African Scientific Journal
ISSN : 2658-9311
Vol : 03, Num 33 Décembre 2025

Towards a More Equitable Moroccan Green Taxation System: Proposal for a Progressive Taxation Model Based on Sectoral Carbon Footprints.

Auteur 1 : Sara KAYOUH.
Auteur 2 : Pr Omar Hniche.

Sara KAYOUH, (0009-0002-9920-7134*,Doctorante, Laboratoire de recherche en Compétitivité Economique et Performance Managériale- LARCEPEM Faculté des Sciences Juridiques, Economiques et Sociale Souissi Université Mohammed V de Rabat, Maroc

Omar HNICHE, (Enseignant-chercheur, PES, Laboratoire de recherche en Compétitivité Economique et Performance Managériale- LARCEPEM Faculté des Sciences Juridiques, Economiques et Sociale Souissi Université Mohammed V de Rabat, Maroc

Déclaration de divulgation : L'auteur n'a pas connaissance de quelconque financement qui pourrait affecter l'objectivité de cette étude.

Conflit d'intérêts : L'auteur ne signale aucun conflit d'intérêts.

Pour citer cet article : KAYOUH .S & HNICHE. O (2025) « Towards a More Equitable Moroccan Green Taxation System: Proposal for a Progressive Taxation Model Based on Sectoral Carbon Footprints », African Scientific Journal « Volume 03, Num 33 » Pp: 1422 – 1441.

DOI : 10.5281/zenodo.18109971
Copyright © 2025 – ASJ

African Scientific Journal
ISSN : 2658-9311
Vol : 03, Num 33 Décembre 2025

Résumé

L'aggravation continue du changement climatique et le renforcement des contraintes environnementales mettent en question la viabilité des schémas de croissance conventionnels, notamment dans les pays émergents marqués par une forte diversité sectorielle. Dans ce contexte, la fiscalité verte s'affirme comme un levier central de l'action publique visant à corriger les externalités environnementales tout en favorisant un développement durable. Néanmoins, la performance et la justice de cette fiscalité reposent largement sur les choix de conception, le ciblage sectoriel et l'environnement institutionnel dans lequel elle s'inscrit. Cet article analyse la capacité d'un dispositif de fiscalité verte fondé sur une progressivité des empreintes carbone sectorielles à permettre au Maroc de concilier efficacité environnementale, équité fiscale et soutenabilité économique.

La recherche s'appuie sur une revue systématique de la littérature menée selon le protocole PRISMA, à partir de publications scientifiques évaluées par les pairs et répertoriées dans les bases Scopus et Web of Science sur la période 2007–2025. Vingt-deux études ont été sélectionnées, incluant des travaux économétriques (ARDL et CS-ARDL), des modèles d'équilibre général calculable, des analyses d'impacts sectoriels ainsi que des études institutionnelles portant sur la fiscalité environnementale au Maroc et dans des économies présentant des caractéristiques similaires.

Les résultats mettent en évidence que les instruments de fiscalité verte, et en particulier la taxation du carbone, contribuent à une réduction notable des émissions de gaz à effet de serre sur le long terme, surtout lorsqu'ils sont accompagnés de politiques complémentaires telles que le renforcement des capacités énergétiques, l'innovation technologique et la transition numérique. Toutefois, l'analyse souligne l'existence de fortes hétérogénéités sectorielles en termes d'intensité carbone et de capacités d'adaptation, limitant ainsi l'efficacité des mécanismes fiscaux uniformes. À cet égard, des dispositifs de taxation progressive différenciés par secteur apparaissent plus pertinents pour améliorer la performance environnementale tout en réduisant les impacts économiques et sociaux défavorables. Par ailleurs, la qualité des institutions, l'efficacité de la gouvernance fiscale et les modalités de recyclage des recettes jouent un rôle déterminant dans l'efficacité des politiques mises en œuvre et leur acceptabilité sociale.

En conclucion, l'étude montre qu'un système de fiscalité verte progressive, fondé sur les empreintes carbone sectorielles, représente un instrument de gouvernance prometteur pour articuler les objectifs environnementaux avec les exigences d'équité fiscale et de soutenabilité économique au Maroc.

Mots clés : Fiscalité verte ; Taxe carbone ; Empreinte carbone sectorielle ; Équité fiscale ; Durabilité environnementale ; Maroc ; Fiscalité progressive

AFRICAN SCIENTIFIC JOURNAL
MANAGEMENT AND ECONOMIC DEVELOPMENT

African Scientific Journal
ISSN : 2658-9311
Vol : 03, Num 33 Décembre 2025

Abstract

The growing intensity of climate change and environmental constraints has challenged the sustainability of traditional growth models, particularly in emerging economies characterized by strong sectoral heterogeneity. In this context, green taxation has gained prominence as a key policy instrument for internalizing environmental externalities while supporting sustainable development. However, the effectiveness and equity of environmental taxation critically depend on its design, sectoral alignment, and institutional context. This article examines whether a green taxation model based on **progressive sectoral carbon footprints** can enable Morocco to reconcile environmental effectiveness, fiscal equity, and economic sustainability.

The study adopts a **systematic literature review** methodology in accordance with the PRISMA guidelines, drawing on peer-reviewed articles indexed in Scopus and Web of Science over the period 2007–2025. A total of 22 studies were included, encompassing econometric analyses (ARDL and CS-ARDL), computable general equilibrium (CGE) models, sectoral impact assessments, and institutional studies related to environmental taxation in Morocco and comparable economies.

The results indicate that green and carbon taxation can significantly reduce greenhouse gas emissions in the long run, particularly when combined with complementary policies such as energy capacity expansion, technological upgrading, and digital transformation. However, the findings also reveal substantial **sectoral disparities** in carbon intensity and adjustment capacity, which limit the effectiveness of uniform tax schemes. Progressive, sector-based taxation frameworks emerge as more suitable for enhancing environmental efficiency while mitigating adverse economic and social effects. Moreover, institutional quality, fiscal governance, and revenue recycling mechanisms are identified as decisive factors shaping policy outcomes and social acceptability.

Overall, the article demonstrates that a progressive green taxation model grounded in sectoral carbon footprints constitutes a promising governance tool for aligning environmental objectives with fiscal equity and economic sustainability in Morocco.

Keywords: Green taxation; Carbon tax; Sectoral carbon footprint; Fiscal equity; Environmental sustainability; Morocco; Progressive taxation

African Scientific Journal
ISSN : 2658-9311
Vol : 03, Num 33 Décembre 2025

Introduction

The intensification of climate-related disruptions and the growing accumulation of environmental constraints have profoundly challenged the traditional foundations of economic public policy. Growth models based on the extensive exploitation of natural resources and the insufficient internalization of environmental externalities are increasingly recognized as structurally unsustainable. In this context, environmental taxation has gradually emerged as a central regulatory instrument, situated at the intersection of economic policy, environmental governance, and social justice. Far from being limited to a purely budgetary function, green taxation is now conceived as a strategic lever for transforming productive structures, steering economic behavior, and financing the ecological transition.

The effectiveness of environmental taxation depends less on the mere existence of a tax instrument than on the manner in which it is designed, targeted, and aligned with the sectoral specificities of the economies concerned. Yu et al. (2021) demonstrate that progressively structured carbon taxes are more likely to stimulate green innovation dynamics than uniform tax schemes, particularly by incentivizing carbon-intensive sectors to adopt cleaner technologies. Complementarily, Zhang and Zhang (2018) highlight the complex trade-offs between carbon taxation, economic welfare, and sectoral performance, emphasizing that poorly calibrated environmental taxes may generate adverse redistributive effects and undermine social acceptability.

These findings are consistent with analyses based on computable general equilibrium (CGE) models, which reveal differentiated impacts of environmental taxation across national productive structures. Wissema and Dellink (2007), in the case of Ireland, and Liu et al. (2018), in the context of a highly emission-intensive economy such as Saskatchewan, show that the macroeconomic effects of carbon taxation are closely linked to sectoral carbon intensity and firms' technological adaptation capacity. Similarly, studies applying CGE models to the Chinese economy (Guo et al., 2014; Lu et al., 2010) indicate that uniform environmental taxation tends to produce asymmetric outcomes, disproportionately burdening strategic sectors without generating commensurate environmental gains.

In emerging economies, these challenges are further amplified. Okombi and NdoumBabouama (2024) argue that the effectiveness of environmental taxation in developing countries is strongly conditioned by institutional quality, policy credibility, and the ability to redistribute tax revenues in an equitable manner. In this regard, Domguia et al. (2024) warn against the risk of socially regressive green taxation, which may exacerbate energy poverty if not accompanied by targeted compensatory mechanisms. These contributions call for moving beyond a purely technocratic view of environmental taxation toward a broader reflection encompassing fiscal justice and social inclusion.

African Scientific Journal
ISSN : 2658-9311
Vol : 03, Num 33 Décembre 2025

Morocco represents a particularly relevant case within these debates. Since the early 2000s, the country has undertaken a series of ambitious reforms aimed at promoting energy transition and sustainable development. According to El Hafdaoui (2024), Morocco's long-term low-carbon strategy is characterized by a gradual reconfiguration of its energy mix, supported by substantial investments in renewable energy sources. Nevertheless, this energy transition remains insufficiently underpinned by a coherent and structured environmental fiscal reform. Existing instruments largely reflect a fragmented combination of incentives and sector-specific taxes rather than an integrated framework of green taxation.

Empirical evidence further highlights the limitations of the current policy mix. Ben Azzeddine et al. (2024) identify a partial decoupling between economic growth and greenhouse gas emissions in Morocco, suggesting that while existing policies have yielded some improvements, they have not yet triggered a deep structural transformation. Similarly, Asli et al. (2024) show that key determinants of environmental sustainability in Morocco—namely human capital, urbanization, and energy consumption—interact differently across sectors, thereby reducing the effectiveness of uniform fiscal approaches.

From this perspective, green taxation appears as a coordination instrument that remains underutilized. Ben Youssef and Dahmani (2024) emphasize that environmental taxes can contribute to enhanced environmental sustainability in Africa only if they are embedded within a framework that acknowledges productive capacities, urban dynamics, and institutional constraints. Empirical evidence provided by Amayed (2025), based on a CS-ARDL approach applied to Egypt, Morocco, and Tunisia, confirms that green taxation exerts a significant long-term effect on emission reduction, particularly when combined with investments in energy capacity and digital transformation. However, these effects remain heterogeneous across countries and sectors, underscoring the importance of finely differentiated fiscal instruments.

Despite the growing body of literature, several critical gaps persist. First, most studies addressing environmental taxation in Morocco rely on aggregated macroeconomic analyses, thereby overlooking substantial sectoral disparities in carbon footprints. Second, the issue of fiscal progressivity applied to sectoral emissions remains marginal in existing research, despite the pronounced heterogeneity of environmental responsibility across Moroccan economic sectors. Finally, recent debates on fiscal reform particularly those surrounding tax amnesty policies analyzed by Bennani et al. (2025) and Mechita et al. (2025) reveal a deficit of fiscal legitimacy that may hinder the acceptability of new environmental taxes if they are perceived as inequitable or inefficient.

African Scientific Journal
ISSN : 2658-9311
Vol : 03, Num 33 Décembre 2025

Against this backdrop, a critical question inevitably arises: **to what extent can a green taxation model based on progressive sectoral carbon footprints enable Morocco to reconcile environmental effectiveness, fiscal equity, and economic sustainability?**

The objective of this study is to examine whether a green taxation model based on progressive sectoral carbon footprints can enable Morocco to reconcile environmental effectiveness, fiscal equity, and economic sustainability. By adopting a systematic literature review approach, this article seeks to synthesize empirical and theoretical evidence in order to identify the conditions under which differentiated environmental taxation can enhance environmental outcomes while limiting adverse economic and social effects in emerging economies characterized by strong sectoral heterogeneity.

This article is structured into four complementary sections. The first section presents the methodology of the systematic literature review, detailing the research protocol, scientific databases used, inclusion and exclusion criteria, and analytical synthesis methods. The second section reports the results of the review, highlighting major trends in the literature on green taxation, carbon taxation, and their environmental, economic, and sectoral effects, with particular attention to the Moroccan context. The third section discusses the findings by confronting them with dominant theoretical frameworks and comparable international experiences, thereby deriving implications for public policy, fiscal governance, and ecological transition. Finally, the last section offers a concluding synthesis, outlining the study's scientific contributions, methodological limitations, and directions for future research, particularly regarding the design of a progressive green taxation model based on sectoral carbon footprints.

3. Methodology

3.1. Research design

This study adopts a **systematic literature review** as its primary research design in order to provide a comprehensive and structured synthesis of existing knowledge on green taxation and carbon pricing policies, with a particular focus on the Moroccan context. Systematic reviews are increasingly recognized in sustainability research as a rigorous methodological approach to consolidate fragmented empirical evidence and to identify emerging research gaps in complex and multidisciplinary fields. In contrast to narrative reviews, this approach ensures transparency, replicability, and methodological robustness, which are core requirements for high-quality research in sustainability studies.

This methodological approach is grounded in a positivist and evidence-based epistemological positioning. Given the fragmented and heterogeneous nature of empirical studies on green taxation, carbon taxation, and environmental fiscal policies, a systematic literature review allows for the consolidation of diverse quantitative and qualitative findings within a coherent analytical

African Scientific Journal
ISSN : 2658-9311
Vol : 03, Num 33 Décembre 2025

framework. The study follows a deductive reasoning process, whereby established theoretical propositions on environmental taxation and fiscal equity are confronted with empirical evidence drawn from econometric analyses, computable general equilibrium models, and sectoral studies focusing on Morocco and comparable emerging economies.

The choice of a systematic review is particularly justified by the heterogeneity of existing studies on environmental taxation, which employ diverse empirical methods such as ARDL and CS-ARDL models (Asli et al., 2024; Amayed, 2025), computable general equilibrium models (Decaluwe et al., 2009; Devarajan et al., 2011), and sectoral impact analyses (Ed-Daoudi&Oubejja, 2021). This diversity necessitates a structured methodological framework capable of integrating findings across different analytical perspectives.

3.2. Review protocol and methodological framework

The review process was conducted in accordance with the **PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses)** guidelines, which are widely adopted in sustainability-oriented research to enhance methodological transparency and consistency. The PRISMA framework guided the identification, screening, eligibility assessment, and final inclusion of studies.

The objective of the review was not to perform a quantitative meta-analysis, given the methodological heterogeneity of the selected studies, but rather to conduct a **qualitative and thematic synthesis** of the literature. This approach is consistent with previous systematic reviews published in *Sustainability*, where qualitative synthesis is preferred when studies differ substantially in scope, data structure, and analytical techniques.

3.3. Literature search strategy

The literature search was carried out using the **Scopus** and **Web of Science** databases, which are recognized for their extensive coverage of peer-reviewed journals in sustainability, environmental economics, and public policy. The search covered publications from **2007 to 2025**, allowing the inclusion of both foundational studies on carbon taxation (Wissema&Dellink, 2007) and recent empirical contributions addressing green taxation and sustainable development (Ben Youssef &Dahmani, 2024; Okombi&NdoumBabouama, 2024).

A combination of keywords and Boolean operators was employed, including: *green taxation*, *environmental taxation*, *carbon tax*, *fiscal policy*, *carbon emissions*, *sectoral emissions*, *sustainability*, and *Morocco*. Searches were conducted in both **English and French** to ensure adequate coverage of international studies as well as research focusing specifically on the Moroccan case.

African Scientific Journal
ISSN : 2658-9311
Vol : 03, Num 33 Décembre 2025

Table 1. Inclusion and exclusion criteria for study selection.

Criterion	Inclusion	Exclusion
Publication period	Articles publishedbetween 2007 and 2025	Articles publishedbefore 2007
Language	Publications in English or French	Publications in otherlanguages
Source type	Peer-reviewedscientific journal articles	Grey literature, reports, policy briefs, books, conference abstracts
Thematic focus	Green taxation, environmental taxation, carbon tax, fiscal policy and environmental sustainability	Topics unrelated to environmental or carbon taxation
Geographical scope	Studies focusing on Morocco or comparable emerging and developing economies	Studies exclusively focused on developed economies without relevance for Morocco
Methodologicalapproach	Empirical studies (econometric analyses, CGE models, comparative studies, systematic reviews)	Purely conceptual or normative studies without empirical analysis
Sectoral dimension	Studies addressing sectoral impacts, emissions, or differentiated effects of taxation	Studiesignoringsectoralheterogeneity
Policy relevance	Studies providing implications for public policy, fiscal design, or environmental governance	Studies lacking policy or managerial implications

African Scientific Journal
ISSN : 2658-9311
Vol : 03, Num 33 Décembre 2025

3.4. Inclusion and exclusion criteria

To ensure the relevance and scientific quality of the reviewed literature, explicit inclusion and exclusion criteria were defined prior to the selection process. Studies were included if they: (i) were published in peer-reviewed academic journals; (ii) explicitly addressed green taxation, carbon taxation, or environmental fiscal policies; (iii) employed empirical, theoretical, or comparative analytical frameworks; and (iv) focused on Morocco or on comparable developing and emerging economies.

Studies were excluded if they consisted of non-peer-reviewed documents, policy briefs, or reports lacking methodological transparency, or if their primary focus was not directly related to environmental taxation and sustainability outcomes.

3.5. Study selection process

The selection process followed a multi-stage screening procedure. Initially, titles and abstracts were reviewed to assess thematic relevance. Duplicate records were removed. Subsequently, the full texts of the remaining articles were examined to confirm compliance with the inclusion criteria. This process resulted in a final corpus encompassing econometric analyses (Asli et al., 2024; Amayed, 2025), CGE-based studies (Decaluwe et al., 2009; Devarajan et al., 2011), sectoral assessments (Ed-Daoudi&Oubejja, 2021), and bibliometric reviews (Bendaoud et al., 2025).

3.6. Data extraction and synthesis

For each selected study, a standardized data extraction matrix was applied to collect information on research objectives, theoretical frameworks, methodological approaches, geographical focus, and key findings. The extracted data were subsequently organized thematically in order to identify dominant research trends related to the environmental effectiveness, economic impacts, and equity implications of green taxation.

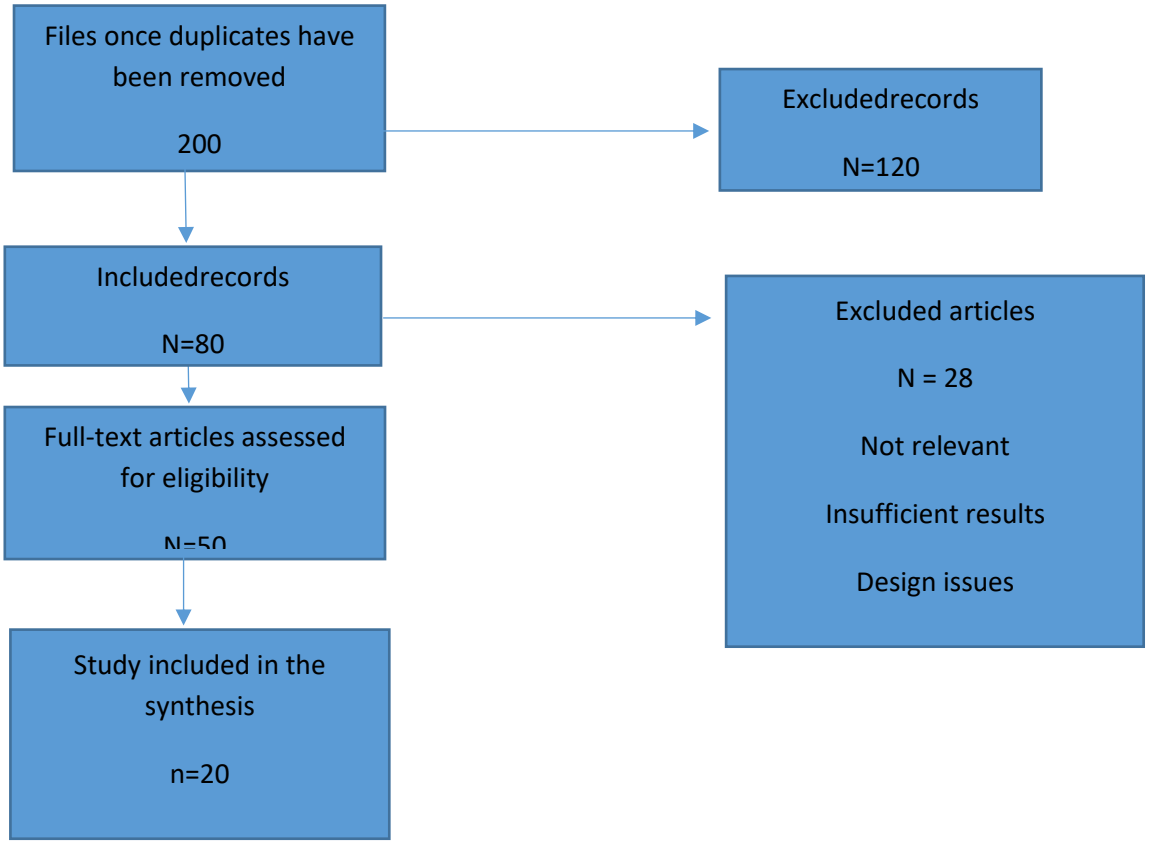
This thematic organization facilitated the comparison of results across studies and supported the identification of consistent patterns, contradictions, and research gaps, particularly with regard to the sectoral differentiation of carbon taxation and its implications for sustainable development.

3.7. Quality assessment of the selected studies

Finally, the methodological quality of the selected studies was assessed based on criteria commonly applied in sustainability research, including clarity of research design, appropriateness of empirical methods, robustness of data sources, and coherence between results and conclusions. Particular attention was given to studies employing advanced econometric techniques (Amayed, 2025) and CGE models (Decaluwe et al., 2009; Devarajan et al., 2011), due to their relevance for analyzing the sectoral and distributive effects of environmental taxation.

African Scientific Journal
ISSN : 2658-9311
Vol : 03, Num 33 Décembre 2025

Figure 1. PRISMA diagram.



Source: Author's elaboration based on the PRISMA guidelines.

4. Results

The systematic review resulted in the inclusion of 22 peer-reviewed studies addressing green taxation, carbon taxation, and related environmental fiscal instruments within Morocco and comparable economic contexts. The selected literature encompasses a broad range of methodological approaches, including time-series econometric analyses, panel data techniques, computable general equilibrium (CGE) models, sectoral impact assessments, and bibliometric reviews. This diversity allows for a comprehensive synthesis of empirical evidence regarding the environmental, economic, and sectoral effects of green taxation.

4.1. Methodological distribution of the selected studies

The results indicate a predominance of quantitative empirical approaches within the reviewed literature. Econometric techniques are widely employed, particularly autoregressive distributed lag (ARDL) and cross-sectionally augmented ARDL (CS-ARDL) models. Studies by Asli et al. (2024) and Amayed (2025) exemplify this trend, using ARDL-based frameworks to assess the long- and short-run relationships between environmental sustainability, energy consumption, economic growth, and fiscal variables in Morocco and neighboring countries. These approaches are frequently supported by panel cointegration and error-correction methodologies, drawing on the methodological foundations established by Westerlund (2007).

African Scientific Journal
ISSN : 2658-9311
Vol : 03, Num 33 Décembre 2025

A second major methodological group consists of computable general equilibrium (CGE) models, which are used to capture economy-wide and sectoral interactions. Foundational contributions by Decaluwe et al. (2009) and Devarajan et al. (2011) provide the analytical framework adopted in several studies to simulate the impacts of carbon taxation under different policy scenarios. International applications, such as those by Guo et al. (2014), Lu et al. (2010), Liu et al. (2018), and Wissema and Dellink (2007), complement Moroccan-focused analyses by offering comparative insights into sectoral and distributive effects.

In addition, the corpus includes sector-specific studies (Ed-Daoudi&Oubejja, 2021), bibliometric and literature reviews (Bendaoud et al., 2025), and policy-oriented empirical analyses (Ettahiri&Benazzou, 2024), highlighting the multidimensional nature of green taxation research.

4.2. Environmental effectiveness of green and carbon taxation

Across the reviewed studies, a consistent finding emerges regarding the positive environmental impact of green taxation. Empirical evidence suggests that environmental and carbon taxes contribute to the reduction of greenhouse gas emissions, particularly in the long run. Amayed (2025) demonstrates that green taxation, when combined with increased energy capacity and digital transformation, significantly improves environmental quality in Morocco, Egypt, and Tunisia. The CS-ARDL results indicate stronger long-term effects compared to short-term dynamics, underscoring the delayed but persistent influence of fiscal instruments.

Similarly, Ben Youssef and Dahmani (2024), using cross-country African data, find that environmental taxes play a statistically significant role in enhancing environmental sustainability, although their effectiveness is moderated by productive capacities and urbanization dynamics. These results align with the decoupling analysis conducted by Ben Azzeddine et al. (2024), which identifies a partial decoupling between economic growth and greenhouse gas emissions in Morocco, suggesting that existing policies have contributed to emission reductions without fully disrupting growth trajectories.

International CGE-based studies reinforce these findings. Liu et al. (2018) show that carbon taxation in emission-intensive economies leads to substantial emission reductions, while Guo et al. (2014) and Lu et al. (2010) confirm similar outcomes in the Chinese context. However, these reductions are unevenly distributed across sectors, highlighting the importance of differentiated tax designs.

4.3. Sectoral impacts and heterogeneity of effects

A salient result of the review concerns the heterogeneous sectoral impacts of green taxation. Several studies emphasize that the environmental and economic effects of carbon taxes vary significantly across sectors, depending on carbon intensity, energy dependence, and technological adaptability. Ed-Daoudi and Oubejja (2021) show that carbon taxation in Morocco

African Scientific Journal
ISSN : 2658-9311
Vol : 03, Num 33 Décembre 2025

disproportionately affects the cereals market and the electricity sector, with distinct implications for production costs and price transmission mechanisms.

CGE-based analyses further reveal that uniform carbon taxes tend to generate asymmetric outcomes. Wissema and Dellink (2007) and Devarajan et al. (2011) demonstrate that energy-intensive sectors bear a higher adjustment burden, potentially leading to competitiveness losses if compensatory measures are not implemented. Similar sectoral asymmetries are observed in the Chinese economy (Guo et al., 2014; Lu et al., 2010), where differentiated impacts across industrial and service sectors are reported.

These findings are consistent with the Moroccan empirical literature, which suggests that sectoral heterogeneity limits the effectiveness of uniform fiscal instruments. Asli et al. (2024) highlight that environmental sustainability determinants such as energy consumption and urbanization exert sector-specific effects, thereby reducing the efficiency of one-size-fits-all taxation schemes.

4.4. Economic growth, welfare, and distributional outcomes

The reviewed studies provide mixed evidence regarding the **economic and welfare effects** of green taxation. While environmental benefits are generally supported, the economic implications depend on tax design and accompanying policies. Zhang and Zhang (2018) show that carbon taxation in the tourism sector can reduce CO_2 emissions while generating welfare trade-offs, particularly in regions heavily reliant on tourism revenues.

In the Moroccan context, Ben Azzeddine et al. (2024) indicate that environmental policies have not significantly hindered economic growth, although the absence of a fully integrated fiscal framework limits their transformative potential. CGE simulations by Devarajan et al. (2011) and Liu et al. (2018) suggest that recycling tax revenues can mitigate negative growth effects, reinforcing the importance of revenue allocation mechanisms.

Distributional concerns are explicitly addressed by Domguia et al. (2024), who find that environmental taxes may exacerbate energy poverty if social compensation mechanisms are absent. These findings are echoed by Okombi and NdoumBabouama (2024), who demonstrate that institutional quality plays a critical role in ensuring that environmental taxation supports inclusive green growth rather than reinforcing existing inequalities.

4.5. Institutional and policy-related dimensions

Institutional factors emerge as a key determinant of green taxation outcomes. Okombi and NdoumBabouama (2024) emphasize that governance quality, fiscal credibility, and administrative capacity condition the effectiveness of environmental taxes in developing countries. This institutional dimension is particularly relevant in the Moroccan context, where fiscal reforms have historically faced challenges related to legitimacy and compliance.

African Scientific Journal
ISSN : 2658-9311
Vol : 03, Num 33 Décembre 2025

Studies on fiscal reform, including those by Bennani et al. (2025) and Mechita et al. (2025), although not directly focused on environmental taxation, reveal structural weaknesses in the Moroccan fiscal system that may affect the acceptability of new green taxes. These works highlight the importance of transparency, equity, and trust in the tax system, which indirectly influence the feasibility of implementing progressive environmental taxation.

4.6. Synthesis of key findings

Overall, the results of the systematic review indicate that green and carbon taxation can contribute meaningfully to emission reduction and environmental sustainability in Morocco and comparable economies. However, their effectiveness is contingent upon sectoral differentiation, institutional quality, and complementary policies, such as energy investments and digital transformation (Amayed, 2025; El Hafdaoui, 2024). The reviewed literature consistently points to the limitations of uniform tax schemes and underscores the relevance of progressive, sector-based approaches to environmental taxation.

5. Discussion

The results reveal a convergence of evidence supporting the environmental effectiveness of green and carbon taxation, yet they simultaneously expose significant limitations related to sectoral heterogeneity, institutional constraints, and distributional effects. These findings contribute to ongoing debates in environmental economics and public policy regarding the conditions under which fiscal instruments can effectively support sustainable development.

5.1. Green taxation as an effective but conditional environmental instrument

The reviewed literature provides strong empirical support for the role of green taxation in reducing greenhouse gas emissions, particularly in the long run. Studies employing econometric approaches, such as those by Amayed (2025) and Asli et al. (2024), confirm that environmental taxes exert statistically significant effects on environmental quality when embedded within broader policy frameworks that include energy capacity expansion and structural reforms. These findings are consistent with the theoretical expectations of environmental taxation as a mechanism for internalizing negative externalities.

However, the effectiveness of green taxation emerges as highly conditional. As shown by Ben Youssef and Dahmani (2024), the impact of environmental taxes is mediated by productive capacities and urbanization dynamics, suggesting that fiscal instruments alone are insufficient to induce deep environmental transitions. This observation resonates with the partial decoupling identified by Ben Azzeddine et al. (2024), which indicates that while emissions may grow at a slower pace than economic output, existing policies have not yet achieved a full structural transformation of the Moroccan economy.

African Scientific Journal
ISSN : 2658-9311
Vol : 03, Num 33 Décembre 2025

From a policy perspective, these results suggest that green taxation should not be conceptualized as a standalone solution but rather as a component of an integrated sustainability strategy. This interpretation aligns with OECD (2025) indicators, which emphasize the need for policy coherence between fiscal instruments, innovation policies, and energy strategies to achieve green growth.

5.2. The central role of sectoral differentiation

One of the most salient contributions of the reviewed literature lies in its consistent emphasis on sectoral heterogeneity. CGE-based studies (Decaluwe et al., 2009; Devarajan et al., 2011; Guo et al., 2014) demonstrate that uniform carbon taxes generate uneven adjustment costs across sectors, disproportionately affecting energy-intensive industries. Similar conclusions are drawn from sector-specific analyses in Morocco, such as Ed-Daoudi and Oubejja (2021), who highlight the differentiated impacts of carbon taxation on the cereals market and the electricity sector.

These findings reinforce the argument that a one-size-fits-all approach to green taxation is ill-suited to economies characterized by heterogeneous sectoral structures, such as Morocco. The empirical evidence supports the relevance of progressive and sector-based tax designs, as advocated by Yu et al. (2021), who show that progressive carbon taxes are more effective in stimulating green innovation while mitigating excessive burdens on less polluting sectors.

The discussion therefore substantiates the core premise of this article: the effectiveness and fairness of green taxation depend critically on its alignment with sectoral carbon footprints. By accounting for sector-specific emission intensities and adjustment capacities, progressive taxation schemes may enhance both environmental outcomes and economic resilience.

5.3. Economic growth, welfare trade-offs, and revenue recycling

The relationship between green taxation and economic growth remains a central concern in policy debates. The reviewed studies reveal that environmental taxes do not necessarily impede growth, but their macroeconomic effects are contingent upon revenue recycling mechanisms. CGE simulations by Devarajan et al. (2011) and Liu et al. (2018) illustrate that reallocating tax revenues toward productive investments or reducing distortionary taxes can offset potential negative impacts on output and employment.

In the Moroccan context, the absence of a comprehensive environmental fiscal reform limits the ability to harness such double-dividend effects. Ben Azzeddine et al. (2024) suggest that current policies have mitigated emissions without undermining growth, yet their scope remains insufficient to induce systemic change. Moreover, Zhang and Zhang (2018) show that sector-specific taxes, such as those applied to tourism-related emissions, involve welfare trade-offs that must be carefully managed.

African Scientific Journal
ISSN : 2658-9311
Vol : 03, Num 33 Décembre 2025

These findings highlight the importance of transparent and targeted revenue recycling strategies. Without such mechanisms, green taxation risks being perceived as a purely extractive instrument, undermining its social acceptability and political feasibility.

5.4. Distributional effects and social acceptability

A critical insight emerging from the review concerns the **distributional consequences** of green taxation. Domguia et al. (2024) provide compelling evidence that environmental taxes can exacerbate energy poverty in the absence of compensatory measures. This risk is particularly acute in developing and emerging economies, where energy expenditures represent a substantial share of household income.

Okombi and NdoumBabouama (2024) further demonstrate that institutional quality plays a decisive role in determining whether environmental taxation supports inclusive green growth or reinforces existing inequalities. These findings underscore the necessity of embedding green taxation within a broader social policy framework that includes targeted subsidies, social transfers, or differentiated tax rates.

The Moroccan case illustrates the relevance of these concerns. Studies on fiscal reform and tax amnesty (Bennani et al., 2025; Mechita et al., 2025) reveal persistent challenges related to fiscal legitimacy and taxpayer trust. Introducing new environmental taxes without addressing these structural issues may exacerbate resistance and reduce compliance, thereby limiting policy effectiveness.

5.5. Institutional capacity and governance challenges

Institutional factors emerge as a cross-cutting determinant of green taxation outcomes. The reviewed literature consistently indicates that governance quality, administrative capacity, and policy credibility condition the effectiveness of environmental fiscal instruments. El Hafdaoui (2024) emphasizes that Morocco's long-term low-carbon strategy requires stronger institutional coordination to align fiscal, energy, and industrial policies.

From this perspective, green taxation should be viewed not only as an economic instrument but also as a governance challenge. Effective implementation requires robust monitoring systems, transparent allocation of revenues, and coordination across ministries and policy domains. The findings suggest that strengthening institutional frameworks is a prerequisite for the successful adoption of progressive, sector-based taxation schemes.

5.6. Implications for the design of a Moroccan green taxation model

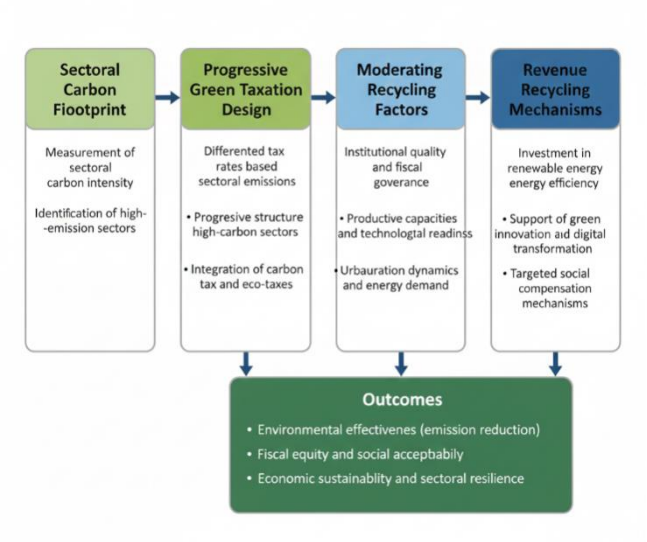
Taken together, the results and their interpretation point toward several implications for the design of a Moroccan green taxation model. First, fiscal instruments should be progressive and sectorally differentiated, reflecting variations in carbon intensity and adjustment capacity. Second, green taxation should be embedded within an integrated policy framework that combines fiscal measures

African Scientific Journal
ISSN : 2658-9311
Vol : 03, Num 33 Décembre 2025

with energy investments, innovation incentives, and digital transformation, as highlighted by Amayed (2025).

Third, social acceptability must be addressed through explicit compensatory mechanisms and transparent revenue recycling. Finally, institutional reforms aimed at enhancing fiscal legitimacy and governance capacity are essential to ensure long-term effectiveness.

Figure 2. Conceptual framework of progressive green taxation based on sectoral carbon footprint



Source: Author's elaboration based on the systematic literature review.

Figure 2 presents a conceptual framework illustrating the causal mechanisms through which a progressive green taxation model based on sectoral carbon footprints can contribute to sustainable development outcomes. The framework is structured around a sequential logic that links the measurement of sectoral emissions to fiscal design choices, mediating factors, and sustainability outcomes.

The first component emphasizes the sectoral carbon footprint, highlighting the importance of accurately measuring carbon intensity across economic sectors and identifying high-emission activities. This step constitutes the analytical foundation of the model, as it allows policymakers to move beyond aggregated emission indicators and to recognize the heterogeneous environmental responsibilities of different sectors.

Building on this measurement, the framework proposes a progressive green taxation design characterized by differentiated tax rates based on sectoral emission intensity. By assigning higher tax burdens to carbon-intensive sectors while limiting pressure on low-emission activities, the model aims to enhance environmental efficiency while preserving economic competitiveness. The integration of carbon taxes and eco-taxes within a progressive structure reflects an effort to internalize environmental externalities in a manner consistent with principles of fiscal equity.

African Scientific Journal
ISSN : 2658-9311
Vol : 03, Num 33 Décembre 2025

The framework further incorporates moderating factors that condition the effectiveness of green taxation policies. Institutional quality and fiscal governance influence policy credibility and compliance, while productive capacities and technological readiness determine the ability of sectors to adapt to fiscal signals. Urbanization dynamics and energy demand structures are also recognized as critical contextual variables shaping the environmental and economic impacts of taxation.

A central role is assigned to revenue recycling mechanisms, which mediate the relationship between taxation and sustainability outcomes. The reinvestment of tax revenues in renewable energy, energy efficiency, green innovation, and digital transformation is expected to reinforce the environmental effectiveness of the policy. At the same time, targeted social compensation mechanisms are included to mitigate potential regressive effects and enhance social acceptability. The interaction of these components ultimately leads to three interconnected outcomes: environmental effectiveness, through emission reductions; fiscal equity, by ensuring a fairer distribution of the tax burden; and economic sustainability, by supporting sectoral resilience and long-term growth. The framework thus conceptualizes progressive green taxation not merely as a fiscal instrument, but as a governance tool capable of aligning environmental objectives with economic and social considerations.

African Scientific Journal
ISSN : 2658-9311
Vol : 03, Num 33 Décembre 2025

6. Conclusion

This article set out to examine whether a green taxation model based on progressive sectoral carbon footprints could enable Morocco to reconcile environmental effectiveness, fiscal equity, and economic sustainability. By adopting a systematic literature review and synthesizing empirical and theoretical contributions spanning econometric analyses, computable general equilibrium models, sectoral studies, and institutional assessments, the study provides a comprehensive and integrated perspective on the role of environmental taxation in the Moroccan context.

The findings confirm that green and carbon taxation can serve as effective instruments for reducing greenhouse gas emissions, particularly over the long term. Empirical evidence drawn from ARDL and CS-ARDL approaches (Asli et al., 2024; Amayed, 2025) consistently shows that environmental taxes contribute to improvements in environmental quality when combined with complementary factors such as energy capacity expansion and digital transformation. These results are reinforced by cross-country analyses in Africa (Ben Youssef &Dahmani, 2024) and by CGE-based simulations conducted in both developed and emerging economies (Wissema&Dellink, 2007; Liu et al., 2018; Guo et al., 2014). Collectively, this body of evidence supports the theoretical premise that environmental taxation can internalize negative externalities and induce cleaner production patterns.

However, the review also highlights that the effectiveness of green taxation is highly contingent on its design and implementation. One of the most robust conclusions emerging from the literature concerns the centrality of sectoral heterogeneity. Studies focusing on Morocco (Ed-Daoudi&Oubejja, 2021; Ben Azzeddine et al., 2024) as well as international CGE analyses (Devarajan et al., 2011; Lu et al., 2010) demonstrate that sectors differ markedly in carbon intensity, energy dependence, and technological adaptability. As a result, uniform taxation schemes tend to generate asymmetric economic impacts, disproportionately burdening energy-intensive sectors without delivering proportional environmental gains. These findings corroborate the arguments advanced by Yu et al. (2021), who show that progressive carbon taxation structured around emission intensity is more conducive to green innovation and environmental efficiency.

In the Moroccan case, this sectoral dimension is particularly salient. While existing policies have contributed to a partial decoupling between economic growth and emissions (Ben Azzeddine et al., 2024), they have not yet produced a deep structural transformation. Asli et al. (2024) further demonstrate that key drivers of environmental sustainability human capital, urbanization, and energy consumption interact differently across sectors, limiting the effectiveness of aggregated fiscal instruments. These results strongly suggest that a progressive, sector-based approach to green taxation is more appropriate for addressing Morocco’s heterogeneous economic structure.

African Scientific Journal
ISSN : 2658-9311
Vol : 03, Num 33 Décembre 2025

From an equity perspective, the review underscores that environmental taxation entails significant distributional challenges. Domguia et al. (2024) provide evidence that environmental taxes may exacerbate energy poverty if compensatory mechanisms are absent, while Okombi and NdoumBabouama (2024) emphasize that institutional quality is crucial for ensuring that green taxation supports inclusive green growth rather than reinforcing existing inequalities. These concerns are particularly relevant in Morocco, where debates surrounding fiscal reform and tax amnesty (Bennani et al., 2025; Mechita et al., 2025) reveal persistent issues of fiscal legitimacy, trust, and compliance. In this context, the social acceptability of new environmental taxes cannot be taken for granted and must be actively addressed through transparent and equitable policy design.

Institutional capacity and governance quality emerge as cross-cutting determinants of success. The literature consistently indicates that environmental taxation is most effective when embedded within coherent policy frameworks that align fiscal instruments with energy strategies, industrial policies, and social protection systems. El Hafdaoui (2024) highlights that Morocco's long-term low-carbon strategy requires stronger institutional coordination to ensure consistency between environmental objectives and fiscal measures. Without such coordination, green taxation risks remaining fragmented and limited in scope.

A green taxation model based on progressive sectoral carbon footprints can enable Morocco to reconcile environmental effectiveness, fiscal equity, and economic sustainability, provided that several key conditions are met. First, taxation must be explicitly differentiated according to sectoral emission intensity, reflecting heterogeneous environmental responsibilities and adjustment capacities. Second, tax revenues should be recycled through targeted mechanisms that support renewable energy, energy efficiency, green innovation, and digital transformation, as emphasized by Amayed (2025). Third, compensatory social measures are essential to mitigate regressive effects and enhance social acceptability. Finally, institutional reforms aimed at strengthening fiscal governance, transparency, and policy credibility are indispensable.

This article contributes to the literature by advancing an integrated conceptual framework that links sectoral carbon measurement, progressive fiscal design, moderating institutional factors, and sustainability outcomes. By synthesizing fragmented empirical evidence, it highlights the limitations of uniform taxation schemes and underscores the relevance of sector-based approaches in emerging economies. Methodologically, the study demonstrates the value of systematic reviews in consolidating diverse analytical perspectives and identifying coherent policy implications.

African Scientific Journal
ISSN : 2658-9311
Vol : 03, Num 33 Décembre 2025

Reference:

- Amayed, Y. (2025). *Digital transformation and green taxation: A CS-ARDL approach to assess the impact of energy capacity on environmental quality in Egypt, Morocco and Tunisia*. EmpiricalEconomicsLetters, 24(6), 77–89.
- Asli, H. E., Hamid, L., Zineb, A., & Mohamed, A. (2024). *Impact of human capital, economic factors, energy consumption, and urban growth on environmental sustainability in Morocco: An ARDL approach*. International Journal of Energy Economics and Policy, 14(2), 656–668.
- Ben Azzeddine, B., Hossaini, F., &Savard, L. (2024). *Greenhouse gas emissions and economic growth in Morocco: A decoupling analysis*. Journal of Cleaner Production.
- Ben Youssef, A., &Dahmani, M. (2024). *Evaluating environmental sustainability in Africa: The role of environmental taxes, productive capacities, and urbanization dynamics*. Economies, 12(4).
- Bendaoud, H., El Ouazzani Salma, T., & El Haddad, M. (2025). *Green taxation in the service of sustainable development in Morocco: Bibliometric and literature review*. International Journal of Environmental Sciences, 11(6).
- Bennani, S., Kadil, G., &Ennadifi, I. (2025). *L'amnistie fiscale : une réforme clé pour la régularisation de la situation fiscale au Maroc*. In *Proceedings of the 2nd International Conference on Economy & International Finance (EFI-2025)*, Proceedings Book Series, Vol. 20, pp. 94–101.
- Decaluwe, B., Lemelin, A., Maisonnave, H., & Robichaud, V. (2009). *PEP-1-1: The PEP standard computable general equilibrium model, single-country, static version*.
- Devarajan, S., Go, D. S., Robinson, S., &Thierfelder, K. (2011). *Tax policy to reduce carbon emissions in a distorted economy: Illustrations from a South Africa CGE model*.
- Domguia, E. N., Ngounou, B. A., Pondie, T. M., &Bitoto, F. E. (2024). *Environmental tax and energy poverty: An economic approach for an environmental and social solution*. Energy.
- Ed-Daoudi, M. A., &Oubejja, K. (2021). *Carbon tax effect on the cereals market and electricity sector in Morocco*.
- El Hafdaoui, H. (2024). *Long-term low carbon strategy of Morocco: A review*.
- Ettahiri, L., &Benazzou, L. (2024). *The eco taxes for environmental protection in the light of sustainable development goals: Evidence from Morocco*. E3S Web of Conferences.
- Guo, Z., Zhang, X., Zheng, Y., & Rao, R. (2014). *Exploring the impacts of a carbon tax on the Chinese economy using a CGE model with a detailed disaggregation of energy sectors*.

African Scientific Journal
ISSN : 2658-9311
Vol : 03, Num 33 Décembre 2025

- Liu, L., Huang, C. Z., Huang, G., Baetz, B., &Pittendrigh, S. M. (2018). *How a carbon tax will affect an emission-intensive economy: A case study of Saskatchewan, Canada*.
- Lu, C., Tong, Q., & Liu, X. (2010). *The impacts of carbon tax and complementary policies on Chinese economy*.
- Mechita, S. B., Kadil, G., &Ennadifi, I. (2025). *L'amnistie fiscale : une réforme clé pour la régularisation de la situation fiscale au Maroc*. Proceedings Book Series, Vol. 20, pp. 94–101.
- OECD. (2025). *Green growth indicators*.
- Okombi, I. F., &NdoumBabouama, V. B.-D. (2024). *Environmental taxation and inclusive green growth in developing countries: Does the quality of institutions matter?* Environmental Science and Pollution Research.
- Westerlund, J. (2007). *Testing for error correction in panel data*. Oxford Bulletin of Economics and Statistics.
- Wissema, W., &Dellink, R. (2007). *AGE analysis of the impact of a carbon energy tax on the Irish economy*.
- Yu, X., Xu, Y., Sun, M., & Zhang, Y. (2021). *The green-innovation-inducing effect of a unit progressive carbon tax*. Sustainability, 13(21), 11708.
- Zhang, J., & Zhang, Y. (2018). *Carbon tax, tourism CO_2 emissions and economic welfare*.