

Green finance, institutional trust and energy-transition governance in Morocco

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Abstract

This article examines the institutional conditions under which green finance can effectively support Morocco's energy transition. Existing research documents financial instruments and renewable-energy projects, but rarely connects institutional trust, instrument credibility and multilevel governance within one African stakeholder-based empirical framework. It asks: under what institutional conditions is green finance perceived as effective by Moroccan energy-transition stakeholders? The study uses questionnaire data from 200 entrepreneurs, bankers, financial experts, environmental experts and public decision-makers. Descriptive analysis, reliability testing and structural equation modelling show that perceived credibility and transparency are positively associated with perceived effectiveness ($\beta = 0.797$), perceived benefits ($\beta = 0.740$) and lower perceived barriers ($\beta = 0.747$), with $p < 0.001$ and $\alpha = 0.93$. International cooperation appears operationally useful, but the strategic-appropriation dimension has negative reliability ($\alpha = -0.35$), while the second model has inadequate fit (RMSEA = 0.156; SRMR = 0.144). No definitive structural inference is therefore drawn from that component. The article concludes that green finance operates as a governance arrangement whose developmental effectiveness depends on traceability, credible disclosure, domestic coordination and institutional learning.

Keywords: Morocco; green finance; energy transition; institutional trust; credibility; multilevel governance; structural equation modelling; Africa.

Classification JEL: Q56; G18; Q42; O13.

Paper type: Empirical Research.

Résumé

Cet article étudie les conditions institutionnelles dans lesquelles la finance verte peut soutenir efficacement la transition énergétique du Maroc. La littérature documente les instruments financiers et les projets renouvelables, mais analyse encore rarement, dans un même cadre empirique africain, la confiance institutionnelle, la crédibilité des instruments et la gouvernance multi-niveaux. La question posée est la suivante : dans quelles conditions institutionnelles la finance verte est-elle perçue comme efficace par les acteurs marocains de la transition énergétique ? L'étude mobilise un questionnaire administré à 200 parties prenantes, dont des entrepreneurs, banquiers, experts financiers, experts environnementaux et décideurs publics. Les analyses descriptives, les tests de fiabilité et la modélisation par équations structurelles montrent que la crédibilité et la transparence perçues sont positivement associées à l'efficacité perçue ($\beta = 0,797$), aux bénéfices perçus ($\beta = 0,740$) et à la réduction des obstacles ($\beta = 0,747$), avec $p < 0,001$ et $\alpha = 0,93$. La coopération internationale soutient la capacité opérationnelle, mais la dimension d'appropriation stratégique présente une fiabilité négative ($\alpha = -0,35$) et le second modèle un ajustement insuffisant (RMSEA = 0,156 ; SRMR = 0,144). Ces résultats imposent une interprétation prudente de cette composante. L'article conclut que la finance verte fonctionne comme un dispositif de gouvernance dont l'efficacité dépend de la traçabilité, de la transparence et de l'apprentissage institutionnel national.

Mots clés : Maroc ; finance verte ; transition énergétique ; confiance institutionnelle ; crédibilité ; gouvernance multi-niveau ; modélisation par équations structurelles ; Afrique.

JEL Classification : Q56 ; G18 ; Q42 ; O13.

Type du papier : Recherche empirique.

1. Introduction

Across Africa, climate policy is increasingly mediated through financial instruments, institutional partnerships and development strategies that connect decarbonisation with economic transformation. Energy transitions are not limited to technological substitution. They are political, organisational and social processes in which states, investors, public agencies, firms and international organisations negotiate the direction, credibility and distributive consequences of low-carbon development. This institutional perspective is especially relevant in economies that must improve energy security, expand infrastructure, preserve fiscal space and meet international climate commitments at the same time.

The scale and composition of African climate finance make this governance question particularly important. Climate Policy Initiative (CPI) reports that tracked climate finance to Africa averaged USD 43.7 billion in 2021 and 2022, while international sources supplied 87 per cent of the total and private finance represented only 18 per cent. The same assessment concludes that current flows cover only a limited share of the investment needs associated with African nationally determined contributions (CPI, 2024). These continental patterns do not determine the Moroccan case, but they show why the credibility of financial arrangements, domestic resource mobilisation and institutional learning are central to the effectiveness of external support.

Morocco is a prominent case in debates on renewable energy and climate finance. It has developed large solar and wind programmes, dedicated public institutions and a stated target of raising renewable sources to 52 per cent of installed electricity capacity by 2030. The World Bank's Morocco Country Climate and Development Report estimates that a resilient and low-carbon pathway to the 2050s would require investment with a present value of about USD 78 billion and identifies governance, financing and equity as cross-cutting issues (World Bank, 2022). The country's visibility as a renewable-energy frontrunner therefore coexists with high capital needs, dependence on external resources, uneven territorial capacities and the practical challenge of converting climate ambition into bankable and socially credible projects.

Green bonds, green loans and climate-finance facilities do not automatically generate transformative outcomes. Market participants must consider the environmental label reliable, the use of proceeds traceable, reporting accurate and project-selection rules credible. The Green Bond Principles place use of proceeds, project evaluation and selection, management of proceeds and reporting at the centre of market integrity (ICMA, 2025). These requirements make green finance an institutional arrangement rather than a neutral channel through which capital simply moves toward projects.

A specific scientific gap follows from this observation. Research on corporate green bonds links credible issuance and disclosure to firm and investor outcomes (Flammer, 2021; Tang and Zhang, 2020), while African studies emphasise the effects of financial development, green investment and institutional quality (Antwi et al., 2024; Nchofoung et al., 2024). Recent reviews also identify weak regulatory frameworks, perceived risk, limited local capacity and dependence on external resources as recurring constraints on African green finance (Lwesya, 2025). However, the literature still rarely examines, within one stakeholder-based model, how perceived institutional credibility connects green financial instruments, multilevel cooperation and governance capacity in Morocco. Existing Morocco-focused work more often studies energy systems, technology strategies or macroeconomic relationships than the perceptions through which actors judge the credibility of instruments (Ikram and Sadki, 2024). This article addresses that narrower gap without claiming that stakeholder perceptions measure observed investment performance.

The analysis distinguishes institutional trust from institutional credibility. Institutional trust is a relational willingness to accept vulnerability based on positive expectations about another

actor or system. Credibility is an attributed quality: the perceived capacity of a rule, institution or instrument to deliver reliable information and honour stated commitments. The distinction follows the organisational-trust literature, which treats ability, benevolence and integrity as antecedents of trust rather than synonyms for it (Mayer et al., 1995). In the present study, transparency, traceability and reporting are treated as observable credibility cues. Trust describes the broader stakeholder response that may arise when these cues reduce uncertainty. The central research question is therefore: under what institutional conditions does green finance become effective in supporting Morocco's energy transition, as perceived by the stakeholders who finance, implement or evaluate transition-related activities? Two hypotheses organise the empirical analysis. H1 states that perceived credibility and transparency of green financial instruments are positively associated with perceived effectiveness, perceived benefits and lower perceived barriers. H2 states that international cooperation strengthens operational capacity, but that its contribution to strategic appropriation depends on coherent domestic institutional learning. The second hypothesis is intentionally conditional because cooperation may deliver resources without producing a shared national understanding of long-term priorities.

The article makes three contributions. First, it integrates sustainable-finance research with institutional analysis by treating transparency and traceability as governance mechanisms that structure stakeholder judgments. Second, it provides evidence from a Moroccan sample of 200 professional stakeholders, thereby complementing aggregate cross-country and project-centred research. Third, it separates the operational usefulness of international cooperation from its strategic appropriation. This distinction helps explain how externally supported projects may advance even when domestic actors do not share a stable view of the institutional purpose of cooperation.

The scope of the claims is deliberately limited. The data are cross-sectional and perception-based; the sample is non-probabilistic; and the available analytical record does not contain every item-level diagnostic required for full measurement validation. The results are therefore interpreted as structured associations among stakeholder perceptions, not as causal effects or representative estimates for the Moroccan population. This caution is particularly important for the cooperation model, whose reliability and residual-fit indicators are problematic.

The remainder of the article is structured as follows. Section 2 reviews green-finance credibility, institutional trust, socio-technical transition theory and multilevel governance, and then derives the hypotheses and conceptual model. Section 3 presents the Moroccan context, sampling logic, measures, analytical strategy and methodological limitations. Section 4 reports the descriptive, reliability and structural results, discusses their interpretation and develops actor-specific implications. Section 5 concludes with the theoretical contribution, limitations and operational research questions for future work.

2. Literature review and analytical framework

2.1. Green finance, information and instrument credibility

The literature on green finance has grown with the expansion of green bonds, sustainability-linked instruments, environmental, social and governance investment strategies and climate-related disclosure frameworks. A common premise is that financial markets can redirect capital toward environmentally sustainable activities when standards, incentives and information systems reduce uncertainty. Evidence on corporate green bonds suggests that labelled issuance can be associated with environmental commitments and market responses, but the meaning of the label depends on credible project selection, external review and post-issuance reporting (Flammer, 2021; Tang and Zhang, 2020). Deschryver and de Mariz (2020) similarly identify transparency and comparability as conditions for expanding the green bond market.

Credibility problems arise because issuers and investors do not possess the same information about project eligibility, environmental additionality or the use of proceeds. Green-finance standards seek to reduce these asymmetries by specifying processes rather than guaranteeing outcomes. The current Green Bond Principles emphasise transparent disclosure, the management of proceeds and reporting, while recommending external review as a means of strengthening market integrity (ICMA, 2025). These mechanisms do not eliminate greenwashing risk, but they create observable signals against which stakeholders can evaluate an instrument.

The relationship between green finance and wider sustainability outcomes is also conditioned by institutional quality. Friede et al. (2015) show that the relationship between environmental, social and governance practices and financial performance is heterogeneous across a large body of studies. More recent African evidence indicates that governance quality can moderate the environmental effects of financial development and green investment (Antwi et al., 2024), while green finance and green innovation are associated with industrial-development outcomes across African countries (Nchofoung et al., 2024). These aggregate results motivate, but do not replace, analysis of how professional stakeholders interpret credibility in a specific national setting.

2.2. Institutional trust and perceived credibility

Institutional analysis explains why formal rules and enforcement arrangements shape expectations. Institutions reduce uncertainty by structuring interactions and making commitments more predictable (North, 1990). Applied to green finance, this perspective suggests that taxonomies, eligibility rules, reporting systems and verification procedures influence whether market participants consider an environmental claim dependable. Credibility is therefore attached to the design and implementation of the arrangement, whereas trust describes a stakeholder's readiness to rely on that arrangement under uncertainty.

The distinction is analytically important. Mayer et al. (1995) define trust as a willingness to be vulnerable based on positive expectations, while identifying perceived ability, benevolence and integrity as antecedents. A green instrument can appear credible because its rules are clear, proceeds are traceable and reporting is externally reviewable. These attributes may support trust, but the two concepts are not interchangeable. The questionnaire indicators used here primarily capture perceived credibility and transparency; the term institutional trust is reserved for the broader relational interpretation that links those perceptions to willingness to rely on the governance system.

This approach also prevents an overly individualised interpretation. Respondents are not simply rating a bank or public agency. They are evaluating an institutional field that includes issuers, regulators, ministries, project developers, auditors and international partners. Strong associations between credibility cues and perceived effectiveness would therefore indicate a coherent stakeholder schema, not proof that an individual institution objectively performs well.

2.3. Socio-technical transitions and multilevel governance

Energy-transition research adds a systems perspective. Transitions emerge through interactions among technologies, infrastructures, markets, policy and social groups (Geels, 2002). Governance studies further show that transitions are shaped by selection pressures, coordination and the capacity to align actors operating at different levels (Smith et al., 2005). Green finance is one component of this architecture. Capital can support renewable-energy deployment, but finance alone cannot resolve regulatory instability, weak project pipelines, grid constraints or unequal territorial capacity.

Multilevel governance is especially relevant where domestic transition strategies depend on multilateral banks, climate funds, bilateral agencies and development-finance institutions.

These actors can provide concessional resources, guarantees, expertise and policy support, yet authority and knowledge remain distributed across levels of government and non-state networks (Bulkeley and Betsill, 2005). Cooperation may therefore improve project execution without producing strategic coherence. Newell and Mulvaney (2013) add a political-economy concern: low-carbon change must be assessed through the distribution of benefits, costs and capabilities, not only through installed capacity or finance volumes.

Recent African evidence reinforces this point. The continent's climate finance remains strongly dependent on international sources, and finance is concentrated across countries and sectors (CPI, 2024). The systematic review by Lwesya (2025) identifies institutional weakness, limited technical capacity, perceived investment risk and underdeveloped markets among the recurring obstacles. International cooperation can address some of these constraints, but its developmental value depends on whether knowledge, project-preparation capacity and monitoring systems become embedded in domestic institutions.

2.4. The Moroccan case and the empirical gap

Morocco combines long-term renewable-energy planning with active engagement in international climate and development finance. Its public agencies and flagship projects have made the country visible in energy-transition debates, while national plans increasingly connect renewables, industrial policy and green technologies. Recent research on Morocco examines green-technology strategy and the institutional conditions of sustainable development (Ikram and Sadki, 2024), while the World Bank identifies decarbonisation, climate resilience, financing, governance and equity as interdependent policy challenges (World Bank, 2022).

This literature establishes the relevance of the case but leaves a specific empirical question open. Studies based on macroeconomic indicators or technology assessments do not show whether entrepreneurs, bankers, experts and public decision-makers interpret green instruments through a shared credibility framework. Nor do they necessarily distinguish concrete benefits from the strategic appropriation of external partnerships. The present study does not claim that no prior work addresses Moroccan green finance. Its contribution is narrower: it jointly examines stakeholder perceptions of instrument credibility, perceived outcomes and international cooperation in one institutional-governance framework.

2.5. Hypotheses and conceptual model

H1. *Perceived credibility and transparency of green financial instruments are positively associated with perceived effectiveness, perceived benefits and lower perceived barriers.*

H2. *International cooperation is positively associated with operational capacity, but its contribution to strategic appropriation depends on coherent domestic institutional learning.*

Figure 1: Conceptual model of the study

Explanatory construct	Hypothesis	Outcome dimensions
Perceived credibility and transparency	H1	Perceived effectiveness Perceived benefits Lower perceived barriers
International cooperation	H2	Operational capacity Strategic appropriation

Source: Authors' conceptualisation.

The two components are estimated separately on the same sample. They are not two subsamples and they do not constitute a single integrated structural model. This separation follows the distinct measurement problems of instrument credibility and international cooperation and is essential to the interpretation of fit indices.

3. Research methodology

3.1. Research context: Morocco

Morocco provides an analytically useful setting because climate ambition, international partnerships and domestic institutional capacity interact directly. The renewable-capacity target for 2030 and the scale of investment needs identified in the national climate and development assessment imply that public budgets cannot finance the transition alone (World Bank, 2022). Coordination is required among public institutions, commercial banks, project developers, firms, investors and international partners.

Flagship projects demonstrate planning and implementation capacity, but they do not remove questions about access to finance, scale, territorial inclusion and the bankability of smaller initiatives. For firms and local actors, eligibility criteria, project-preparation expertise and information can determine whether a formally available instrument is usable in practice. The case therefore enables analysis of the relationship between climate ambition and perceived institutional credibility rather than an evaluation of any single project or institution.

3.2. Research design and sampling

The study uses a cross-sectional questionnaire completed by 200 Moroccan stakeholders involved directly or indirectly in green finance and the energy transition. Five functional categories were targeted: policy-makers, entrepreneurs, financial experts, bankers and environmental experts. The sampling strategy is best characterised as purposive and non-probabilistic because inclusion was based on professional relevance to the institutional field rather than random selection from a complete population frame. The design seeks functional diversity and cannot support population-level prevalence estimates.

The final distribution is balanced across categories: entrepreneurs account for 20.5 per cent of the sample, financial experts 20.0 per cent, bankers 20.0 per cent, environmental experts 20.0 per cent and policy-makers 19.5 per cent. Approximately 70 per cent report more than ten years of professional experience. The recruitment log supplied with the manuscript did not state the number of persons invited or contacted. A response rate therefore cannot be calculated reliably and is not reported.

The survey documentation available for this revision does not contain a verifiable record of a pilot test, expert-content validation, or a formal translation and back-translation procedure. No such procedure is claimed retrospectively. The absence of that record limits the assessment of content equivalence in a potentially multilingual setting and is treated as a methodological limitation requiring correction in a future administration.

Table 1: Survey design and respondent profile

Category	Share of sample	Interpretive relevance
Entrepreneurs	20.5%	Project development and market implementation
Financial experts	20.0%	Assessment of investments and instruments
Bankers	20.0%	Credit allocation and financial intermediation
Environmental experts	20.0%	Environmental credibility and technical assessment
Policy-makers	19.5%	Public policy and institutional coordination
More than 10 years of experience	Approximately 70%	Professional maturity of the surveyed field

Source: Authors, based on survey data (2025).

3.3. Questionnaire and measurement

The questionnaire covered socio-professional characteristics, perceptions of the energy transition, knowledge and evaluation of green financial instruments, international cooperation, technology and innovation. Responses used a four-point Likert scale. An even number of

response categories was used to obtain a directional judgment where the instrument required agreement or disagreement rather than selection of a neutral midpoint. This design may reduce midpoint use, but it can also force uncertain respondents toward a directional category and affect response distributions. The trade-off is recognised in the interpretation.

The first empirical component focuses on the perceived credibility and transparency of green financial instruments. Three outcome dimensions are examined: perceived effectiveness, perceived benefits and lower perceived barriers. The second component distinguishes the operational experience of international cooperation from its strategic appropriation. Operational experience concerns access to support, resources and knowledge transfer. Strategic appropriation concerns the perceived place of partnerships within domestic long-term governance.

Cronbach's alpha is used as an internal-consistency diagnostic. A high coefficient supports consistency among items but does not, on its own, establish unidimensionality or construct validity. A negative coefficient indicates a severe measurement problem that can arise from inconsistent item direction, coding errors, multidimensionality or negative average covariance. Such a result cannot be interpreted as merely an interesting substantive ambivalence; it requires item-level diagnosis before the construct is used for structural inference.

3.4. Analytical strategy, model separation and reproducibility limits

The empirical strategy combines descriptive statistics, internal-consistency analysis and structural equation modelling. The two models are estimated independently on the same 200 observations. The sample is not divided between models. Model 1 tests the association of perceived credibility and transparency with effectiveness, benefits and lower barriers. Model 2 assesses the distinction between the operational experience and strategic appropriation of international cooperation.

A sample of 200 can be adequate for a compact structural model, but adequacy depends on the number of freely estimated parameters, indicator quality, estimator, distributional assumptions and missing-data treatment rather than on a universal minimum (Kline, 2016). In the present case, the available analytical record reports CFI, TLI, RMSEA and SRMR but does not preserve the chi-square statistic, model degrees of freedom, estimator or complete item-level output. The statistical package is likewise not identified in the supplied record. These elements cannot be reconstructed from the summary coefficients and are not invented in this revision.

The absence of chi-square, degrees of freedom, estimator, standardised loadings, average variance extracted and discriminant-validity diagnostics limits reproducibility and prevents a complete assessment of the measurement model. Accordingly, the first model is interpreted as evidence of coherent associations rather than a confirmed causal structure. The second model is treated as inadequately fitting and its structural implications are not considered established. Full replication requires the raw item-level dataset, codebook and original analysis syntax or output.

A multi-group comparison is not reported. Each occupational group contains about 39 to 41 respondents, and the available materials do not include measurement-invariance tests or item-level data. Estimating group differences without demonstrating configural and metric invariance would risk attributing measurement differences to substantive professional effects. Occupational category and experience should therefore be analysed as controls or grouping variables only after the measurement model has been repaired and re-estimated.

3.5. Ethical and data-protection considerations

The documentation supplied for revision does not include a formal ethics-committee approval reference or a complete consent and anonymisation protocol. The article therefore makes no unsupported claim of institutional approval. This documentary gap is a limitation. Any final submission should be checked against the authors' original fieldwork records so that the

applicable consent, confidentiality, data-retention and institutional-review information can be reported accurately. No claim about these procedures should be added without verifiable documentation.

4. Results and discussion

4.1. Descriptive profile and Model 1 results

The balanced distribution across the five professional categories reduces the risk that the descriptive profile reflects only one occupational viewpoint. It does not, however, transform the purposive sample into a representative one. The high share of respondents with more than ten years of experience indicates professional maturity, while potentially giving less weight to newer entrants and younger professionals.

For the green-financial-instrument items, Cronbach's alpha equals 0.93 and the average inter-item correlation is 0.76. The values indicate strong internal consistency, although a very high average inter-item correlation can also signal item redundancy. The available output does not permit inspection of item-total correlations or a complete factor-validation assessment. The scale is therefore described as internally consistent, not fully validated.

The standardised associations between perceived credibility and transparency and the three outcome dimensions are positive and statistically significant in the reported output. The coefficient is 0.797 for perceived effectiveness, 0.740 for perceived benefits and 0.747 for lower perceived barriers, with p-values below 0.001. These estimates support H1 at the level of stakeholder perceptions: respondents who judge instruments to be more credible and transparent also tend to judge them more effective, beneficial and less constrained.

Reported values of CFI = 1.000, TLI = 1.000 and RMSEA = 0.000 cannot be treated as independent evidence of excellent fit without the chi-square statistic and degrees of freedom. Such values commonly occur in saturated or nearly saturated specifications for which global fit has little discriminating value. Since the archived results supplied for revision do not include those missing quantities, the fit claim is withdrawn. Interpretation rests on the reported coefficients, their direction, significance and the internal-consistency result, subject to the measurement limitations already stated.

Table 2: Credibility, transparency and perceived outcomes

Relationship or diagnostic	Reported value	Interpretation
Credibility/transparency with perceived effectiveness	$\beta = 0.797$; $p < 0.001$	Strong positive association
Credibility/transparency with perceived benefits	$\beta = 0.740$; $p < 0.001$	Strong positive association
Credibility/transparency with lower perceived barriers	$\beta = 0.747$; $p < 0.001$	Strong positive association
Internal consistency	$\alpha = 0.93$	High; possible item redundancy should be checked
Global-fit indices	CFI = 1.000; TLI = 1.000; RMSEA = 0.000	Not interpretable without χ^2 and degrees of freedom

Source: Authors, based on survey data (2025).

4.2. Model 2 and psychometric diagnosis

The operational-experience dimension of international cooperation has a reported Cronbach's alpha of 0.77, which is compatible with acceptable internal consistency for exploratory analysis. The strategic-perception dimension has $\alpha = -0.35$. This negative coefficient is a serious psychometric anomaly. It means that the items do not operate as a coherent scale in the reported scoring and may reflect reverse-coding problems, heterogeneous content or a failure of unidimensionality.

The available materials do not contain the item wording, item-total correlations, inter-item covariance matrix or raw data required to determine which explanation is correct. A purification procedure cannot be performed responsibly from aggregate coefficients. The strategic-perception scale is therefore excluded from definitive substantive inference. H2 is only partially consistent with the descriptive evidence on operational usefulness and is not validated for strategic appropriation.

The second model also has inadequate residual fit: RMSEA equals 0.156 and SRMR equals 0.144, both well above conventional thresholds commonly used as diagnostic guides. High CFI and TLI values of 0.999 do not offset the residual misfit. This pattern requires respecification and re-estimation, not a softened description of a minor need for refinement. The cooperation model is retained only to document the measurement problem and to define a future analytical task.

A defensible re-analysis would begin by verifying item coding and reverse-scored statements, inspecting inter-item and item-total correlations, evaluating standardised loadings and residuals, and testing a revised measurement structure. Composite reliability, average variance extracted and discriminant validity should then be reported before any structural paths are interpreted. These procedures require the item-level dataset and original analysis environment.

Table 3: International cooperation and measurement diagnostics

Dimension or index	Reported value	Revised interpretation
Operational experience	$\alpha = 0.77$	Acceptable internal consistency for exploratory use
Strategic perception	$\alpha = -0.35$	Invalid as a coherent scale pending item-level diagnosis
Incremental fit	CFI = 0.999; TLI = 0.999	Insufficient to establish fit when residual indices are poor
Residual fit	RMSEA = 0.156; SRMR = 0.144	Inadequate; model requires respecification
Hypothesis H2	Partially supported	Operational aspect only; strategic aspect not validated

Source: Authors, based on survey data (2025).

4.3. Discussion: credibility as governance infrastructure

The first model shifts attention from the nominal availability of climate finance to the institutional conditions under which stakeholders regard it as usable. Respondents connect effectiveness, benefits and lower barriers with credibility and transparency. This pattern is consistent with green-bond research showing that disclosure and credible commitments matter for corporate and investor responses (Flammer, 2021; Tang and Zhang, 2020). It also supports an institutional interpretation: standards and reporting reduce uncertainty by making environmental claims more assessable (North, 1990; ICMA, 2025).

The result should not be overstated. The dependent variables are perceptions collected from the same respondents at one point in time. Shared method, similar wording and respondent consistency may inflate correlations. The study did not preserve a procedural or statistical common-method-bias diagnostic in the supplied analytical record. This risk is therefore recognised explicitly. Future work should separate predictor and outcome measurement temporally, use independent project or financial data, vary response formats where justified and test marker-variable or latent-method-factor specifications when the design supports them.

The cooperation findings must be interpreted more cautiously than in the original manuscript. Operational support, resource access and knowledge transfer may be visible to respondents, but the strategic-perception scale does not provide reliable evidence of a shared national interpretation. This is compatible with multilevel-governance theory, in which resources and authority are distributed among domestic and international actors (Bulkeley and Betsill, 2005).

It is also consistent with current African climate-finance evidence showing strong reliance on international sources and persistent domestic capacity gaps (CPI, 2024; Lwesya, 2025). The empirical results, however, cannot determine whether dependence or fragmented governance causes the measurement instability.

The distinction between credibility and trust clarifies the theoretical contribution. Traceability, reporting and verification are perceived attributes of instruments and institutions. They can make commitments credible. Trust is the relational willingness to rely on those arrangements when outcomes remain uncertain. The observed associations show that credibility cues organise stakeholder perceptions; they do not directly measure behavioural reliance, investment decisions or institutional performance. This more precise formulation places the findings within institutional and organisational-trust theory (Mayer et al., 1995).

The Moroccan case also qualifies celebratory accounts of renewable-energy leadership. Flagship projects and ambitious targets demonstrate policy capacity, yet the next phase of transition requires credible access pathways for firms, banks and territorial actors. Recent Morocco-focused research stresses that technology strategy and sustainable-development choices must be considered as integrated systems (Ikram and Sadki, 2024). The present stakeholder evidence adds that integration must include information quality, reporting and domestic learning.

No multi-group conclusion is drawn. Professional categories may differ in their evaluation of eligibility rules, risk, environmental integrity or international partnerships, but a valid comparison requires measurement invariance and sufficient group-level information. The nearly balanced occupational profile creates a useful basis for future analysis, not proof of cross-group equivalence.

4.4. Actor-specific governance implications

Table 4: Operational recommendations by stakeholder group

Actor	Priority action	Expected governance contribution
Regulators and public authorities	Publish coherent eligibility rules, reporting expectations and comparable indicators; coordinate sectoral and territorial implementation.	Greater predictability, oversight and policy coherence.
Banks and financial institutions	Develop green-project appraisal skills, document allocation decisions and report environmental use of funds.	Improved credibility, risk assessment and traceability.
Entrepreneurs and project developers	Strengthen project preparation, impact baselines and verifiable reporting from project design onward.	More bankable projects and lower information asymmetry.
Environmental and financial experts	Support independent review, measurement quality and professional training across institutions.	Stronger technical integrity and comparable evidence.
International partners	Attach support to co-designed knowledge transfer, local analytical capacity and transparent exit or handover arrangements.	Greater domestic appropriation and reduced long-term dependence.

Source: Authors' recommendations derived from the literature and study findings.

4.5. Limitations

First, the cross-sectional design identifies associations among perceptions and does not establish causality. Second, purposive sampling supports functional diversity but not statistical representativeness, and the response rate cannot be calculated from the available recruitment documentation. Third, the use of one questionnaire and one measurement occasion creates a risk of common method bias. Fourth, the available record does not document a pretest,

translation protocol, formal ethics approval, estimator, software, chi-square, degrees of freedom or complete missing-data treatment.

Fifth, the measurement model is incompletely reported because standardised item loadings, average variance extracted, composite reliability and discriminant validity are unavailable. Sixth, the negative alpha for strategic perception and the poor RMSEA and SRMR of the cooperation model preclude definitive inference. Seventh, professional groups and experience are not used as controls because the supplied materials do not support measurement-invariance testing or reliable multi-group estimation. These limitations materially restrict the scope of the conclusions and define the requirements for replication.

5. Conclusion

This article examines the institutional conditions under which green finance is perceived as effective in Morocco's energy transition. The strongest empirical result is the consistent positive association of perceived credibility and transparency with perceived effectiveness, benefits and lower barriers. The reported standardised coefficients range from 0.740 to 0.797 and the credibility scale has high internal consistency. These results support H1 as an association among stakeholder perceptions, subject to the cross-sectional design and incomplete measurement diagnostics.

The cooperation component does not support an equally strong conclusion. Operational experience has acceptable internal consistency, but the strategic-perception scale has a negative alpha and the model has poor residual fit. H2 is therefore only partially supported. International cooperation may provide visible operational resources, but the current measurement cannot establish coherent strategic appropriation. Treating this limitation openly strengthens the study by separating a substantive policy concern from an invalid scale-based inference.

The theoretical contribution lies in connecting institutional economics, organisational trust and multilevel transition governance. Rules, reporting and traceability operate as credibility devices that reduce uncertainty. Stakeholders may develop trust when these devices make institutional commitments dependable. International cooperation adds a second level of governance in which operational resources do not automatically become domestic strategic capacity. Green finance is thus conceptualised as an institutional arrangement embedded in national and international coordination, rather than as a purely technical financial product.

The practical implications differ by actor. Regulators should provide stable taxonomies, eligibility criteria and comparable disclosure requirements. Banks should strengthen project appraisal and allocation reporting. Entrepreneurs should integrate verifiable environmental indicators into project preparation. Experts should reinforce independent review and measurement quality. International partners should make co-design, knowledge transfer and domestic analytical capacity explicit components of their interventions. Together, these measures can turn financial inflows into durable institutional capital.

Four operational research questions follow. First, after correcting item coding and validating the scale, which dimensions of international cooperation explain operational capacity and which explain strategic appropriation? Second, do the credibility paths remain stable across bankers, entrepreneurs, experts and public decision-makers once measurement invariance is established? Third, do perceived credibility scores predict observed project approval, financing cost, disbursement or environmental reporting quality? Fourth, does institutional trust change over time when disclosure rules, verification practices or project outcomes change? A preregistered longitudinal design combining survey, interview and project-level data would address these questions more convincingly.

Future research should begin with a documented pilot test, multilingual translation and back-translation where required, item-level psychometric analysis and a reproducible statistical script. It should report the estimator, software version, missing-data handling, chi-square,

degrees of freedom, loadings, composite reliability, average variance extracted and discriminant validity. These steps are necessary before the cooperation model can be interpreted substantively or compared across groups.

Morocco's transition shows why credibility is infrastructure. Physical assets remain indispensable, but green-finance arrangements also require reliable standards, traceable proceeds, transparent reporting and domestic learning mechanisms. Where these institutional supports are credible, stakeholders are more likely to regard finance as effective. Where measurement and strategic coherence are weak, the appropriate response is not to smooth over uncertainty, but to improve both the governance system and the evidence used to evaluate it.

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Declaration on the use of artificial intelligence

Artificial intelligence was used solely for linguistic proofreading and language correction. It was not used to generate the scientific content, data, analyses, results, or conclusions of this article. The authors remain fully responsible for the content of the manuscript.