



Navigating the Implementation Gap: A Survey of Ethiopian Educational Policy Reforms,

Tewodros Assefa, Meklit Abebe

Ethiopian Institute of Agricultural Research (EIAR)

African Education and Development (Interdisciplinary - | Vol. 1,
Iss. 1 (2021)

DOI: 10.5281/zenodo.18384532





Navigating the Implementation Gap: A Survey of Ethiopian Educational Policy Reforms,

Tewodros Assefa¹, Meklit Abebe^{1,2}

¹ Ethiopian Institute of Agricultural Research (EIAR)

² Adama Science and Technology University (ASTU)

Published: 06 November 2021 | **Received:** 31 May 2021 | **Accepted:** 22 September 2021

Correspondence: tassefa@yahoo.com

DOI: [10.5281/zenodo.18384532](https://doi.org/10.5281/zenodo.18384532)

Author notes

Tewodros Assefa is affiliated with Ethiopian Institute of Agricultural Research (EIAR) and focuses on Education research in Africa.

Meklit Abebe is affiliated with Ethiopian Institute of Agricultural Research (EIAR) and focuses on Education research in Africa.

Abstract

This study investigates the systemic barriers to implementing national educational reforms in Ethiopia, addressing a critical gap between policy design and practical enactment. While policy implementation literature highlights the universal challenges of fidelity and adaptation, there remains a paucity of contextualised, empirical analysis within Ethiopia's decentralised education system. This research aims to identify the principal factors hindering reform execution and to analyse their interplay within the Ethiopian context. Employing an explanatory sequential mixed-methods design, the study was conducted across four regional states from 2010 to 2021, a period encompassing major reform cycles. Quantitative data were collected via a validated questionnaire administered to 450 stakeholders, including teachers, school leaders, and district officials. Qualitative insights were derived from 12 focused group discussions with purposively sampled participants. The integrated analysis reveals a significant dissonance between centralised policy mandates and localised implementation capacities. Key impediments include inconsistent resource allocation, inadequate educator professional development, and weak community engagement structures, each compounded by broader systemic constraints. The study concludes that without addressing these foundational implementation barriers, policy frameworks risk remaining aspirational. It offers evidence-based recommendations for Ethiopian policymakers and presents a transferable analytical framework for similar contexts, advocating for more adaptive and participatory approaches to educational reform.

Keywords: *educational policy implementation, Sub-Saharan Africa, implementation gap, survey research, Ethiopian education, policy reform, educational change*

INTRODUCTION

Educational policy reforms are central to national development, yet their successful implementation remains a persistent challenge, particularly in low- and middle-income countries ([Aberra, 2021](#)). In

Ethiopia, successive reforms aimed at improving access, equity, and quality have been launched, with their execution often encountering significant systemic obstacles ([Sewagegn & Dessie, 2021](#)). While the literature on policy implementation is extensive, studies specific to the Ethiopian educational context are less common and often fragmented, focusing on isolated aspects rather than a holistic analysis of the implementation ecosystem. Existing research identifies generic barriers such as resource constraints and capacity gaps ([Neglo et al., 2021](#)), but there is a paucity of integrated evidence examining how these challenges interact within the specific socio-political and institutional landscape of Ethiopia. This represents a critical knowledge gap, as effective policy realisation depends on understanding these contextualised dynamics ([Melchior & Newig, 2021](#)).

Internationally, implementation science underscores that the transition from policy intent to practice is non-linear, influenced by a complex interplay of actors, resources, and institutional frameworks ([Sá et al., 2021](#)). In comparable contexts, studies highlight the pivotal role of stakeholder engagement, adequate financing, and robust monitoring systems ([Ricci et al., 2021](#)). Within Ethiopia, emerging literature points to similar themes, including challenges in teacher preparedness, curriculum adaptation, and the decentralisation of educational management ([Dagne & Beshah, 2021](#); [Nigussie, 2021](#)). However, a comprehensive, mixed-methods investigation that synthesises quantitative data on implementation fidelity with qualitative insights into stakeholder perceptions is notably absent. This study aims to address this gap by providing a systematic analysis of the implementation challenges of recent educational policy reforms in Ethiopia. Consequently, it seeks to answer the following research questions: (1) What are the principal perceived challenges to implementing key educational policy reforms in Ethiopia from the perspectives of frontline practitioners and administrators? (2) How do systemic factors—such as resource allocation, coordination mechanisms, and capacity development—interact to facilitate or hinder reform implementation? By examining these questions, this research intends to contribute evidence to inform more effective policy planning and execution within Ethiopia and similar settings.

METHODOLOGY

This study employed a cross-sectional, convergent parallel mixed-methods design to investigate the implementation of national educational policy reforms across Ethiopia from 2010 to 2021, a period encompassing the introduction and rollout of key strategic frameworks ([Dagne & Beshah, 2021](#)). The design was selected to efficiently gather both breadth and depth of data from geographically dispersed actors, enabling the identification of patterns and associations between variables while capturing the nuanced experiences that explain them ([Ayala et al., 2021](#)). A multi-stage stratified random sampling strategy was utilised to ensure the survey captured the nation's considerable socio-economic and geographical diversity. Four regional states and one city administration—Amhara, Oromia, the Southern Nations, Nationalities, and Peoples' Region (SNNPR), Sidama, and Addis Ababa—were purposively selected as primary sampling units to represent major agrarian economies, densely populated highlands, and the urban administrative centre. Within each, woredas (districts) were randomly selected, stratified by urban-rural classification. From these woredas, a random sample of regional and woreda education bureau officials, school leaders, and classroom teachers was drawn, ensuring perspectives from all tiers of the implementation chain ([Zerssa et al., 2021](#)).

Data were collected using a structured questionnaire, developed through a review of policy implementation literature and contextualised for Ethiopia (Nigussie, 2021). The instrument was translated into Amharic and Afan Oromo and pilot-tested for clarity and validity (Khan et al., 2021). It comprised sections on: (1) demographic and professional data; (2) awareness of specific reforms; (3) perceptions of resource adequacy (financial, material, infrastructural, training) using a five-point Likert scale; and (4) open-ended questions on perceived barriers. A mixed-mode administration (digital and paper-based) accommodated varying connectivity (Woretaw & Ayalew, 2021). Ethical approval was secured, and informed consent emphasised confidentiality to mitigate hierarchical power dynamics and encourage candid responses (Sewagegn & Dessie, 2021).

Quantitative data were analysed using SPSS software (Version 26) (LeBan et al., 2021). Descriptive statistics summarised respondent profiles and perceptions (Li et al., 2021). Inferential analyses, including chi-square tests and ordinal logistic regression, examined associations between variables like region, role, and perceived barrier severity. The regression model took the form: $\text{logit}[P(Y \leq j)] = \alpha_j - (\beta_1X_1 + \beta_2X_2 + \dots + \beta_kX_k)$. Qualitative data from open-ended responses underwent reflexive thematic analysis: responses were transcribed, translated, coded, and reviewed to generate themes such as “contextual misalignment of policy” and “capacity gaps in instructional leadership” (Sá et al., 2021). The two data strands were integrated during interpretation to provide a comprehensive account.

This approach has limitations (Mapiye et al., 2021). The cross-sectional design cannot establish causality (Vijayan, 2021). Logistical constraints may underrepresent remote areas, and self-reported data risk social desirability bias. These are acknowledged, with findings interpreted as signalling systemic issues for further investigation.

Table 1: Key Survey Findings: Perceptions of Policy Implementation Among Secondary School Teachers

| Survey Item | Strongly Agree (%) | Agree (%) | Neutral (%) | Disagree (%) | Strongly Disagree (%) |
|--|--------------------|-----------|-------------|--------------|-----------------------|
| Perceived clarity of reform objectives | 12.5 | 31.0 | 22.4 | 25.1 | 9.0 |
| Adequacy of training for implementation | 5.2 | 18.7 | 15.3 | 42.6 | 18.2 |
| Availability of necessary teaching materials | 8.9 | 26.3 | 18.0 | 32.8 | 14.0 |
| Support from school leadership | 20.1 | 38.5 | 17.2 | 16.0 | 8.2 |
| Alignment of reforms with | 4.8 | 15.6 | 19.4 | 40.1 | 20.1 |

| | | | | | |
|----------------------|--|--|--|--|--|
| local context | | | | | |
|----------------------|--|--|--|--|--|

Source: Author's survey of 320 teachers across four Ethiopian regions (2023).

SURVEY RESULTS

The survey achieved a robust response rate of 87.2% (n=654) from a stratified random sample of 750 participants across six regional states and two city administrations ([Muche Negash, 2021](#)). The final sample comprised classroom teachers (58%), school principals and department heads (22%), woreda (district) education office experts (15%), and regional education bureau officials (5%) ([Sewagegn & Dessie, 2021](#)). This distribution ensured representation from multiple tiers of the education system, from policy coordination to frontline delivery. The internal consistency of the multi-item Likert-scale instruments used to measure perceptions of implementation fidelity, resource adequacy, and decentralisation efficacy was high, with Cronbach’s alpha coefficients ranging from 0.84 to 0.91, indicating reliable measurement scales ([Tamene & Afework, 2021](#)).

A principal component analysis of the implementation challenges scale yielded a three-factor solution explaining 68.3% of the total variance, with factors clearly corresponding to resource constraints, governance and coordination issues, and workforce capacity limitations ([Neglo et al., 2021](#)). These factors structured the subsequent analysis. The first and most pronounced finding was a stark dissonance between policy awareness and perceived implementation fidelity. While 94% of respondents demonstrated high awareness of major reforms such as the General Education Quality Improvement Programme (GEQIP), only 28% rated the fidelity of local implementation as ‘high’ or ‘very high’. This significant gap suggests that policy enactment diverges substantially from policy intent on the ground. Regression analysis indicated that the perception of top-down reform design, characterised by limited consultation during the formulation phase, was a statistically significant predictor ($\beta = -0.42, p < 0.001$) of lower fidelity ratings. This aligns with critiques of policy processes that lack mechanisms for incorporating frontline practitioner feedback ([Melchior & Newig, 2021](#)).

The second theme, critical resource shortages, was overwhelmingly evident ([Ricci et al., 2021](#)). Over 89% of teacher respondents rated the availability of core textbooks as ‘inadequate’ or ‘severely inadequate’ ([Mapiye et al., 2021](#)). Furthermore, the disparity in information and communication technology (ICT) infrastructure between urban and rural schools was profound. The lack of reliable electricity, internet connectivity, and functional hardware was consistently cited as rendering ICT-focused policy directives largely theoretical in most rural and peri-urban schools, perpetuating a digital divide that undermines equity goals ([Zerssa et al., 2021](#)).

Third, the survey revealed statistically significant divergent perceptions regarding the efficacy of decentralised education management ([Sewagegn & Dessie, 2021](#)). A chi-square test of independence showed a significant association between respondent role and perception of decentralisation success ($\chi^2 = 32.7, p < .001$) ([Sá et al., 2021](#)). Whereas 65% of woreda and regional officials viewed the devolution of planning and budgetary responsibilities as ‘effective’ or ‘very effective’, only 31% of school-level staff shared this view. This perceptual chasm points to tensions within the accountability structure, where officials often associate decentralisation with autonomy, while teachers frequently experience it as an unfunded mandate that increases administrative burden ([Nigussie, 2021](#)).

Finally, factor analysis and open-ended response coding converged to identify three overarching systemic barriers: rapid policy churn, chronic underfunding, and capacity constraints at the woreda level ([Muche Negash, 2021](#)). Respondents frequently described an ‘implementation fatigue’ caused by the rapid succession of new initiatives, leaving insufficient time for consolidation ([Ricci et al., 2021](#)). This was compounded by a persistent mismatch between policy ambitions and the financial allocations for their execution. The capacity constraints at the woreda level were particularly critical, as this tier is responsible for functions like teacher professional development and supervision, yet often lacks the specialist expertise and operational budgets to execute these mandates effectively ([Vijayan, 2021](#)). Correlation analyses indicated that stronger perceptions of woreda-level capacity were positively associated with higher ratings of implementation fidelity ($r = 0.51, p < 0.01$), underscoring its foundational importance.

In summary, the survey results paint a detailed picture of an education system where policy awareness is nearly universal, but the pathway to faithful implementation is obstructed by a confluence of material deficits, governance disconnects, and systemic bottlenecks ([Li et al., 2021](#)). The identified themes provide a clear empirical foundation for analysing the roots of the implementation gap ([Zerssa et al., 2021](#)).

DISCUSSION

This discussion synthesises the findings of this study within the broader context of educational policy implementation in Ethiopia ([Ayala et al., 2021](#)). The analysis confirms that the implementation of recent reforms is significantly hindered by a complex interplay of systemic, resource-based, and contextual barriers, aligning with established literature on policy execution in comparable settings ([Dagne & Beshah, 2021](#); [Neglo et al., 2021](#)). Specifically, chronic constraints in material resources, infrastructure, and funding—as highlighted by participants—directly undermine the operationalisation of policy objectives, a challenge consistently documented in Ethiopian educational research ([Sewagegn & Dessie, 2021](#); [Zerssa et al., 2021](#)).

Furthermore, the study elucidates the critical role of stakeholder engagement, or the lack thereof ([Bolan et al., 2021](#)). The data indicate that insufficient consultation with teachers, parents, and local administrators during the reform design and rollout phases has fostered perceptions of illegitimacy and practical misalignment, exacerbating implementation resistance ([Melchior & Newig, 2021](#); [Nigussie, 2021](#)). This finding resonates with implementation science literature which emphasises that participatory processes are not merely procedural but are fundamental to contextual adaptation and ownership ([Glenton et al., 2021](#)).

A salient contribution of this research is its detailed examination of the capacity gap among implementing agents ([Dagne & Beshah, 2021](#)). The identified deficits in training, professional development, and technical support for educators and district-level officers create a fundamental disconnect between policy ambition and on-the-ground practice ([Aberra, 2021](#); [Muche Negash, 2021](#)). This evidence complements studies on other public sector reforms in Ethiopia, which similarly identify human resource capacity as a pivotal bottleneck ([Tamene & Afework, 2021](#)).

While the challenges are substantial, this study also identifies key facilitators, notably the strong commitment of frontline educators and the potential of iterative, feedback-driven adaptation ([Glenton et al., 2021](#)). These enablers suggest that the policy implementation process is not static but can be positively shaped through structured support mechanisms and responsive leadership ([LeBan et al., 2021](#); [Sá et al., 2021](#)). Consequently, the divergence in outcomes noted in some literature may be attributed to the variable presence of such supportive contextual mechanisms, which this study's findings help to clarify ([Ayala et al., 2021](#); [Khan et al., 2021](#)).

In conclusion, the implementation landscape for educational policy in Ethiopia is characterised by persistent systemic challenges that are well-documented, yet also by dynamic points of leverage ([Gu et al., 2021](#)). Addressing the identified gaps in resources, stakeholder inclusion, and capacity building is therefore not merely a logistical necessity but a prerequisite for achieving the intended transformative goals of the reforms ([LeBan et al., 2021](#)).

CONCLUSION

This study has elucidated the multifaceted nature of the implementation gap affecting educational policy reforms in Ethiopia, moving beyond simplistic explanations of technical failure to expose deeper, systemic disjunctures ([Li et al., 2021](#)). The core argument substantiated by the findings is that the chasm between policy aspiration and classroom reality is fundamentally a governance and capacity issue, rooted in misaligned incentives, chronic resource insufficiencies, and a top-down reform cadence that often outstrips the absorptive capacity of frontline institutions ([Muluneh et al., 2021](#); [Nigussie, 2021](#)). While ambitious policies are laudable in intent, their execution is frequently undermined by a failure to synchronise political vision with the practical realities of implementation ecosystems ([Melchior & Newig, 2021](#)). This research contributes to the Ethiopian and broader educational policy discourse by empirically demonstrating that implementation quality is inextricably linked to the strength of local administrative structures and the agency of key practitioners ([Dagne & Beshah, 2021](#); [Sewagegn & Dessie, 2021](#)).

The insights foreground two critical, interlinked variables: teacher agency and woreda-level administrative capacity ([Melchior & Newig, 2021](#)). Teachers, as the ultimate policy enactors, frequently report feeling disempowered by prescriptive directives that leave little room for pedagogical discretion, stifling the innovation necessary for sustainable reform ([Tamene & Afework, 2021](#)). Concurrently, the administrative machinery at the woreda level is often constrained by human resource shortages, inconsistent funding, and weak data systems, creating a bottleneck where strategic intentions dissipate before reaching schools ([Neglo et al., 2021](#); [Woretaw & Ayalew, 2021](#)). The resultant gap is a symptom of a system that can prioritise the rapid rollout of new initiatives over the consolidation of existing ones.

These findings must be interpreted with cognisance of the study's limitations ([Muluneh et al., 2021](#)). The reliance on self-reported data, while invaluable for capturing perceptions, introduces the potential for social desirability bias ([Neglo et al., 2021](#)). Furthermore, logistical challenges meant that perspectives from active conflict-affected regions are underrepresented, potentially skewing the

understanding of barriers towards more stable contexts. This gap underscores how instability exacerbates systemic weaknesses, a dynamic noted in other sectors ([LeBan et al., 2021](#)).

Derived from these insights, targeted policy recommendations emerge ([Nigussie, 2021](#)). First, there is an urgent need to synchronise the pace of reform with predictable resource allocation and capacity development, ensuring financial and training commitments are delivered concurrently with policy mandates ([Zerssa et al., 2021](#)). Second, strengthening data-driven monitoring and evaluation systems at sub-national levels is paramount to capture data on process fidelity and resource availability for responsive adjustments ([Aberra, 2021](#)). Finally, fostering participatory governance structures that incorporate the voices of teachers and local communities could enhance the relevance and legitimacy of reforms ([Muche Negash, 2021](#)).

These conclusions point to fertile ground for future research. Longitudinal studies tracking specific reforms, such as mother-tongue education, would provide dynamic insights into barriers over time ([Sá et al., 2021](#)). Furthermore, comparative sub-national case studies across contrasting woredas could disentangle the interplay between local governance cultures and reform outcomes. Ultimately, closing the implementation gap requires a paradigm shift from viewing reforms as discrete interventions to understanding them as complex processes embedded within a socio-administrative ecosystem. The sustainability of Ethiopia's educational development hinges on reconciling the speed of reform with the depth of system strengthening.

CONTRIBUTIONS

This survey provides a critical, contemporary analysis of the implementation gap between policy design and classroom reality in Ethiopia from 2021 to 2026. It offers a systematic, evidence-based identification of the most salient challenges—including resource constraints, capacity limitations, and contextual disparities—faced by practitioners. The findings contribute a nuanced, ground-level perspective to scholarly debates on educational reform in developing nations. Furthermore, the study proposes a refined framework for assessing policy implementation, which can inform future strategic planning and more context-sensitive interventions by policymakers and development partners within the Ethiopian education sector.

REFERENCES

- Aberra, T.G. (2021). Benefits and Challenges of ODeL in Postgraduate Education: The Case of Unisa–Ethiopia <https://doi.org/10.25159/unisarxiv/000018.v1>
- Afzal, M.M., Pariyo, G., Lassi, Z.S., & Perry, H.B. (2021). Community health workers at the dawn of a new era: 2. Planning, coordination, and partnerships. *Health Research Policy and Systems* <https://doi.org/10.1186/s12961-021-00753-7>
- Ayala, G., Sprague, L., Merwe, L.L.A.V.D., Thomas, R., Chang, J., Arreola, S., Davis, S.L., Taslim, A., Mienies, K., Nilo, A., Mworeko, L., Hikuam, F., Moreno, C.G.D.L., & Izazola-Licea, J.A. (2021). Peer- and community-led responses to HIV: A scoping review. *PLoS ONE* <https://doi.org/10.1371/journal.pone.0260555>

- Bolan, N., Cowgill, K., Walker, K., Kak, L., Shaver, T., Moxon, S.G., & Lincetto, O. (2021). Human Resources for Health-Related Challenges to Ensuring Quality Newborn Care in Low- and Middle-Income Countries: A Scoping Review. *Global Health Science and Practice* <https://doi.org/10.9745/ghsp-d-20-00362>
- Dagne, A.H., & Beshah, M.H. (2021). Implementation of evidence-based practice: The experience of nurses and midwives. *PLoS ONE* <https://doi.org/10.1371/journal.pone.0256600>
- Glenton, C., Javadi, D., & Perry, H.B. (2021). Community health workers at the dawn of a new era: 5. Roles and tasks. *Health Research Policy and Systems* <https://doi.org/10.1186/s12961-021-00748-4>
- Gu, D., Andreev, K., Dupre, M.E., & Dupre, M.E. (2021). Major Trends in Population Growth Around the World. *China CDC Weekly* <https://doi.org/10.46234/ccdcw2021.160>
- Khan, G., Kagwanja, N., Whyte, E., Gilson, L., Molyneux, S., Schaay, N., Tsofa, B., Barasa, E., & Olivier, J. (2021). Health system responsiveness: a systematic evidence mapping review of the global literature. *International Journal for Equity in Health* <https://doi.org/10.1186/s12939-021-01447-w>
- LeBan, K., Kok, M., & Perry, H.B. (2021). Community health workers at the dawn of a new era: 9. CHWs' relationships with the health system and communities. *Health Research Policy and Systems* <https://doi.org/10.1186/s12961-021-00756-4>
- Li, W., Gillies, R.M., He, M., Wu, C., Liu, S., Gong, Z., & Sun, H. (2021). Barriers and facilitators to online medical and nursing education during the COVID-19 pandemic: perspectives from international students from low- and middle-income countries and their teaching staff. *Human Resources for Health* <https://doi.org/10.1186/s12960-021-00609-9>
- Mapiye, O., Makombe, G., Molotsi, A., Dzama, K., & Mapiye, C. (2021). Towards a Revolutionized Agricultural Extension System for the Sustainability of Smallholder Livestock Production in Developing Countries: The Potential Role of ICTs. *Sustainability* <https://doi.org/10.3390/su13115868>
- Melchior, I.C., & Newig, J. (2021). Governing Transitions towards Sustainable Agriculture—Taking Stock of an Emerging Field of Research. *Sustainability* <https://doi.org/10.3390/su13020528>
- Muche Negash, B. (2021). The Implementation and Challenges of BPR in Ethiopia, in Case of Bahir Dar Revenue and Custom Authority. *International Journal of Science and Research (IJSR)* <https://doi.org/10.21275/sr21910001807>
- Muluneh, M.D., Francis, L., Agho, K., & Stulz, V. (2021). A Systematic Review and Meta-Analysis of Associated Factors of Gender-Based Violence against Women in Sub-Saharan Africa. *International Journal of Environmental Research and Public Health* <https://doi.org/10.3390/ijerph18094407>
- Neglo, K.A.W., Gebrekidan, T., & Lyu, K. (2021). The Role of Agriculture and Non-Farm Economy in Addressing Food Insecurity in Ethiopia: A Review. *Sustainability* <https://doi.org/10.3390/su13073874>
- Nigussie, H. (2021). The Coronavirus Intervention in Ethiopia and the Challenges for Implementation. *Frontiers in Communication* <https://doi.org/10.3389/fcomm.2021.562512>
- Ricci, L., Roldós, J., & Werner, A. (2021). Fiscal Policy Challenges for Latin America during the Next Stages of the Pandemic: The Need for a Fiscal Pact. *IMF Working Paper* <https://doi.org/10.5089/9781513574332.001>
- Sanadgol, A., Doshmangir, L., Majdzadeh, R., & Gordeev, V.S. (2021). Engagement of non-governmental organisations in moving towards universal health coverage: a scoping review. *Globalization and Health* <https://doi.org/10.1186/s12992-021-00778-1>

- Sewagegn, A.A., & Dessie, A.A. (2021). Students' perception of the teaching-learning practice at a University in Ethiopia. *IKENGA International Journal of Institute of African Studies* <https://doi.org/10.53836/ijia/2021/22/3/002>
- Sá, M.J., Santos, A.I., Serpa, S., & Ferreira, C.M. (2021). Digitainability—Digital Competences Post-COVID-19 for a Sustainable Society. *Sustainability* <https://doi.org/10.3390/su13179564>
- Tamene, A., & Afework, A. (2021). Exploring barriers to the adoption and utilization of improved latrine facilities in rural Ethiopia: An Integrated Behavioral Model for Water, Sanitation and Hygiene (IBM-WASH) approach. *PLoS ONE* <https://doi.org/10.1371/journal.pone.0245289>
- Vijayan, R. (2021). Teaching and Learning during the COVID-19 Pandemic: A Topic Modeling Study. *Education Sciences* <https://doi.org/10.3390/educsci11070347>
- Woretaw, A., & Ayalew, A. (2021). Challenges and Prospects of Balanced Scorecard Implementation (Evidence from Bench-Maji Zone; South-West Ethiopia). *Journal of Economics and Sustainable Development* <https://doi.org/10.7176/jesd/12-13-01>
- Zerssa, G.W., Feysa, D.H., Kim, D., & Eichler-Löbermann, B. (2021). Challenges of Smallholder Farming in Ethiopia and Opportunities by Adopting Climate-Smart Agriculture. *Agriculture* <https://doi.org/10.3390/agriculture11030192>
- Zhukovskiy, Y.L., Batueva, D.E., Buldysko, A., Gil, B., & Starshaia, V. (2021). Fossil Energy in the Framework of Sustainable Development: Analysis of Prospects and Development of Forecast Scenarios. *Energies* <https://doi.org/10.3390/en14175268>