps: Chronic sanitation and hygiene infrastructure deficits

With the technical expertise of Tigal Water Splash and Fancy Water Drops ensuring climate-resilient sanitation standards, the K'olago B site is positioned to become:

• A Global Standard: A UNESCO-aligned WASH demonstration site
• A Resilient Model: A blueprint for climate-smart rural infrastructure
• An Economic Engine: A women-led hub for sustainable economic empowerment
• A Scalable Solution: A replicable framework for the Lake Victoria Basin and beyond

Operation Revitalize Africa respectfully invites partnership in advancing this mission. By aligning strategic philanthropic or investment goals with the K-IRE Ecosystem, clean water—not risk—can define the future of K'olago B Village. Together, this initiative will transform a community's daily struggle into a sustainable foundation for health, safety, and economic opportunity.

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