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The feasibility assessment approach

Climate Technology Progress Report **2025**

SUGGESTED CITATION

United Nations Environment Programme Copenhagen Climate Centre (UNEP-CCC). Climate Technology Progress Report 2025: Advancing Biobased Technologies in the Bioeconomy. Copenhagen, Denmark.

Appendix A

APPENDIX A: THE FEASIBILITY ASSESSMENT APPROACH

The feasibility assessment approach adopted in this Report builds from SR1.5, AR6 WG2 and WG3 as well as the CTPR 2022, CTPR 2023, and CTPR 2024 (IPCC, 2022, 2023; UNEP-CCC & UNFCCC-TEC, 2022). Feasibility for the global-level analysis conducted by the IPCC was defined along six dimensions: economic, technological, environmental, geophysical, sociocultural, and institutional. Indicators are then developed for each dimension. Indicators of feasibility within the dimensions are contextual and differ slightly between adaptation and mitigation options, and for adaptation options, between regions. The indicators were selected based on a review of scholarship and expert consultation and had underlying questions to guide the assessment of feasibility, depicted in the third column of table 1 (adaptation) and the second column in table S.1.1 (mitigation). In the AR6 report, for adaptation, the assessment generally focused on whether or not a given indicator was a barrier, and whether or not there was a knowledge gaps. For mitigation, the assessment focused on whether indicators hindered or facilitated implementation. In defining some indicators as facilitators, the mitigation FA recognizes that some options are outperforming the options they aim to replace – e.g. bio-based plastics reducing dependence on fossil-derived plastics while increasingly becoming cost-competitive. Similarly, mitigation options can also have co-benefits – e.g. sustainable biofuels and bioenergy with carbon capture and storage (BECCS) reduce greenhouse gas emissions while improving rural employment and waste valorization – which also increases the potential for a mitigation option to be rapidly implemented and at a larger scale.

A clear line of sight to the underlying evidence and literature was developed for each decision throughout the assessment. This involved carefully tracking the evidence for each option and mapping them onto specific indicators. As per IPCC guidance, confidence language was applied to each assessment based on the amount of, and the level of agreement on, the evidence.

Combining indicators for an overall feasibility score

Options can also be assigned an overall assessment. In a departure from AR6, both adaptation and mitigation options were assessed in the same method. Each feasibility dimension, overall feasibility was assessed as the arithmetic mean score of the relevant underlying indicators. Based on this, dimensions were classified as having insignificant barriers (2.5–3), mixed or moderate barriers (1.5–2.5) or significant barriers (below 1.5) to feasibility. Indicators assessed as not applicable (NA), limited evidence (LE), or no evidence (NE) were not included in this overall assessment. This mapping process is important for transparency purposes. Moreover, the same combining approach was used to assess the score of indicators grouped together for presentations purposes. This is shown in Figure S.A.1 and Table S.A.1 below.

Table S.A.1: The guidance table from SR1.5

<table>
<tr><th>Entry for Indicator-Option Combination</th><th colspan="2">Guidance for Conducting the Feasibility Assessment for Mitigation and Adaptation Options</th></tr>
<tr><td>NA (not applicable)</td><td colspan="2">The indicator is not relevant to the option</td></tr>
<tr><td>NE (no evidence)</td><td colspan="2">• No peer-reviewed literature could be located supporting an assessment of whether this indicator would limit the option´s feasibility
• The peer-reviewed literature that mentions the issue is not robust enough</td></tr>
<tr><td>LE (limited evidence)</td><td colspan="2">• One or two papers make statements/ present research that could be the basis for the assessment, but this evidence is considered too limited
• Two or more papers provide a basis for the assessment as a side issue in the paper, not as a core issue</td></tr>
<tr><td>A</td><td rowspan="3">• A feasibility assessment can be made:
• If there are one or two robust papers (or more) that contain references which also support the assessment
• If literature is plentiful
• If one or a number of meta-studies and reviews provide extensive treatment of the indicator-option combination</td><td>A = The indicator could block the feasibility of this option</td></tr>
<tr><td>B</td><td>B = The indicator does not have a positive nor a negative effect on the feasibility of the option</td></tr>
<tr><td>C</td><td>C = The indicator does not pose any barrier to the feasibility of this option</td></tr>
</table>

Figure S.A.1. Methodology

1. Define scope

Based on the scope of the study (global/national/local/ sectoral) identify system transitions and underlying adaptation and mitigation technologies

2. Develop indicators

Across feasibility dimensions, develop indicators through literature review and expert elicitation

3. Create database

Conduct literature review for each adaptation technology at the indicator level

4. Conduct assessment

Assess each option at indicator-level giving scores for feasibility (high, medium and low), identifying where there is limited evidence (low evidence, no evidence), and where an indicator is not applicable

5. Check robustness

Cross-check each indicator-level score by 2-3 expert reviewers and adjust based on additional literature, regional diversity

6. Combine indicators

Combine indicator-level assessment (arithmetic mean of the relevant underlying indicators) to develop dimension-level score. The methods for combining the score is shown below.

7. Assess synergies and trade-offs

For adaptation options, assess positive or negative implications for mitigation

For mitigation options, assess positive or negative implications for adaptation

8. Report and visualise

Report dimension-level assessment through spider charts, traffic light tables etc. Differentiation of an option's feasibility diascussed in tables/text accompanying visuals

Calculating a score for each dimensions

High feasibility is weighed with a score of 3, medium feasibility with a score of 2 and low feasibility with a score of 1. This formula indicates, based on this weighing, how the composite feasibility of a dimension is obtained. The composite feasibility of an option, across dimensions, is calculated using the same weighing.

STEP 1

How many indicators in one dimension are effective (applicable)?

effective indicators = #indicators - #not applicable

STEP 2

How many indicators have sufficient litterature?

effective indicators - #NE & LE[1]

STEP 3

Average of the effective indicators with sufficient evidence[2]

$$\frac{(1*A + 2*B + 3*C)}{\#\text{ effective indicators} - \#NE\ \&\ LE}$$

STEP 4

Assign category to dimension[3]

Legend of Feasibility Assessment Tables		Legend criteria for overall feasibility of each of the dimension-option combinations
Not applicable		All indicators are NA
Insufficient evidence		#NE & LE > 0.5 * #effective indicators
Low feasibility		AVG ≤ 1.5
Medium feasibilty		1.5 < AVG ≤ 2.5 #NE & LE ≤ 0.5 * #effective indicators
High feasibility		AVG > 2.5 #NE & LE ≤ 0.5 * #effective indicators

Source: modified from Singh et al. (2020)

[1] NA: Non-Applicable, NE: No Evidence, LE: Low Evidence

[2] Low = 1, medium = 2 and high =3 A, B and C represent three hypothetical indicators.

[3] This approach was followed for the adaptation assessment. A similar assessment was followed for mitigation on enablers and barriers, but the dimensions are continuous rather than discrete.

Ensuring robustness and transparency

All assessments drew on two rounds of internal review to ensure coherence, coverage and balance. Reviews included adding literature and improving the coverage of studies – e.g. to include evidence from Latin American countries, peer-reviewed and grey literature – and removing any perceived biases. Each option's indicator-level assessment was validated by at least three authors. If indicator-level assessment differed, it was reconciled between the team of authors based on the literature each individually reviewed. As indicated above, for regional or contextual differences in option-level feasibility, text was used to explain the differentiating factors. Ideally, a systematic review would be conducted to comprehensively document relevant literature. However, when resources or time are limited, semi-systematic assessment approaches could be followed, such as standard practices of literature review – searching databases to achieve reference saturation – followed by careful and iterative reference checking, expert suggestions and internal peer review. The latter was employed for the AR6 reports due to time constraints resulting in assessing several thousand unique references for SR1.5, AR6 Working Group 2 and AR6 Working Group 3. When the process is downscaled at national or subnational level, where references are limited to allow an extensive literature review, the assessment can rely on expert consultations and grey literature.

Notes on the methodology:

For each of the technologies identified in the chapter, reviews of the literature, government reports, and policy documents post-AR6 were conducted (with a few exceptions of literature prior to 2021 not included in AR6 and how included here) with the goal of identifying whether there were any major changes in the scoring beyond the comprehensive assessment completed in AR6. We did not conduct a full systematic review, but rather it is a scan of the peer-review literature, looking for any major updates and/or systematic reviews that are already available in the literature. As a result, a score that is the same as the one in AR6 may indicate that there was no major change in the literature, thus further emphasizing the results. If the assessment score had not changed with more robust evidence (e.g., a post-AR6 systematic review in the peer review literature), this is reflected in the scoring of robustness and strength of evidence.

It should also be noted that WG2 and WG3 took different approaches to the scoring of the technologies on the indicators. Namely WG2 adopted the SR1.5 approach which develops a single score for overall feasibility. By contrast, WG3 evaluated separately aspects of increasing and decreasing feasibility, arguing that a decision-maker should be able to evaluate the extent to which the environment was supportive and not supportive of a given option. However, the single score approach of WG2 can be easier to interpret for screening across technologies and hence, this approach is adopted here. The details of the scoring are retained in the text.

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Appendix B

APPENDIX B: THE FEASIBILITY ASSESSMENT RESULTS

B.1: Ongoing global FAs and Regional differences:

Regional results will be presented through the distribution presented in Table S.B.1 below which follows AR6 WGII:

Table S.B.1: WGII regions

Regions Def. AR6	
S/N	WGII
1	Africa
2	Asia
3	Australasia
4	Central and South America
6	Europe
7	North America
8	Small islands

B.2: Feasibility Assessement tables

ADAPTATION

Biogas

Dimensions	Indicator	Score	References
Geophysical	Physical feasibility	C	(Jaramillo et al., 2025) (Ni, 2024) (Lohani et al., 2024) (Issahaku et al., 2024) (Garkoti et al., 2024) (Gaballah et al., 2024) (Gbadeyan et al., 2024) (Uzorka et al., 2025) (O'Hara et al., 2023)
	Hazard risk reduction potential	B	(Hegazy et al., 2025) (Beswick et al., 2025) (Dee et al., 2022) (Tamburini et al., 2023) (Vinti et al., 2024) (Nix et al., 2022) (Ramya et al., 2023) (Rahman et al., 2023) (Kimutai et al., 2025)
	Land use change enhancement potential	C	(Levavasseur et al., 2023) (Levavasseur et al., 2023) (Launay et al., 2022) (De Laurentiis et al., 2024) (Liu et al., 2023) (Słomka et al., 2024) (Svitnič et al., 2024) (Yang et al., 2023) (Schuster et al., 2024) (Englund et al., 2023) (Park et al. 2024)
Environmental-ecological	Ecological capacity	C	(Soares et al., 2022) (Vasan et al., 2024) (Okokpujie, 2024) (Li et al., 2025) (Bulbul et al., 2023) (Ahmad et al., 2024)
	Adaptive capacity/ resilience	B	(Cheng et al., 2023) (Zhou, 2024) (Mehetre et al., 2024) (Maroušek et al., 2024) (Batsioula et al., 2023) (Wang et al., 2024) (Prasad et al., 2025) (Masood et al., 2023)
Technological	Technical resource availability	C	(Khiratkar et al., 2022) (Piechota et al., 2024) (Marconi et al., 2023) (Giocoli et al., 2025) (Ferreira et al., 2022) (Pawłowska et al., 2025) (Czekała et al., 2024) (dos Reis Santos Borges et al., 2025) (Moraes et al., 2022) (Ashokkumar et al., 2025)
	Risks mitigation potential	B	(Gital et al., 2024) (Carlsson et al., 2024) (Batsioula et al., 2023) (Bakkaloglu et al., 2022) (Prasad et al., 2025) (Zhou, 2024) (Tchonkouang et al., 2024) (Wang et al., 2023) (Santos et al., 2025)
Economic	Socioeconomic vulnerability reduction potential	B	(Li et al., 2022) (Uen et al., 2023) (Bharadwaj et al., 2022) (Strubbe et al., 2024) (Kandulu et al., 2024) (Cimini et al., 2022) (Agar et al., 2022) (Singh et al., 2022) (Pertiwiningrum et al., 2022)
	Employment and productivity enhancement potential	C	(Yu et al., 2024) (Lohosha et al., 2023) (Garkoti et al., 2025) (Yang et al., 2024) (Sidek et al., 2022) (Katsaprakakis et al., 2022) (Verner et al., 2023) (Shallo et al., 2025) (Padmavathy et al., 2025)
	Microeconomic viability	B	(Sagastume Gutiérrez et al., 2022) (Oyewusi et al., 2025) (Pallegedara et al., 2023) (Li et al., 2024) (Mukisa et al., 2022) (Mthimunye Thabiso et al., 2025) (Singh et al., 2022) (Rocha-Meneses et al., 2023)
	Macroeconomic viability	B	(Thrän et al., 2023) (Farghali et al., 2022) (Vaskina et al., 2025) (Trypolska, 2023) (Bakkaloglu et al., 2022) (Kurbatova et al., 2023) (Gital et al., 2024) (Marconi et al., 2023)
Socio-cultural	Socio-cultural acceptability	B	(Boyd Williams et al., 2022) (Boyd Williams et al., 2022) (Mancini et al., 2022) (Zieba Falama et al., 2024) (Situmeang et al., 2022) (Tornel-Vázquez et al., 2024) (Luna-delRisco et al., 2025) (Tornel-Vázquez et al., 2025) (Bourdin et al., 2023) (Donacho et al., 2023)
	Social co-benefits (health, education)	C	(Kimutai et al., 2025) (Lohano, 2025) (Li et al., 2025) (Gurmessa et al., 2024) (Kouser et al., 2022) (Pradhan Shrestha et al., 2024) (Álvarez-Fraga et al., 2025) (van Midden et al., 2023) (Nix et al., 2022)
	Social and regional inclusiveness	LE	(Shallo et al., 2025) (Tornel-Vázquez et al., 2024) (Gwandure et al., 2023) (Lohani et al., 2024) (Huluka, 2022) (Xie et al., 2022) (Prasad et al., 2025) (Bharadwaj et al., 2022) (Tanyi et al., 2023)
	Gender equity	LE	(Huluka, 2022) (Tornel-Vázquez et al., 2024) (C et al., 2025) (Pradhan Shrestha et al., 2024) (Villamor, 2023) (Tornel-Vázquez et al., 2025) (Gwandure et al., 2023) (Pallegedara et al., 2023) (Ameridyani et al., 2025) (Nix et al., 2022)
	Intergenerational equity	LE	(Lohano, 2025) (Aremu et al., 2025) (Amato et al., 2022) (Lall et al., 2023) (Stevens et al., 2023) (Kimutai et al., 2025) (Kouser et al., 2022) (Boyd Williams et al., 2022) (Boyd Williams et al., 2022) (Mukisa et al., 2022)
Institutional	Political acceptability	C	(Svitnič et al., 2024) (Sulewski et al., 2023) (Gebrekidan et al., 2024) (Bourdin et al., 2024) (Pacheco Cruz, 2022) (Guerra-Mota et al., 2024) (Bertolino et al., 2023) (Corrêa et al., 2024) (Costa et al., 2023) (Moraes et al., 2022)
	Legal and regulatory acceptability	B	(Abanades et al., 2022) (Dhull et al., 2024) (Werkneh et al., 2023) (Almansa et al., 2023) (Sobhi et al., 2024) (Siwach et al., 2024)
	Institutional capacity and administrative feasibility	B	(Ciechanowski et al., 2025) (Corrêa et al., 2024) (Usykova et al., 2024) (Amin et al., 2022) (Riemersma et al., 2024) (Park et al., 2025) (Hamidov et al., 2024) (Ngetuny et al., 2025) (Vea Simpson, 2024) (Rasimphi et al., 2022)
	Transparency and accountability potential	LE	(Tjutju et al., 2024) (Kiselev et al., 2024) (Shogole, 2025) (Chodkowska-Miszczuk, 2022) (Vea Simpson, 2024) (Ziegler-Rodriguez et al., 2025) (Usykova et al., 2024) (Yamaji et al., 2024) (Gebrekidan et al., 2024)

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Dimensions	Indicator	Score	References
Geophysical	Physical feasibility	B	(Nadaf et al., 2025) (Zhang et al., 2023) (Yang et al., 2022) (Gazal et al., 2024) (Han et al., 2022) (Jabłońska-Trypuć et al., 2023) (Babich et al., 2024) (de Lima Araújo et al., 2022) (Awasthi et al., 2023) (Abd et al., 2025)
	Hazard risk reduction potential	A	(Mgeni et al., 2025) (Bruckler et al., 2025) (Santos et al., 2025) (Das et al., 2025)
	Land use change enhancement potential	A	(Kharia et al., 2023) (Løvenskiold et al., 2022) (Lee et al., 2025) (Ding et al., 2023) (Nogueira et al., 2024) (Fang et al., 2025) (Wang, 2022) (O'Neill et al., 2025) (MIGNONE et al., 2022) (Díaz Cachay et al., 2024) (Park et al. 2024)
Environmental-ecological	Ecological capacity	A	(Milindi et al., 2024) (Grandis et al., 2023) (Batool et al., 2025) (Teja et al., 2024) (Koul et al., 2022) (Aghadadashi et al., 2024) (Zhu et al., 2025) (Dussan et al., 2025) (KUMAR et al., 2023) (Kumar et al., 2024)
	Adaptive capacity/ resilience	A	(Bruckler et al., 2025) (Santos et al., 2025) (Lee et al., 2025) (Tchonkouang et al., 2024) (Bhandari et al., 2025) (Biazi et al., 2022) (Varriale et al., 2024) (Oloyede et al., 2024) (Jabbarzadeh et al., 2025) (Andrade et al., 2022)
Technological	Technical resource availability	B	(Rajesh et al., 2024) (Zhang et al., 2023) (Dhanya, 2022) (Beluhan et al., 2023) (Yang et al., 2022) (Nair et al., 2022) (Fasioli Silva et al., 2022) (Yolcu et al., 2021) (Shi et al., 2022)
	Risks mitigation potential	A	(Samani et al., 2023) (Biswas, 2024) (Shahbaz et al., 2022) (Puškár, 2022) (Girgibo et al., 2024) (Ghahremanlou et al., 2024) (Jabbarzadeh et al., 2025) (Løvenskiold et al., 2022) (Tchonkouang et al., 2024) (Bhandari et al., 2025) (Park et al. 2024)
Economic	Socioeconomic vulnerability reduction potential	A	(Tchonkouang et al., 2024) (Araghi et al., 2023) (Mvelase et al., 2024) (Sethumadhavan et al., 2024) (Sultana et al., 2022) (Borujeni et al., 2023) (Shafiei-Alavijeh et al., 2024) (Motsi et al., 2022) (Han et al., 2022) (Mirkouei, 2024)
	Employment and productivity enhancement potential	B	(Sultana et al., 2022) (Bisht et al., 2025) (Aguilar-Rivera, 2024) (Mushtaq et al., 2023) (Rudnyckyj et al., 2025) (Gupta et al., 2023) (Gazal et al., 2024) (Kumar et al., 2022) (Bibra et al., 2022)
	Microeconomic viability	B	(Sobczak et al., 2022) (Duarah et al., 2023) (Klaver et al., 2023) (Dominic et al., 2025) (Quintino et al., 2022) (Prado et al., 2025) (Gozan et al., 2022) (Kiteto et al., 2025) (Fit et al., 2025) (Kumar et al., 2022)
	Macroeconomic viability	B	(Segovia-Hernández et al., 2022) (Sobczak et al., 2022) (Kocak et al., 2022) (Afedzi et al., 2025) (Kaur et al., 2025) (Taheri et al., 2024) (Chhandama et al., 2022) (Boly et al., 2022) (Prakash et al., 2025) (Sultana et al., 2022)
Socio-cultural	Socio-cultural acceptability	B	(L.M. et al., 2023) (Hernández-López et al., 2024) (Kirshner et al., 2022) (Vijayan et al., 2024) (Onyeaka et al., 2022) (Haldar et al., 2022) (Han et al., 2022) (Das et al., 2023) (Lefu et al., 2025) (Tchonkouang et al., 2024)
	Social co-benefits (health, education)	B	(Iakovidou et al., 2024) (Bhandari et al., 2025) (Aghadadashi et al., 2024) (Biswas, 2024) (Gao, 2022) (Messmann et al., 2023) (Tadioto et al., 2023) (Shahbaz et al., 2022) (Qi et al., 2024) (Martín-Alfonso et al., 2024)
	Social and regional inclusiveness	A	(L.M. et al., 2023) (Salahi et al., 2024) (Same et al., 2024) (Onyema et al., 2023) (Christianides et al., 2025) (Messmann et al., 2023) (Mvelase et al., 2024) (Fang et al., 2025) (Trindade et al., 2022) (Miftah et al., 2024)
	Gender equity	A	(Bhandari et al., 2025) (Sultana et al., 2022) (Santana Suárez et al., 2025) (Verma et al., 2022) (Zheng et al., 2024) (L.M. et al., 2023) (Šárka et al., 2023) (Klaver et al., 2023) (Berger, 2024) (Zhang et al., 2025)
	Intergenerational equity	A	(Zhang et al., 2023) (Xu et al., 2024) (Xue et al., 2024) (Ding et al., 2023) (Díaz Cachay et al., 2024) (Portocarrero et al., 2024) (Zegada-Lizarazu et al., 2022) (Audibert et al., 2025) (Thakur et al., 2024) (Kharia et al., 2023) (Xue et al., 2023)
Institutional	Political acceptability	A	(Vicente Perin et al., 2025) (Kumar et al., 2022) (Letti et al., 2022) (Duarah et al., 2023) (Amândio et al., 2022) (Moreira et al., 2023) (Becerra-Pérez et al., 2023) (Holmatov et al., 2022) (Miftah et al., 2024) (Nandi et al., 2023)
	Legal and regulatory acceptability	C	(Ghosh et al., 2025) (Herrera-Franco et al., 2022) (Zhuang et al., 2025) (Becerra-Pérez et al., 2023) (Vicente Perin et al., 2025) (Raheja et al., 2022) (Fu et al., 2024) (Zardoshti Zadeh Yazdi et al., 2025) (Raina et al., 2024) (Ujwal et al., 2022)
	Institutional capacity and administrative feasibility	B	(Vicente Perin et al., 2025) (Nandi et al., 2023) (Miftah et al., 2024) (Grandis et al., 2024) (Becerra-Pérez et al., 2023) (Ujwal et al., 2022) (Duodu et al., 2023) (Khan et al., 2023) (Adewuyi, 2022) (Zhuang et al., 2025)
	Transparency and accountability potential	A	(Vicente Perin et al., 2025) (Nandi et al., 2023) (Miftah et al., 2024) (Becerra-Pérez et al., 2023) (Nenciu et al., 2021) (Schuenemann et al., 2022) (Afedzi et al., 2025) (Rachman, 2025) (Abideen et al., 2023) (Zhang et al., 2023)

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Dimensions	Indicator	Score	References
Geophysical	Physical feasibility	B	(Uliana et al., 2024) (Malik et al., 2022) (Shukla et al., 2023) (Ningthoujam et al., 2024) (Elsagan et al., 2023) (Antunes et al., 2022) (Mahanty et al., 2024) (Singh et al., 2022) (Sathendra et al., 2022) (Alba Fierro et al., 2024)
	Hazard risk reduction potential	A	Lin et al., 2023) (Nenciu et al., 2021) (Bhandari et al., 2025) (Srivastava et al., 2023) (Saïed et al., 2023) (Xie et al., 2024) (Özenen-Kavlak et al., 2023) (Ofori-Agyemang et al., 2024) (Chipkar et al., 2022) (Chipkar et al., 2024)
	Land use change enhancement potential	B	(Bridhikitti et al., 2023) (Ding et al., 2023) (Wang, 2022) (Nogueira et al., 2024) (Lee et al., 2025) (MIGNONE et al., 2022) (Kharia et al., 2023) (Parenti et al., 2024) (Cui et al., 2024) (Lehtilä et al., 2025)
Environmental-ecological	Ecological capacity	B	(KUMAR et al., 2023) (Wu et al., 2022) (Zegada-Lizarazu et al., 2022) (Zhang et al., 2024) (Cappelli et al., 2025) (Lugani et al., 2024) (Schuenemann et al., 2022) (Same et al., 2024) (Nascimento et al., 2024) (Samani et al., 2023)
	Adaptive capacity/ resilience	B	(Bruckler et al., 2025) (Sheikh et al., 2025) (Samani et al., 2023) (Tchonkouang et al., 2024) (Zegada-Lizarazu et al., 2022) (Wirawan et al., 2025) (Lugani et al., 2024) (Santos et al., 2025) (Fu et al., 2022) (Nascimento et al., 2024)
Technological	Technical resource availability	B	(Taghizadeh-Alisaraei et al., 2023) (Bordonal et al., 2024) (Bukhari et al., 2025) (Singh et al., 2024) (Lugani et al., 2024) (Wang et al., 2022) (Patel et al., 2024) (El Hage et al., 2022) (Sganzerla et al., 2022) (Fansuri et al., 2024)
	Risks mitigation potential	B	(Prado et al., 2025) (Same et al., 2024) (Shi et al., 2025) (Nogueira et al., 2024) (Løvenskiold et al., 2022) (Wang, 2022) (Wang et al., 2022) (Khanna et al., 2023) (Nadaf et al., 2025) (Calvin et al. 2021) (Park et al. 2024)
Economic	Socioeconomic vulnerability reduction potential	B	(Tchonkouang et al., 2024) (Motsi et al., 2022) (Tulashie et al., 2023) (Kirshner et al., 2022) (Jayakumar et al., 2023) (Alavijeh et al., 2023) (Mvelase et al., 2024) (Prasad et al., 2021) (Aguilar-Rivera, 2024) (Sethumadhavan et al., 2024)
	Employment and productivity enhancement potential	B	(Prado et al., 2025) (Nunta et al., 2023) (Malik et al., 2023) (Infanzón-Rodríguez et al., 2023) (Sukma et al., 2025) (Saad et al., 2024) (Lin et al., 2023) (Kamboj et al., 2024) (Bordonal et al., 2024) (Silvello et al., 2022)
	Microeconomic viability	A	(Bukhari et al., 2025) (Yamakawa et al., 2023) (Roy Choudhury et al., 2024) (Jain et al., 2024) (Mubarak Alqahtani, 2024) (Sukma et al., 2025) (Yang et al., 2025) (Kaur et al., 2025) (de Mélo et al., 2023) (Correia et al., 2024)
	Microeconomic viability	B	(Bukhari et al., 2025) (Roy Choudhury et al., 2024) (Jain et al., 2024) (Sukma et al., 2025) (Yang et al., 2025) (Pattnaik et al., 2024) (Correia et al., 2024) (Vigneswaran et al., 2024) (Mubarak Alqahtani, 2024) (de Mélo et al., 2023)

Socio-cultural	Socio-cultural acceptability	LE	(Mehmood et al., 2024) (Awogbemi et al., 2022)
	Social co-benefits (health, education)	B	(KUMAR et al., 2023) (Malik et al., 2023) (Sajid et al., 2025) (Yang et al., 2025) (Panakkal et al., 2021) (Iakovidou et al., 2024) (Rao et al., 2024) (Xian et al., 2024) (Aghadadashi et al., 2024) (Soni et al., 2025)
	Social and regional inclusiveness	B	(Strobel et al., 2025) (El Akkari et al., 2023) (Schulz et al., 2025) (Rose, 2022) (Malik et al., 2023) (Wang et al., 2022) (Parenti et al., 2024) (Christianides et al., 2025) (Nandi et al., 2023)
	Gender equity	B	(Santoro et al., 2025) (Sultana et al., 2022) (Rahman et al., 2022) (Li et al., 2025) (Singh et al., 2024) (Phoemchalard et al., 2024) (van Zoonen et al., 2024) (Jambhulkar et al., 2023) (Tapking et al., 2024) (Bhandari et al., 2025)
	Intergenerational equity	NE	
Institutional	Political acceptability	C	(Trindade et al., 2022) (Vicente Perin et al., 2025) (Kocak et al., 2022) (Osei et al., 2025) (Herrera-Franco et al., 2022) (Olabi et al., 2023) (Miftah et al., 2024) (Atzler et al., 2023) (Awogbemi et al., 2022) (Lavrador et al., 2022)
	Legal and regulatory acceptability	B	(Raina et al., 2024) (Awogbemi et al., 2025) (Herrera-Franco et al., 2022) (Fu et al., 2024) (Haas et al., 2023) (Ghane et al., 2024) (Miftah et al., 2024) (Wives et al., 2024) (Zhuang et al., 2025) (Karuppiah et al., 2022)
	Institutional capacity and administrative feasibility	B	(Vicente Perin et al., 2025) (Nandi et al., 2023) (Nascimento et al., 2024) (Lugani et al., 2024) (Wirawan et al., 2024) (Miftah et al., 2024) (Saad et al., 2024) (Danso et al., 2022) (Samani et al., 2023) (Yang et al., 2025)
	Transparency and accountability potential	NE	

Biodiesel

Dimensions	Indicator	Score	References
Geophysical	Physical feasibility	C	(Žaglinskis et al., 2023) (Mahmoud Ibrahim et al., 2022) (Natesan et al., 2024) (Wang et al., 2023) (Kondrasheva et al., 2023) (Surakasi et al., 2023) (Touloupakis et al., 2025) (Viraj Miyuranga et al., 2022) (Xue et al., 2023) (Saurabh et al., 2023)
	Hazard risk reduction potential	NE	(Yang et al., 2022) (Viana et al., 2022) (Sinha et al., 2025) (Moura et al., 2024) (Albuquerque et al., 2022) (Arellano, 2023) (Acaroglu et al., 2022) (Arpiwi et al., 2023)
	Land use change enhancement potential	A	(Chiriacò et al., 2024) (Purnama et al., 2025) (Wang et al., 2023) (Lee et al., 2025) (Almeida et al., 2022) (Suckling et al., 2022) (Heimann et al., 2024) (Silitonga et al., 2025) (Barros et al., 2025) (Brandão et al., 2022)
Environmental-ecological	Ecological capacity	A	(Ershov et al., 2023) (Intamano et al., 2024) (Lai et al., 2023) (Mohamed et al., 2025) (Namini et al., 2025) (Patel et al., 2024) (Thanahiranya et al., 2025) (Usapein et al., 2022) (Shen et al., 2023) (Ali Ijaz Malik et al., 2024)
	Adaptive capacity/ resilience	B	(Ershov et al., 2023) (Agustina et al., 2024) (Habib et al., 2024) (Boyd et al., 2025) (Mohamed et al., 2025) (Namini et al., 2025) (Chhandama et al., 2023) (Thanahiranya et al., 2025) (Rahim et al., 2024) (Usapein et al., 2022)
Technological	Technical resource availability	B	(Ershov et al., 2023) (Chiriacò et al., 2024) (Frota de Albuquerque Landi et al., 2022) (Ashqar et al., 2024) (Wang et al., 2023) (Zaman et al., 2022) (Kumar et al., 2025) (Lee et al., 2025) (Namini et al., 2025) (Intamano et al., 2024)
	Risks mitigation potential	A	(Ershov et al., 2023) (Hemanandh et al., 2025) (Kumar et al., 2024) (Uski et al., 2024) (Chiriacò et al., 2024) (Žaglinskis et al., 2023) (Sleem et al., 2024) (Negi et al., 2023) (Pérez-Rangel et al., 2025) (Razzak et al., 2025)
Economic	Socioeconomic vulnerability reduction potential	B	(Ferronato et al., 2024) (Wu et al., 2024) (Jambhulkar et al., 2023) (Acharya et al., 2025) (Degani et al., 2022) (Komalasari et al., 2023) (Jangre et al., 2022) (Musharavati et al., 2024) (Liu et al., 2022) Add (Park et al. 2024)
	Employment and productivity enhancement potential	C	(Namini et al., 2025) (Intamano et al., 2024) (Abdullah et al., 2025) (Ogata et al., 2023) (Musthafa et al., 2023) (Al-Anazi et al., 2024) (Ghosh et al., 2024) (Gozan et al., 2022) (Park et al. 2024)
	Microeconomic viability	B	(Uski et al., 2024) (Ashqar et al., 2024) (Namini et al., 2025) (Manikandan et al., 2023) (Tulashie et al., 2025) (Saravanan et al., 2024) (Al-Aseebee et al., 2023) (Thanahiranya et al., 2025) (Senusi et al., 2024) (Sakthivel, 2024)
	Macroeconomic viability	B	(Ashqar et al., 2024) (Uski et al., 2024) (Manikandan et al., 2023) (Saravanan et al., 2024) (Tulashie et al., 2025) (Namini et al., 2025) (Senusi et al., 2024) (Thanahiranya et al., 2025) (Sakthivel, 2024) (Nguyen et al., 2025)
Socio-cultural	Socio-cultural acceptability	B	(Husaini et al., 2025) (Riayatsyah et al., 2022) (Sharma et al., 2024) (Etim et al., 2022) (Sharma et al., 2024 (Saxena et al., 2023) (Dias et al., 2022) (Nunes et al., 2024) (Yousof et al., 2022)
	Social co-benefits (health, education)	B	(Uski et al., 2024) (Sulistyo et al., 2025) (Aljaafari et al., 2022) (Manikandan et al., 2023) (Munir et al., 2023) (Oh et al., 2024) (Viraj Miyuranga et al., 2022) (Osman et al., 2024) (Casas et al., 2024)
	Social and regional inclusiveness	A	(Kapetanović et al., 2024) (Coelho et al., 2024) (Rum et al., 2022) (Halimatussadiah et al., 2025) (Kim, 2022) (Almeida et al., 2022) (Kharia et al., 2023) (Zhu et al., 2022) (Otsason et al., 2025)
	Gender equity	LE	(Karpudewan, 2024) (Yaseen et al., 2023) (Somyong et al., 2022) (Jawahar Vishnu et al., 2022) (Liu et al., 2023) (Kumar et al., 2025) (Leal et al., 2022) (Jambhulkar et al., 2023) (Alves Júnior et al., 2024) (Ohtonen et al., 2025)
	Intergenerational equity	B	(Tekani et al., 2025) (Karpudewan, 2024) (Costa et al., 2022)
Institutional	Political acceptability	C	(Farobie et al., 2022) (Chung et al., 2025) (Indrawan et al., 2023) (Husaini et al., 2025) (Olabi et al., 2023) (Rahman et al., 2025) (Atzler et al., 2023) (Koushik et al., 2024) (Osei et al., 2025) (Verma et al., 2024) (Polat and Altınbaş 2023)
	Legal and regulatory acceptability	C	(Kumar et al., 2025) (Bas et al., 2022) (Debnath et al., 2025) (Ali Ijaz Malik et al., 2024) (Husaini et al., 2025) (Plata et al., 2022) (Azman et al., 2023) (Adewuyi et al., 2022) (Foo et al., 2022) (Sinsirimongkol et al., 2022) (Polat and Altınbaş 2023)
	Institutional capacity and administrative feasibility	B	(Ershov et al., 2023) (Namini et al., 2025) (Usapein et al., 2022) (Shukla et al., 2023) (Fathurrahman et al., 2023) (Thanahiranya et al., 2025) (da Silva Neto et al., 2025) (Niyas et al., 2023) (Rahim et al., 2024) (Polat and Altınbaş 2023)
	Transparency and accountability potential	B	(Nathan et al., 2025) (Peixoto et al., 2023) (Polat and Altınbaş 2023)

Algae Fuel

Dimensions	Indicator	Score	References
Geophysical	Physical feasibility	B	(Mirle et al., 2025) (Kosowska-Golachowska et al., 2022) (Khoo et al., 2023) (Atnoorkar et al., 2024) (Rasheed et al., 2023) (Khoo et al., 2023) (Khan et al., 2022) (Ahamefule et al., 2024) (Shashikumar et al., 2024) (Szulczyk et al., 2022)
	Hazard risk reduction potential	A	(Bodycomb et al., 2023)
	Land use change enhancement potential	C	(Debnath et al., 2022) (Kumar et al., 2022) (Ratomski et al., 2023) (Quiroz et al., 2023) (Verma et al., 2023)
Environmental-ecological	Ecological capacity	B	Choudhary et al., 2025) (Hasnain et al., 2023) (Yaashikaa et al., 2022) (Pérez Mesa et al., 2024) (Sarwer et al., 2022) (Kumar et al., 2022) (Jabłońska-Trypuć et al., 2023) (Rai et al., 2022) (Dammak et al., 2024)
	Adaptive capacity/ resilience	C	(Sarwer et al., 2022) (Chhandama et al., 2023) (Mirle et al., 2025) (Mizrachi et al., 2025) (Debnath et al., 2022) (Kumar et al., 2022) (Agathokleous et al., 2022) (Karmakar et al., 2024) (Amalapridman et al., 2025) (Venkatesan et al., 2022)
Technological	Technical resource availability	B	(Bello et al., 2024) (Wu et al., 2023) (Das et al., 2022) (Sahu et al., 2024) (Zhu et al., 2023) (Kumar et al., 2022) (Ganesh Saratale et al., 2022) (Verma et al., 2023) (Khalid et al., 2022) (Ahmad Sobri et al., 2024)
	Risks mitigation potential	A	(Sarwer et al., 2022) (Rozina et al., 2025) (Bothra et al., 2023) (Rony et al., 2023) (İnan et al., 2023) (Kumar et al., 2022) (Karmakar et al., 2024) (Hasnain et al., 2023) (Kumar et al., 2022) (O'Neill et al., 2023)
Economic	Socioeconomic vulnerability reduction potential	LE	(Paravantis, 2022) (Rony et al., 2023) (Saranya et al., 2022) (Ennaceri et al., 2023) (O'Neill et al., 2023) (Das Gupta et al., 2025) (Debnath et al., 2022) (Bothra et al., 2023) (Bradley et al., 2023) (Saranya et al., 2022)
	Employment and productivity enhancement potential	LE	(Maroušek et al., 2023) (Saranya et al., 2022) (Amaral et al., 2022) (Gaurav et al., 2024) (Lusk et al., 2023) (Khoo et al., 2023) (Alam, 2022) (Ennaceri et al., 2023) (Qurat-ul-Ain et al., 2024) (Baldev et al., 2022)
	Microeconomic viability	A	(Ennaceri et al., 2023) (Akram et al., 2025) (Malini et al., 2024) (Thangaivel et al., 2022) (Falfushynska, 2024) (Sharma et al., 2022) (Jabłońska-Trypuć et al., 2023) (Ahmad et al., 2024) (Quiroz et al., 2025) (Kumar et al., 2024)
	Macroeconomic viability	A	(Rony et al., 2023) (Özdemir, 2023) (Falfushynska, 2024) (Akram et al., 2025) (Ennaceri et al., 2023) (Choudhary et al., 2022) (Choudhary et al., 2025) (Jabłońska-Trypuć et al., 2023) (Kashyap et al., 2023) (Mirle et al., 2025)
Socio-cultural	Socio-cultural acceptability	B	(Mehmood et al., 2024)
	Social co-benefits (health, education)	LE	(Karmakar et al., 2024) (Saranya et al., 2022) (Wahab et al., 2025) (Wood, 2022) (Thanigaivel et al., 2022) (Malode et al., 2022) (Shashikumar et al., 2024) (Anuradha et al., 2023) (Sarker et al., 2024) (Sahu et al., 2024)
	Social and regional inclusiveness	A	(Saranya et al., 2022) (Sharma et al., 2023) (Maroušek et al., 2023) (Arnold et al., 2024) (Bothra et al., 2023) (Malini et al., 2024) (Amaral et al., 2022) (Ennaceri et al., 2023) (Ahmad Sobri et al., 2024) (Szulczyk et al., 2022)
	Gender equity	LE	(Paravantis, 2022)
	Intergenerational equity	NE	NE
Institutional	Political acceptability	B	(Paravantis, 2022) (Bhatia et al., 2022) (Mehmood et al., 2024) (Talukder et al., 2024)
	Legal and regulatory acceptability	B	(Bajpai, 2022) (Ghosh et al., 2024) (Maliha et al., 2023) (Verma et al., 2023) (Ratomski et al., 2023) (Malode et al., 2022) (Akram et al., 2025) (Mondal et al., 2023) (Saranya et al., 2022)
	Institutional capacity and administrative feasibility	A	Mirle et al., 2025) (Saranya et al., 2022) (Szulczyk et al., 2022) (Sharma et al., 2023) (Maroušek et al., 2023) (Kumar et al., 2022) (Singh et al., 2023) (Padhi et al., 2025) (Zandi Lak et al., 2024) (Stephy et al., 2025)
	Transparency and accountability potential	LE	(Saranya et al., 2022) (Maroušek et al., 2023) (Mirle et al., 2025) (Maliha et al., 2023) (Ennaceri et al., 2023) (Verma et al., 2023) (Sharma et al., 2023) (Kumar et al., 2024) (Szulczyk et al., 2022) (Singh et al., 2023)

Wood and Solid Fuel

Dimensions	Indicator	Score	References
Geophysical	Physical feasibility	C	(Mack et al., 2024) (Anestis et al., 2025) (Chen et al., 2024) (Vilas Boas et al., 2024) (Drobniak et al., 2024) (Romero et al., 2023) (Riaz et al., 2022) (Boadu et al., 2022) (Shehab et al., 2022)
	Hazard risk reduction potential	B	NE
	Land use change enhancement potential	B	(Silva et al., 2022) (Suryawan et al., 2024) (Matheus et al., 2024) (Padder et al., 2024) (Ali et al., 2024) (Souza et al., 2024) (Zhang et al., 2025)
Environmental-ecological	Ecological capacity	B	(Lopes Silva et al., 2025) (Wang et al., 2023) (Mohammadi et al., 2022) (Muhammed Raji et al., 2025) (Antwi et al., 2022) (Singara veloo et al., 2025) (Park et al., 2023) (Demirel, 2024) (Pradhan et al., 2025) (Malnar et al., 2023)
	Adaptive capacity/ resilience	B	(Singara veloo et al., 2025) (Pradhan et al., 2025) (Morales-Máximo et al., 2025) (Muhammed Raji et al., 2025) (Mohammadi et al., 2022) (Park et al., 2023) (Srinivasan et al., 2023) (Natesan et al., 2023) (Demirel, 2024) (Rugolo et al., 2022)
Technological	Technical resource availability	C	(Mack et al., 2024) (Toscano et al., 2022) (Yunusa et al., 2023) (Selivanov et al., 2025) (Orozco-Ramírez et al., 2022) (M. Ribeiro et al., 2022) (Jeguirim et al., 2024) (Endriss et al., 2025) (Gilbert Jesuet et al., 2024) (Hofmann et al., 2022)
	Risks mitigation potential	C	(Mack et al., 2024) (Kuchler et al., 2024) (Iryani et al., 2023) (Chaudhary et al., 2022) (Chen et al., 2024) (Yin et al., 2024) (MOICEANU et al., 2023) (Drobniak et al., 2025) (Ganesan et al., 2024) (Drobniak et al., 2023)
Economic	Socioeconomic vulnerability reduction potential	C	(Verma et al., 2024) (Yadav et al., 2024) (Natesan et al., 2023) (Zimmermannova et al., 2022) (Pérez et al., 2022) (Epuitai et al., 2022) (Ugolini et al., 2025) (Yin et al., 2024) (de Morais et al., 2023)
	Employment and productivity enhancement potential	C	(Vance et al., 2023) (Шевчик-Костюк et al., 2025) (Jasinskas et al., 2024) (Lin et al., 2023) (Nazli et al., 2025) (Cazier et al., 2024) (Nedilska et al., 2023) (Guigou et al., 2023) (Lohosha et al., 2025) (Kusvuran et al., 2022)
	Microeconomic viability	B	(Durán et al., 2023) (Güler, 2024) (Ziaei-Rad et al., 2024) (Abdulkareem-Alsultan et al., 2025) (Riaz et al., 2023) (Oñate et al., 2024) (Morales-Máximo et al., 2025) (Bappah et al., 2022) (Chen et al., 2024) (Soomro et al., 2023)
	Macroeconomic viability	B	(Durán et al., 2023) (Riaz et al., 2023) (Morales-Máximo et al., 2025) (Abdulkareem-Alsultan et al., 2025) (Chen et al., 2024) (Oñate et al., 2024) (Malico, 2024) (Soomro et al., 2023) (Güler, 2024) (Muhammed Raji et al., 2025)

Socio-cultural	Socio-cultural acceptability	B	(Hezam et al., 2023)
	Social co-benefits (health, education)	C	(Yin et al., 2024) (Chaudhary et al., 2022) (Sánchez-Pólito et al., 2024) (Yadav et al., 2024) (Isaxon et al., 2022) (Shayo et al., 2022) (Epuitai et al., 2022) (Siwale et al., 2022) (Kubica et al., 2022) (Al-Tardeh, 2025)
	Social and regional inclusiveness	B	(Yadav et al., 2024) (Morales-Máximo et al., 2025) (Chatterjee et al., 2023) (Ugolini et al., 2025) (Ruiz-García et al., 2022) (Santos Júnior et al., 2023) (Feurdean et al., 2023) (Soria-González et al., 2022) (Rugolo et al., 2022 (Kuerban et al., 2025)
	Gender equity	B	(Pathirathna et al., 2022) (Natesan et al., 2023) (Dey et al., 2024) (Epuitai et al., 2022) (Li et al., 2025) (Pérez et al., 2022) (Li et al., 2023) (Shayo et al., 2022) (Singh et al., 2024)
	Intergenerational equity	B	NE
Institutional	Political acceptability	B	(Silva et al., 2022) (Ismail et al., 2023) (Teirumnieka et al., 2023) (Hezam et al., 2023) (Leoni et al., 2022) (Lala et al., 2025)
	Legal and regulatory acceptability	B	(Sá et al., 2024) (Chaudhary et al., 2022) (Tsiropoulos et al., 2022) (Muzyka et al., 2024) (Adam et al., 2024) (Hezam et al., 2023) (Silva et al., 2025) (COSTA NETO et al., 2025) (Volpe et al., 2022) (Obidziński et al., 2022)
	Institutional capacity and administrative feasibility	A	(Debele et al., 2025) (Mohammadi et al., 2022) (Muhammed Raji et al., 2025) (Singara veloo et al., 2025) (Demirel, 2024) (Park et al., 2023) (Oñate et al., 2024) (Pradhan et al., 2025) (Sacramento Rivero et al., 2022) (Srinivasan et al., 2023)
	Transparency and accountability potential	A	NE

Biohydrogen

Dimensions	Indicator	Score	References
Geophysical	Physical feasibility	B	(Chandran et al., 2023) (Yang et al., 2023) (Sharma et al., 2024) (Singh et al., 2023) (Hupp et al., 2023) (Dange et al., 2022) (Udaypal et al., 2024) (Priya et al., 2023) (Bagheri et al., 2024) (Karishma et al., 2022)
	Hazard risk reduction potential	B	NE
	Land use change enhancement potential	A	(Debnath et al., 2022) (Lackner, 2022) (Goren et al., 2023) (dos Santos et al., 2025) (Liu et al., 2025) (Tiwari et al., 2024) (Padi et al., 2025)
Environmental-ecological	Ecological capacity	B	(Harichandan, 2025) (Patidar, 2025) (Khalvati, 2024) (Babu Pallam et al., 2024) (Viviano et al., 2024) (Yaashikaa et al., 2022) (Fuentes-Santiago et al., 2023) (Zhang et al., 2023) (Yaashikaa et al., 2022) (Deivayanai et al., 2022)
	Adaptive capacity/ resilience	B	(Zohri et al., 2025) (Madadi Avargani et al., 2022) (Debnath et al., 2022) (Baía et al., 2025) (Harichandan, 2025) (Xie et al., 2025) (Rozina et al., 2024) (Abate et al., 2024) (Khodakivskyi et al., 2025) (Tin et al., 2024)
Technological	Technical resource availability	A	(Lanjekar et al., 2023) (Wang, 2023) (Srivastava et al., 2024) (Sharma et al., 2024) (Sogani et al., 2025) (Aslam et al., 2023) (Zhang et al., 2024) (Radhika et al., 2022) (Parakh et al., 2023)
	Risks mitigation potential	B	(Wang et al., 2023) (Li et al., 2022) (Rahimnejad, 2023) (Shahbaz et al., 2022) (Gautam et al., 2023) (Goria et al., 2024) (Woon et al., 2023) (Hidalgo et al., 2023)
Economic	Socioeconomic vulnerability reduction potential	B	(Gautam et al., 2022) (Sethumadhavan et al., 2024) (El-Qelish et al., 2024) (Al-Dailami et al., 2022) (Bello et al., 2023) (Ananthi et al., 2024) (Tang et al., 2023) (Madhumidha et al., 2024) (Nawaz et al., 2025)
	Employment and productivity enhancement potential	B	(Chandran et al., 2023) (Kumar et al., 2024) (Khalvati, 2024) (Bhatia et al., 2023) (Debeni Devi et al., 2022) (Mandotra et al., 2023) (Debnath et al., 2022) (Kannan et al., 2025) (Rawat et al., 2023) (Zhao et al., 2025)
	Microeconomic viability	A	(Parakh et al., 2023) (Jha et al., 2024) (Hidalgo et al., 2023) (Amin et al., 2024) (Patel et al., 2022) (Devi et al., 2024) (Xie et al., 2025) (Priya et al., 2023) (Deng et al., 2024) (Pachaiappan et al., 2024)
	Macroeconomic viability	B	(Qureshi et al., 2025) (Jha et al., 2024) (Pachaiappan et al., 2024) (Bamiteko et al., 2024) (Senthil Rathi et al., 2024) (Lacroux et al., 2023) (Parakh et al., 2023) (Amin et al., 2024) (Woon et al., 2023) (Hidalgo et al., 2023)
Socio-cultural	Socio-cultural acceptability	C	(Awogbemi et al., 2022)
	Social co-benefits (health, education)	C	(Shanmuganathan et al., 2023) (Khan et al., 2024) (Goren et al., 2023) (Iakovidou et al., 2024) (Raturi et al., 2022) (Lim et al., 2022) (Aghadadashi et al., 2024) (Díaz et al., 2022) (Nageshwari et al., 2023) (Mahmood et al., 2023)
	Social and regional inclusiveness	A	(Mukelabai et al., 2022) (Sajid et al., 2022) (Machineni et al., 2023) (Citation not found) (Sim et al., 2024) (Jitto et al., 2023) (Jitto et al., 2024) (Wang et al., 2023)
	Gender equity	NE	(Jiang et al., 2025)
	Intergenerational equity	C	NE
Institutional	Political acceptability	C	(Verma et al., 2024) (Saxena et al., 2022) (Unknown Author, 2024) (Full et al., 2022) (Hamda et al., 2025) (Awogbemi et al., 2022)
	Legal and regulatory acceptability	B	(Raina et al., 2024) (Kaur et al., 2025) (Di Nardo et al., 2025) (Reigstad et al., 2022) (Full et al., 2022) (Kumar et al., 2024) (Khodakivskyi et al., 2025) (Song et al., 2023) (Sharma et al., 2025) (Singh et al., 2025)
	Institutional capacity and administrative feasibility	B	(Chandrasekhar et al., 2025) (Jiao et al., 2024) (Madadi Avargani et al., 2022) (Xing et al., 2025) (Khetkorn et al., 2023) (Chandrasekhar et al., 2023) (Güngörmüşler et al., 2025) (Ying et al., 2025) (dos Santos et al., 2025)
	Transparency and accountability potential	B	NE

Forest-Based Adaptation

Dimensions	Indicator	Score	References
Geophysical	Physical feasibility	A	(Mo et al., 2023) (Libert-Amico et al., 2022) (Austin et al., 2020) (Augustynczik et al., 2025) (Campos et al., 2022) (Key et al., 202
	Hazard risk reduction potential	C	(Libert-Amico et al., 2022) (Dobhal et al., 2024) (Antwi et al., 2024) (Teich et al., 2022) (FAO, 2024) (Campos et al., 2022) (Key et al., 2022)
	Land use change enhancement potential	C	(Libert-Amico et al., 2022) (Austin et al., 2020) (Antwi et al., 2024) (van den Bosch et al., 2024) (FAO, 2024) (Campos et al., 2022) (Key et al., 2022)
Environmental-ecological	Ecological capacity	C	(Mo et al., 2023) (Libert-Amico et al., 2022) (Gopalakrishna et al., 2024) (Munera-Roldan et al., 2023) (Campos et al., 2022) (Restrepo et al., 2024) (Key et al., 2022)
	Adaptive capacity/ resilience	C	(Libert-Amico et al., 2022) (Dobhal et al., 2024) (Shivakoti et al., 2021) (Teich et al., 2022) (Munera-Roldan et al., 2023) (Key et al., 2022)
Technological	Technical resource availability	B	(Dobhal et al., 2024) (Teich et al., 2022) (Hallberg-Sramek et al., 2022) (FAO, 2024)
	Risks mitigation potential	C	(Dobhal et al., 2024) (Teich et al., 2022) (FAO, 2024) (Campos et al., 2022)
Economic	Socioeconomic vulnerability reduction potential	B	(Libert-Amico et al., 2022) (Chaly et al., 2025) (Hallberg-Sramek et al., 2022) (FAO, 2024) (Araos et al., 2021) (Restrepo et al., 2024)
	Employment and productivity enhancement potential	C	(Libert-Amico et al., 2022) (Antwi et al., 2024) (Hallberg-Sramek et al., 2022) (FAO, 2024) (Austin et al., 2020)
	Microeconomic viability	A	(Libert-Amico et al., 2022) (Hallberg-Sramek et al., 2022) (FAO, 2024) (Austin et al., 2020)
	Macroeconomic viability	C	(Libert-Amico et al., 2022) (Antwi et al., 2024) (Hallberg-Sramek et al., 2022) (FAO, 2024) (Austin et al., 2020)
Socio-cultural	Socio-cultural acceptability	C	(Dobhal et al., 2024) (Antwi et al., 2024) (Chaly et al., 2025) (Himes et al., 2023) (Munera-Roldan et al., 2023) (Munera-Roldan et al., 2024)
	Social co-benefits (health, education)	C	(Antwi et al., 2024) (Chaly et al., 2025) (Hallberg-Sramek et al., 2022) (van den Bosch et al., 2024) (Restrepo et al., 2024)
	Social and regional inclusiveness	B	(Libert-Amico et al., 2022) (Gopalakrishna et al., 2024) (Antwi et al., 2024) (Hallberg-Sramek et al., 2022) (FAO, 2024) (Araos et al., 2021) (Hytten and Pearson, 2025)
	Gender equity	B	(Gopalakrishna et al., 2024) (Chaly et al., 2025) (FAO, 2024) (Araos et al., 2021)
	Intergenerational equity	B	(Gopalakrishna et al., 2024) (Chaly et al., 2025) (FAO, 2024) (Araos et al., 2021
Institutional	Political acceptability	A	(Augustynczik et al., 2025) (Antwi et al., 2024) (Himes et al., 2023) (Munera-Roldan et al., 2024)
	Legal and regulatory acceptability	A	(Augustynczik et al., 2025) (Antwi et al., 2024) (Himes et al., 2023) (Munera-Roldan et al., 2024)
	Institutional capacity and administrative feasibility	A	(Djoudi et al., 2022) (Antwi et al., 2024) (Shivakoti et al., 2021) (Munera-Roldan et al., 2024) (Nikodemus et al., 2022)
	Transparency and accountability potential	B	(Shivakoti et al., 2021) (Himes et al., 2023) (Munera-Roldan et al., 2024) (Nikodemus et al., 2022)

MSW & Biodigesters

Dimensions	Indicator	Score	References
Geophysical	Physical feasibility	A	(park , 2024) (Uranga-Valencia et al., 2025) (Brady et al., 2023)
	Hazard risk reduction potential	N/A	
	Land use change enhancement potential	LE	(Islam, 2024) (Brady et al., 2023)
Environmental-ecological	Ecological capacity	B	(Islam, 2024) (Brady et al., 2023) (De Laurentiis et al., 2024)
	Adaptive capacity/ resilience	A	(Islam et al., 2024) (Uranga-Valencia et al., 2025) (Brady et al., 2023) (De Laurentiis et al., 2024)
Technological	Technical resource availability	A	(Uranga-Valencia et al., 2025) (De Laurentiis et al., 2024)
	Risks mitigation potential	C	(Uranga-Valencia et al., 2025)
Economic	Socioeconomic vulnerability reduction potential	A	(Uranga-Valencia et al., 2025) (Brady et al., 2023)
	Employment and productivity enhancement potential	B	(Uranga-Valencia et al., 2025) (Brady et al., 2023)
	Microeconomic viability	A	(Hannan et al., 2018) (Uranga-Valencia et al., 2025) (Brady et al., 2023)
	Macroeconomic viability	A	(Uranga-Valencia et al., 2025) (Hannan et al., 2018) (Brady et al., 2023)

Socio-cultural	Socio-cultural acceptability	B	(Hannan et al., 2018) (Brady et al., 2023)
	Social co-benefits (health, education)	B	(Uranga-Valencia et al., 2025)
	Social and regional inclusiveness		
	Gender equity		
	Intergenerational equity		
Institutional	Political acceptability	B	(Uranga-Valencia et al., 2025)
	Legal and regulatory acceptability	B	(Uranga-Valencia et al., 2025) (Hannan et al., 2018)
	Institutional capacity and administrative feasibility	B	(Uranga-Valencia et al., 2025) (Hannan et al., 2018) (Park 2025) (Grundmann 2025)
	Transparency and accountability potential		(Park 2025) (Grundmann 2025)

Biomass Conversion with & without CHP

Dimensions	Indicator	Score	References
Geophysical	Physical feasibility	A	(Tolessa, 2023) (Mensah et al., 2024) (Alemu et al., 2024)
	Hazard risk reduction potential		
	Land use change enhancement potential	C	(Brady et al., 2023)
Environmental-ecological	Ecological capacity	A	Alemu et al. (2024) Brady et al. (2023)
	Adaptive capacity/ resilience	A	Kassim et al. (2024) Nkosi et al. (2024) Mensah et al. (2024)
Technological	Technical resource availability	A	(Brady et al., 2023) (Kassim et al., 2024) (Nkosi et al., 2022) (Mensah et al., 2024) (Alemu et al., 2024)
	Risks mitigation potential	LE	(Mensah et al., 2024)
Economic	Socioeconomic vulnerability reduction potential	A	(Kassim et al. 2024) (Alemu et al. 2024)
	Employment and productivity enhancement potential	A	(Brady et al., 2023) (Nkosi et al., 2022) (Alemu et al., 2024)
	Microeconomic viability	C	(Raman et al., 2025)
	Macroeconomic viability	A	(Mensah et al., 2024) (Alemu et al., 2024)
Socio-cultural	Socio-cultural acceptability	C	
	Social co-benefits (health, education)	A	(Röder et al., 2022) (Alemu et al., 2024)
	Social and regional inclusiveness	A	(Brady et al., 2023) (Kassim et al., 2024) (Röder et al., 2022)
	Gender equity	C	(Alemu et al., 2024)
	Intergenerational equity		
Institutional	Political acceptability	B	(Alemu et al., 2024)
	Legal and regulatory acceptability	C	(Alemu et al., 2024)
	Institutional capacity and administrative feasibility	LE	(Alemu et al., 2024) (Brady et al., 2023) (Röder et al., 2022) (Mensah et al., 2024)
	Transparency and accountability potential	LE	(Röder et al., 2022)

MITIGATION

Biogas

Dimensions	Indicator	Score	DOI
Geophysical	Physical potential	C	(Nayeem et al., 2024) (Giocoli et al., 2025) (Ijaz et al., 2023) (Marconi et al., 2023) (Khiratkar et al., 2022) (Boiocchi et al., 2023) (Ngabala et al., 2024) (Dahlgren, 2022) (Haregu et al., 2023)
	Geophysical resources	C	(Shrestha et al., 2022) (Neri et al., 2023) (Rao et al., 2024) (Sakina et al., 2023) (Salomon et al., 2022) (Gandiglio et al., 2022) (Tanyi et al., 2023) (Goel et al., 2024) (Deka et al., 2025) (Siegmeier et al., 2023)
	Land use	C	(Ding et al., 2023) (Svitnič et al., 2024) (De Laurentiis et al., 2024) (Levavasseur et al., 2023) (Pappalardo et al., 2022) (van Selm et al., 2025) (Fienitz, 2025) (Geoghegan et al., 2023) (Styles et al., 2022)
Environmental-ecological	Air pollution	C	(Sharma et al., 2022) (Singh et al., 2023) (Lohano, 2025) (Abba et al., 2022) (Almalawi et al., 2022) (Belkin, 2024) (Kumar et al., 2023) (Mohamed et al., 2022) (Matandirotya et al., 2022) (Afrane et al., 2022)
	Toxic waste, ecotoxicity eutrophication	C	(Dembele et al., 2025) (Czekała et al., 2022) (Salomon et al., 2022) (Xu et al., 2023) (Sobhi et al., 2024) (Romio et al., 2024) (Maksishko, 2022) (Zielińska et al., 2024) (Dhull et al., 2024) (Singh et al., 2023)
	Water quantity and quality	C	(Skoczko, 2025) (Singh, 2024) (Monroy-Licht et al., 2024) (Maksishko, 2022) (Jabari et al., 2022) (J. Krause et al., 2023) (Peral et al., 2023) (Vo et al., 2023) (Takeuchi et al., 2022) (Khoury et al., 2023)
	Biodiversity	C	(Hallikma et al., 2023) (Becker et al., 2024) (Fürst-Preiß et al., 2024) (Kiefer et al., 2023) (Fendel et al., 2022) (von Cossel et al., 2024) (Von Cossel et al., 2022) (Jordan et al., 2024)
Technological	Simplicity	C	(Yang et al., 2022) (Mutungwazi et al., 2025) (Cheng et al., 2024) (Issahaku et al., 2024) (Li et al., 2022) (Perman et al., 2024) (Strubbe et al., 2024) (Araujo et al., 2024) (Wang et al., 2022) (Wei et al., 2024)
	Technological scalability	B	(Ketuama et al., 2022) (Ngetuny et al., 2025) (González et al., 2023) (Salomon et al., 2022) (Nleya et al., 2023) (Archana et al., 2024) (Romio et al., 2024) (Bumharter et al., 2023) (Singh et al., 2023) (Chen et al., 2023)
	Maturity and technology readiness	C	(Patyra et al., 2024) (Czatzkowska et al., 2025) (Wang et al., 2022) (Yang et al., 2022) (Yang et al., 2022) (Adnane et al., 2025) (Yang et al., 2022) (Cheng et al., 2024) (Wu et al., 2022)
Economic	Costs in 2030 and long term	A	(Obileke et al., 2022) (Picón Lescano et al., 2024) (Yousefi et al., 2023) (Bedana et al., 2022) (Rasool et al., 2024) (Kazmi et al., 2024) (Taheri et al., 2022) (Sharvini et al., 2022) (Paulinetti et al., 2022)
	Employment effects and economic growth	C	(Yu et al., 2024) (Garkoti et al., 2025) (Rasimphi et al., 2022) (Yadav et al., 2022) (Sibanda et al., 2024) (Prasad et al., 2025) (Gwandure et al., 2023)
Socio-cultural	Public acceptance	B	(Bharadwaj et al., 2023) (Mancini et al., 2022) (Lisiak-Zielińska et al., 2023) (Boyd Williams et al., 2022) (Sadegh et al., 2024) (Ahmed et al., 2022) (Benassai, 2023) (Boyd Williams et al., 2022) (Keck et al., 2025)
	Effects on health and well-being	C	(Boyd Williams et al., 2022) (Villamor, 2023) (Boyd Williams et al., 2022) (Rahman et al., 2023) (Tornel-Vázquez et al., 2024) (Bussa et al., 2023) (Nix et al., 2022) (Tokarchuk et al., 2022) (Pradhan Shrestha et al., 2024) (Rudziak et al., 2024)
	Distributional effects	B	(Gwandure et al., 2023) (Tornel-Vázquez et al., 2024) (Verner et al., 2023) (Tornel-Vázquez et al., 2025) (Qing et al., 2022) (Luna-delRisco et al., 2025) (Ameridyani et al., 2025) (Yadav et al., 2022) (Boyd Williams et al., 2022) (Boyd Williams et al., 2022)
Institutional	Political acceptance	C	(Ciechanowski et al., 2025) (Limaye et al., 2025) (Corrêa et al., 2024) (Calero et al., 2023) (Fertahi et al., 2023) (Sulewski et al., 2023) (Zhang, 2024) (Guerra-Mota et al., 2024) (Maroušek et al., 2023) (Feiz et al., 2022)
	Institutional capacity, governance, cross-sectoral coordination	B	(Corrêa et al., 2024) (Niang et al., 2022) (Hamidov et al., 2024) (Riemersma et al., 2024) (Warbroek et al., 2023) (Zheng et al., 2025) (Bharadwaj et al., 2022) (Berthe et al., 2022) (Shah et al., 2024) (Amin et al., 2022)
	Legal and administrative capacity	C	(Gustafsson et al., 2022) (Pilipenets et al., 2025) (Abanades et al., 2022) (Vidigal et al., 2025) (Ciechanowski et al., 2025) (Listiningrum et al., 2022) (Adnane et al., 2025) (Riemersma et al., 2024)

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Dimensions	Indicator	Score	DOI
Geophysical	Physical potential	A	(Nogueira et al., 2024) (Løvenskiold et al., 2022) (Fasioli Silva et al., 2022) (Wang, 2022) (Justus et al., 2024) (Juneja et al., 2024) (Fu et al., 2022) (Zanon-Zotin et al., 2023) (O'Neill et al., 2025) (Benavides et al., 2025) (Park et al. 2024)
	Geophysical resources	A	(Nogueira et al., 2024) (Løvenskiold et al., 2022) (Juneja et al., 2024) (Zhang et al., 2023) (Rajamehala et al., 2022) (Go et al., 2022) (Fito et al., 2023) (Gazal et al., 2024) (Algburi et al., 2025) (Thakur et al., 2024) (Park et al. 2024)
	Land use	A	(Nogueira et al., 2024) (Kharia et al., 2023) (Løvenskiold et al., 2022) (Ding et al., 2023) (Lee et al., 2025) (Nadaf et al., 2025) (Cui et al., 2024) (Fang et al., 2025) (Attfield et al., 2023) (O'Neill et al., 2025) (Park et al. 2024)
Environmental-ecological	Air pollution	B	(Li et al., 2024) (Cavelius et al., 2023) (Nagy et al., 2023) (Shan et al., 2023) (Qu et al., 2025) (Cachafeiro et al., 2024) (Nogueira et al., 2024) (Xie et al., 2024) (Juneja et al., 2024) (Segovia-Hernández et al., 2022)
	Toxic waste, ecotoxicity eutrophication	A	(Yang et al., 2025) (Garolera De Nucci et al., 2023) (Jabłońska-Trypuć et al., 2023) (Najar-Almanzor et al., 2023) (Baccar et al., 2022) (Dibazar et al., 2024) (Ren et al., 2024) (Juneja et al., 2024) (Shitu et al., 2024) (Chahal et al., 2025)
	Water quantity and quality	A	(Quiroz et al., 2022) (Zhang et al., 2023) (Fito et al., 2023) (Camargos et al., 2025) (Nogueira et al., 2024) (Ma et al., 2024) (Volkova et al., 2023) (Yang et al., 2022) (Lv et al., 2024)
	Biodiversity	A	(Nogueira et al., 2024) (Lee et al., 2025) (Patle et al., 2023) (Nadaf et al., 2025) (Pallath et al., 2024) (Onyeaka et al., 2025) (Juneja et al., 2024) (Kamboj et al., 2024) (Løvenskiold et al., 2022) (Singh et al., 2023) (Park et al. 2024)
Technological	Simplicity	B	(Juneja et al., 2024) (Prado et al., 2025) (Fasioli Silva et al., 2022) (Cai et al., 2023) (Marzoughi et al., 2022) (Devi et al., 2023) (Singh et al., 2023) (Kazmi et al., 2025) (Nogueira et al., 2024) (Konur, 2023)
	Technological scalability	B	(Nogueira et al., 2024) (Løvenskiold et al., 2022) (Prado et al., 2025) (Figueiredo, 2024) (Juneja et al., 2024) (Sushkova, 2025) (Singh et al., 2023) (Devi et al., 2023) (Fansuri et al., 2024) (Kharia et al., 2023) (Park et al. 2024)
	Maturity and technology readiness	C	(Jain et al., 2024) (Nogueira et al., 2024) (Moreira et al., 2023) (Devi et al., 2023) (Singh et al., 2023) (Juneja et al., 2024) (Raj et al., 2022) (Pattnaik et al., 2024) (Verma et al., 2023) (Devi et al., 2024)
Economic	Costs in 2030 and long term	B	(Justus et al., 2024) (Setiawan et al., 2024) (Patange et al., 2022) (Liu et al., 2025) (Lin et al., 2024) (Özenen-Kavlak et al., 2023) (Krekkeitsakul et al., 2023) (Fasioli Silva et al., 2022) (O'Hara, 2025)
	Employment effects and economic growth	B	(Nogueira et al., 2024) (Sultana et al., 2022) (Ortiz-Sanchez et al., 2025) (Juneja et al., 2024) (Singh et al., 2023) (Yang et al., 2025) (Araghi et al., 2023) (Mvelase et al., 2024) (Fasioli Silva et al., 2022)

Socio-cultural	Public acceptance	B	(Hernández-López et al., 2024) (Han et al., 2022) (Nogueira et al., 2024) (Juneja et al., 2024) (Zaky et al., 2022) (Fasioli Silva et al., 2022) (Rajesh et al., 2024) (Boly et al., 2022) (Justus et al., 2024) (Vasilakou et al., 2023)
	Effects on health and well-being	B	(Aghadadashi et al., 2024) (Iakovidou et al., 2024) (Osiolo et al., 2023) (Bhandari et al., 2025) (Azarakhsh et al., 2024) (Qu et al., 2025) (Juneja et al., 2024) (Mambo et al., 2024) (Shahbaz et al., 2022) (Aneesh et al., 2023)
	Distributional effects	A	(Nogueira et al., 2024) (Justus et al., 2024) (Sobczak et al., 2022) (Juneja et al., 2024) (Løvenskiold et al., 2022) (Aguilar-Rivera, 2024) (Han et al., 2022) (Rajesh et al., 2024) (Yang et al., 2025) (Fasioli Silva et al., 2022) (Park et al. 2024)
Institutional	Political acceptance	C	(Zaky et al., 2022) (Hernández-López et al., 2024) (Vicente Perin et al., 2025) (Falowo et al., 2023) (Devi et al., 2023) (Juneja et al., 2024) (Kocak et al., 2022) (Nogueira et al., 2024) (Nandi et al., 2023) (Trivedi et al., 2025)
	Institutional capacity, governance, cross-sectoral coordination	B	(Miftah et al., 2024) (Vicente Perin et al., 2025) (Nandi et al., 2023) (Sun et al., 2024) (Nogueira et al., 2024) (Juneja et al., 2024) (Fasioli Silva et al., 2022) (Lidasan et al., 2024) (Zhu et al., 2022) (Li et al., 2022)
	Legal and administrative capacity	B	(Herrera-Franco et al., 2022) (Vicente Perin et al., 2025) (Juneja et al., 2024) (Fasioli Silva et al., 2022) (Nogueira et al., 2024) (Zhuang et al., 2025) (Yang et al., 2025) (Miftah et al., 2024) (Piwowar et al., 2022) (Mukherjee, 2025)

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Dimensions	Indicator	Score	DOI
Geophysical	Physical potential	B	(Ningthoujam et al., 2024) (Mahanty et al., 2024) (Rusănescu et al., 2024) (Valamonfared et al., 2024) (Antunes et al., 2022) (Elsagan et al., 2023) (Uliana et al., 2024) (Malik et al., 2022) (da Silva Viana et al., 2023) (Fu et al., 2022)
	Geophysical resources	B	(Zhang et al., 2023) (Nenciu et al., 2021) (Safaripour et al., 2023) (Wu et al., 2022) (Umesh et al., 2025) (Misra et al., 2023) (Ribeiro et al., 2023) (Soni et al., 2023) (Hota et al., 2024) (Rajamehala et al., 2022)
	Land use	B	(Lee et al., 2025) (MIGNONE et al., 2022) (Nogueira et al., 2024) (Ding et al., 2023) (Kharia et al., 2023) (Wang, 2022) (Løvenskiold et al., 2022) (Fang et al., 2025) (Bridhikitti et al., 2023) (Attfield et al., 2023) (Calvin et al. 2021) (Park et al. 2024)
Environmental-ecological	Air pollution	C	(Malik et al., 2023) (Nunta et al., 2023) (Srivastava et al., 2023) (Xie et al., 2024) (Strobel et al., 2025) (Sajid et al., 2025) (Rana et al., 2023) (Nagy et al., 2023) (Rimkus et al., 2023) (El-Sheekh et al., 2022)
	Toxic waste, ecotoxicity eutrophication	B	(Prajapati et al., 2022) (Taghizadeh-Alisaraei et al., 2023) (Bukhari et al., 2025) (Wang et al., 2022) (Yang et al., 2025) (Patel et al., 2024) (Rusănescu et al., 2024) (Kumar et al., 2023) (Borrero-López et al., 2022) (Hu et al., 2023)
	Water quantity and quality	B	(KUMAR et al., 2023) (Zhang et al., 2023) (Fito et al., 2023) (Patel et al., 2024) (Camargos et al., 2025) (Sganzerla et al., 2022) (Zheng et al., 2024) (Lv et al., 2024) (Yang et al., 2022) (Madhumidha et al., 2024)
	Biodiversity	B	(Malik et al., 2023) (Onyeaka et al., 2025) (Pallath et al., 2024) (Milindi et al., 2024) (Nogueira et al., 2024) (Kharia et al., 2023) (Pappas et al., 2023) (Nadaf et al., 2025) (Al-Hammadi et al., 2025) (Dwivedi et al., 2024)
Technological	Simplicity	A	(Pereira-Crespo et al., 2024) (Atzler et al., 2023) (Posoongnoen et al., 2025) (Marzoughi et al., 2022) (Jayakumar et al., 2025) (Bach et al., 2022) (Dongmo et al., 2024) (Aissi et al., 2025)
	Technological scalability	A	(Prado et al., 2025) (Gill et al., 2025) (Osiolo et al., 2023) (Woźniak et al., 2025) (Ghosh et al., 2025) (Unyay et al., 2024) (Ahmad et al., 2024) (Bao et al., 2025) (Agrawal et al., 2025) (Jain et al., 2024)
	Maturity and technology readiness	B	(Jain et al., 2024) (Silvello et al., 2022) (Fansuri et al., 2024) (Nascimento et al., 2024) (Singh et al., 2024) (Hammond et al., 2023) (Bukhari et al., 2025) (Castro-Ochoa et al., 2023) (de Carvalho et al., 2023) (Vasilakou et al., 2023)
Economic	Costs in 2030 and long term	B	(Vasilakou et al., 2023) (Thakur et al., 2024) (Jain et al., 2024) (Periyasamy et al., 2023) (Quratulain et al., 2023) (Sganzerla et al., 2022) (Sukma et al., 2025) (Göbel et al., 2022) (Portocarrero et al., 2024) (Sheikh et al., 2025) (Scapini et al. 2023)
	Employment effects and economic growth	C	(KUMAR et al., 2023) (Mvelase et al., 2024) (Sheikh et al., 2025) (Misra et al., 2023) (Araghi et al., 2023) (Jayakumar et al., 2023) (Roy Choudhury et al., 2024) (Singh et al., 2024) (Kumar et al., 2023) (Raina et al., 2024)
Socio-cultural	Public acceptance	B	(Prado et al., 2025) (Sajid et al., 2025) (Konur, 2023) (Konur, 2023)
	Effects on health and well-being	C	(Qu et al., 2025) (KUMAR et al., 2023) (Singh et al., 2024) (Osiolo et al., 2023) (Malik et al., 2023) (Mambo et al., 2024) (Santana Suárez et al., 2025) (Roy Choudhury et al., 2024) (Jain et al., 2024) (Bhandari et al., 2025)
	Distributional effects	B	(KUMAR et al., 2023) (Singh et al., 2024) (Jain et al., 2024) (Roy Choudhury et al., 2024) (Prajapati et al., 2022) (Tulashie et al., 2023) (de Mélo et al., 2023) (Jayakumar et al., 2023) (Uddin et al., 2025) (Raina et al., 2024)
Institutional	Political acceptance	C	(Vicente Perin et al., 2025) (Zaky et al., 2022) (Trindade et al., 2022) (Miftah et al., 2024) (Kocak et al., 2022) (Osei et al., 2025) (Herrera-Franco et al., 2022) (Falowo et al., 2023) (Olabi et al., 2023)
	Institutional capacity, governance, cross-sectoral coordination	B	(Nandi et al., 2023) (Miftah et al., 2024) (Samani et al., 2023) (Sun et al., 2024) (Vicente Perin et al., 2025) (Lugani et al., 2024) (Nascimento et al., 2024) (Mamo et al., 2024) (Danso et al., 2022) (Bruckler et al., 2025)
	Legal and administrative capacity	B	(Lugani et al., 2024) (Nascimento et al., 2024) (Parenti et al., 2024) (Danso et al., 2022) (Tewfik et al., 2022) (Zegada-Lizarazu et al., 2022) (Yang et al., 2025) (Saad et al., 2024) (Samani et al., 2023) (Lara-Meléndez et al., 2023)

Biodiesel

Dimensions	Indicator	Score	DOI
Geophysical	Physical potential	B	(Ershov et al., 2023) (Chiriacò et al., 2024) (Uski et al., 2024) (Negi et al., 2023) (Sleem et al., 2024) (Žaglinskis et al., 2023) (Frota de Albuquerque Landi et al., 2022) (Ojo et al., 2024) (Tibesigwa et al., 2024) (Xue et al., 2023) (Saurabh et al., 2023) (Yang et al., 2023)
	Geophysical resources	B	(Chiriacò et al., 2024) (Ershov et al., 2023) (Intamano et al., 2024) (Banerjee et al., 2023) (Silitonga et al., 2025) (Purnama et al., 2025) (Kock et al., 2024) (Hao et al., 2022) (Lee et al., 2025) (Xue et al., 2023) (Saurabh et al., 2023)
	Land use	A	(Chiriacò et al., 2024) (Purnama et al., 2025) (Zhu et al., 2022) (Wang et al., 2023) (Suckling et al., 2022) (Lee et al., 2025) (Brandão et al., 2022) (Almeida et al., 2022) (Heimann et al., 2024) (Barros et al., 2025)

Environmental-ecological	Air pollution	A	(Uski et al., 2024) (Kumar et al., 2024) (Sleem et al., 2024) (Žaglinskis et al., 2023) (Ohtonen et al., 2025) (Maes et al., 2022) (Chaudhari et al., 2025) (Webster et al., 2025) (Sumana Yajaman Belludi et al., 2024)
	Toxic waste, ecotoxicity eutrophication	A	(Ershov et al., 2023) (Hemanandh et al., 2025) (Frota de Albuquerque Landi et al., 2022) (Sleem et al., 2024 (Razzak et al., 2025) (Negi et al., 2023) (Darwin et al., 2023) (Hosseinzadeh-Bandbafha et al., 2022) (Sánchez-Lara et al., 2022) (Kumar et al., 2025)
	Water quantity and quality	A	(Netshifhefhe et al., 2022) (Ershov et al., 2023) (Hemanandh et al., 2025) (Banerjee et al., 2023) (Subramanian et al., 2025) (Sleem et al., 2024) (Razzak et al., 2025) (Kumar et al., 2024) (Intamano et al., 2024) (Uski et al., 2024)
	Biodiversity	A	(Purnama et al., 2025) (Almeida et al., 2022) (Barros et al., 2025) (Ali Ijaz Malik et al., 2024) (Karlsson Potter et al., 2023) (Albuquerque et al., 2024) (da Silva et al., 2025) (Benajes et al., 2024) (Suali et al., 2023) (Aquino et al., 2022)
Technological	Simplicity	C	(Namini et al., 2025) (Nagarajan et al., 2022) (GEBREHİWOT et al., 2022) (Kivevele et al., 2024) (Gul et al., 2021) (Parvizi et al., 2022) (Bukkarapu et al., 2022) (Yusof et al., 2025) (Kumar et al., 2025) (Vargas-Estrada et al., 2022)
	Technological scalability	B	(Ali Ijaz Malik et al., 2024) (Mushtruk et al., 2024) (Foo et al., 2022) (Peranginangin et al., 2024) (Gozan et al., 2022) (Benajes et al., 2024) (Estevez et al., 2022) (Szczepaniak et al., 2025) (Elshehawy et al., 2022)
	Maturity and technology readiness	C	(Ershov et al., 2023) (Hemanandh et al., 2025) (Kumar et al., 2024) (Negi et al., 2023) (Sleem et al., 2024) (Subramanian et al., 2025) (Uski et al., 2024) (Darwin et al., 2023) (Pérez-Rangel et al., 2025)
Economic	Costs in 2030 and long term	B	(Ershov et al., 2023) (Hemanandh et al., 2025) (Pérez-Rangel et al., 2025) (Kumar et al., 2024) (Subramanian et al., 2025) (Uski et al., 2024) (Negi et al., 2023) (Sleem et al., 2024) (Chiriacò et al., 2024) (Darwin et al., 2023) (Park et al. 2024)
	Employment effects and economic growth	C	(Ershov et al., 2023) (Hemanandh et al., 2025) (Kumar et al., 2024) (Negi et al., 2023) (Sleem et al., 2024) (Uski et al., 2024) (Pérez-Rangel et al., 2025) (Subramanian et al., 2025) (Darwin et al., 2023) (Chiriacò et al., 2024) (Park et al. 2024)
Socio-cultural	Public acceptance	B	(Lobato-Calleros et al., 2022) (De Oliveira et al., 2025) (Leichter et al., 2022) (Mena-Cervantes et al., 2022) (Zaheer Ahmed et al., 2024) (Ahmad et al., 2024) (Debnath et al., 2025) (Ogata et al., 2023) (Babatunde et al., 2022)
	Effects on health and well-being	B	(Ershov et al., 2023) (Hemanandh et al., 2025) (Kumar et al., 2024) (Uski et al., 2024) (Sleem et al., 2024) (Negi et al., 2023) (Manikandan et al., 2023) (Subramanian et al., 2025) (Frota de Albuquerque Landi et al., 2022) (Darwin et al., 2023)
	Distributional effects	A	(Uski et al., 2024) (Paiz et al., 2022) (Jeyaseelan et al., 2023) (Yan et al., 2022) (Suardi et al., 2024) (Patel et al., 2024) (Viraj Miyuranga et al., 2022) (Silitonga et al., 2025) (Musharavati et al., 2023)
Institutional	Political acceptance	C	(Chung et al., 2025) (Rahman et al., 2025) (Jangre et al., 2022) (Olabi et al., 2023) (Farobie et al., 2022) (Lobato-Calleros et al., 2022) (Durgut, 2025) (Oloyede et al., 2023) (Osei et al., 2025) (Trindade et al., 2022) (Polat and Altınbaş 2023).
	Institutional capacity, governance, cross-sectoral coordination	B	(Ershov et al., 2023) (Staricco et al., 2022) (Namini et al., 2025 (Fouda et al., 2025) (Rahman et al., 2025) (Thanahiranya et al., 2025) (da Silva Neto et al., 2025) (Fathurrahman et al., 2023) (Zhang et al., 2022) (Niyas et al., 2023) (Polat and Altınbaş 2023)
	Legal and administrative capacity	B	(Ershov et al., 2023) (Hemanandh et al., 2025) (Kumar et al., 2024) (Sleem et al., 2024) (Negi et al., 2023) (Uski et al., 2024) (Subramanian et al., 2025) (Chiriacò et al., 2024) (Darwin et al., 2023) (Frota de Albuquerque Landi et al., 2022) (Polat and Altınbaş 2023).

Algae fuels

Dimensions	Indicator	Score	DOI
Geophysical	Physical potential	C	(Kumar et al., 2022) (Quiroz et al., 2023) (Lutzu et al., 2024) (Sarwer et al., 2022) (Debnath et al., 2022) (DALAY, 2024) (Devi et al., 2024) (Rony et al., 2023) (Kumar et al., 2022)
	Geophysical resources	A	(Wu et al., 2023) (Wang et al., 2022) (Zhang et al., 2023) (Anuradha et al., 2023) (Wang et al., 2023) (Awasthi et al., 2023) (Ganesh Saratale et al., 2022) (Chhandama et al., 2023) (Das Gupta et al., 2025)
	Land use	C	(Quiroz et al., 2023) (Ratomski et al., 2023) (Kumar et al., 2022) (Debnath et al., 2022) (Verma et al., 2023)
Environmental-ecological	Air pollution	C	(Karmakar et al., 2024) (Elumalai et al., 2022) (Sarwer et al., 2022) (Annamalai et al., 2024) (Singh et al., 2023) (Quiroz et al., 2023) (Rozina et al., 2025) (Ge et al., 2022) (Karpanai Selvan et al., 2022)
	Toxic waste, ecotoxicity eutrophication	A	(Pérez Mesa et al., 2024) (Devi et al., 2024) (Hamed et al., 2022) (Vellaiyan, 2024) (Díaz et al., 2022) (Jabłońska-Trypuć et al., 2023) (Das et al., 2024) (Bhatt et al., 2022) (Yaashikaa et al., 2022) (Hasnain et al., 2023)
	Water quantity and quality	A	(Wu et al., 2023) (Vellaiyan, 2024) (Quiroz et al., 2022) (Khandelwal et al., 2023) (Zahedi et al., 2022) (Anuradha et al., 2023) (Nath et al., 2024) (Sarwer et al., 2022) (Sugoro et al., 2022) (Hasnain et al., 2025)
	Biodiversity	B	(Paravantis, 2022) (Chhandama et al., 2023) (Singh et al., 2023) (Munir et al., 2022) (O'Neill et al., 2022) (O'Neill et al., 2023) (biodiinson et al., 2025)
Technological	Simplicity	A	(Jha et al., 2024)
	Technological scalability	A	(Bello et al., 2024) (Baldev et al., 2022) (Stephy et al., 2025) (Szulczyk et al., 2022) (Verma et al., 2023) (Devi et al., 2024) (Akram et al., 2025) (Tan et al., 2024) (Jha et al., 2024) (Moon et al., 2022)
	Maturity and technology readiness	A	(Jain et al., 2024) (Bello et al., 2024) (Maroušek et al., 2023) (Maliha et al., 2023) (Kumar et al., 2022) (Ahmad Sobri et al., 2024) (Sarwer et al., 2022) (Saranya et al., 2022) (Das Gupta et al., 2025) (Stephy et al., 2025)
Economic	Costs in 2030 and long term	A	(Maroušek et al., 2023) (Polat and Altınbaş 2023) (Thanigaivel et al., 2022) (Akram et al., 2025) (Jha et al., 2024) (Sharma et al., 2023) (Sarwer et al., 2022) (Saranya et al., 2022) (Ennaceri et al., 2023) (Kumar et al., 2022)
	Employment effects and economic growth	B	(Sharma et al., 2023) (Ennaceri et al., 2023) (Maroušek et al., 2023) (Saranya et al., 2022) (Akram et al., 2025) (Maliha et al., 2023) (Yaashikaa et al., 2022) (Szulczyk et al., 2022) (Kumar et al., 2022) (Ahmad Sobri et al., 2024)
Socio-cultural	Public acceptance	B	(Paravantis, 2022) (Banerjee et al., 2022) (Sahu et al., 2024) (Elumalai et al., 2022) (Karmakar et al., 2024) (Nowruzi et al., 2023) (Mohite et al., 2024) (Konur, 2023) (Goria et al., 2024) (Arnold et al., 2024)
	Effects on health and well-being	C	(Wahab et al., 2025) (Saranya et al., 2022) (Maroušek et al., 2023) (Abbasi et al., 2024) (Rengarajan et al., 2024) (Karmakar et al., 2024) (Goswami et al., 2022) (Kumar et al., 2022) (Wood, 2022) (Bej et al., 2024)
	Distributional effects	B	(Saranya et al., 2022) (Karmakar et al., 2024) (Elumalai et al., 2022) (Zhu et al., 2023) (Jose et al., 2024) (Tong et al., 2023) (Rony et al., 2023) (Debnath et al., 2022) (Vellaiyan, 2024)
Institutional	Political acceptance	B	(Paravantis, 2022) (Selvaraj et al., 2022) (Bhatia et al., 2022) (Talukder et al., 2024)
	Institutional capacity, governance, cross-sectoral coordination	A	(Kumar et al., 2022) (Sarwer et al., 2022) (Karmakar et al., 2024) (Chandrasekhar et al., 2023) (P et al., 2023) (Pulidindi et al., 2022) (Gao et al., 2022) (Amalapridman et al., 2025) (Dung Nguyen et al., 2024) (Venkatesan et al., 2022)
	Legal and administrative capacity	B	(kankia et al., 2024) (O'Neill et al., 2023) (Maroušek et al., 2023) (Saranya et al., 2022) (Szulczyk et al., 2022) (Ahmad Sobri et al., 2024) (Mirle et al., 2025) (Kumar et al., 2022) (O'Neill et al., 2022) (Ennaceri et al., 2023)

Wood and Solid Fuel

Dimensions	Indicator	Score	DOI
Geophysical	Physical potential	B	(Mack et al., 2024) (Mack et al., 2024) (Anestis et al., 2025) (Vilas Boas et al., 2024) (Castillo-Tera et al., 2025) (Samal et al., 2024) (Kuptz et al., 2022) (Romero et al., 2023) (Chen et al., 2024) (Leoni et al., 2024)
	Geophysical resources	B	(M. Ribeiro et al., 2022) (Stolarski et al., 2023) (Shamsudin et al., 2022) (Selivanov et al., 2025) (Castillo-Tera et al., 2025) (Orozco-Ramírez et al., 2022) (Asim Ibrahim et al., 2024) (Gilbert Jesuet et al., 2024) (Komandur et al., 2024) (Ganesan et al., 2024)
	Land use	A	(Silva et al., 2022) (Suryawan et al., 2024) (Souza et al., 2024) (Padder et al., 2024) (Matheus et al., 2024) (Ali et al., 2024) (Zhang et al., 2025)
Environmental-ecological	Air pollution	A	(Mack et al., 2024) (Isaxon et al., 2022) (Chaudhary et al., 2022) (Kuchler et al., 2024) (Chowdhury et al., 2022) (Yin et al., 2024) (Gulia et al., 2025) (Vijay et al., 2024) (Chen et al., 2024) (Medina et al., 2024)
	Toxic waste, ecotoxicity eutrophication	C	(Iryani et al., 2023) (Anestis et al., 2025) (Selivanov et al., 2025) (Vilas Boas et al., 2024) (Asim Ibrahim et al., 2024) (Silveira et al., 2025) (Castillo-Tera et al., 2025) (Hofmann et al., 2022) (Siwale et al., 2022) (Sá et al., 2024)
	Water quantity and quality	B	(Mack et al., 2024) (Mack et al., 2024) (Endriss et al., 2025) (Toscano et al., 2022) (Kuchler et al., 2024) (Iryani et al., 2023) (Na Nagara et al., 2024) (Mortadha et al., 2025) (Kuptz et al., 2022) (Sá et al., 2024)
	Biodiversity	A	(Al-Tardeh, 2025) (Shamsudin et al., 2022) (Cutz et al., 2025) (Soomro et al., 2023) (Manzini Poli et al., 2022)
Technological	Simplicity	C	(Morales-Máximo et al., 2025)
	Technological scalability	B	(Khan et al., 2025)
	Maturity and technology readiness	C	(Bhaduri et al., 2023) (Mack et al., 2024) (Mack et al., 2024) (Kota et al., 2022) (Mortadha et al., 2025) (Endriss et al., 2025) (Yunusa et al., 2023) (Gilbert Jesuet et al., 2024) (Bartocci et al., 2022) (MOICEANU et al., 2023) (Lee et al., 2024)
Economic	Costs in 2030 and long term	B	(Mack et al., 2024) (Toscano et al., 2022) (MOICEANU et al., 2023) (SAWAI et al., 2022) (Mortadha et al., 2025) (Stolarski et al., 2023) (Kongto et al., 2024) (Durán et al., 2023) (Adam et al., 2024) (Li et al., 2025)
	Employment effects and economic growth	B	(Kuchler et al., 2024) (Ucella-Filho et al., 2023) (MOICEANU et al., 2023) (Ge et al., 2023) (Gilbert Jesuet et al., 2024) (Gasperini et al., 2024) (Mohammadi et al., 2022) (Lee et al., 2024) (Gorbachev et al., 2025) (Dudziec et al., 2023)
Socio-cultural	Public acceptance	B	(Selivanov et al., 2025) (Debele et al., 2025) (Epuitai et al., 2022) (Al-Tardeh, 2025) (Drobniak et al., 2024) (Nasrin et al., 2022) (Malpica-Maldonado et al., 2022) (Zhang et al., 2022) (Silva et al., 2022) (Charis et al., 2024)
	Effects on health and well-being	A	(Kuchler et al., 2024) (Yin et al., 2024) (Isaxon et al., 2022) (Yadav et al., 2024) (Ucella-Filho et al., 2023) (Lee et al., 2024) (Siwale et al., 2022) (Ge et al., 2023) (Chaudhary et al., 2022) (Shayo et al., 2022)
	Distributional effects	A	(Kuchler et al., 2024) (Ucella-Filho et al., 2023) (Lee et al., 2024) (Gorbachev et al., 2025) (Ge et al., 2023) (Mohammadi et al., 2022) (Srinivasan et al., 2023) (Riaz et al., 2022) (Pradhan et al., 2025) (Mörtenkötter et al., 2024)
Institutional	Political acceptance	B	(Silva et al., 2022) (Nasrin et al., 2022) (Hezam et al., 2023) (Charis et al., 2024) (Teirumnieka et al., 2023) (Leoni et al., 2022) (Ismail et al., 2023) (Msemwa et al., 2022) (Lala et al., 2025)
	Institutional capacity, governance, cross-sectoral coordination	A	(Tsiropoulos et al., 2022) (Singara veloo et al., 2025) (Silva et al., 2025) (Debele et al., 2025) (Srinivasan et al., 2023) (Mohammadi et al., 2022) (Muhammed Raji et al., 2025) (Pradhan et al., 2025) (Sacramento Rivero et al., 2022) (Park et al., 2023)
	Legal and administrative capacity	A	(Sá et al., 2024) (Singara veloo et al., 2025) (Muhammed Raji et al., 2025) (Mohammadi et al., 2022) (Adam et al., 2024) (Pradhan et al., 2025) (Park et al., 2023) (Demirel, 2024) (Sacramento Rivero et al., 2022) (Oñate et al., 2024)

Biohydrogen

Dimensions	Indicator	Score	References
Geophysical	Physical potential	C	(Krishna Prasad, 2025) (Sharma et al., 2024) (Udaypal et al., 2024) (Sher et al., 2024) (Yang et al., 2023) (Dange et al., 2022) (Singh et al., 2023) (Anand et al., 2024) (Chandran et al., 2023) (Karishma et al., 2022)
	Geophysical resources	B	(Goren et al., 2023) (Srivastava et al., 2024) (Khetkorn et al., 2023) (Aslam et al., 2023) (Al-Dailami et al., 2022) (Sogani et al., 2025) (Ganguly et al., 2025) (Uzun, 2022) (Wang, 2023) (Parakh et al., 2023)
	Land use	A	(Debnath et al., 2022) (Lackner, 2022) (Goren et al., 2023) (Tiwari et al., 2024) (Padi et al., 2025) (Liu et al., 2025) (dos Santos et al., 2025)
Environmental-ecological	Air pollution	C	(Dash et al., 2025) (Khan et al., 2025) (Shanmuganathan et al., 2023) (Kant Bhatia et al., 2022) (Dewangan et al., 2024) (Abdelqader et al., 2021) (Shrivasava et al., 2024) (Zhao et al., 2023) (Ibáñez-López et al., 2025) (Goren et al., 2023)
	Toxic waste, ecotoxicity eutrophication	B	(Akroum-Amrouche et al., 2024) (Meena et al., 2025) (Putatunda et al., 2023) (Anjum et al., 2023) (Derdiche et al., 2025) (Mohanakrishna et al., 2023) (Kanwal et al., 2022) (Lacroux et al., 2023) (Nirmala et al., 2023) (Ivanenko et al., 2024)
	Water quantity and quality	B	(Gujjala et al., 2022) (Iqbal et al., 2022) (Khetkorn et al., 2023) (Goren et al., 2023) (Borah et al., 2024) (Goria et al., 2022) (Phan et al., 2025) (More et al., 2025) (Ganguly et al., 2025) (Kundu et al., 2022)
	Biodiversity	A	(Ahmadi et al., 2024) (Singh et al., 2023) (Borah et al., 2024) (Harichandan, 2025) (Albuquerque et al., 2024) (Sher et al., 2024) (Al-Hammadi et al., 2024) (Ali et al., 2022) (Roy et al., 2022) (Xiao et al., 2022)
Technological	Simplicity	A	(Tang et al., 2023) (Moura et al., 2024) (Abd-El-Haleem, 2023) (Elerakey et al., 2024)
	Technological scalability	B	(Parakh et al., 2023) (Omer et al., 2025) (Asrul et al., 2025) (Raut et al., 2025) (Puteri et al., 2025) (Luo et al., 2025) (Dowaidar, 2025) (Emmanuel et al., 2025) (Al-Farsi et al., 2024) (Faruk Kilicaslan et al., 2025)
	Maturity and technology readiness	B	(Lanjekar et al., 2023) (Putatunda et al., 2023) (Di Nardo et al., 2025) (Kanwal et al., 2022) (Teke et al., 2024) (Sharma et al., 2024) (Li et al., 2022) (Gautam et al., 2023) (Radhika et al., 2022)
Economic	Costs in 2030 and long term	B	(Yagüe et al., 2024) (Ganguly et al., 2025) (Reigstad et al., 2022) (Younas et al., 2022) (Ayub et al., 2024) (Baía et al., 2025) (Jha et al., 2024) (Raina et al., 2024) (Anjum et al., 2023)
	Employment effects and economic growth	C	(Krishna Prasad, 2025) (Omer et al., 2025) (Di Nardo et al., 2025) (Zarei et al., 2024) (Reigstad et al., 2022) (Derdiche et al., 2025) (Umunnawuike et al., 2024) (Muddasar et al., 2022) (Sivaramakrishnan et al., 2021)
Socio-cultural	Public acceptance	B	(Rani et al., 2022) (Sharma et al., 2024) (Anjum et al., 2023) (Ivanenko et al., 2024) (Putatunda et al., 2023) (Senthil Rathi et al., 2024) (Hussien et al., 2025) (Palikrousis et al., 2025) (Shahbaz et al., 2022) (Ayub et al., 2024)
	Effects on health and well-being	C	(Raturi et al., 2022) (Iakovidou et al., 2024) (Aghadadashi et al., 2024) (Shahbaz et al., 2022) (Atasoy et al., 2024) (Davoodbeygi et al., 2024) (Mahmood et al., 2023) (Liu et al., 2025) (Maciel et al., 2023)
	Distributional effects	B	(Ariful Islam et al., 2025) (Davoodbeygi et al., 2024) (Muddasar et al., 2022) (Magdalena et al., 2023) (Ndayisenga et al., 2022) (Bozieva et al., 2023) (Morya et al., 2022) (Liu et al., 2025) (Hidalgo et al., 2023) (Singh et al., 2022)

Institutional	Political acceptance	C	(Rani et al., 2022) (Verma et al., 2024) (Saxena et al., 2022) (Thajuddin et al., 2026) (Sridhar et al., 2022) (Adekanbi et al., 2023) (Full et al., 2022) (Hamda et al., 2025) (Sudhakar et al., 2024)
	Institutional capacity, governance, cross-sectoral coordination	B	(Khetkorn et al., 2023) (Reigstad et al., 2022) (Chandrasekhar et al., 2025) (Roque et al., 2025) (Madadi Avargani et al., 2022) (Xing et al., 2025) (Chandrasekhar et al., 2023) (Kulkarni et al., 2023) (Jiao et al., 2024)
	Legal and administrative capacity	B	(Khetkorn et al., 2023) (Chandrasekhar et al., 2025) (Madadi Avargani et al., 2022) (Jiao et al., 2024) (Zhang et al., 2023) (Yin et al., 2024) (Xing et al., 2025) (Kulkarni et al., 2023) (Chandrasekhar et al., 2023) (Al-Dailami et al., 2022)

Bioplastic

Dimensions	Indicator	Score	References
Geophysical	Physical potential	N/A	
	Geophysical resources	B	(Brizga et al., 2020) (Islam et al., 2024) (Rosenboom et al., 2022)
	Land use	B	(Islam et al., 2024) (Rosenboom et al., 2022)
Environmental-ecological	Air pollution	C	(Atiwesh et al., 2021) (Rosenboom et al., 2022) 4
	Toxic waste, ecotoxicity eutrophication	A	(Nik Mut et al., 2024) (Tang et al., 2025)
	Water quantity and quality	B	(Brizga et al., 2020)
	Biodiversity	B	(Brizga et al., 2020)
Technological	Simplicity	B	(Zhao et al., 2023) (Huang et al., 2025)
	Technological scalability	C	(Mattlar et al., 2025) (Huang et al., 2025) (Brizga et al., 2020)
	Maturity and technology readiness	C	(Mattlar et al., 2025) (Huang et al., 2025)
Economic	Costs in 2030 and long term	A	(Huang et al., 2025) (Brizga et al., 2020)
	Employment effects and economic growth	N/A	
Socio-cultural	Public acceptance	C	(Dilkes-Hoffman et al., 2019) (Weinrich et al., 2023) (Cruz et al., 2022)
	Effects on health and well-being	B	(Mattlar et al., 2025) (Brizga et al., 2020)
	Distributional effects	B	(Weinrich et al., 2023) (Cruz et al., 2022)
Institutional	Political acceptance	B	(Dilkes-Hoffman et al., 2019) (Silva et al., 2024)
	Institutional capacity, governance, cross-sectoral coordination	B	(Weinrich et al., 2023) (Silva et al., 2024) (van Noordwijk 2023)
	Legal and administrative capacity	B	(Silva et al., 2024) (van Noordwijk 2023)

Agroforestry

Dimensions	Indicator	Score	References
Geophysical	Physical potential	C	(Terasaki Hart et al., 2023) (Quandt et al., 2023) (Sambou et al. 2024)
	Geophysical resources	N/A	(Beillouin et al., 2023) (Dmuchowski et al., 2024) (Zhu et al., 2020) (Kuyah et al. 2023)
	Land use	C	(Beillouin et al., 2023) (G et al., 2025) (Dmuchowski et al., 2024)
Environmental-ecological	Air pollution	C	(G et al., 2025) (Mayr et al., 2025) (Quandt et al., 2023) (Tagwi et al. 2023)
	Toxic waste, ecotoxicity eutrophication	C	(Zhu et al., 2020) (Beillouin et al., 2023) (Dmuchowski et al., 2024)
	Water quantity and quality	C	(Quandt et al., 2023) (Zhu et al., 2020) (Dmuchowski et al., 2024) (Tagwi et al. 2023)
	Biodiversity	B	(Boinot et al., 2022) (Jung et al., 2025) (Dmuchowski et al., 2024) (Tagwi et al. 2023)
Technological	Simplicity	C	(Bogale et al., 2023) (ASSÈDÉ et al., 2023) (Viñals et al., 2023)
	Technological scalability	B	(Mayr et al., 2025) (ASSÈDÉ et al., 2023) (Bogale et al., 2023)
	Maturity and technology readiness	C	(Mayr et al., 2025) (ASSÈDÉ et al., 2023) (Zeratsion et al., 2024)
Economic	Costs in 2030 and long term	B	(Quandt et al., 2023) (ASSÈDÉ et al., 2023) (Castle et al., 2021) (Tagwi et al. 2023)
	Employment effects and economic growth	B	(Castle et al., 2021) (ASSÈDÉ et al., 2023) (Bogale et al., 2023) (Tagwi et al. 2023)
Socio-cultural	Public acceptance	B	(Montero-de-Oliveira et al., 2025) (Zabala et al., 2025) (Dmuchowski et al., 2024)
	Effects on health and well-being	A	(Jung et al., 2025) (Castle et al., 2021) (Bogale et al., 2023) (Tagwi et al. 2023) (Nkansah-Dwamena 2024)
	Distributional effects	N/A	(Castle et al., 2021) (Quandt et al., 2023) (Bogale et al., 2023)
Institutional	Political acceptance	B	(Zabala et al., 2025) (Montero-de-Oliveira et al., 2025)
	Institutional capacity, governance, cross-sectoral coordination	B	(Datta et al., 2024) (Katic, 2021) (Urruth et al., 2022)
	Legal and administrative capacity	B	(Katic, 2021) (Urruth et al., 2022) (Kumar et al., 2023)

Biomaterial for buildings

Dimensions	Indicator	Score	References
Geophysical	Physical potential	C	(Lahayrech et al., 2024) (Chen et al., 2024) (Fahim et al., 2022) (Bredenoord, 2024)
	Geophysical resources	C	(Woodard & Milner, 2016) (D'Amico, Pomponi & Hart, 2021) (Fahim et al., 2022)
	Land use	B	(Kayo et al., 2019) (Balasbaneh, Sher & Yeoh, 2022) (Balasbaneh & Sher, 2021) (Sotayo et al., 2020)
Environmental-ecological	Air pollution	B	(Balasbaneh, Sher & Yeoh, 2022)
	Toxic waste, ecotoxicity eutrophication	A	(Balasbaneh, Sher & Yeoh, 2022) (Balasbaneh & Sher, 2021) (Sotayo et al., 2020)
	Water quantity and quality	A	(Vallejos et al., 2025)
	Biodiversity	A	(Fransson Christiansson & Roos, 2023)
Technological	Simplicity	C	(Michalak & Michalak, 2024) (Švajlenka & Kozlovská, 2022) (Hu, 2023)
	Technological scalability	C	(Sutkowska et al., 2024)
	Maturity and technology readiness	C	(Starzyk et al., 2024)
Economic	Costs in 2030 and long term	LE	(Hrdlicka, Cupal and Komosna, 2022)
	Employment effects and economic growth	N/A	
Socio-cultural	Public acceptance	B	(Nyrud et al., 2024) (Lähtinen et al., 2021) (Han, Yang and Lee, 2022) (Harju, 2022) (Viholainen et al., 2021)
	Effects on health and well-being	LE	(Hariadi and Carlisle, 2025)
	Distributional effects	N/A	
Institutional	Political acceptance	B	(Wiegand and Ramage, 2022) (Rahman et al., 2024) (Franzini, Toivonen and Toppinen, 2018)
	Institutional capacity, governance, cross-sectoral coordination	B	(Gosselin et al., 2017) (Rahman et al., 2024) (Victorero and Bustamante, 2025)
	Legal and administrative capacity	B	(Gosselin et al., 2017) (Victorero and Bustamante, 2025)

MSW

Dimensions	Indicator	Score	References
Geophysical	Physical potential	C	(Ulloa-Murillo et al., 2022) (Ferronato et al., 2021) (Tisi et al., 2023) (Miramontes-Martínez et al., 2024) (Dadario et al., 2023)
	Geophysical resources	N/A	
	Land use	C	(Ulloa-Murillo et al., 2022) (Tisi et al., 2023) (Miramontes-Martínez et al., 2024) (Dadario et al., 2023)
Environmental-ecological	Air pollution	C	(Ulloa-Murillo et al., 2022) (Ferronato et al., 2021) (Tisi et al., 2023) (Miramontes-Martínez et al., 2024) (Dadario et al., 2023) (Torres-Lozada et al., 2023)
	Toxic waste, ecotoxicity eutrophication	B	(Ferronato et al., 2021) (Tisi et al., 2023) (Dadario et al., 2023)
	Water quantity and quality	N/A	
	Biodiversity	N/A	
Technological	Simplicity	A	(Dadario et al., 2023)
	Technological scalability	C	(Ulloa-Murillo et al., 2022) (Tisi et al., 2023) (Miramontes-Martínez et al., 2024) (Dadario et al., 2023)
	Maturity and technology readiness	C	(Tisi et al., 2023) (Miramontes-Martínez et al., 2024) (Dadario et al., 2023)
Economic	Costs in 2030 and long term	N/A	(Miramontes-Martínez et al., 2024)
	Employment effects and economic growth	A	(Tisi et al., 2023)
Socio-cultural	Public acceptance	N/A	(Miramontes-Martínez et al., 2024) (Dadario et al., 2023)
	Effects on health and well-being	C	(Ulloa-Murillo et al., 2022) (Tisi et al., 2023) (Dadario et al., 2023)
	Distributional effects	N/A	
Institutional	Political acceptance	LE	(Dadario et al., 2023)
	Institutional capacity, governance, cross-sectoral coordination	N/A	
	Legal and administrative capacity	LE	(Tisi et al., 2023) (Miramontes-Martínez et al., 2024) (Dadario et al., 2023)

Biomass conversion with and without Combined Heat and Power

Dimensions	Indicator	Score	References
Geophysical	Physical potential	C	(Galimova et al., 2022) (A.M. et al., 2023)
	Geophysical resources	A	(Galimova et al., 2022)
	Land use	LE	(A.M. et al., 2023)
Environmental-ecological	Air pollution	LE	(Galimova et al., 2022)
	Toxic waste, ecotoxicity eutrophication	N/A	
	Water quantity and quality	LE	(Winberg et al., 2023)
	Biodiversity	A	(Sharmila et al., 2024) (A.M. et al., 2023) (Winberg et al., 2023)
Technological	Simplicity	B	
	Technological scalability	C	(Galimova et al., 2022) (Sharmila et al., 2024)
	Maturity and technology readiness	B	(Galimova et al., 2022) (Sharmila et al., 2024)
Economic	Costs in 2030 and long term	LE	(Galimova et al., 2022) (Sharmila et al., 2024)
	Employment effects and economic growth	B	(A.M. et al., 2023)
Socio-cultural	Public acceptance	B	(A.M. et al., 2023)
	Effects on health and well-being	B	(Galimova et al., 2022)
	Distributional effects	N/A	
Institutional	Political acceptance	B	(Sharmila et al., 2024) (A.M. et al., 2023) (Islam et al., 2024)
	Institutional capacity, governance, cross-sectoral coordination	A	(Islam et al., 2024)
	Legal and administrative capacity	A	(Sharmila et al., 2024) (Islam et al., 2024)

FA RESULTS FOR ADAPTATION, AFRICA

Biomass briquette / agroforestry technologies

Dimensions	Indicator	Score	References
Geophysical	Physical potential	B	(García-López et al., 2024)
	Hazard risk reduction potential	B	(Houndjo Kpoviwanou et al., 2024)
	Land use change enhancement potential	B	(Muthee et al., 2022)
Environmental-ecological	Ecological capacity	C	(Otieno et al., 2022) (Muthee et al., 2022)
	Adaptive capacity/ resilience	C	(Sheppard et al., 2020) (Muthuri et al., 2023)
Technological	Technical resource availability	A	(Kpalo et al., 2020) (Muthee et al., 2022)
	Risks mitigation potential	B	(Bensch et al., 2021) (Tschora et al., 2020)
Economic	Socioeconomic vulnerability reduction potential	C	(Muthuri et al., 2023) (Kpalo et al., 2020).
	Employment and productivity enhancement potential	C	(Houndjo Kpoviwanou et al., 2024) (Muthee et al., 2022).
	Microeconomic viability	C	(Bot et al., 2022) (Kpalo et al., 2022)
	Macroeconomic viability	B	(Bot et al., 2022) (García-López et al., 2024).
Socio-cultural	Socio-cultural acceptability	A	(Dagnachew et al., 2020) (Houndjo Kpoviwanou et al., 2024)
	Social co-benefits (health, education)	B	(García-López et al., 2024) (Lubwama et al., 2020)
	Social and regional inclusiveness	A	(Houndjo Kpoviwanou et al., 2024)
	Gender equity	B	(Kassaye et al., 2025) (Houndjo Kpoviwanou et al., 2024) (Kpalo et al., 2020).
	Intergenerational equity	B	(Ali et al., 2024) (Houndjo Kpoviwanou et al., 2024) (Fané et al., 2024).
Institutional	Political acceptability	B	(Sambou et al., 2024) (Muthee et al., 2022) (Lubwama et al., 2020)
	Legal and regulatory acceptability	A	(Houndjo Kpoviwanou et al., 2024)
	Institutional capacity and administrative feasibility	A	(Ndlovu et al., 2021) (Houndjo Kpoviwanou et al., 2024)
	Transparency and accountability potential	A	(Acheampong et al., 2023)

Biogas digesters

Dimensions	Indicator	Score	References
Geophysical	Physical potential	C	(Ali et al., 2020) (Kemausuor et al., 2018) (Mthimunye Thabiso et al., 2025).
	Hazard risk reduction potential	B	(Avery et al., 2014)
	Land use change enhancement potential	B	(Balgah et al., 2023) (Kalina et al., 2022) (Chen et al., 2023)
Environmental-ecological	Ecological capacity	B	(Rashama et al., 2025) (Kamusoko et al., 2024) (Chen et al., 2023)
	Adaptive capacity/ resilience	B	(Kemausuor et al., 2018)
Technological	Technical resource availability	A	(Roopnarain et al., 2017) (Ijoma et al., 2022) (Shonhiwa et al., 2023)
	Risks mitigation potential	B	(Mthimunye Thabiso et al., 2025) (Robin et al., 2024) (Rasimphi et al., 2024)
Economic	Socioeconomic vulnerability reduction potential	B	(Roopnarain et al., 2020) (Shirinda et al., 2025) (Kalina et al., 2022)
	Employment and productivity enhancement potential	B	(Gbadeyan et al., 2024)
	Microeconomic viability	B	(Gbadeyan et al., 2024)
	Macroeconomic viability	B	(Mwirigi et al., 2014)

Socio-cultural	Socio-cultural acceptability	A	(Dumont et al., 2021) (Roopnarain et al., 2020) (Roopnarain et al., 2017)
	Social co-benefits (health, education)	C	(Balgah et al., 2023)
	Social and regional inclusiveness	A	(Tolessa, 2024)
	Gender equity	LE	(Villamor, 2023) (Roopnarain et al., 2020)
	Intergenerational equity	LE	(Balgah et al., 2023) (Gbadeyan et al., 2024).
Institutional	Political acceptability	A	(Rashama et al., 2025) (Phillips, 2025) (Ketuama et al., 2022)
	Legal and regulatory acceptability	A	(Gbadeyan et al., 2024)
	Institutional capacity and administrative feasibility	A	(Clemens et al., 2018) (Balgah et al., 2023)
	Transparency and accountability potential	A	(Parawira, 2009) (Roopnarain et al., 2017)

Improved Biomass Cookstoves

Dimensions	Indicator	Score	References
Geophysical	Physical potential	C	(Phillip et al., 2023) (Yunusa et al., 2023) (Khavari et al., 2023)
	Hazard risk reduction potential	B	(Phillip et al., 2023) (Khavari et al., 2023) (Hassan et al., 2024)
	Land use change enhancement potential	LE	(Mperejekumana et al., 2024) (Phillip et al., 2023) (Khavari et al., 2023)
Environmental-ecological	Ecological capacity	B	(Mperejekumana et al., 2024) (Wassie et al., 2021) (Sundberg et al., 2020)
	Adaptive capacity/ resilience	C	(Ackerl et al., 2023) (Dagnachew et al., 2020) (Bensch et al., 2021)
Technological	Technical resource availability	A	(Apeh et al., 2024) (Hassan et al., 2024) (Wamalwa et al., 2022)
	Risks mitigation potential	B	(Adane et al., 2021) (LaFave et al., 2019) (Mitchell et al., 2020)
Economic	Socioeconomic vulnerability reduction potential	LE	(Phillip et al., 2023)
	Employment and productivity enhancement potential	LE	(Sundberg et al., 2020) (Dagnachew et al., 2020) (Wassie et al., 2021)
	Microeconomic viability	C	(Phillip et al., 2023)
	Macroeconomic viability	C	(Ankel-Peters et al., 2025) (Mekonnen et al., 2022).
Socio-cultural	Socio-cultural acceptability	B	(Zulu et al., 2024) (Kapfudzaruwa et al., 2017) (Pailman et al., 2018)
	Social co-benefits (health, education)	LE	(Matavel et al., 2022) (Adane et al., 2021) (ELTAYEBMUNEER et al., 2003
	Social and regional inclusiveness	B	(Dagnachew et al., 2020) (Phillip et al., 2023) (Khavari et al., 2023)
	Gender equity	B	(Jagoe et al., 2020) (Chandrasekaran et al., 2023) (Ardrey et al., 2021)
	Intergenerational equity	B	(Jagoe et al., 2020) (Apeh et al., 2024) (Hassan et al., 2024)
Institutional	Political acceptability	B	(Mperejekumana et al., 2024) (Adkins et al., 2010) (Kaputo et al., 2023)
	Legal and regulatory acceptability	A	(Apeh et al., 2024) (Kyayesimira et al., 2021) (Bensch et al., 2021
	Institutional capacity and administrative feasibility	A	(Mperejekumana et al., 2024) (Dagnachew et al., 2020) (Sundberg et al., 2020)
	Transparency and accountability potential	LE	(Kelly et al., 2018) (Ankel-Peters et al., 2025) (Bensch et al., 2024)

FA RESULTS FOR MITIGATION, LATIN AMERICA

Biomass Conversion with and without CHP

Dimensions	Indicator	Score	References
Geophysical	Physical potential	C	(Paloma Mantovani et al., 2022) (Silva et al., 2022) (Mahdavi et al., 2024) (Delgado-Plaza et al., 2022) (Aparecida Segecic et al., 2023).
	Geophysical resources	C	(Deitos et al., 2024) (Paloma Mantovani et al., 2022) (Domingues et al., 2022) (Mahdavi et al., 2024).
	Land use	LE	(Paloma Mantovani et al., 2022).
Environmental-ecological	Air pollution	C	(Paloma Mantovani et al., 2022) (Silva et al., 2022) (Mahdavi et al., 2024) (Delgado-Plaza et al., 2022) (Lucena et al., 2023) (Aparecida Segecic et al., 2023).
	Toxic waste, ecotoxicity eutrophication	N/A	
	Water quantity and quality	LE	(Domingues et al., 2022)
	Biodiversity	LE	(Deitos et al., 2024) (Domingues et al., 2022) (Delgado-Plaza et al., 2022) (Lucena et al., 2023).
Technological	Simplicity	N/A	
	Technological scalability	C	(Domingues et al., 2022) (Delgado-Plaza et al., 2022) (Aparecida Segecic et al., 2023)
	Maturity and technology readiness	C	(Deitos et al., 2024) (Paloma Mantovani et al., 2022) (Silva et al., 2022) (Delgado-Plaza et al., 2022)
Economic	Costs in 2030 and long term	B	(Domingues et al., 2022) (Silva et al., 2022) (Delgado-Plaza et al., 2022).
	Employment effects and economic growth	C	(Paloma Mantovani et al., 2022) (Domingues et al., 2022) (Lucena et al., 2023) (Aparecida Segecic et al., 2023)
Socio-cultural	Public acceptance	LE	(Silva et al., 2022) (Silva et al., 2025) (Delgado-Plaza et al., 2022).
	Effects on health and well-being	N/A	
	Distributional effects	LE	(Paloma Mantovani et al., 2022)
Institutional	Political acceptance	N/A	
	Institutional capacity, governance, cross-sectoral coordination	LE	(Paloma Mantovani et al., 2022) (Aparecida Segecic et al., 2023)
	Legal and administrative capacity	LE	(Deitos et al., 2024) (Paloma Mantovani et al., 2022) (Silva et al., 2022) (Silva et al., 2025).

Biomass Conversion with and without CHP – Latin America

Dimensions	Indicator	Score	References
Geophysical	Physical potential	C	(Tolessa, 2023) (A.M. et al., 2023) (Kassim et al., 2025) (Alemu et al., 2024)
	Geophysical resources	C	(Röder et al., 2022) (Kassim et al., 2025) (Mensah et al., 2024) (Alemu et al., 2024)
	Land use	LE	(Alemu et al., 2024)
Environmental-ecological	Air pollution	C	(Kassim et al., 2025) (Röder et al., 2022) (Alemu et al., 2024).
	Toxic waste, ecotoxicity eutrophication	N/A	
	Water quantity and quality	N/A	
	Biodiversity	C	(A.M. et al., 2023) (Kassim et al., 2025) (Röder et al., 2022) (Alemu et al., 2024)
Technological	Simplicity	N/A	
	Technological scalability	C	(Röder et al., 2022) (Mensah et al., 2024) (Alemu et al., 2024).
	Maturity and technology readiness	C	(A.M. et al., 2023) (Kassim et al., 2025) (Röder et al., 2022).
Economic	Costs in 2030 and long term	A	
	Employment effects and economic growth	C	(A.M. et al., 2023) (Röder et al., 2022) (Alemu et al., 2024)
Socio-cultural	Public acceptance	LE	(Geddafa et al., 2023).
	Effects on health and well-being	A	(Kassim et al., 2025) (Röder et al., 2022) (Alemu et al., 2024)
	Distributional effects	N/A	
Institutional	Political acceptance	B	(A.M. et al., 2023) (Mensah et al., 2024) Alemu et al. 2024).
	Institutional capacity, governance, cross-sectoral coordination	A	(Röder et al., 2022) (Mensah et al. 2024) (Alemu et al. 2024).
	Legal and administrative capacity	LE	(Brady et al. 2023)

FA RESULTS FOR MITIGATION, MUNICIPAL SOLID WASTE & BIODIGESTERS, AFRICA

MSW & Biodigesters

Dimensions	Indicator	Score	References
Geophysical	Physical potential	C	(Robin et al., 2024) (A.M. et al., 2023) (Kassim et al., 2025) (Tolessa, 2023) (Tolessa, 2023) (Geddafa et al., 2023) (Segura-Rodríguez et al., 2024) (Tolessa, 2024).
	Geophysical resources	C	(Tolessa, 2023) (Kassim et al., 2025) (Tolessa, 2024) (Segura-Rodríguez et al., 2024).
	Land use		
Environmental-ecological	Air pollution	C	(Robin et al., 2024) (Kassim et al., 2025) (Tolessa, 2023) (Geddafa et al., 2023)
	Toxic waste, ecotoxicity eutrophication		
	Water quantity and quality		
	Biodiversity	C	(Robin et al., 2024) (A.M. et al., 2023) (Kassim et al., 2025).
Technological	Simplicity	LE	(Tolessa, 2024).
	Technological scalability	C	(Tolessa, 2023) (Segura-Rodríguez et al., 2024) (Tolessa, 2024).
	Maturity and technology readiness	C	(Robin et al., 2024) (A.M. et al., 2023) (Kassim et al., 2025) (Geddafa et al., 2023) (Segura-Rodríguez et al., 2024) (Tolessa, 2024).
Economic	Costs in 2030 and long term	B	(Robin et al., 2024) (Tolessa, 2024).
	Employment effects and economic growth	C	(A.M. et al., 2023) (Tolessa, 2023)
Socio-cultural	Public acceptance	B	(Geddafa et al., 2023) (Segura-Rodríguez et al., 2024) (Tolessa, 2024).
	Effects on health and well-being	C	(Robin et al., 2024) (Kassim et al., 2025) (Segura-Rodríguez et al., 2024) (Tolessa, 2024).
	Distributional effects	C	(Segura-Rodríguez et al., 2024) (Tolessa, 2024)
Institutional	Political acceptance	B	(Robin et al., 2024) (A.M. et al., 2023) (Tolessa, 2024)
	Institutional capacity, governance, cross-sectoral coordination	A	(Tolessa, 2023) (Segura-Rodríguez et al., 2024) (Tolessa, 2024)
	Legal and administrative capacity	A	(Robin et al., 2024) (A.M. et al., 2023)

FA RESULTS FOR MITIGATION, LATIN AMERICA

Municipal Solid Waste & Biodigesters

Dimensions	Indicator	Score	References
Geophysical	Physical potential	C	(Ulloa-Murillo et al., 2022) (Ferronato et al., 2021) (Tisi et al., 2023) (Miramontes-Martínez et al., 2024) (Dadario et al., 2023).
	Geophysical resources	N/A	
	Land use	C	(Ulloa-Murillo et al., 2022) (Tisi et al., 2023) (Miramontes-Martínez et al., 2024) (Dadario et al., 2023).
Environmental-ecological	Air pollution	C	(Ulloa-Murillo et al., 2022) (Ferronato et al., 2021) (Tisi et al., 2023) (Miramontes-Martínez et al., 2024) (Dadario et al., 2023) (Torres-Lozada et al., 2023).
	Toxic waste, ecotoxicity eutrophication	B	(Ferronato et al., 2021) (Tisi et al., 2023) (Dadario et al., 2023)
	Water quantity and quality	N/A	
	Biodiversity	N/A	
Technological	Simplicity	A	(Dadario et al., 2023)
	Technological scalability	C	(Ulloa-Murillo et al., 2022) (Tisi et al., 2023) (Miramontes-Martínez et al., 2024) (Dadario et al., 2023)
	Maturity and technology readiness	C	(Tisi et al., 2023) (Miramontes-Martínez et al., 2024) (Dadario et al., 2023)
Economic	Costs in 2030 and long term	N/A	(Miramontes-Martínez et al., 2024)
	Employment effects and economic growth	A	(Tisi et al., 2023).
Socio-cultural	Public acceptance	N/A	(Miramontes-Martínez et al., 2024) (Dadario et al., 2023)
	Effects on health and well-being	C	(Ulloa-Murillo et al., 2022) (Tisi et al., 2023) (Dadario et al., 2023).
	Distributional effects	N/A	
Institutional	Political acceptance	LE	(Dadario et al., 2023)
	Institutional capacity, governance, cross-sectoral coordination	N/A	
	Legal and administrative capacity	LE	(Tisi et al., 2023) (Miramontes-Martínez et al., 2024) (Dadario et al., 2023).

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