

Mineral certification and the conditions for production change

For government decision makers in Peru, Colombia and the Democratic Republic of the Congo and international partners

Elies Lucio | 24 September 2026

The decision

Commission a limited pilot before expanding mineral certification. Follow certified transactions through to production, outside sales, producer payments and public cash requirements. The three calibrations accompanying *For a Handful of Gold* explain why this wider account matters. Better screening can improve origin claims while barely changing extraction. Trading arrangements can keep mines operating by shifting losses to intermediaries. Where adjustment depends on public intervention, the state must receive enough of the return to sustain its effort. [1–4]

The calculations offer grounds for appraisal; national benefits, implementation costs and affordability remain unestablished, and deployment requires its own approval. Their scope includes selected gold-production strata in Peru and Colombia, cobalt in the Democratic Republic of the Congo (DRC), world markets and hypothetical local economies. The “candidate” strata are model-defined exposure scenarios. They do not measure illegal mining, armed control or harm. Each model examines a different part of the problem; they have not been jointly estimated.

Follow the material beyond the certificate

Certification governs access to a preferred market. A producer who loses that access may find another buyer, allowing extraction to continue after a certificate is rejected. Officials therefore need to distinguish the material that passes certification from the material that is produced or sold elsewhere. Certificate shares and trade destinations cannot, on their own, reveal how much production has changed.

In the gold scenarios covering mine supply, with responses that differ across origins, raising the assumed probability of late discovery from 25% to 35% or 50% reduces candidate extraction by 0.0056–0.21% in Peru and 0.0030–0.055% in Colombia. Diligence takes chosen values, and outside spending stays fixed within each comparison. The ranges give the smallest and largest effects among the explored scenarios, under regional procurement and margin assumptions. Peru's procurement evidence remains provisional; applying regional purchase-price ratios to a national candidate stratum is a further assumption. Those ratios alone cannot establish how supply responds to prices. The exercise excludes cases outside its maintained market branch with positive fraud. These restrictions preclude a national forecast. [2]

For the DRC candidate stratum, extraction falls by 0.057–0.74% when cobalt is modeled alone and by 0.013–0.19% when an assumed copper-cobalt revenue link supports production. The latter assumption draws on an industrial revenue comparison, rather than measured artisanal production technology. Revenue from a second product can weaken the effect of restricting sales of the first.

Outside purchases can change even the direction of the result. When the production scenarios combine tighter screening with chosen increases or decreases in outside spending, production effects reverse sign. Any proposal to reduce extraction must therefore examine the remaining buyers and the prices they offer. The immediate implication is to measure diversion and alternative sales. The feasibility, cost and merits of restricting outside demand remain open questions.

Establish who absorbs the loss

A high transmission rate can apply to a very small flow. In the shared world gold market example, assumed late discovery rises from 25% to 50%. The resulting fall in extraction equals about 90% of the candidate entries displaced from certification. Those entries amount to just 0.018% of initial candidate output; total candidate extraction consequently falls by about 0.016%. This comparison holds outside spending fixed and applies the provisional upper Peruvian procurement ratio to world supply, assuming zero net recovery. It cannot be read as an effect on Peru's national production. Both the displaced flow and the total output base are needed to judge its scale. [3]

Who absorbs a charge depends on the organization of trade. In the hypothetical village economies, selling arrangements, access to essential goods and households' outside options determine how a buyer charge reaches production. In some configurations, intermediaries absorb it through lower profits and output stays unchanged. Allowing all three institutional responses preserves output in the explored comparisons, but does not establish that household welfare is protected. Other sensitivity configurations have no activity before or after the charge; their zero change says nothing about protecting an operating mine.

An institution's contribution can also reverse sign. Extending a charge to a losing buyer can alter auction payments and turn the selling institution's contribution negative. Rival offers and payment rules matter alongside the covered buyer's purchases. The pilot should therefore record losing and absent bids, household consumption and income, and entry or exit, as well as mineral quantities. These are proposed observations; the calibration has not collected them.

Finance the adjustment that the incentives can sustain

Over time, certification affects the returns to research as well as current sales. The dynamic calibration examines private research and government intervention in separate gold and cobalt economies. Halving the assumed share of potential tax proceeds received by government eliminates intervention attempts through model period 100 in every explored policy case for the affected governments. Market production effects still occur: the revenue condition concerns public intervention. The model does not translate its periods into years. [4]

Screening alone produces small changes. With private research and assumed late discovery raised from 25% to 50%, period-100 world candidate output falls by about 0.013–0.014% for gold and 0.28–0.35% for cobalt. Combined scenarios yield contractions of 12–15% and 8.49–8.54%, respectively, while imposing an outside-expenditure decline approaching 25%. The cost and feasibility of inducing that decline are unmeasured. These ranges are explored scenario extrema. The larger effects cannot be attributed to screening alone, and comparisons with the static model cannot rank policies. Two configurations with frozen technology and growing certified spending lack a supported continuation and are excluded.

Research support has different consequences in the two markets. In cobalt, private research already chooses the supported technology, leaving the support instrument redundant. In gold, support changes research and requires grants. Under the central supported gold baseline, discounted expected grants over periods 0–100 total about US\$13.6 billion; discounted positive central cash deficits after fees total about US\$3.2 billion. These model accounts are scaled to nominal reference values and use a 0.95 discount factor per model period. They are not annual agency budgets. Grants already enter the cash account, so adding the two totals would count them twice.

Refundable collateral ties up cash and creates a liability for its holder; its principal belongs in a separate account from operating expenditure and financing charges. Later tax receipts cannot meet an earlier cash shortfall without bridge finance. Governments and partners need to identify who pays, when payment falls due, and the borrowing terms and authority. Fees that cover modeled operations alone establish neither affordability nor a positive social return.

Compare a small set of next steps

These options assign proposed appraisal tasks. Each government would designate the legally competent bodies; no existing agency mandate is asserted here. Cross-border coordination, finance and technical assistance require explicit agreements.

Option	Responsible actor	Mechanism	Distributional trade-off	Financing implication	Condition before proceeding
Certification pilot	Nationally designated authority and participating buyers	Link audits to lots and outside sales	Fees and exclusion can burden sellers	Budget verification and liquidity separately	Compatible production and transaction records; reviewable comparison design
Livelihood and transaction safeguards	Nationally designated social and market bodies	Measure outside options and bargaining	Support may protect consumption while sustaining output	Identify the payer for support	Observe household budgets, offers and participation; choose welfare outcomes
Coordinated adjustment appraisal	Governments, buyer partners and willing international funders	Examine outside demand, research and collection	Losses and gains differ across actors and borders	Separate grants, country cash bridges and refundable principal	Verify authority, capture, operational costs and any outside-spending response

Evidence for the next decision

Before implementation, choose the objective: reliable origin claims, reduced candidate production, improved livelihoods or reduced measured harm. These objectives require different observations and may conflict. Set the pilot's duration, outcome definitions and expansion thresholds in advance. The thresholds are policy choices, not estimates from these models. An independent reviewer should examine the assignment or comparison design before any causal evaluation or statistical power calculation.

The review must distinguish certificate reliability from changes in production and welfare. Reliable audits with stable production could meet the first objective and miss the second. Lower output with worsening essential consumption could undermine the livelihood objective. Decisions to continue, redesign or stop should follow the agreed outcomes and funding limits, with reasons recorded.

The required records connect assayed lots to quantities, deductions, payments, buyer offers and repeat audits; household budgets to participation and exit; and tax liabilities to dated collections. They also track the success, reach and reversal of attempted interventions. International partners can help reconcile cross-border records and assess financing proposals, subject to national authority. The existing research materials provide collection templates, with no observations yet entered.

Expansion should require evidence that the intended outcome improves, the distribution of costs is acceptable under the chosen objectives, and identified actors can finance the cash requirements. Current new causal policy-effect significance is **NOT ESTIMABLE FROM CURRENT EVIDENCE**. The next decision rests on collecting that evidence and establishing who will bear the costs of adjustment.

References and research materials

[1] Lucio, Elies. 2026. *For a Handful of Gold*. Verified 13 September edition. [2] Lucio. 2026. *Certification, procurement and production*. [3] Lucio. 2026. *Policy transmission and institutional resilience*. [4] Lucio. 2026. *Innovation, market segmentation and state capacity*. Calibrations revised 24 September. Exact records, definitions and verification are in [calibration_revision_2026-09-24](#); publication claim crosswalk and local reproduction links accompany this brief.