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Trade-Offs Among SDGs: How the Pursuit of Economic, Food, and Urban Development Goals May Undermine Climate and Equity Targets?

Walter Leal Filho[1,2,3] | Maria Alzira Pimenta Dinis[4,5] | Tarek Ben Hassen[6]

[1]Hamburg University of Applied Sciences, Research and Transfer Centre "Sustainable Development and Climate Change Management", Hamburg, Germany | [2]WSB Merito University, Wroclaw, Poland | [3]School of Science and the Environment. Manchester Metropolitan University, Manchester, UK | [4]Fernando Pessoa Research, Innovation and Development Institute (FP-I3ID), university Fernando Pessoa (UFP), Porto, Portugal | [5]Marine and Environmental Sciences Centre (MARE), University of Coimbra, Coimbra, Portugal | [6]Department of International Affairs, College of Arts and Sciences, Qatar University, Doha, Qatar

Correspondence: Tarek Ben Hassen (thassen@qu.edu.qa)

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ABSTRACT

The United Nations Sustainable Development Goals (SDGs) provide a comprehensive framework for addressing global challenges; however, their implementation reveals critical tensions between development priorities and climate action that warrant deeper examination. Indeed, one significant factor impacting the implementation of the SDGs is the presence of conflicts between certain goals. Accordingly, this study aims to critically examine how the pursuit of economic growth (SDG 8), food security (SDG 2), clean energy (SDG 7), and urban development (SDG 11) may exacerbate climate change and environmental degradation (SDGs 13–15) while also reinforcing social inequalities (SDGs 6, 10). Employing a review-based approach to assess SDG interactions—focusing on the climate-development nexus, particularly the relationship between economic expansion (SDG 8), environmental sustainability (SDGs 13–15), and social equity (SDGs 1, 5, and 10)—this research identifies key areas of conflict that challenge the framework's internal coherence. Findings indicate significant trade-offs between economic growth and environmental sustainability, alongside previously underexamined tensions between social equity goals and resource-intensive development strategies. Accordingly, the study proposes a roadmap for resolving these tensions through integrated climate governance, targeted interventions, and cross-sectoral decision-making that aligns development with the Paris Agreement and the 2030 Agenda. The practical implications of the study are twofold. First, it triggers a reflection on the root causes of conflicting goals, a serious problem that has been largely overlooked. Second, it highlights the importance of addressing the need to pay more attention to existing conflicts, as they have adverse effects that should be avoided. By offering actionable recommendations, this study contributes to the evolving discourse on sustainable development within the context of climate change mitigation and adaptation. It provides a strategic pathway toward balancing economic development with environmental resilience, ensuring that SDG implementation aligns with the urgent need for climate action within the remaining timeframe before 2030.

1 | Introduction

The Sustainable Development Goals (SDGs), adopted by United Nations Member States in 2015, provide a comprehensive framework to address global challenges, including poverty, inequality, climate change, and environmental degradation (United Nations 2015). Unlike their predecessor, the Millennium Development Goals (MDGs), the SDGs embody a shift toward an integrated approach that extends beyond poverty alleviation to address the intricate relationships between economic growth, social inclusion, and environmental sustainability (de Jong and Vijge 2021). With 2030 as the target year, the SDGs recognize the interdependence of social, economic, and environmental factors (Biermann et al. 2017; Nilsson et al. 2016). Rather than isolated interventions, the framework emphasizes coordinated action, where addressing one SDG influences others—for instance, climate action (SDG 13) impacts food security (SDG 2), economic growth (SDG 8), and public health (SDG 3) (International Science Council 2017). Additionally, the principle of "leaving no one behind" ensures that development is inclusive, targeting inequalities within and between societies, particularly for marginalized groups, women, and youth (Gupta and Vegelin 2016). This marks a critical evolution in global sustainability governance, shifting from a narrow economic focus to a holistic vision of resilience and planetary well-being (Kanie et al. 2019).

However, as we move into 2025, the urgency of addressing climate change while simultaneously advancing the SDGs has intensified (Sachs et al. 2024; United Nations 2015). While poverty reduction, access to education, and gender equality have improved in many regions, significant structural and systemic barriers remain (Leal Filho et al. 2023). The COVID-19 pandemic caused substantial setbacks in SDG achievement, reversing years of progress, but also exposed deep-rooted inequalities, disproportionately affecting marginalized communities and straining healthcare, education, economic stability, and food security (El Bilali and Ben Hassen 2024; Sachs et al. 2024; United Nations 2015). The pandemic exacerbated inequalities, disproportionately affecting marginalized communities, highlighting the need for resilient health systems and social protection frameworks (Goniewicz et al. 2023; Tan et al. 2023). Moreover, climate change has emerged as a central force driving a cascade of socioeconomic and environmental crises. Rising global temperatures, shifting precipitation patterns, and increasing extreme weather events—such as droughts, hurricanes, floods, and wildfires—are placing unprecedented stress on agricultural systems, exacerbating food insecurity, disrupting water availability (Forster et al. 2024; World Meteorological Organization 2024), and displacing millions of people (FAO et al. 2023).

Moreover, SDGs funding has faced significant setbacks, with many countries experiencing budgetary constraints that hinder their ability to invest in sustainable projects (UN 2024). The economic impacts of the COVID-19 pandemic, coupled with rising inflation, debt burdens, and fluctuating energy prices, have further strained government expenditures, reducing allocations for climate action, poverty reduction, and infrastructure development. Developing nations, in particular, face severe funding gaps, restricting their ability to scale up climate adaptation and mitigation strategies (Khan et al. 2024). The current geopolitical landscape also presents further challenges, complicating international cooperation on global development agendas. Conflicts such as the war in Ukraine, ongoing trade disputes, and economic tensions between major economies have diverted political focus and financial resources away from SDG implementation, shifting priorities toward defense spending, energy security, and economic stabilization (Nguyen et al. 2023). Without renewed global commitment and innovative financing mechanisms, achieving the SDGs by 2030 remains increasingly uncertain (Göçoğlu et al. 2025).

Furthermore, beyond these challenges, a concerning trend emerges: pursuing certain SDGs can inadvertently hinder the progress of others, creating a complex dilemma in achieving a balanced and holistic approach to sustainable development (Fuso Nerini et al. 2017; Hickel 2019; Renaud et al. 2022). While the SDGs are designed to be interconnected and mutually reinforcing, their implementation often reveals trade-offs and conflicts that can slow progress or even reverse gains in other areas (Elder 2025). For instance, economic growth (SDG 8) often relies on resource extraction and industrial expansion, leading to higher emissions and biodiversity loss, which directly conflict with climate action (SDG 13) and ecosystem conservation (SDGs 14 and 15). Likewise, expanding agriculture to achieve food security (SDG 2) can intensify water consumption and deforestation, straining clean water availability (SDG 6) and land protection (SDG 15). These tensions underscore the need for integrated policy frameworks and strategic decision-making to ensure that advancements in one goal do not come at the expense of another (Nilsson et al. 2016).

Furthermore, the growing literature on the Sustainable Development Goals (SDGs) has highlighted their interconnected nature; yet few studies systematically examine their conflicts and trade-offs. This article contributes to the debate by (1) providing a comprehensive framework to identify and categorize SDG conflicts, (2) synthesizing documented trade-offs across different levels, and (3) proposing policy pathways to mitigate these tensions. While prior research has focused on synergies, our work explicitly addresses competing priorities—such as economic growth (SDG 8) versus environmental conservation (SDGs 13–15)—offering a nuanced understanding of their implications. By integrating quantitative and qualitative methods, we reveal context-specific barriers to SDG coherence, advancing both theoretical and practical discussions. Our findings challenge the assumption of universal SDG compatibility, providing policymakers with actionable insights to navigate conflicting objectives. This study thus fills a critical gap in sustainability governance, emphasizing the need for targeted, adaptive strategies to achieve equitable progress. Accordingly, the article addresses a perceived research gap by combining a review of the existing literature with evidence of conflicts among some goals, complementing the process with the development of a policy-relevant roadmap to support actionable interventions.

This analysis is structured in four interconnected parts. First, we present our methodological framework for identifying and characterizing SDG interactions. Secondly, we examine critical conflicts between SDGs, with particular focus on quantified trade-offs among economic development (SDG 8), environmental

conservation (SDGs 13–15), food security (SDG 2), energy access (SDG 7), and urbanization (SDG 11). Building on this analysis, we develop a temporally explicit roadmap for SDG implementation, identifying key intervention points and policy levers for the late 2024–2030 period. Finally, we propose evidence-based strategies for achieving SDG targets while minimizing negative interactions, emphasizing institutional mechanisms and policy frameworks that can facilitate integrated implementation approaches.

2 | Methodology

This study adopts a review-based methodology, drawing from peer-reviewed literature, policy reports, and global sustainability assessments to analyze key conflicts within the SDGs framework. This approach has three main advantages. First, this approach offers a comprehensive understanding of SDG conflicts by synthesizing diverse sources of information, which helps identify cross-cutting issues affecting multiple SDGs. The second advantage lies in its scientific rigor, as reliance on peer-reviewed literature ensures that the analysis is grounded in well-established research findings, thereby enhancing its credibility and reliability. Finally, incorporating policy reports and global sustainability assessments bridges the gap between research and practice, allowing for the translation of theoretical insights into actionable policy recommendations that can inform decision-making and implementation strategies at national and international levels.

By synthesizing findings from empirical research and policy evaluations, this study provides a comprehensive assessment of SDG interactions, with a particular focus on trade-offs that hinder implementation. As a first step, we conducted an extensive literature review, systematically searching the Web of Science and Scopus databases for peer-reviewed publications from 2015 to 2024 that explicitly examine interactions between multiple SDGs. Search terms included combinations of "Sustainable Development Goals," "SDG interactions," "trade-offs," "conflicts," and specific goal pairings (e.g., "SDG 8" AND "SDG 13"). Following this, to broaden the scope, we supplemented database searches with targeted exploration of gray literature, incorporating reports from international organizations, such as the UN agencies, the OECD, and the World Bank, to capture policy-driven insights. Publications were selected based on three criteria: (1) explicit analysis of interactions between two or more SDGs, (2) clear identification of adverse interactions or trade-offs, and (3) inclusion of empirical evidence supporting the identified interactions.

Moreover, building upon established frameworks for analyzing SDG interactions (Nilsson et al. 2016; Schmidt-Traub et al. 2017), we sought to develop a policy-relevant roadmap that moves beyond theoretical discussion toward actionable interventions. This required integrating elements from quantitative systems modeling and qualitative policy analysis, emphasizing temporal dynamics and context-specific implementation challenges. Informed by Nilsson et al. (2016) seminal work on SDG interactions, our roadmap combines quantitative trajectory mapping with qualitative assessments of SDG implementation barriers. The study also draws from Le Blanc's (2015) critical analysis framework in SDG integration research, identifying key intervention points for improving policy coherence.

The roadmap's structure was developed through key methodological steps. Firstly, an expert-driven literature review focusing on SDG implementation challenges, mainly drawing from the systematic reviews by Fuso Nerini et al. (2019) on climate action and Biermann et al. (2022) on governance frameworks. Secondly, a temporal mapping exercise identifies critical junctures and decision points when considering priorities relating to economic growth (SDG 8), social development (SDGs 1, 5, 10), and environmental protection (SDGs 13, 14, 15). The trajectory arcs were modeled using trend analysis revealed from existing SDG literature. The placement of critical decision points was determined through a systematic study of implementation barriers and resource conflicts, building on the methodology developed by Schmidt-Traub et al. (2017) for the SDGs. This approach allows for a dynamic representation of SDG interactions while identifying key implementation challenges and opportunities for synchronized progress across different development dimensions.

Table 1 below summarizes the literature review and selection process employed in this study to enhance transparency and structure. While the review does not adhere to a PRISMA framework, it reflects a systematic and expert-guided synthesis of evidence from both academic and policy sources.

TABLE 1 | Summary of literature review process.

Step	Description
Review type	Expert-driven structured review of peer-reviewed literature, policy reports, and assessments
Databases consulted	Web of Science, Scopus, Google Scholar, and selected gray literature from global agencies
Time frame	2015–2024
Search focus	SDG interactions, trade-offs, conflicts, synergies, and implementation challenges
Search terms	"Sustainable Development Goals", "SDG interactions", "trade-offs", "conflicts", for example, "SDG 8" AND "SDG 13"
Inclusion criteria	Relevance to SDG interactions; empirical or policy relevance; focus on conflicts/trade-offs
Exclusion criteria	Non-empirical studies, tangential topics, or a lack of relevance to SDG conflicts
Selection method	Title/abstract screening followed by full-text review
Synthesis method	Qualitative integration of empirical findings and policy recommendations

3 | The Conflicting SDGs: Key Trade-Offs and Challenges

Whereas the SDGs are designed to be interconnected and mutually reinforcing, their practical implementation has increasingly highlighted that these goals do not always work in harmony, with progress toward some goals potentially undermining others (Spaiser et al. 2017). Indeed, achieving some SDGs could contradict others, creating significant challenges in policy implementation (Table 2).

It can be seen that one of the most prominent conflicts exists between SDG 8 (Decent work and economic growth) and environmental goals such as SDG 13 (Climate action), SDG 14 (Life below water), and SDG 15 (Life on land). Economic growth is a key driver of job creation and poverty reduction, making it a critical priority for many governments. However, its reliance on industrial expansion, fossil fuel consumption, and resource-intensive production systems presents significant environmental challenges (Haberl et al. 2020). Industrial activities contribute to increased resource consumption, pollution, and biodiversity loss, undermining long-term ecological stability. The expansion of extractive industries, such as mining and deforestation-driven agriculture, accelerates habitat destruction and disrupts ecosystems, further exacerbating environmental degradation (Dasgupta et al. 2021). Research shows that sustaining economic growth while ensuring environmental sustainability is challenging (Hickel and Kallis 2020).

Furthermore, the dominant economic paradigm, which prioritizes GDP growth, often overlooks the ecological limits of natural resource extraction and waste absorption. Pursuing rapid economic development without adequate environmental safeguards can hinder efforts to combat climate change (Hickel 2019). Despite international commitments to green growth strategies, the tension between economic expansion and sustainability remains unresolved. The "decoupling" idea suggests that economies can grow without increasing environmental harm. The theory may be regarded as naíve by some, since growth as a whole and economic growth in particular are usually associated with a depletion of natural resources, especially non-renewable ones. While some high-income countries have

TABLE 2 | Key trade-offs between selected SDGs.

Primary SDG goal	Conflicting SDG goal	Nature of conflict	References
SDG 8: Decent work and economic growth	SDGs 13: Climate action; SDG 14: Life Below water; SDG 15: Life on land	– Industrial expansion increases emissions and pollution. – High resource consumption depletes ecosystems. – Extractive industries drive deforestation and biodiversity loss.	(Haberl et al. 2020) (Dasgupta et al. 2021). (Hickel and Kallis 2020). (Hickel 2019) (Elder and Olsen 2019).
SDG 2: Zero hunger	SDGs 6: Clean water and sanitation; SDG 15: Life on land	– Irrigation expansion strains freshwater availability. – Chemical fertilizers contribute to water pollution. – Agricultural land-use change drives habitat loss.	(Filho et al. 2022) (Fanzo and Miachon 2023) (Tubiello et al. 2022) (FAO 2023) (IPCC 2019) (Menegat et al. 2022)
SDG 7: Affordable and clean energy	SDG 15: Life on land	– Hydropower projects lead to river fragmentation. – Biofuel plantations cause deforestation and land conflicts. – Large-scale energy projects displace local communities.	(Fuso Nerini et al. 2017) (Castor et al. 2020) (Silva Lora et al. 2011)
SDG 11: Sustainable cities and communities	SDGs 13: climate action; SDG 15: life on land	– Urbanization destroys natural habitats and green spaces. – Increased energy and resource demand raises emissions. – Gentrification and infrastructure bias deepen social inequality.	(Raimbault and Pumain 2022) (IPCC 2014) (Glaeser et al. 2009). (UN-Habitat 2022).
SDG 4: Quality education	SDG 13: Climate action	– Air travel for international education raises emissions. – Increased academic mobility adds to the global transport footprint.	(McCollum and Nicholson 2023; Shields 2019).

Source: Authors' elaboration based on the literature review.

achieved instances of relative decoupling, where GDP increases outpace environmental degradation, the notion of absolute decoupling—where economic growth coincides with an overall reduction in resource use and emissions—remains highly contested and largely unsupported by empirical evidence (Elder and Olsen 2019).

Recent critiques highlight that the decoupling trends observed thus far lack the necessary magnitude or scope to achieve sustainability targets (Bithas et al. 2021). Hickel and Kallis (2020) contend that there is insufficient evidence to suggest that absolute decoupling is happening swiftly enough to remain within the limits set by planetary boundaries. The European Environmental Bureau (2019) also finds no empirical evidence to support the notion of decoupling at the scale necessary to avert environmental breakdown. Further, it illustrates that even seemingly positive outcomes frequently depend on outsourcing emissions to other nations or are compromised by rebound effects. The limitations indicate that depending exclusively on decoupling to align economic growth with sustainability may be erroneous. Haberl et al. (2020) caution that decoupling is limited by biophysical boundaries, particularly in sectors such as construction, transport, and food systems that are inherently resource-intensive. For instance, a global economic growth rate of 3% per year makes it empirically unfeasible to reduce overall resource use and cut CO_2 emissions fast enough to stay within the 2°C carbon budget. The industrial sector alone accounts for a significant share of global greenhouse gas emissions, and increasing global production to sustain economic growth further exacerbates this trend. This directly contradicts the sustainability objectives of the SDGs, as the pursuit of SDG 8 (economic growth) inherently drives resource extraction and emissions, undermining SDG 12 (Responsible Consumption and Production) and SDG 13 (Climate Action) (Hickel 2019).

In addition, the pursuit of SDG 2 (Zero Hunger), while essential for global food security, often comes into direct conflict with environmental and resource conservation objectives, particularly SDG 6 (Clean Water and Sanitation) and SDG 15 (Life on Land). In fact, while climate change significantly impacts food systems, they also contribute to it. Indeed, from agricultural practices to consumer habits, the sector contributes substantially to greenhouse gas (GHG) emissions and environmental degradation, driving global warming (Filho et al. 2022). Achieving food security requires expanding irrigation systems, using chemical fertilizers, and intensifying land cultivation, which significantly pressures water resources and ecosystems. Additionally, land-use changes driven by agricultural expansion contribute to deforestation, habitat destruction, and soil degradation, release stored carbon, reduce future carbon sequestration, and undermine biodiversity and long-term sustainability (Fanzo and Miachon 2023). For instance, in 2019, agri-food systems were responsible for a significant portion of global GHG emissions, contributing 21% of carbon dioxide emissions, 53% of methane emissions, and 78% of nitrous oxide emissions (Tubiello et al. 2022).

The agro-food sector contributes to climate change through multiple pathways. First, land-use changes, such as deforestation for agricultural expansion, release stored carbon into the atmosphere. Forests act as crucial carbon sinks, and their destruction not only emits stored carbon but also diminishes future carbon sequestration capacity (IPCC 2019). Second, livestock production is a significant source of agricultural emissions, accounting for approximately 14.5% of total anthropogenic GHG emissions. Ruminant animals such as cows, sheep, and goats produce methane through enteric fermentation, while manure management further emits methane and nitrous oxide (FAO 2023). Additionally, synthetic fertilizers contribute to emissions by releasing nitrous oxide, a highly potent GHG. The synthetic nitrogen fertilizer supply chain was responsible for 10.6% of agricultural emissions and 2.1% of global GHG emissions in 2018 (Menegat et al. 2022).

Thirdly, the transition to clean and renewable energy is central to achieving SDG 7 (Affordable and Clean Energy), reducing reliance on fossil fuels, and mitigating climate change. Renewable energy development is widely regarded as a crucial step toward a low-carbon future; however, its large-scale implementation is not without significant environmental consequences. While clean energy sources such as solar, wind, and hydroelectric power offer solutions to fossil fuel dependency, they also present trade-offs with SDG 15 (Life on Land) by disrupting ecosystems, altering landscapes, and intensifying resource competition (Fuso Nerini et al. 2017). One significant example is hydroelectric power, often promoted as a sustainable energy source. While hydropower provides a renewable alternative to coal and oil, constructing large hydroelectric dams can have profound ecological and social consequences. These projects frequently lead to widespread deforestation, river fragmentation, and habitat loss, threatening biodiversity and displacing communities. The alteration of natural water flow disrupts aquatic ecosystems, reduces fish populations, and affects the livelihoods of those dependent on river resources (Castor et al. 2020). Similarly, biofuel plantations, widely promoted as a clean alternative to fossil fuels, contribute to deforestation, soil degradation, and biodiversity loss. The large-scale cultivation of crops such as palm oil, soy, and sugarcane for biofuels requires vast amounts of arable land, often leading to the clearing of forests and grasslands. This expansion intensifies land-use conflicts, threatening forests, traditional agricultural lands, and Indigenous communities. Biofuel expansion can also exacerbate global carbon emissions rather than reduce them, as deforestation releases stored carbon, negating the climate benefits of biofuels (Silva Lora et al. 2011).

Fourthly, the rapid expansion of urban areas, a key component of SDG 11 (Sustainable Cities and Communities), is often seen as a driver of economic growth and social development. However, rapid urban expansion usually comes at the cost of habitat destruction, biodiversity loss, increased energy consumption, and waste generation, directly conflicting with environmental SDGs such as SDG 13 (Climate Action) and SDG 15 (Life on Land). Undeniably, policies promoting urban economic growth can lead to increased GHG emissions and resource depletion (Raimbault and Pumain 2022). Indeed, urban areas account for approximately three-quarters of global GHG emissions. Cities are responsible for 67%–76% of global energy consumption and 71%–76% of energy-related CO_2 emissions, highlighting their significant role in climate change (IPCC 2014).

Further, urbanization does not benefit all residents equally, frequently exacerbating inequalities and creating conflicts with SDG 10 (Reduced Inequalities). When urban development prioritizes infrastructure expansion, real estate growth, and economic revitalization without inclusive policies, marginalized communities, such as low-income groups, migrants, and informal settlers, are often excluded from the benefits, leading to deepening social disparities. One of the most pressing issues in this conflict is gentrification, where urban renewal projects, rising property values, and new commercial developments displace low-income residents from their neighborhoods (Glaeser et al. 2009). Urban development policies that fail to integrate social equity considerations often lead to segregated cities, where economic prosperity is concentrated in certain areas. At the same time, low-income populations remain in underdeveloped neighborhoods with restricted access to employment, quality education, and healthcare (UN-Habitat 2022). Therefore, balancing these competing objectives requires integrated urban planning that considers environmental impacts alongside economic and social development (Raimbault and Pumain 2022).

While this section highlighted prominent SDG conflicts, there are also less visible tensions. For instance, international mobility related to SDG 4 (Quality Education)—including travel by students and academic staff—can contribute significantly to emissions, thus creating a potential conflict with SDG 13 (Climate Action) (McCollum and Nicholson 2023; Shields 2019).

4 | Accelerating Action for Sustainable Development Goals: The Final Countdown

As 2025 begins, the imperative to accelerate progress toward achieving the SDGs by 2030 becomes increasingly urgent. The historical pattern of well-intentioned declarations failing to translate into meaningful change must not repeat itself with the 2030 Agenda. Despite decades of sustainable development commitments, many have fallen short of their promised transformations, threatening to undermine the SDGs' ambitious vision (Leal Filho, Vasconcelos, et al. 2022). The path forward demands a fundamental shift from declaration to implementation, recognizing that the SDGs represent our last best hope for creating a sustainable and equitable world. This requires strategic alignment of national policies with SDG targets, increased funding for sustainable initiatives, stronger coordination between governmental, private sector, and civil society actors, and enhanced capacity building at local and national levels. With alarming gaps in achievement threatening the 2030 targets, the next 5 years must prioritize urgent and transformative actions that can bridge the growing divide between current outcomes and the desired goals. Central to this effort are several key areas of focus:

- *Accelerating implementation*: To meet the SDGs, nations must move beyond planning and initiate rapid, coordinated action (Leal Filho et al. 2023). Countries must work to integrate SDG-related policies into national and local development frameworks fully, ensuring alignment across all sectors, from agriculture (Kanter et al. 2016) and education (Artyukhov et al. 2022) to healthcare and infrastructure (Mahmood et al. 2024). Collaboration among ministries, businesses, and civil society is essential for creating synergies and ensuring coordinated progress toward these objectives (Leal Filho, Dibbern, et al. 2024). Without this integrated approach, progress will remain fragmented and insufficient, as some areas of development could outpace others, leaving critical goals unmet.
- *Mobilizing resources*: One of the major roadblocks to achieving the SDGs is the lack of sufficient financial resources, particularly in developing countries. In addition to traditional funding sources, innovative mechanisms must be designed to increase financial support. Public-private partnerships, alongside international cooperation, are essential to mobilize investments in sustainable projects (Leal Filho, Dibbern, et al. 2024), especially those targeting poverty reduction (Niaz 2022), climate action (Fuso Nerini et al. 2019), and social development (Subroto and Datta 2024). These collaborations should focus on leveraging the private sector's resources and expertise while ensuring that investments benefit the communities that need them most (Leal Filho, Vidal, et al. 2022). Furthermore, increasing research, development, and technology transfer funding will be pivotal in scaling solutions to meet SDG targets.
- *Strengthening governance*: Effective governance is the backbone of SDG implementation (Biermann et al. 2022; Leal Filho et al. 2023). Governments at all levels must establish frameworks that not only foster economic growth but also promote equity and inclusivity. Transparent decision-making and anti-corruption measures are critical to ensure that resources are allocated effectively and that policies reach the most marginalized populations. Strong governance systems are also key in addressing inequalities and ensuring every citizen has access to opportunities, services, and protections (Fritz et al. 2019; Menne et al. 2020). By strengthening institutional capacities, governments can enhance their ability to track progress, identify barriers, and ensure that policies are adaptable in a rapidly changing global environment.
- *Enhancing data collection and monitoring*: Robust data systems are foundational to understanding where progress is being made and where gaps remain. Comprehensive data collection, monitoring, and evaluation mechanisms will provide the evidence needed to inform policy decisions (Breuer et al. 2019), track the impact of interventions, and hold stakeholders accountable (Haritas and Das 2023). These systems must include disaggregated data to ensure that progress is made equitably across all groups, particularly the most vulnerable (Herbert et al. 2022). Timely and accurate data will also help identify emerging issues, enabling governments and organizations to adjust strategies and interventions quickly before problems become insurmountable.
- *Promoting public awareness and engagement:* Achieving the SDGs is not solely the responsibility of governments and international bodies. Public engagement and grassroots movements are crucial in driving long-term, sustainable change. Public engagement and grassroots movements are essential for sustainable change. Raising awareness about the SDGs and the importance

of collective action can inspire citizens to take ownership of their local communities' development and participate actively in the transformation process (Fritz et al. 2019). Education and outreach must highlight SDG interconnectedness and encourage actions like waste reduction and supporting local businesses (Leal Filho, Neiva, et al. 2024; Roy et al. 2023). Supporting community-led initiatives, fostering collaboration among local organizations, and amplifying the voices of marginalized groups will be key to ensuring that the SDGs reflect the needs and aspirations of all people.

Accordingly, we developed a roadmap to implement the SDGs (Late 2024–2025), following, as explained above, a review-based design anchored in systems thinking and critical analysis. Figure 1 outlines key challenges in achieving critical UN SDGs by 2030, divided into four phases: late 2024 (immediate actions), 2026 (mid-point review), 2028 (acceleration phase), and 2030 (final evaluation). Progress is represented by three colored arcs:

- Red arc (economic growth—SDG 8): Highlights improvements in industrialization and job creation but acknowledges conflicts with environmental protection.
- Green arc (environmental protection—SDGs 13, 14, 15): Shows significant challenges in climate action and sustainability due to ongoing unsustainable practices.
- Blue arc (social development—SDGs 1, 5, 10): Indicates slow progress in poverty reduction, gender equality, and social equity.

Critical decision points in 2026 and 2028 are marked with yellow dots, representing potential conflicts that require significant interventions. The roadmap suggests immediate actions in 2024 to accelerate SDG implementation, mobilize resources, and strengthen governance. Mid-term goals (2026–2028) focus on assessing progress, addressing weaknesses, and enhancing international cooperation. The 2030 targets emphasize final SDG achievement, impact measurement, and post-2030 planning. The roadmap underscores the urgency of balanced, collaborative actions, warning that failure to resolve conflicts between economic, environmental, and social priorities by 2026 and 2028 could risk overall SDG success, with global sustainability and equity consequences.

To prevent conflicts between SDGs, policymakers should prioritize some areas to maximize synergies and minimize trade-offs. Immediate action may focus on developing policies that simultaneously address multiple SDGs (e.g., climate action + poverty reduction + health). They may also strengthen inter-ministerial collaboration to avoid siloed decision-making. In addition, they may use systems thinking to assess the unintended consequences of policies on other SDGs. Regarding the mid-term goals, policymakers may promote agroecological practices to balance food security (SDG 2) with environmental sustainability (SDGs 13, 15). They may also work on policies to reduce food waste (SDG 12) while ensuring equitable access (SDG 1, 2). Furthermore, legislation may be pursued to support smallholder farmers in preventing land degradation (SDG 15) and poverty (SDG 1). Finally, concerning the 2030 targets, policymakers may scale up renewable energy (SDG 7) while ensuring job creation (SDG 8) and industrial growth

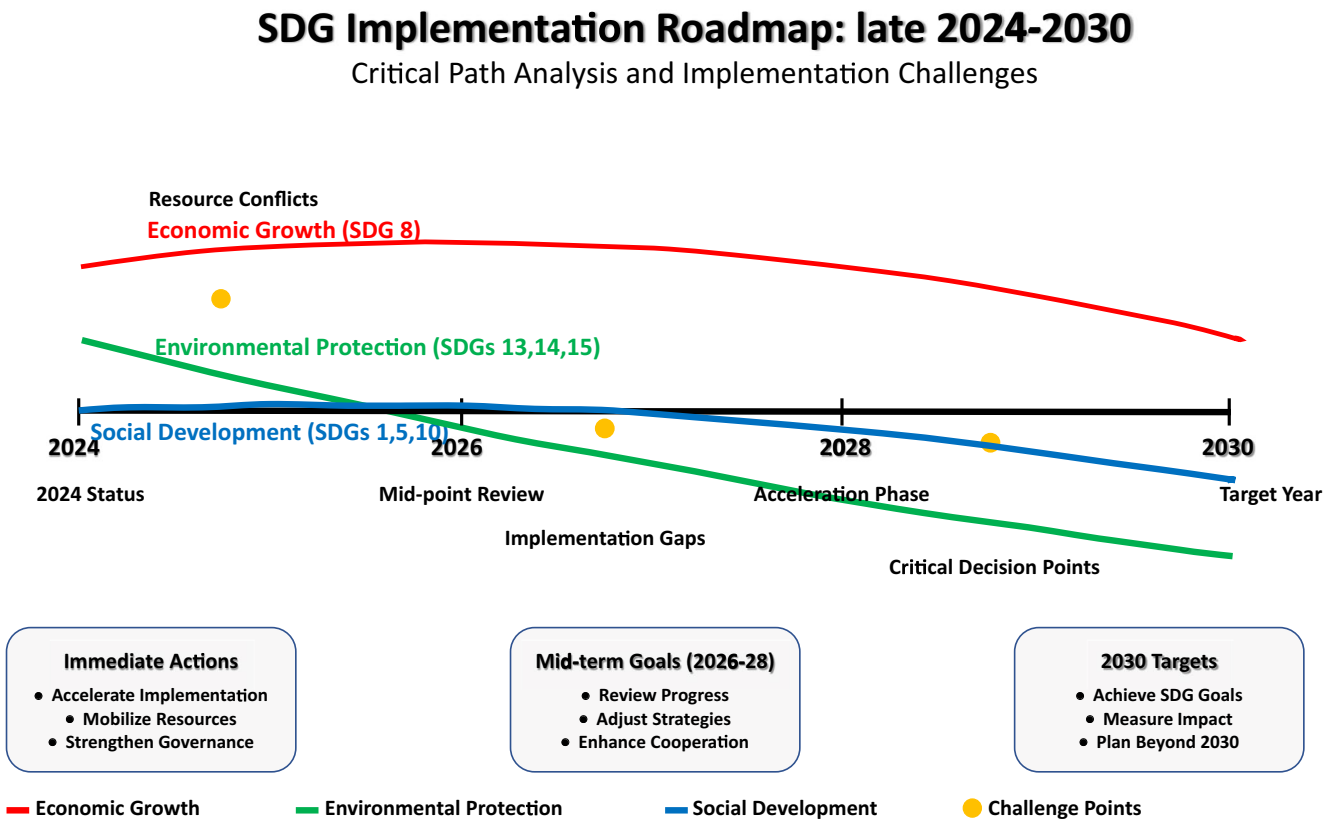

FIGURE 1 | SDGs action plan: 2024–2030. *Source:* Authors' Elaboration.

(SDG 9). They may also consider policies that avoid bioenergy expansion that threatens food security (SDG 2) or biodiversity (SDG 15). They may also work toward ensuring a just transition for communities dependent on fossil fuels (SDG 10).

To illustrate the practical relevance of the proposed roadmap, we present three country-level examples that demonstrate how trade-offs among SDGs manifest in real contexts and how integrated policy strategies can help mitigate these tensions. First, India represents a complex case of balancing industrial growth (SDG 9), energy access (SDG 7), and climate action (SDG 13). The nation continues to depend significantly on coal for its electricity generation; however, it has also achieved notable advancements in expanding solar and wind energy sources. India has set ambitious objectives to reach 50% of its installed power generation capacity from energy resources that are not based on fossil fuels. India currently holds the fifth position worldwide in installed solar power capacity and ranks fourth in wind power capacity, with its total renewable energy capacity exceeding 100 gigawatts (McKinsey 2022; Shankar et al. 2022).

Secondly, Brazil confronts a persistent dilemma regarding the balance between agricultural expansion (SDG 2) and forest conservation (SDG 15). The growth of agribusiness in forested regions has led to considerable deforestation in the Amazon, jeopardizing biodiversity and climate objectives. Accordingly, the agriculture, forests, and land-use sector constitutes a fundamental component of Brazil's Nationally Determined Contributions (NDCs) to the Paris Agreement (PA). Brazil has committed to halting illegal deforestation, and its energy objectives focus on enhancing the share of renewable energy and improving efficiency by 2030. However, its attempts at decarbonization are further hampered by the need to strike a balance between environmental sustainability and providing its large population access to reasonably priced energy, many of whom still lack consistent power. Significant advancements in renewable energy have been made possible by historical dependence on hydroelectric power; nevertheless, political changes have weakened the continuous application of anti-deforestation initiatives. Although Brazil's developments in biodiesel generation help to lower transportation sector emissions, deforestation still poses a major obstacle to its overall emissions reduction objectives (Hebeda et al. 2023; Köberle et al. 2020; da Silva et al. 2022).

Thirdly, South Africa offers a compelling example of the complex trade-offs in achieving climate and development goals. With coal now providing more than 80% of the nation's power, the country's energy system primarily depends on coal, which seriously impedes fast decarbonization. The government has launched renewable energy projects to diversify its energy mix, focusing on solar, wind, and concentrated solar power (CSP). However, the change remains difficult, especially for coal-dependent towns experiencing economic disturbance. By supporting biofuel mixing and the acceptance of electric cars, South Africa aims to achieve at least a 28% reduction in GHG emissions by 2030. Furthermore, included in mitigating actions are better land management techniques in agriculture and forestry, as well as the restoration of ecosystems. These projects show how closely national climate plans link environmental sustainability, economic resilience, and energy use (Msimango et al. 2023; Tyler and Hochstetler 2021).

5 | Conclusions

As this article has shown, the analysis of conflicting goals within the SDGs framework reveals the intricate web of interdependencies that characterize sustainable development. While the SDGs are designed to promote holistic progress, pursuing certain goals can inadvertently undermine others, leading to unintended consequences. Among the various examples provided in this article, it is seen that aggressive economic growth aimed at achieving Goal 8 (Decent Work and Economic Growth) can exacerbate environmental degradation, contradicting Goal 13 (Climate Action). This highlights the need for policy coherence and integrated solutions that recognize the complexities of sustainability.

This article contributes to sustainability studies by systematically mapping critical SDG trade-offs—such as economic growth versus environmental protection (SDG 8 vs. 13) and food security versus biodiversity (SDG 2 vs. 15)—and proposing some measures for minimizing goal conflicts. Unlike prior studies focusing on synergies, our research identifies context-specific leverage points where interventions can reconcile competing priorities. By integrating systems thinking and stakeholder perspectives, the study offers actionable pathways for policymakers to align short-term development targets with long-term sustainability objectives. Additionally, we highlight understudied tensions (e.g., SDG 9 vs. 12 on industrial expansion versus circularity) and challenge the assumption of universal SDG compatibility, providing a more nuanced foundation for future research and governance strategies.

Failure to resolve SDG conflicts at important intervention points, such as those set for 2026 and 2028, might have serious consequences. The ongoing trade-off between economic expansion and environmental conservation may lead to unsustainable development paths, increasing carbon emissions, and permanent biodiversity loss. Similarly, ignoring social justice in energy and urban transitions may exacerbate disparities and spark public outrage, thereby compromising the long-term credibility of policies. If left unaddressed, these disputes risk impeding or even reversing progress on numerous SDGs, undermining the 2030 Agenda and larger global sustainability initiatives.

To mitigate the conflicts outlined in this article, the various stakeholders (e.g., national, regional, and local governments, NGOs, academia, and industry) must engage in collaborative governance and adopt holistic frameworks that consider synergies and trade-offs among the SDGs. This involves fostering multi-stakeholder partnerships, enhancing data transparency, and promoting adaptive governance mechanisms that respond to emerging challenges. Ultimately, the successful realization of the SDGs hinges on the commitment to address these conflicts proactively, ensuring that progress in one area does not come at the expense of another. By embracing a more nuanced understanding of sustainability, we can work toward solutions that harmonize the goals, leading to a more equitable, resilient, and sustainable future for industrialized and developing countries.

The review of literature, policy reports, and global assessments demonstrates that many conflicts arise from competing interests, limited resources, and differing stakeholder priorities. The examples provided illustrate the real-world implications of these

conflicts, emphasizing that achieving one goal, such as eradicating poverty (Goal 1), may not only take precedence but also negatively impact environmental sustainability (Goal 15). These contradictions necessitate a paradigm shift in how we approach sustainable development, urging a departure from siloed thinking toward a more integrated, systems-based approach.

However, this article has some limitations. The first one is that it focuses on the conflicts between some SDGs and does not consider all of them. Also, this study did not follow a formal PRISMA protocol, as its methodology was grounded in an expert-driven, integrative review design rather than a systematic review. Moreover, the study did not entail first-hand data collection and relied on secondary sources. Nevertheless, this paper makes a valuable contribution to the literature by highlighting the critical need to address conflicting goals within the Sustainable Development Agenda.

Whereas this study advances the understanding of trade-offs between SDGs, several key areas require further investigation to strengthen policy responses and theoretical frameworks. For instance, future research should deepen comparative analyses across regions, income levels, and governance systems to assess how SDG conflicts manifest differently. For example, does rapid industrialization in emerging economies intensify SDG 7 (Affordable Energy) vs. SDG 13 (Climate Action) conflicts more than in developed nations? Case studies and large-N statistical analyses could identify patterns and exceptions, helping to tailor localized solutions. Also, most studies treat SDG conflicts statically, yet trade-offs may evolve over time. Longitudinal studies could track whether early investments in education (SDG 4) later reduce inequalities (SDG 10) or if short-term economic growth (SDG 8) leads to irreversible environmental damage (SDG 15). Scenario modeling and historical policy analyses would be valuable in assessing path dependencies. Future studies could also explore the role of advanced technologies, including digital mapping and robotics, in reconciling growth-oriented goals with equity and environmental protection (Almuaythir et al. 2024; Aziz et al. 2025).

Further work should also examine how sectoral policies (e.g., agriculture, energy, urban planning) exacerbate or mitigate SDG tensions. For example, does agroecology better reconcile SDG 2 (Zero Hunger) and SDG 12 (Responsible Consumption) than industrial farming? Field experiments and stakeholder interviews could uncover best practices. Moreover, research should explore more why certain SDGs are prioritized over others, analyzing power structures, lobbying, and institutional biases. Qualitative studies on policy-making processes could reveal why environmental goals (SDGs 13–15) are often deprioritized despite their long-term urgency.

Future studies should also explore how emerging frameworks, such as Industry 5.0, can support sustainable infrastructure development (SDG 9) while balancing economic, environmental, and social objectives. Recent research highlights how these technologies can be leveraged to empower SDG implementation through intelligent and human-centric innovation strategies (Daoud et al. 2025). Finally, testing integrative policy approaches, such as green fiscal reforms, circular economy incentives, or participatory SDG budgeting, could provide actionable insights. Computational models (e.g., agent-based simulations) could assess policy effectiveness before real-world implementation. By addressing these gaps, future research can move beyond identifying conflicts toward actionable, context-sensitive solutions for sustainable development.

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