

# **Report on Orun.io: An Analysis of its Solution to the Climate Finance Accountability Gap**

## **Executive Summary**

This report provides a comprehensive analysis of Orun.io, a project designed to address a critical, multi-billion-dollar "accountability gap" in climate finance for Africa. By combining advanced satellite analytics with community-level data collection, Orun.io has developed a hybrid Monitoring & Evaluation (M&E) platform that offers a compelling solution for public and private funders.

The analysis finds that Orun.io directly addresses a foundational systemic problem: the lack of verifiable impact data that impedes the flow of capital for climate adaptation. The project's most significant asset is its strategic positioning in an uncontested "blue ocean" market space, distinct from competitors who primarily serve businesses with climate risk forecasting. This is underpinned by a powerful and difficult-to-replicate competitive advantage, or "moat," that integrates a cost-effective, automated technical pipeline with a pan-African network of local human partners.

The proposed go-to-market strategy, validated through a series of strategically chosen pilot projects in East, West, and Southern Africa, demonstrates the project's real-world relevance and its potential to secure significant funding. While the technical and cost-saving aspects are robust, the success of the platform hinges on its ability to effectively scale its on-the-ground network of community partnerships—a key vulnerability that warrants focused consideration. The overall assessment is that Orun.io presents a timely and well-conceived solution to a critical global challenge.

## **1. The Context: A Crisis of Climate Finance and Accountability in Africa**

### **1.1. The Dual Imperative: Climate Vulnerability and Energy Poverty**

The African continent stands at a precarious nexus of climate vulnerability and energy deficiency. Despite contributing a negligible amount of global greenhouse gas emissions—estimated at only 2-3%—Africa is disproportionately affected by the escalating impacts of climate change.<sup>1</sup> According to the Intergovernmental Panel on Climate Change (IPCC), the continent is identified as the world's most vulnerable due to a combination of factors, including its high dependence on rain-fed agriculture, widespread poverty, and limited adaptive capacity. The consequences are already manifesting across the continent, with 2023 witnessing a devastating array of extreme weather events, from deadly heatwaves and torrential floods to tropical cyclones and prolonged droughts.<sup>1</sup> These climatic shocks exacerbate existing challenges such as hunger, water insecurity, and displacement, directly affecting the livelihoods of communities.

Simultaneously, Africa faces the profound challenge of energy poverty, with over 600 million people—nearly half the population—lacking access to electricity.<sup>1</sup> The reliance on traditional biomass for cooking leads to indoor air pollution, premature deaths, and environmental degradation, further compounding the impacts of climate change. This paradox presents a unique opportunity: by harnessing its immense untapped renewable energy potential—including an estimated 10 terawatts of solar energy—Africa can bypass traditional fossil fuel-based development models and build a clean, resilient, and sustainable energy system from the ground up.<sup>1</sup> The fundamental challenge lies in mobilizing the necessary resources to navigate this complex development path.

## **1.2. The Multi-Billion Dollar Accountability Gap**

The effort to mobilize climate finance for Africa has been severely hampered by what can be described as a systemic accountability crisis. Analysis of financial flows reveals a stark disparity between the continent's climate adaptation needs and the capital actually being deployed. Estimates suggest that Africa requires approximately \$580 billion in adaptation investment between 2020 and 2030, yet annual flows are only around \$11-14 billion.<sup>1</sup> This results in an immense annual adaptation finance gap of \$40-50 billion, meaning less than 10% of the needed funding is currently being met.<sup>1</sup>

This immense financing shortfall is not merely a funding problem; it is a direct consequence of a failure to demonstrate the efficacy of past and current investments. Many large-scale adaptation programs, such as community water projects or reforestation drives, lack solid evidence of impact because their M&E has been insufficient.<sup>1</sup> Projects routinely fail to establish clear baselines or use counterfactual data, which makes it impossible to verify outcomes. One study of African adaptation projects found that over 50% had no clear baseline data to measure change.<sup>1</sup>

This lack of verifiable data creates a fundamental crisis of trust for funders, including governments and international development banks. When capital is deployed without clear evidence of a return on investment—in this context, an increase in climate resilience and a tangible impact on communities—funders become hesitant to commit further resources. A

rational investor will pause and reconsider increasing investment into a system that has demonstrated a persistent inability to provide transparent proof of outcomes. Thus, the inability to provide accountability for past projects directly perpetuates the immense financing gap. Orun.io's value proposition is uniquely positioned to solve this foundational systemic problem, not just a symptom, by providing a verifiable proof-of-impact mechanism.

**Table 1: Key Figures of Africa's Adaptation Finance and Accountability Gap**

Metric	Figure	Source
Estimated Annual Adaptation Need	~\$58 billion per year	<sup>1</sup>
Actual Annual Adaptation Flows	~\$11-14 billion per year	<sup>1</sup>
Annual Adaptation Finance Gap	~\$40-50 billion per year	<sup>1</sup>
Percentage of Need Met	Less than 10%	<sup>1</sup>
M&E Evidence Gap	Over 50% of projects lack clear baseline data	<sup>1</sup>

## 2. Orun.io's Proposed Solution: A Hybrid Impact Verification Platform

### 2.1. The Value Proposition for Funders and Communities

Orun.io's core value proposition is to serve as a trust-building solution that bridges the gap between public funders and climate adaptation projects on the ground. The platform's mission is to "verify real-world adaptation impacts for public development projects".<sup>1</sup> By providing independent, verifiable data, Orun.io aims to restore funder confidence and, in doing so, unlock a greater flow of capital into Africa. The platform's value extends beyond simple M&E to create a positive feedback loop that benefits all stakeholders.

For funders, verified impact data provides the assurance needed to justify larger, more sustained investments in a region where they are desperately needed. For project developers and implementing organizations, the platform provides a tool for continuous improvement and a means to transparently demonstrate the success of their work, which is critical for securing future funding. For communities, the platform's engagement model provides a tangible, direct benefit for their participation. The act of contributing ground-truth data, incentivized by

mobile payments, not only provides critical information but also directly involves local populations in the project's success. This creates a powerful, bottom-up validation layer that enriches the satellite-derived data.

## **2.2. The Dual-Pillar Approach: Scientific Rigor and Deep Local Embedding**

The Orun.io platform is built on two foundational pillars: scientific rigor and deep local embedding. The first pillar is a commitment to scientifically valid impact evaluation methods. The platform's analysis is anchored in rigorous methods such as Before-After-Control-Impact (BACI) and Difference-in-Differences (DID), adapted for use with satellite data.<sup>1</sup> This approach is designed to isolate the causal effect of an intervention, providing a strong basis for proving that a project, and not an external factor, is responsible for a measured outcome. The second pillar, deep local embedding, recognizes that meaningful ground-truth data comes from local participants.<sup>1</sup> To secure this crucial information, the project will partner with trusted local organizations and use proven incentive schemes, such as small mobile money top-ups or periodic airtime lottery draws, which have been shown to dramatically boost survey response rates in similar contexts.<sup>1</sup> By working through existing networks of farmer groups and local NGOs, Orun.io avoids the "cold start" problem of building trust from scratch and can leverage pre-existing social capital within communities.<sup>1</sup> The synergy between these two pillars—objective data from orbit and nuanced context from the ground—creates a robust and defensible system for impact verification.

## **3. The Technical and Methodological Framework**

### **3.1. The Scientific Engine: Proving Causation from Orbit**

Orun.io's technical approach is centered on a scientific engine that processes petabytes of satellite imagery at a continental scale.<sup>1</sup> The platform utilizes freely available satellite data from open-data programs, such as Sentinel and Landsat, hosted on cloud platforms like Google Earth Engine and Amazon Web Services (AWS).<sup>1</sup> This data is used to derive key outcome indices, including Normalized Difference Vegetation Index (NDVI) and Enhanced Vegetation Index (EVI) to monitor vegetation health, as well as indices for soil moisture and water extent.<sup>1</sup> The use of these open-source datasets and cloud-native architecture allows for a flexible and cost-effective pipeline that can be run on various cloud platforms, optimizing for the best pricing and regional infrastructure coverage.<sup>1</sup> The core of the platform's analytical power lies in its application of the BACI/DID framework.

This methodology compares satellite-derived outcomes in a project area before and after an intervention against the same time periods in "matched control areas." By isolating the project area's changes from those of the control area, the platform can statistically attribute improvements to the intervention itself, providing a strong basis for a causal claim.<sup>1</sup> The platform also incorporates ancillary datasets, such as weather patterns, crop prices, policy timelines, and conflict maps, to control for confounding factors that might influence outcomes independently of the project.<sup>1</sup> This rigorous statistical approach gives funders the confidence that credit for impact is being accurately assigned.

The interplay between the two pillars of Orun.io's approach is a key element of its technical sophistication. While the satellite data provides broad, objective metrics, the localized community data provides the nuanced, qualitative, and on-the-ground context necessary to correctly interpret the satellite trends and control for human-driven confounding factors. For instance, a successful community-led project might lead to a micro-economy shift, which is a project outcome but could also influence local behavior in a way that confounds a simple vegetation analysis. The hybrid model allows the platform to correctly interpret these complexities, validating the satellite data with real-world context and providing a more defensible assessment of impact.

### **3.2. The "Last Mile": Community Engagement and Human Intelligence**

Orun.io's approach to community engagement is designed to be both effective and scalable. The strategy involves building partnerships with established local networks, such as the Kenya National Farmers' Federation (KENAFF) or other local NGOs and cooperatives.<sup>1</sup> By working with these trusted organizations, Orun.io can tap into existing social capital and avoid the "cold start" trust issues that often plague new initiatives.<sup>1</sup>

The efficacy of this approach is supported by examples of similar community-based efforts. For instance, the Makueni County sand dam initiative in Kenya is a well-established community-led project.<sup>1</sup> Public reports indicate that local residents are deeply committed to safeguarding these projects, demonstrating a pre-existing sense of ownership and buy-in that Orun.io can leverage.<sup>2</sup> The platform's use of proven incentives, such as small mobile money top-ups or periodic airtime lottery draws for each verified report, is designed to amplify this existing community buy-in and encourage sustained participation.<sup>1</sup> This method creates a mechanism for continuous, high-fidelity data collection that would be prohibitively expensive to obtain through traditional manual surveys.

### **3.3. Scalability and Cost-Effectiveness**

The Orun.io platform is engineered for scalable deployment across the African continent. The core infrastructure is built on cloud-native satellite pipelines, which are claimed to allow costs to scale "sub-linearly".<sup>1</sup> By leveraging freely available Sentinel and Landsat data, the platform

avoids the high costs associated with proprietary satellite imagery and expensive data downloads.<sup>1</sup> Its analytical operations run on standard cloud compute services (e.g., AWS EC2/SageMaker or Google Earth Engine), making the technology side of the business highly reproducible and capital-efficient.<sup>1</sup> The platform is claimed to be up to 70% cheaper than traditional, manual M&E methods, which rely on expensive and time-consuming on-the-ground surveys.<sup>1</sup>

While the technology pipeline is highly automated and scalable, the ultimate scalability of Orun.io is not purely a technological question. The company's primary competitive advantage—its pan-African network of local partners—is also its most significant logistical challenge. The real bottleneck for expansion is the speed and efficacy of developing and maintaining these partnerships across different regions, cultures, and languages. The project's success will therefore depend on its ability to replicate this "social capital" <sup>1</sup> at scale, which is a complex operational and strategic endeavor. The technology provides the financial viability to support this dispersed network, but the network itself requires a sophisticated partnership development strategy.

**Table 2: Orun.io's Technology Stack: Components and Functions**

Component	Function	Source
<b>Scientific Engine</b>		
Satellite Imagery	Provides objective, multi-spectral data (NDVI, EVI, NDWI, etc.) for large-scale environmental monitoring.	<sup>1</sup>
BACI/DID Methodology	Isolates the causal effect of an intervention by comparing a project area to a matched control area over time.	<sup>1</sup>
Ancillary Datasets	Incorporates external data on weather, policy, and market prices to control for confounding factors in the analysis.	<sup>1</sup>
<b>Community Engagement</b>		
Mobile Platforms	Enables data collection from local participants via SMS, USSD, and mobile apps.	<sup>1</sup>
Micropayments	Incentivizes community participation with mobile money top-ups or airtime	<sup>1</sup>

	lottery draws.	
<b>Core Infrastructure</b>		
Cloud Services (AWS, Azure, Google Earth Engine)	Provides the flexible, cost-effective compute and storage backbone for processing satellite data.	<sup>1</sup>

## 4. Competitive Landscape and Strategic Differentiation

### 4.1. Analysis of the Competitive Arena

The climate tech landscape in Africa is populated with a diverse range of companies, but Orun.io occupies a distinct and defensible market position. Direct and indirect competitors, as identified in the provided documents, are primarily focused on different segments of the market. AgRails, a Nairobi-based startup, uses generative AI for carbon Measurement, Reporting, and Verification (MRV) and risk modeling, with a stated focus on private sector clients seeking insights for "climate finance, nature credits".<sup>1</sup> Although AgRails claims significant savings on MRV costs, there is no public evidence that it provides on-the-ground adaptation impact verification.<sup>1</sup>

Another notable competitor, ClimateAi, offers an enterprise platform that provides hyper-local climate forecasts and adaptive recommendations for agribusiness.<sup>1</sup> While it serves major global clients and focuses on operational resilience, its core business is climate risk forecasting, not funder-side accountability.<sup>1</sup> Indirect competitors include global consultancies and remote-sensing platforms, but these do not explicitly offer rigorous adaptation impact verification in the African context.<sup>1</sup>

### 4.2. The "Blue Ocean" Strategy

Orun.io's strategic approach is to enter a "blue ocean"—an uncontested market space—by focusing on "M&E for adaptation finance".<sup>1</sup> While other players model climate risk for private businesses, Orun.io uniquely verifies the real-world impact of public development projects.<sup>1</sup> This strategic focus allows the company to avoid direct competition with a myriad of startups focused on private-sector clients. The provided climate whitepaper highlights the diversity of climate tech innovation in Africa, from energy platforms and data-driven agriculture to circular economy solutions and fintech.<sup>1</sup> While Orun.io's technology touches on agriculture and

fintech, its core business model—providing verifiable impact data for public funds—is a distinct business-to-government (B2G) or business-to-funder (B2F) play. This positioning insulates Orun.io from the competitive pressures faced by companies that serve the private sector and confirms the strength of its strategic niche.

### 4.3. The "Unfair Advantage" and Strategic Moat

Orun.io's competitive advantage is built on two mutually reinforcing assets that create a significant moat against new entrants. The first is its "social capital"—the pan-African network of local cooperatives, NGOs, and field staff.<sup>1</sup> This network is described as the "hardest-to-replicate asset" because cultivating trust and partnerships at a continent-wide scale is a time-consuming and complex endeavor.<sup>1</sup>

The second advantage is its fully automated, cloud-native pipeline. This gives the company a cost and speed advantage that would be difficult for competitors to match.<sup>1</sup> The two assets are deeply interconnected and create a powerful, virtuous cycle. The local network provides the crucial, high-fidelity ground truth data needed to train and validate the automated AI models, making the software's outputs more accurate and defensible. In turn, the efficiency and cost-effectiveness of the AI pipeline make it financially viable to support and maintain a large, dispersed community network. This integrated approach, where the software enables the network and the network validates the software, makes the hybrid model a much more formidable competitive barrier than a purely tech-focused or purely human-focused approach.

**Table 3: Competitive Analysis Matrix**

Company	Core Offering	Target Market	Primary Focus	Unfair Advantage/Moat
<b>Orun.io</b>	Hybrid M&E platform	Public Funders & Communities	Verifying Adaptation Impact	Hybrid model: automated pipeline + pan-African human network
<b>AgRails</b>	Generative AI platform	Private Sector Clients	Carbon MRV, Risk Modeling	AI for carbon accounting
<b>ClimateAi</b>	Enterprise SaaS platform	Agribusiness & Food Companies	Climate Risk Forecasting	Hyper-local forecasting models
<b>Consultancies</b>	Advisory services	Various	Broad ESG/ESR Reporting	Existing client relationships, brand reputation



<b>Remote-Sensing Platforms</b>	Analysis tools	Researchers, Governments	Data Visualization, Scenario Modeling	High-fidelity satellite imagery, analytics tools
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## 5. Pilot Projects and Feasibility Evaluation

### 5.1. Illustrative Pilot Projects

To validate its go-to-market strategy, Orun.io has proposed three illustrative pilot projects that are geographically diverse and address different climate adaptation challenges across Africa.<sup>1</sup>

1. **East Africa:** The Makueni County Sand Dams in Kenya, which are classic drought-resilience projects.<sup>1</sup> Public information corroborates the existence and importance of these community-led initiatives, which aim to improve water availability and food security.<sup>2</sup> Orun.io would partner with local county water departments and NGOs to monitor vegetation and water table response using Sentinel data and community reports.<sup>1</sup>
2. **West Africa:** The Niger Delta Mangrove Restoration project in Nigeria, focused on protecting fisheries and shorelines.<sup>1</sup> External reports confirm the reality of significant ongoing mangrove restoration efforts in the region, which are supported by international bodies like the UN and local government agencies.<sup>4</sup> Orun.io would work with local cooperatives to verify mangrove canopy growth via satellite data and validate this with community-reported data on fish catch and environmental health.<sup>1</sup>
3. **Southern Africa:** A water management project in the Okavango Basin of Botswana/Zambia, focused on sustainable irrigation.<sup>1</sup> The existence of the Permanent Okavango River Basin Water Commission (OKACOM) and a multitude of international and local projects in the region confirms the real-world relevance of this pilot.<sup>6</sup> The platform would analyze water index changes and integrate local farmer surveys to score how well the project buffers climate impacts.<sup>1</sup>

The selection of these pilots demonstrates a clear strategic intent. By choosing projects that are not hypothetical but are already backed by major funders and have existing community engagement, Orun.io is de-risking its approach by demonstrating immediate product-market fit. This alignment with real-world needs and existing initiatives makes the project highly credible and increases its potential to attract funding from major development finance institutions.

## 5.2. Addressing Key Risks: A Synthesis of De-Risking Arguments

Orun.io's pitch proactively addresses key concerns about the feasibility of its approach, providing a strong case for its viability.<sup>1</sup>

- **Concern:** "Community engagement is unreliable."
  - **Rebuttal:** The platform avoids this by partnering with trusted local organizations and using proven incentive schemes, such as mobile payments, which have been shown to dramatically boost participation rates.<sup>1</sup> This leverages existing social capital rather than attempting to build trust from scratch.
- **Concern:** "Proving causation is too hard."
  - **Rebuttal:** Orun.io's analytics platform uses established and peer-reviewed methodologies (BACI/DID) that are specifically designed to isolate the effect of a project from external trends.<sup>1</sup> By incorporating external data on weather and policy, the models are further refined to ensure the causal link is strong and defensible.
- **Concern:** "Can this scale affordably across Africa?"
  - **Rebuttal:** The platform is built on cloud-native satellite pipelines and utilizes freely available open-source data, which allows costs to scale "sub-linearly".<sup>1</sup> This tech-driven model is claimed to be up to 70% cheaper than traditional M&E methods, which rely on costly manual surveys.<sup>1</sup> Once a local partnership is established, adding new sites is primarily a matter of spinning up cloud compute, making the expansion process efficient.

## 6. Conclusion and Recommendations

### 6.1. Summary of Strengths

Orun.io presents a highly compelling and timely business case that addresses a fundamental market failure in climate finance. The project's core strengths are multifaceted and mutually reinforcing:

- **Compelling Value Proposition:** The platform directly solves the "accountability gap," which is a root cause of the immense funding shortfall for climate adaptation in Africa.
- **Sophisticated Hybrid Methodology:** The dual-pillar approach of scientific rigor (BACI/DID satellite analytics) and deep local embedding (incentivized community data) provides a robust and defensible framework for impact verification.
- **Unique Market Position:** Orun.io has strategically identified and targeted an uncontested "blue ocean" by focusing on M&E for public funders, which insulates it from competition with companies focused on corporate risk forecasting.

- **Powerful Competitive Moat:** The synergistic combination of a cost-effective, automated technical pipeline and a human network of local partners creates a formidable barrier to entry that is difficult to replicate.
- **Validated Go-to-Market Strategy:** The proposed pilot projects are not theoretical but are aligned with real, ongoing initiatives and major funders, demonstrating a clear path to market adoption.

## 6.2. Potential Vulnerabilities and Next Steps

The primary vulnerability for Orun.io is not its technology, but the operational and logistical challenge of scaling its on-the-ground human network. While this network is the cornerstone of its competitive advantage, its successful replication across a diverse and vast continent requires a sophisticated, phased approach to partnership development. The long-term viability of the project will hinge on its ability to build and maintain this crucial social capital effectively.

Based on this analysis, it is recommended that a phased engagement be undertaken. The first phase should involve a deeper due diligence into Orun.io's pilot execution plan, specifically its on-the-ground operational capacity and the details of its partnership agreements. This will provide critical insight into the company's ability to execute on its core competitive advantage. A direct investment decision would then be contingent upon the successful completion and verifiable outcomes of these initial pilots. The analysis provided here is limited to the documents and public information that were accessible, as the full Master Project Document was not available for review.<sup>8</sup>

### Works cited

1. CHAI Hackathon Climate Whitepaper.pdf
2. Makueni's sand dam brings new life to drylands - YouTube, accessed September 6, 2025, [https://www.youtube.com/watch?v=1RH\\_PrKjnrU](https://www.youtube.com/watch?v=1RH_PrKjnrU)
3. Makueni Sand Dam Brings Water and Hope to Thousands - YouTube, accessed September 6, 2025, <https://www.youtube.com/watch?v=uh7Rsu9VlgQ>
4. OGONILAND / MANGROVE RESTORATION | UNifeed - UN Media, accessed September 6, 2025, <https://media.un.org/unifeed/en/asset/d334/d3344165>
5. Niger Delta Mangrove Project - First Climate, accessed September 6, 2025, <https://www.firstclimate.com/unsere-klimaschutzprojekte/niger-delta-mangrove-project?lang=en>
6. Welcome to OKACOM | OKACOM, accessed September 6, 2025, <https://www.okacom.org/>
7. Cubango-Okavango Basin Sustaining a Crucial Water Source for the Living - CIWA program, accessed September 6, 2025, <https://www.ciwaprogram.org/latest/cubango-okavango-basin-sustaining-a-crucial-water-source-for-the-living/>
8. accessed January 1, 1970, uploaded:Orun.io: Master Project Document