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LEGAL FRAMEWORKS FOR AN INCLUSIVE GREEN TRANSITION: CHALLENGES AND OPPORTUNITIES IN THE REPUBLIC OF MOLDOVA

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Abstract
The green transition is not only an environmental and economic imperative but also a legal and institutional one. The Republic of Moldova, being among the most climate-vulnerable countries in Europe, faces unique challenges in aligning its legal frameworks with sustainable and inclusive climate objectives. This article analyses Moldova's progress and gaps in building an inclusive green legal architecture. It examines major legislative instruments in energy, climate change, and adaptation, as well as the institutional reforms initiated after 2016 in alignment with EU standards. The research highlights the fragmented institutional landscape, the limited inclusion of vulnerable groups in decision-making processes, and the absence of climate litigation mechanisms. Key findings emphasize the importance of legal empowerment, decentralized adaptation, and capacity-building in local governments. The paper concludes with strategic recommendations, including the creation of environmental courts, liberalization of energy markets, legal safeguards for rural populations, and operationalization of national coordination bodies. Moldova's legal experience may serve as a reference for other transitioning economies seeking a socially just climate transformation.
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1. INTRODUCTION

The Republic of Moldova faces a unique convergence of environmental, economic, and institutional vulnerabilities, positioning it among the most climate-sensitive states in Europe. According to the Notre Dame Global Adaptation Initiative (ND-GAIN) index, Moldova ranks lowest on the continent in terms of

its ability to cope with climate change risks. This ranking is not merely symbolic – it reflects the country's high exposure to extreme weather events such as prolonged droughts, sudden floods, land degradation, and soil erosion, combined with limited institutional and infrastructural resilience (1).

The nation's dependence on agriculture, which contributes significantly to GDP and employment – particularly in rural areas – exacerbates its vulnerability. Recurring climate events such as the droughts of 2007, 2012, and 2020 have not only reduced harvests but also triggered migratory patterns, food insecurity, and rising costs for adaptation in the agricultural sector (7). Moreover, Moldova's energy infrastructure, much of it outdated and reliant on imported sources, is increasingly at risk due to heatwaves, floods, and other extreme weather events that impact transmission and distribution systems.

Recognizing the scale of these threats, Moldova has made considerable efforts in recent years to institutionalize climate adaptation and mitigation. One of the cornerstone documents in this process is the National Climate Change Adaptation Programme until 2030, approved by Government Decision No. 624/2023. This strategy sets forth a multisectoral and multilevel approach to climate resilience, targeting priority areas such as agriculture, water resources, public health, infrastructure, and disaster risk management. Its provisions call for enhanced monitoring and early warning systems, rehabilitation of critical infrastructure, integration of climate risks into local planning, and capacity building among local authorities and civil society.

The implementation of the programme relies on data-driven planning, public awareness campaigns, and close collaboration between national and subnational institutions. One of the notable innovations is the integration of nature-based solutions – such as afforestation, restoration of degraded lands, and promotion of agroecological practices – which are cost-effective and sustainable over the long term (6).

In parallel, Moldova has adopted the Low Emission Development Programme (LEDP) until 2030, via Government Decision No. 659/2023. This document outlines the roadmap toward decarbonization of key sectors, especially energy, transport, industry, and waste management. The LEDP promotes the development of renewable energy sources, enhancement of energy efficiency across residential and industrial sectors, and the creation of incentives for green technology uptake. Importantly, the LEDP is aligned with Moldova's international commitments under the Paris Agreement, particularly its updated Nationally Determined Contribution (NDC) submitted in 2020, which aims to reduce GHG emissions by 70% by 2030 compared to 1990 levels.

These national strategies are reinforced by growing local government engagement. By mid-2024, 13 local public authorities had already developed and approved Local Climate and Energy Action Plans (LCEAPs), with support from the Ministry of Environment, the European Union, and regional development

programs. This localized governance approach allows for a better reflection of community-specific vulnerabilities and the design of tailored adaptation measures that reflect the socio-economic realities of each region.

Moldova's progress in climate governance is also supported by international partnerships and climate finance mechanisms. The country has accessed funds from the Green Climate Fund (GCF), the EU4Climate Programme, and the World Bank, which have enabled the launch of pilot projects in sustainable farming, solar energy, and resilient urban planning. These projects demonstrate a shift from isolated interventions to a coherent, cross-sectoral climate policy architecture, which is essential for systemic change.

In summary, Moldova's current policy landscape reflects a transition from reactive responses to climate events toward a proactive and integrated resilience strategy. The alignment of national plans with international frameworks, the involvement of local governments, and the mobilization of climate finance are all encouraging signals. However, the effectiveness of these strategies will depend on institutional continuity, transparency, and public participation. Climate vulnerability in Moldova is not only a scientific or technical challenge – it is a governance and equity issue. Ensuring that adaptation measures reach the most vulnerable populations, especially in rural and marginalized communities, remains a central priority for a truly inclusive green transition.

2. LEGAL ARCHITECTURE FOR THE ENERGY TRANSITION

Moldova's legal framework is designed around five energy policy pillars: decarbonization, energy efficiency, energy security, internal market integration, and innovation.

The main legal instruments that define this framework include:

a) Law no. 107/2016 on electricity,
b) Law no. 108/2016 on natural gas,
c) Law no. 10/2016 on renewable energy (amended in 2023 to align with RED II),
d) Law no. 139/2018 on energy efficiency,
e) Law no. 461/2001 on petroleum products.

These laws provide the basis for Moldova's commitment to liberalization, market competition, and alignment with the EU acquis (13).

Since 2010, Moldova has been a Contracting Party to the Energy Community and has progressively transposed the EU's Third Energy Package into national legislation. Recent amendments have brought Moldova in line with the REMIT Regulation, promoting transparency and fairness in wholesale energy markets.

Moldova committed to a 27% renewable share by 2030, reducing GHG emissions by 68.6%, and capping final energy consumption at 2.8 Mtoe. Government Decision No. 401/2021 regulates renewable energy capacities, facilitating a predictable investment environment (14). To achieve these targets,

Moldova uses support schemes such as feed-in tariffs and renewable energy auctions. The government has approved capacity allocations for 230 MW of wind, 165 MW of photovoltaic, and additional capacity for biogas and biomass-based thermal electric centers (TECs). Government Decision No. 401/2021 caps the total renewable energy source (RES) capacity at 510 MW under support mechanisms, promoting a predictable investment environment.

With over 75% dependence on energy imports, Moldova has prioritized interconnectivity and diversification. In 2022, the country successfully synchronized with the ENTSO-E grid, enabling operational electricity exchange with Romania. Moldelectrica was officially designated as a Nominated Electricity Market Operator (NEMO) in April 2024 and is piloting a day-ahead market mechanism. Gas security improved with the completion of the Iași–Ungheni–Chișinău pipeline, though regulatory harmonization and capacity upgrades remain ongoing. Strategic gas reserves are being developed following amendments to Law 108/2016, introducing obligations for minimum storage and import diversification. Market liberalization continues under the supervision of the National Agency for Energy Regulation (ANRE), promoting transparency and competition (18, 15).

3. CLIMATE ADAPTATION AND LOCAL RESILIENCE

The National Adaptation Plan (NAP Moldova 2024) marks significant progress in decentralized adaptation planning. With support from the UNDP and the Green Climate Fund, 13 localities have developed and adopted Local Adaptation Plans. The operational national portal clima.gov.md provides real-time risk data and tools for public and institutional use. The Law on Meteorological and Hydrological Activity sets national standards for monitoring and early warning systems. Although sectors such as agriculture, water, and health have begun integrating climate resilience, disparities in implementation persist across regions (19, 5).

Recent legal reforms promote innovation and inclusiveness in the green transition. ANRE establishes new feed-in tariffs for renewable energy investments, including for energy communities and prosumers. Digital licensing platforms facilitate decentralized energy generation. Moldova, as a party to the Aarhus Convention, has a legal obligation to ensure environmental justice and public participation. However, participation in rural consultations remains below 20%, calling for legal aid and targeted reforms to enhance inclusion in energy decision-making and to uphold green rights for vulnerable groups (16, 20).

The draft Integrated National Energy and Climate Plan (PNIEC) 2025-2030, a document that represents a roadmap for achieving the country's decarbonization goals, was publicly consulted on 16 February 2024. The document was developed by the Ministry of Energy with the support of the European Union, provided

through the program "Addressing the Impact of the Energy Crisis in the Republic of Moldova", implemented by UNDP Moldova.

PNIEC sets targets on renewable energy, energy efficiency and greenhouse gas emissions. The plan is a legal commitment of the Republic of Moldova and only covers commitments concerning the territory controlled by the constitutional authorities. All member countries of the European Union and the Energy Community are developing such Plans with implementation until 2030, which are reviewed every 5 years in accordance with the Regulation on the Governance of the Energy Union and Climate Action (part of the "Clean Energy for All Europeans" package). Thus, by 2030, Moldova commits to a 27% share of renewable energy in final energy consumption; to maintain the growth of primary energy consumption at 3000 ktoe and final energy consumption at 2800 ktoe (2770 ktoe and 2592 ktoe respectively in 2022); to reduce greenhouse gas (GHG) emissions by 68.6% compared to 1990 (8, 17).

One of the critical challenges in Moldova's green transition is the fragmentation of institutional responsibilities across ministries and agencies. Despite the existence of national strategies, their implementation often suffers from lack of intersectoral cooperation and overlapping mandates. Strengthening the role of the National Council for Sustainable Development, along with permanent inter-ministerial working groups, could provide greater coherence (Iarmenco Mihaela, 2020). Regular capacity-building programs for civil servants and local government staff, particularly in climate finance, procurement of green infrastructure, and project management, remain underfunded and underutilized. Integrating climate competencies into the civil service curriculum and rewarding institutional performance in adaptation and emissions reduction are crucial steps to ensure results (4, 9).

4. GENDER, EQUITY, AND JUST TRANSITION PRINCIPLES

The inclusive green transition also requires a gender-sensitive and justice-based approach. Moldova's climate and energy frameworks acknowledge vulnerable groups, but implementation often fails to incorporate gender-disaggregated data, targeted outreach, and participatory design. Women in rural areas, elderly populations, and Roma communities are disproportionately affected by energy poverty and climate hazards. A just transition framework must integrate social protection policies, reskilling programs for carbon-intensive industries, and inclusive employment strategies in the renewable sector. International funding proposals submitted by Moldova should include clear equity indicators, and monitoring systems should track the social impact of mitigation and adaptation policies (World Bank (2022). Climate Risk Country Profile 6).

As environmental governance evolves, so does the need for legal redress mechanisms. Climate litigation has become an emerging tool in many jurisdictions to hold governments and corporations accountable for environmental

damage and policy inaction. Moldova lacks a dedicated environmental court or specialized chambers within its judiciary to handle such claims (Plotnic Olesea, 2022). Strengthening access to justice through capacity-building for judges, public interest litigation training for lawyers, and legal standing for NGOs can bridge this gap. Moreover, the inclusion of environmental rights in Moldova's Constitution or civil code reforms could solidify the legal basis for future claims (20).

Given its geographic position, Moldova is highly influenced by climate and energy dynamics in Ukraine, Romania, and the Black Sea region. Regional integration into energy markets and climate adaptation networks offers a strategic opportunity for Moldova to leverage technical know-how, financing, and shared infrastructure. Cross-border river basin management (e.g., Prut and Dniester rivers), joint disaster risk reduction exercises, and transboundary environmental impact assessments should be prioritized. The alignment of Moldova's legal instruments with EU directives on water, air quality, and biodiversity also strengthens its international credibility and preparedness for future EU accession (21).

5. INSTITUTIONAL CAPACITIES AND INTERSECTORAL COORDINATION. FUTURE OUTLOOK AND IMPLEMENTATION GAPS

One of the critical challenges in Moldova's green transition is the fragmentation of institutional responsibilities across ministries and agencies. Despite the existence of national strategies, their implementation often suffers from lack of intersectoral cooperation and overlapping mandates. Strengthening the role of the National Council for Sustainable Development, along with permanent inter-ministerial working groups, could provide greater coherence. Regular capacity-building programs for civil servants and local government staff, particularly in climate finance, procurement of green infrastructure, and project management, remain underfunded and underutilized. Success in Moldova's green transition will rely on robust accountability frameworks, alignment with EU legislation, transparency, and participatory governance. Strategic actions include enhancing climate litigation mechanisms and developing detailed secondary legislation (8, 17). Legal continuity, data transparency, and sustained international engagement remain vital.

To consolidate the inclusive legal framework for the green transition, the following strategic actions are recommended:

1. Institutionalize climate litigation and environmental courts
2. Integrate NECP objectives into all sectoral planning laws
3. Expand public legal education on environmental rights
4. Improve transparency in energy auctions and licensing

Securing adequate financing remains critical to Moldova's successful transition towards sustainability. Moldova has leveraged international climate finance mechanisms, including significant contributions from the Green Climate

Fund (GCF), the European Union's EU4Climate Programme, and the World Bank (5, 6). These financial streams have been pivotal for initiating pilot projects and larger-scale implementations of sustainable agricultural practices, renewable energy developments, and urban resilience programs.

However, effective utilization of these funds often encounters institutional and administrative hurdles. Enhanced transparency, clear governance mechanisms, and streamlined administrative procedures are needed to optimize these financial flows. Additionally, expanding national financial mechanisms, such as green bonds and sustainable investment funds, could attract private sector investment, promoting broader economic engagement in Moldova's green initiatives. Public-private partnerships (PPPs) have demonstrated significant potential in sectors like renewable energy and infrastructure. Yet, to fully harness this potential, Moldova must improve regulatory frameworks to protect investor interests and incentivize sustainable investments. Capacity-building initiatives aimed at equipping local institutions and businesses with the necessary financial and technical expertise are equally crucial.

Public education and awareness form the backbone of effective climate governance. Moldova's efforts in public engagement, however, need considerable strengthening. Despite various campaigns and local government initiatives, general awareness of climate issues remains relatively low. Targeted education programs at all academic levels – from primary education to higher institutions – should integrate sustainability and climate resilience topics. Community-level engagement strategies, particularly in rural and marginalized areas, are essential for fostering broad-based support and participation in climate policies. Effective communication strategies that clearly articulate the benefits of the green transition to the broader public can significantly enhance societal buy-in. Moreover, civil society organizations play a vital role in bridging the gap between governmental policies and community actions. Supporting and strengthening these organizations through capacity-building and adequate funding will amplify their impact in advocacy, education, and mobilization efforts.

Effective monitoring, reporting, and evaluation (MRE) systems are fundamental to ensuring transparency, accountability, and continuous improvement in Moldova's green transition efforts. While Moldova has initiated various MRE mechanisms, significant gaps remain in their comprehensiveness and reliability. Developing robust indicators aligned with international standards, and integrating these into existing national statistical frameworks, can significantly enhance Moldova's ability to track progress effectively. Transparent and publicly accessible reporting mechanisms, such as national climate dashboards and regular status reports, can improve accountability and public trust. International cooperation and partnerships in the MRE domain can also provide critical support through shared technical expertise, capacity-building, and financial resources. Moldova's integration into broader regional and international

climate governance frameworks further reinforces the importance of robust MRE systems.

6. FINAL REFLECTIONS AND LONG-TERM PERSPECTIVES

In reflecting upon Moldova's inclusive green transition journey, several key insights emerge. Legal and institutional frameworks have significantly advanced, laying a strong foundation for future progress. However, sustained success requires ongoing commitment to equity, transparency, and comprehensive community engagement. Future policy and governance efforts must emphasize systematic integration of climate considerations across all sectors. Strengthening the judicial and legal systems through the establishment of specialized environmental courts and enhancing legislative support for vulnerable communities will be essential in ensuring equitable outcomes.

In conclusion, Moldova's ongoing green transition underscores a critical balance between national aspirations and international commitments. By maintaining a strong focus on inclusivity, resilience, and effective governance, Moldova can achieve meaningful and lasting sustainability outcomes, providing valuable lessons for similar transitioning economies globally.

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