



## Why the Village Climate Solutions Project (VCSP) is VM0048-Ready?

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### Executive Summary

Village Climate Solutions Project (VCSP) represents a next-generation avoided deforestation model where jurisdictional-scale science is operationalized through community-controlled governance.

The project is designed to meet the requirements of Verra's VM0048 methodology for high-integrity avoided deforestation. Although currently under VM0015, the project already applies VM0048 principles including jurisdictional baselines, high-resolution data, risk modeling, and the use of probabilistic allocation tools such as VT0007.

Critically, VCSP goes beyond technical alignment by embedding a strong linkage between modeled deforestation risk, observed performance, and grounded in opportunity costs, ensuring conservation is economically viable, while a transparent and participatory benefit-sharing system places decision-making authority in the Village General Assembly, legally comprises of men and women aged 18 and above, as the supreme body determining the use of revenues.

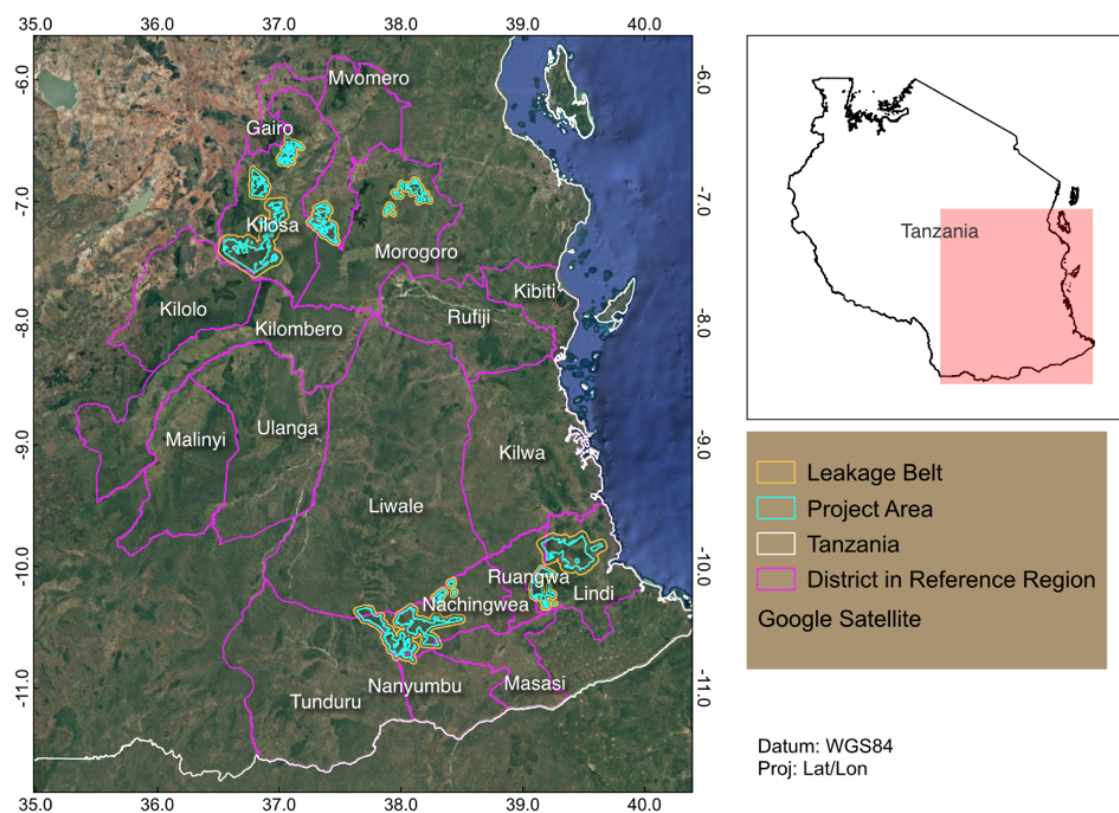
The project promotes a divided model in which communities determine how revenues are allocated between household dividends and community development investments. This integrated approach strengthens accountability, local ownership, and equity, positioning VCSP as fully VM0048-ready ahead of formal transition.

## Jurisdictional-Scale Baseline

VCSP uses a large reference region of 18.6 million hectares (~19% of mainland Tanzania), ensures that deforestation estimates are not artificially inflated and that leakage risks are inherently captured, aligning with VM0048 requirements.

**Table 1: Summary of reference regions**

Parameter	Value
Reference region	18.6 million ha
Share of Tanzania	~19–21%
Project area	327,234 ha
Scaling ratio	~57× larger



**Figure 1 Reference Region Map**

## High-Resolution Data

VCSP derives historical deforestation estimates from statistically robust sampling of high-resolution imagery, integrating optical, radar, and LiDAR datasets to produce highly accurate

forest cover maps, 93% overall accuracy. This meets and exceeds VM0048 expectations for credible baseline construction.

## Deforestation Risk Modeling

The VCSP identified and tested nine empirically validated drivers of deforestation, selected based on their demonstrated relevance to land-use change processes within the reference region. These drivers collectively capture the underlying forces shaping forest conversion, particularly the expansion of low-productivity smallholder agriculture, which accounts for approximately 95% of deforestation in the landscape.

The nine drivers include:

- 1) **Distance to recent deforestation** – capturing spatial contagion effects, where new deforestation is more likely to occur near previously cleared areas
- 2) **Distance to settlements** – reflecting population pressure and proximity to labor and markets
- 3) **Distance to roads** – representing access to transportation and reduced costs of land clearing
- 4) **Distance to water sources** – indicating suitability for farming and settlement patterns
- 5) **Protected area status** – accounting for legal restrictions and varying levels of enforcement
- 6) **Elevation** – influencing climate, accessibility, and agricultural suitability
- 7) **Slope** – affecting the ease and cost of land clearing and cultivation
- 8) **Topographic Position Index (TPI)** – capturing landscape position (e.g., ridge, valley) and associated land-use preferences
- 9) **Soil cation exchange capacity (CEC)** – representing soil fertility and its influence on agricultural productivity

## Grounded in Evidence of drivers of deforestation

The deforestation variables were not only selected based on theoretical relevance but were empirically tested within the project context to ensure that they meaningfully explain observed deforestation patterns. These variables directly reflect the dominant driver in the region: Smallholder agricultural expansion (~96% of deforestation)

Table 2: Key field-based evidence related to VCSP’s baseline assessment

Indicator	Value
Deforestation agents visited	4,853
Disturbance polygons visited	5,273
Size disturbance polygons analyzed	4,635 acres
Proportion of clearing with farming as primary cause	95.45%
Proportion of cleared area with farming activities	95.95%
Most dominant crops cultivated (maize and sesame)	83%
Gender of most disturbance agents	90%+ male
Age group of most disturbance agents 76+%	53+ years
Education level of most disturbance agents	96% primary/none

Findings confirm that deforestation is local, predictable, and driven mainly by smallholder farmers (~96% low education, ~83% local residents).

### Model Calibration and Validation

To ensure robustness and predictive reliability, VCSP applies a forward validation approach, consistent with best practices under VM0048 and guidance from VT0007.

Specifically:

- Models are calibrated using historical data from **2010–2016**
- Model predictions are independently tested against observed deforestation from 2016–2022
- Performance is evaluated using the **Figure of Merit (FOM)**, which quantifies the spatial agreement between predicted and observed deforestation patterns

This approach ensures that the model goes beyond fitting historical trends and demonstrates verified predictive performance. As a result, the baseline is not only statistically robust but also credible, conservative, and aligned with VM0048 requirements for forward-looking deforestation risk modelling.

### Probabilistic Risk Allocation

A key advancement in VCSP’s methodology—and a central element of its alignment with VM0048—is the transition from deterministic (“hard”) allocation to probabilistic risk allocation.

Under traditional VM0015 approaches:

- Only the highest-risk pixels are assumed to be deforested

- Moderate- and low-risk areas are effectively assigned zero deforestation

This results in an over-concentration of deforestation in high-risk zones, reducing spatial realism and introducing systematic bias.

In contrast, VCSP applies the VT0007 allocation framework, which:

- Distributes projected deforestation across all risk classes
- Allocates deforestation proportionally based on observed historical patterns and
- Produces a spatially balanced and more realistic projection of deforestation

The advantages of this approach are clearly reflected in model performance:

- FOM (VT0007 probabilistic allocation): **0.658**
- FOM (VM0015 deterministic allocation): **0.507**

This significant improvement demonstrates that:

- The probabilistic approach more accurately reflects real-world deforestation dynamics
- The model avoids systematic spatial bias
- The resulting baseline is more accurate, conservative, and credible, in line with VM0048 expectations

## Conservative Baseline

VCSP applies conservative assumptions aligned with VM0048, ensuring stable credit generation and avoiding significant adjustments upon transition. VM0048 is designed to reduce inflated baselines and produce lower but higher-integrity credit volumes. VCSP has proactively addressed this by: aligning its baseline assumptions with VM0048-level conservativeness; avoiding overestimation of deforestation risk and using realistic, model-validated projections

## Additionality: Why Deforestation Would Continue Without VCSP?

Without the project:

- Expansion of smallholder agriculture would continue due to low productivity
- Weak land tenure would incentivize forest clearing to claim ownership
- Lack of economic incentives to forest conversion would prevail
- Population pressure near settlements and infrastructure would accelerate clearing

VCSP directly addresses these structural drivers through:

- Agricultural intensification (reducing need for expansion)
- Secure land tenure (CCROs)
- Performance-based incentives grounded on opportunity costs and linked to conservation outcomes

## **Linking deforestation Risk and community Incentives**

VCSP establishes a direct and measurable linkage between modelled deforestation risk, observed forest outcomes, and community incentives. Performance is defined as the difference between expected and observed deforestation, ensuring that results are objectively quantified and transparently monitored.

Community payments are grounded in real opportunity costs, making forest conservation economically competitive with alternative land uses and strengthening the credibility of emission reductions.

The project complements this performance-based system with targeted interventions that address the underlying drivers of deforestation. These include:

- Provision of agricultural extension services to improve productivity on existing farmland, reducing the need for expansion through slash-and-burn practices
- Issuance of Certificates of Customary Rights of Occupancy (CCROs) to strengthen land tenure security and remove incentives for forest clearing as a means of claiming ownership

A defining feature of VCSP is its community-controlled benefit-sharing system, which places decision-making authority directly in the hands of local communities. Through annual Village General Assemblies, all adult members participate in determining:

- The proportion of revenues allocated to community development investments
- The share distributed as household dividends

This participatory “divided model” enhances transparency, accountability, and equity, while strengthening collective ownership over both forest resources and development outcomes. It also creates strong incentives for local leadership to deliver on community priorities.

The project further encourages communities to invest in long-term livelihood improvements, particularly expanding access to secondary education, thereby supporting more sustainable and diversified economic opportunities for future generations

## Leakage Management

Leakage is inherently addressed through:

- A large jurisdictional reference region capturing full landscape dynamics
- Inclusion of all major drivers of deforestation across the system
- Behavioral modelling that reflects how land-use decisions shift spatially

Together, these elements ensure that any displacement of deforestation is captured within the modelling framework, rather than externalized, consistent with VM0048 expectations.

In addition, VCSP adopts a non-displacement (“no eviction”) approach, working directly with farmers to address the underlying drivers of deforestation by:

- Enhancing agricultural productivity on existing farmland, reducing the need for expansion
- Strengthening land tenure security through the issuance of Certificates of Customary Rights of Occupancy (CCROs)

This integrated approach minimizes the risk of activity shifting while ensuring that emission reductions are both socially responsible and environmentally robust.

## Conclusion

The Village Climate Solutions Project (VCSP) is fully VM0048-ready, delivering jurisdictional-scale baselines, high-resolution data, empirically validated deforestation risk modelling, probabilistic allocation, and conservative baseline assumptions. These technical foundations are reinforced by strong, performance-based community incentives directly linked to deforestation risks and underlying drivers.

As a result, VCSP does not require adaptation to meet VM0048 requirements, it is already operating at the VM0048 standard, combining methodological rigor with grounded, community-driven implementation.

For more details, read the methodological annex in our project document available at [Verra Registry](#)