

Tanzania Inspection Report

—Feasibility of Large-Scale Application of Vetiver in East Africa

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1. Background of the Inspection

Vetiver was introduced to Africa by international organizations such as TVNI 30 years ago, and multi-country promotion networks have been established since then. In 2012, China State Construction Engineering Corporation (CSCEC) carried out its first pilot application on highway slopes in the Republic of the Congo. In recent years, the Belt and Road Initiative has fueled an infrastructure boom in East Africa, leading to a surge in demand for slope management in railway and highway construction. However, due to widespread issues including irrational technical design, non-standard application, low seedling survival rate and inadequate maintenance, the implemented vetiver projects have failed to deliver the expected benefits and profits to both clients and contractors, which has brought large-scale application to a standstill. Commissioned by relevant chambers of commerce and TVNI, I conducted a professional technical inspection tour in Tanzania in December 2025, with a focus on evaluating whether the full set of "Vetiver Ecology" technologies can address the aforementioned pain points and achieve profitability.

2. Summary of the Inspection

2.1 On-site Record

2.1.1 Geology and Climate

The elevation along the Uvunza-Burundi Railway ranges from 1,000 to 1,800 meters, ascending in a terraced formation with slopes exceeding 30°. The soil shows distinct vertical zonation, transitioning from sandy soil to red soil and dark brown soil, with a pH value ranging from 4.5 to 6.0. It is characterized by poor water retention, high evaporation rates, and a deficiency in nitrogen and organic phosphorus. The annual average temperature stays between 20°C and 25°C, with significant temperature differences between day and night. The annual precipitation totals 1,262 millimeters: the long rainy season from February to May accounts for 40–50% of the annual rainfall, the short rainy season from September to November contributes 20–30%, and precipitation drops below 50 millimeters in the dry season from June to August. Coupled with the absence of a drainage system, short-duration torrential rains frequently trigger soil erosion, sheet erosion, and landslides.

2.1.2 Vetiver Application Cases in Tanzania

A. Dodoma High-Speed Railway Station: The height of the filled slope is 4 meters, with a slope length of 8 meters and a total area of approximately 600 m². The slope ratio is 1:1.2. The vetiver was planted one week ago at a row and plant spacing of 50 cm × 40 cm (see Figure 1). The soil is of semi-cohesive texture, and the planting depth is only 10 cm, resulting in a germination rate of approximately 40%. An inspection of the pulled-out seedlings revealed a small amount of sheep manure at the root base, with no other nutrients or soil amendments present (see Figure 3).

B. China-Tanzania Industrial Park Railway Section: The row and plant spacing of the vetiver is 40 cm × 40 cm, with the leaves measuring 80–100 cm long. However, all the leaves have turned completely yellow and withered due to zero maintenance.

C. CARE OF CREATION TANZANIA Public Welfare Base: Seedlings are provided to residents of surrounding communities on an irregular basis. The vetiver is trimmed 2–4 times a year for use as fodder, with minimal professional maintenance and management. A small amount of sheep manure is applied, but only scattered on the surface of the plant stems. There is no systematic watering or fertilization regime in place (see Figure 2).

D. Chinese Villas in the Suburbs of Dar es Salaam: The vetiver is used only as a boundary marker (see Figure 4), with no other technical application measures implemented).



图-1



图-3



图-2



图-4

Technical and Economic Conclusion

The current application generally lacks the five core elements of "standardized design, deep planting, soil improvement, basic nutrition supplementation, and maintenance management". Irrational technical

application leads to unsatisfactory remediation outcomes, which in turn results in low profit margins for contractors and extremely limited economic benefits and political achievements for project owners. This vicious cycle ultimately hinders the large-scale promotion of the project.

2.2 Raw Materials and Production Capacity

2.2.1 Raw Materials Local small-scale nurseries are able to supply vetiver seedlings, but the price is three times higher than that in China. In contrast, wood chips, humus soil, and livestock manure are abundant and can be used for self-prepared organic fertilizers.

2.2.2 Production Capacity The daily work efficiency of local farmers is only 30% of that of skilled workers in China. However, if the domestic "contracting + performance-based" model is adopted, the efficiency can be increased by 2–3 times..

2.3 Policies and Business Environment

The government holds a welcoming attitude toward foreign investment, yet the approval process is lengthy and standards are inconsistent. Due to the lack of unified technical specifications, vetiver projects are classified as "experimental engineering projects", which require additional technical verification. This leads to prolonged project cycles and increased costs, further squeezing the profit margins of contractors.

3. Technical Analysis

3.1 Planting Technology

Based on the observed cases, the following issues exist: non-standard planting techniques, failure to design in accordance with the basic requirement of contour lines, excessively narrow row spacing (less than 80 cm), overly wide plant spacing (more than 20 cm), and an overall "plum-blossom" layout. With a planting depth of only around 10 cm, there remains a high possibility of soil erosion and the formation of numerous rill channels.

3.2 Nutrient Supply

Insufficient soil improvement and nutrient supply during the initial planting phase have left vetiver without adequate safeguards for its growth, development and nutrient provision after being planted, making it difficult to achieve the goal of soil stabilization and slope protection in a short period of time.

3.3 Post-Planting Maintenance

The maintenance and management after planting are inadequate. There is insufficient water supply, leading to a low survival rate, and no regular reseeded, pruning or corresponding management measures are implemented.

4. Market and Opportunities

4.1 Favorable Timing

The three railways in East Africa (Tanzania-Burundi, Kenya-Uganda, and Zambia-Tanzania) have a total mileage of approximately 2,000 km, with mountainous sections accounting for no less than 1,000 km. Assuming that 50% of the slope protection work adopts the vetiver technology scheme and each side of the slope is 5 meters wide, the potential treatment area will reach 5 million square meters. Calculated at the unit cost of 1,000 yuan per square meter for the traditional mortar stone masonry

scheme, the theoretical market scale will hit 5 billion yuan. In contrast, with the vetiver technology scheme priced at only 200 yuan per square meter, the theoretical market scale will stand at 1 billion yuan.—This means that for investors (project owners), the cost can be reduced by 80%. For contractors, even with a profit margin of only 20%, the economic benefit generated will amount to 200 million yuan. This win-win structure is bound to stimulate enthusiastic participation from all stakeholders.

The timing is exceptionally ripe for developing vetiver technology application projects in the East African region.

4.2 Favorable Condition

European and American supervision companies have included vetiver as an ESG bonus item, with the prerequisite that "the survival rate shall be no less than 90% and maintenance-free for 3 years". Whoever takes the lead in providing cases that meet the standards will secure orders covering 500 km of railway slopes.

4.3 Favorable Human Resources & Synergies

4.3.1 The Chinese Chamber of Commerce boasts 20 years of local experience and can swiftly coordinate land, labor, and logistics.

4.3.2 Endorsement authorized by TVNI can resolve the barrier of the "experimental" project classification.

4.3.3 The "Vetiver Ecology" team has implemented over 1,000 projects in China, and is fully equipped with the full-chain technologies of "design, breeding, construction, and maintenance", enabling it to deliver mature solutions immediately.

5. Development Plan

5.1 Phase 1 (Years 0–1): Build Benchmark Projects

Secure a 1 km pilot project in Kenya or Tanzania, and implement it in accordance with China's applicable technical standards (rational design + soil matrix improvement + organic fertilizer + microbial inoculants + 90% survival rate). Develop the first vetiver technology compliance report in East Africa and disclose the data for review by governments, project owners, supervision companies, and general contractors.

5.2 Phase 2 (Years 1–2): Localization

Establish a 10-acre seedling breeding base and training center, transfer the construction segment to local contracting teams, and restrict the platform consulting company to providing only technical standards and core materials (organic substrates and microbial inoculants). This approach will increase the profit margin from 20% to 35%.

5.3 Phase 3 (Years 3–5): Product Diversification

Establish a joint laboratory with the University of Morogoro, apply for production licenses for organic substrates and microbial inoculants, and sell high-value-added products targeting the entire ecological engineering application market in East Africa.

5.4 Phase 4 (Year 5 Onwards): Scaling Up and Carbon Sequestration

Expand the vetiver raw material base to 10,000 acres, produce pulp, fiberboard and essential oil, access the international carbon credit trading market, and establish a three-pillar-driven model of "ecological protection + green materials + carbon assets".

6. Action Plan

6.1 January 2026: Complete the registration of Africa Green Technology Solutions Co., Ltd. and reserve 20% of the equity as technical shares for financing purposes.

6.2 February–March 2026: Submit an authorization application for the Africa Regional Liaison Office to TVNI; launch the 10-acre Ecological Cycle Demonstration Park (encompassing vetiver slope protection, organic vegetable cultivation, livestock manure composting, and a microbial inoculant workshop).

6.3 April–December 2026: Host the East Africa vetiver technology seminar on a quarterly basis, inviting government authorities, general contractors, supervision companies and NGOs to conduct on-site observations; complete the first 1 km railway slope pilot project with a survival rate of no less than 90% and a cost of no more than 300 CNY per m², and issue a third-party evaluation report.

6.4 Starting from 2027: Achieve an annual order replication scale of no less than 50 km; allocate 5% of annual profits to TVNI for international promotion and technological upgrading.

7. Conclusions and Recommendations

Vetiver is not without a market in East Africa; instead, the promotion path has been blocked by the vicious cycle of "irrational technology application → substandard remediation effectiveness → insignificant profits and benefits". Leveraging China's mature technologies and local resources, we can fully deliver a "compliant, profitable and replicable" model within 12 months.

It is recommended that all investors complete equity subscription before January 2026 and officially launch the project in February. By advancing three pillars in parallel—technology, standards and cases—we will seize the first-mover advantage in the 500 km, 1.0 billion CNY-scale ecological slope protection market.

We welcome institutions and individuals committed to ecological and agricultural projects in Africa to participate jointly and share the green dividends!

Summary

The Tanzania inspection confirms that vetiver's poor performance in East Africa is not due to the plant itself but to widespread technical misapplication: shallow planting, inadequate soil improvement, insufficient nutrients, and almost no maintenance. These systemic flaws have produced low survival rates, weak slope stabilization, and minimal economic returns—creating a vicious cycle that has stalled large-scale adoption. Yet the region's geology, climate, and infrastructure boom present enormous demand, with up to 5 million m² of treatable railway slopes and a potential 1 billion CNY market for compliant vetiver solutions. Local raw materials are abundant, labor can be made efficient through performance-based contracting, and ESG requirements from Western

supervision firms create a strong incentive for high-survival, maintenance-free systems.

The report concludes that China’s mature “Vetiver Ecology Company”—combining standardized design, deep planting, soil matrix improvement, organic fertilizers, microbial inoculants, and structured maintenance—can break the current bottleneck and deliver a profitable, replicable model within 12 months. A four-phase development plan outlines how to build benchmark projects, localize production, diversify into high-value ecological products, and eventually scale into carbon credits and green materials. With coordinated support from TVNI, Chinese chambers of commerce, and local institutions, early movers can secure a decisive first-mover advantage in a 500 km regional market and unlock long-term ecological and commercial dividends.