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Who speaks for sustainability transformation: Gendered visibility at Taiwan's sustainability forums

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Abstract

Gender scholarship has shown that climate governance is deeply shaped by social inequalities in voice, authority, and participation. Building on this insight, we examine sustainability conferences as key arenas where climate expertise is publicly staged and legitimised. We treat speaker composition at sustainability forums as a diagnostic indicator of how climate governance allocates visibility and authority. Using an original dataset of 976 speaker appearances across 61 conferences held in Taiwan between July and December 2024, we examine gender representation by speaking role, organiser type, and thematic focus. Women accounted for only 25.9% of speakers overall, with particularly low representation in climate and energy transition sessions (15.9%). Female visibility was higher in government-organised events and equity-focused sessions but remained limited across all categories. These findings reveal a persistent gendered division of expertise within Taiwan's climate governance landscape. We argue that speaker composition offers a useful diagnostic indicator of how visibility and public recognition are distributed in sustainability governance arenas. The analysis illustrates how gender-composition mapping can be used to assess inclusivity in hybrid governance arenas beyond formal institutions.

Author summary

Sustainability transformation is shaped not only through laws and policies, but also through public events such as forums, conferences, and business summits. These events bring together experts, officials, and corporate leaders, and play an important role in shaping how climate issues are discussed and understood. In this study, we ask a simple question: who gets to speak at these events? We analyse the gender composition of speakers at major sustainability forums held in Taiwan over a six-month period. By examining who appears on stage—as keynote speakers, panelists, and moderators—we find that men dominate most

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events, particularly those focused on energy and climate transition. Women are more visible in sessions framed around social or gender-related topics, and less visible in areas associated with technical or economic authority. We treat speaker composition as an indicator of how sustainability governance allocates visibility and public recognition. Although our analysis focuses on Taiwan, similar forums play a central role in climate governance worldwide. Our findings suggest that paying attention to who speaks at key events offers a practical way to assess inclusion and exclusion in sustainability decision-making.

Introduction

Scholars have long emphasised that gender matters profoundly in climate change and sustainability, both in terms of how impacts are distributed and how responses are shaped [1–4]. Research has shown that climate risks are mediated by existing social structures, such as divisions of labour, care responsibilities, and access to resources, which often expose women and other marginalised groups to disproportionate vulnerabilities [5,6]. Meanwhile, gender also conditions agency, shaping whose voices are heard in decision-making and whose knowledge is recognised in adaptation and mitigation processes [7–10]. In the context of climate policy and energy transitions, recent studies show that greater gender diversity broadens the spectrum of perspectives taken seriously, thereby affecting which issues are brought to the fore and how priorities are negotiated [11,12]. These findings suggest that gender diversity is constitutive of climate action in terms of both substantive outcomes and the processes through which they are defined.

Conferences and business events are a significant site through which these gendered dynamics unfold. Far from neutral platforms for information exchange, they are arenas where expertise is constructed, reputations established, and professional networks reinforced [13]. Speaking invitations signal professional recognition and consolidate individuals' positions within policy and business communities, functioning as informal governance arenas where legitimacy and authority are negotiated.

Research in several fields demonstrates the consequences of unequal access to these spaces. In conservation biology, women who organise symposia include more women as speakers [14], while in higher education, persistent gender disparities in colloquium speakers reflect structural gatekeeping rather than women's unwillingness to participate [15]. Studies of academic conferences further show that invited talks generate scientific and social benefits such as greater visibility, collaboration, and career mobility. This creates a reinforcing cycle in which already-privileged actors consolidate authority while marginalised voices remain excluded [16].

Gender-composition analysis has become an established methodological approach across fields for analysing inequality in conferences and professional forums. Across different fields, large-scale studies code the gender of keynote speakers, presenters, and conveners to document persistent disparities and organiser effects [17–20]. Related work shows that panels organised by men tend to include

fewer women than those organised by women or mixed-gender teams [14,15,21]. Political science provides a well-established precedent for this approach. Using APSA Annual Meeting programme data, Goodman and Pepinsky [22] show that gender representation varies systematically across subfields, with some divisions particularly prone to all-male panels. Their analysis demonstrates how conference programmes can serve as empirical sites for examining gendered patterns of visibility and professional authority.

In the fields of climate and sustainability, conferences and public forums are especially important. Scholars argue that climate governance is organised around high-level summits, platforms, and events that function as key governance sites for agenda formation, policy direction, and the coordination of initiatives, knowledge, and funding [23–25]. This focus on event-based governance is consistent with broader post-Paris scholarship showing that non-state and sub-state actors have become increasingly central to climate action [26]. As a result, who appears on these stages matters for how climate governance is publicly represented and debated.

Yet, despite the centrality of these venues, their gendered dimensions have received little systematic attention. Only a few institutional-level efforts have adopted such a gender-composition analysis approach. For example, UNFCCC's annual Gender Composition Reports publicly track the sex-disaggregated makeup of constituted bodies, COP delegations, and Bureaux [27]. Meanwhile, the IPCC Gender Task Group has documented shifts in the gender composition of its authorship over assessment cycles [28]. In addition, Singh et al. [29] systematically review how gender is referenced across India's State Action Plans on Climate Change, showing that formal recognition does not necessarily translate into substantive or transformative inclusion. However, these remain primarily internal self-studies confined to treaty bodies, scientific institutions, and official policy documents. They have not been matched by broader academic analyses of sustainability forums and conference spaces, where climate expertise is publicly staged and legitimacy is negotiated across government, business, academia, and civil society.

This article seeks to fill that gap by systematically mapping the gender composition of speakers across major sustainability forums and conferences in Taiwan. By documenting patterns of representation and examining how panels are structured, it offers an empirical entry point into the broader question of whose voices shape the transition. We treat speaker composition at sustainability forums as a diagnostic indicator of how climate governance allocates visibility and authority. While the analysis centres on Taiwan, the case speaks to a wider landscape of sustainability forums, including COP side events, Climate Week NYC, and regional ESG and energy-transition summits. These forums have become influential sites where authority, legitimacy, and expertise are negotiated.

At the same time, we are cognizant of the limitations of the gender-composition analysis approach. Numerical representation cannot capture the distribution of influence within events, the quality of participation, or the wider inequalities that shape access to speaking opportunities. These caveats are important, especially because numerical analysis can risk treating women as a homogenous group or equating visibility with empowerment [30,31]. Nevertheless, we contend that establishing baseline information remains indispensable. Quantitative mapping makes visible patterns of exclusion that might otherwise be normalised or overlooked, and it generates the empirical foundation for deeper investigations into power, agenda-setting, and institutional design.

Before turning to the empirical analysis, it is necessary to situate the study within Taiwan's evolving climate governance landscape. Taiwan has, in recent years, positioned itself as an active participant in global climate governance, pledging to achieve net-zero emissions by 2050 and rapidly expanding its environmental regulatory framework [32,33]. These developments have generated a proliferation of sustainability forums, business summits, and cross-sector conferences that bring together government agencies, corporations, industry associations, and civil society organisations. Such events function as key venues for interpreting policy directions, publicising corporate climate strategies, and negotiating emerging standards around carbon management and sustainability reporting. As these spaces become increasingly central to Taiwan's climate governance architecture, questions of *who speaks* and *who is visible* take on heightened significance.

In parallel, Taiwan is often recognised as a regional leader in gender equality, having developed extensive gender policy machineries since the late 1990s, including gender budgeting, impact assessment mechanisms, and quotas for public committees. These initiatives have helped institutionalise women's participation in the public sector and contributed to milestones such as a 42% female legislature. Yet gender mainstreaming remains largely state-centred: while it has been relatively well embedded in executive-branch procedures, its uptake by political parties has been partial and uneven [34]. This state-centric pattern suggests that its influence beyond formal government institutions, particularly in the private sector or hybrid governance arenas, has remained limited. Climate governance—which relies heavily on business leadership, expert networks, and public–private partnerships—thus operates in a domain where gender equality tools have comparatively weaker reach. This combination makes Taiwan a useful setting for examining whether gender-equality commitments extend into the public-facing forums through which sustainability transformation is debated and legitimised.

Existing scholarship on gender and environmental governance in Taiwan reinforces this picture but remains limited in scope. Peng [35] draws on ecofeminist perspectives to show how women's differentiated vulnerabilities and situated knowledge shape environmental decision-making, while Chen [36] documents the underrepresentation of women on environmental assessment committees and finds that greater female presence strengthens engagement in climate debates. This institutional backdrop intersects with broader structural inequalities in Taiwan's labour market. Women comprise roughly 44% of the total labour force, but only 30% of supervisors and managers, and just 22% of large enterprise owners [37,38]. These gaps shape who is visible, invited, and positioned as an "expert" in public sustainability events. Understanding how these inequalities materialise on conference stages is therefore essential for assessing gendered power in climate governance.

Materials and methods

This study compiles a dataset of 61 sustainability-related conferences, forums, and summits held in Taiwan between July and December 2024. We aimed to capture all publicly advertised events that met our topic criteria during the observation period. Events were identified through continuous monitoring of official event websites, press releases, media coverage, publicly available programmes, and announcements circulated through professional networks. To maximise coverage, we also conducted keyword searches (e.g., "net zero," "ESG," "sustainability forum," "climate conference") on major event platforms (e.g., Accupass). Additional events were identified through organisers' calendars, partner announcements, and cross-references among related events. This multi-source approach ensured that both nationally publicised events and more specialised industry or sectoral meetings entered the dataset.

The July–December 2024 timeframe was chosen deliberately because it coincided not only with a surge of climate-related events in the lead-up to COP29, but also with lively domestic debates on Taiwan's forthcoming carbon fee (implemented in 2025) and the implications of the EU's Carbon Border Adjustment Mechanism (CBAM). Events were included if they were publicly advertised events related to energy, sustainability, environment, or climate and had publicly available programmes and speaker lists. Closed internal meetings, training courses without public speaker programmes, and events for which speaker information could not be verified were excluded. The dataset consists entirely of in-person events held in Taiwan. Because the study focuses on public visibility in sustainability forums, we use speaker appearances listed in event programmes as the unit of analysis.

For each event, we recorded the speaker's name, role (moderator, keynote, or panelist), and the organising body, as well as the date, time, location, session title, and the speaker's professional title as listed in event materials. Gender was coded manually based on publicly available biographical information (including official biographies, organisational websites, and LinkedIn profiles), and when such information was unavailable, through name recognition. Due to data limitations, gender was coded using a binary classification based on publicly available information. This approach cannot capture non-binary identities and should not be interpreted as reflecting the full spectrum of gender diversity. To minimise

errors, two coders independently reviewed the dataset. Entries with ambiguous or missing gender information were excluded from the analysis (9 out of 985 total entries, less than 1%). The final dataset consists of 976 valid entries.

The event organisers were classified into three categories: government, industry, and academia/NGO. We recognise that these boundaries are not always clear, since many events involve multiple organisers and sponsors. For coding purposes, when a government agency was listed among the organisers, the event was categorised as government. Events coded as industry included those convened by business associations, industry-oriented think tanks, or foundations with strong corporate ties. A prominent example is the Taiwan Institute for Sustainable Energy (TAISE), which appeared frequently in the dataset. The "academia/NGO" category grouped events primarily organised by universities, civil society organisations, or advocacy groups. The diversity of organisers highlights that sustainability has become an arena in which actors from government, business, and civil society actively seek visibility and influence. A complete list of events, including the date, event name, and organisers, is provided in the S1 Appendix.

To examine whether gender representation varied across issue framings, we developed a thematic coding scheme based on an inductive reading of programme descriptions. Sessions were grouped into three broad categories: (1) *Climate and Energy Transitions*, including net-zero pathways, carbon markets, adaptation, and renewable energy; (2) *Sustainability and Supply Chains*, covering ESG reporting, finance, supply chain management, and corporate sustainability initiatives; and (3) *Equity and Social Dimensions*, including human rights, DEI, environmental justice, and just transition. Coding was conducted at the session level, with each speaker assigned to the theme of the session in which they appeared.

Results

As shown in Table 1, across the dataset of 976 valid entries, men constituted the majority of speakers at sustainability-related events in Taiwan between July and December 2024. Women accounted for 25.9% of speakers, compared to 74.1% men. A non-trivial share of events were exclusively male: approximately 15% featured no female speakers, while the remaining 85% included at least one woman.

Speaker composition also varied by role. Women were least represented among moderators, accounting for only 21.4% of these positions. Their representation was slightly higher among keynote speakers and panelists, where women made up 26.5%. Despite this difference, women remained a minority across all speaking roles.

Table 1. Gender composition of speakers by role, organiser type, and forum topic.

Category	Male	Female	Total	Female speakers (%)	χ^2	p-value	Cramér's V
Total	723	253	976	25.9			
Role					1.33	.249	.037
Moderator	88	24	112	21.4			
Speaker/Panelist	635	229	864	26.5			
Organiser type					7.21	.027	.086
Academia / NGO	88	29	117	24.8			
Government	157	76	233	32.6			
Industry	478	148	626	23.6			
Forum topic					13.96	< .001	.120
Climate and Energy Transitions	138	26	164	15.9			
Sustainability and Supply Chains	463	166	629	26.4			
Equity and Social Dimensions	122	61	183	33.3			

Note: Pearson chi-square tests examine whether gender composition varies across categories within each grouping. Cramér's V reports effect size. These tests indicate associations rather than causal effects.

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Patterns of representation differed modestly by organiser type, but male dominance persisted across sectors. At industry-organised events, women comprised only 23.6% of speakers, the lowest among the three categories. Government-organised events recorded the highest female share at 32.6%, while events organised by academia and NGOs reported a female share of 24.8%.

Variation was most pronounced across presentation topics. In sessions focused on climate change and energy transition, women represented only 15.9% of speakers. In sessions addressing ESG and supply chain issues—including sustainable finance, ESG reporting, greenwashing, and supply chain management—women accounted for 26.4%. Sessions centred on social themes, such as gender, human rights, community, and just transition, recorded the highest proportion of female speakers at 33.3%. Notably, within the subcategory of gender-related sessions, all six speakers were female. This pattern highlights both the concentration of female voices in gender-focused discussions and their continued underrepresentation in other areas.

To assess whether the observed differences were statistically meaningful, we conducted Pearson chi-square tests of association between gender and speaker role, organiser type, and forum topic. Gender composition did not vary significantly by speaker role, $\chi^2(1, N = 976) = 1.33$, $p = .249$. By contrast, gender composition varied significantly by organiser type, $\chi^2(2, N = 976) = 7.21$, $p = .027$, although the association was small (Cramér's $V = .086$). Gender composition also varied significantly by forum topic, $\chi^2(2, N = 976) = 13.96$, $p < .001$, with a small association (Cramér's $V = .120$). These results indicate that gendered visibility differed more clearly across organisational and thematic contexts than across speaking roles.

Discussion

The gender imbalance observed across Taiwan's sustainability forums is part of a wider structural pattern that extends across academic, policy, and business arenas worldwide. Studies of medical and scientific conferences, for example, consistently find women underrepresented relative to their share of the workforce, not because of lower willingness to participate but because of persistent barriers in speaker selection and agenda-setting processes [14,15].

While the overall imbalance is evident, it is particularly acute in specific domains. For example, women were particularly underrepresented in sessions devoted to energy transition, a pattern that illustrates the gendered division of expertise in climate governance. By contrast, their visibility is often channelled toward socially framed or justice-oriented themes.

The gender imbalance is particularly striking in several major sustainability forums held in Taiwan between July and December 2024. For instance, energy transition-related events were overwhelmingly male-dominated. The 2024 International Forum on Energy Transition and the Solar Photovoltaic Technology Forum featured exclusively male speakers, reflecting the persistent masculinisation of technical and engineering expertise. Similarly, in the 2024 International Forum on Clean Energy System Suppliers and the Supply Chain in Taiwan, only one of dozens of speakers was a woman, highlighting the tokenistic inclusion of female voices within the industrial and supply chain sectors. Together, these examples illustrate how women remain largely excluded from domains associated with technological authority, where expertise continues to be culturally coded as male.

A striking counterexample to the general male dominance can be found in the panel "Toward Gender-Responsive Climate Change Strategies" at the 2024 Taiwan Climate Action Expo (TWCAE 4), which featured an entirely female line-up of six speakers. The session explicitly addressed the intersection of gender and climate, covering topics such as indigenous women's experiences in climate governance and female leadership in the net-zero transition. While this event demonstrates growing recognition of gender perspectives in climate policy, its exceptional composition also underscores the thematic confinement of women's visibility. Female representation becomes prominent only when "gender" itself is the organising principle.

While our data do not establish causal mechanisms, existing research points to several plausible pathways through which such gender imbalances may be reproduced. First, prior research suggests that organisers often rely on familiar

professional networks when selecting speakers, reproducing homophily in academic and professional circles. Prior research shows that male organisers tend to invite disproportionately more men, while female organisers are more likely to include other women [14,21,39]. Because senior positions in business, academia, and policy remain male-dominated, speaker networks are likely to be themselves gendered. All-male line-ups may therefore arise from routine selection practices rather than deliberate exclusion.

Second, gender stereotypes continue to shape perceptions of expertise and authority. Prior research also suggests that organisers frequently invoke ostensibly neutral criteria such as experience, leadership, or impact, yet these standards often embed unconscious bias, as authority and confidence are more readily associated with men [40]. Such stereotypes may make male speakers more likely to be perceived as appropriate representatives of expertise in high-profile sustainability forums.

Third, sectoral labour-market inequalities further constrain the available pool of speakers. Energy and engineering fields—central to sustainability governance—remain heavily male-dominated, particularly in senior and technical roles. Although women account for a higher share of the renewable-energy workforce than in fossil-fuel industries, leadership positions remain overwhelmingly male [41]. These structural patterns may help explain why gender imbalance persists even in rapidly expanding green sectors.

Finally, tokenism and symbolic inclusion can obscure rather than resolve inequality. Inviting one or two women may reduce the visibility of all-male panels, but it does not necessarily redistribute authority or reshape agendas. Research shows that such token representation often confines women to marginal or "soft" roles, leaving underlying hierarchies intact [42,43].

These findings are descriptive, but they are not merely incidental. They show how gender imbalance persists in influential arenas where climate expertise is publicly performed and legitimised.

In terms of policy implication, our findings highlight the value of routine monitoring and disclosure. International climate institutions such as the UNFCCC and the IPCC have increasingly tracked gender composition as a way of assessing progress towards more inclusive forms of climate governance. A similar approach could be adopted by sustainability forums and conferences. Regular reporting of speaker composition would not by itself address underlying inequalities, but it would make patterns of representation more visible and provide a basis for reflection and comparison over time. Event organisers could also take several modest but concrete steps: reviewing speaker composition before programmes are finalised, avoiding all-male panels, and developing broader expert pools. Such measures would not resolve deeper inequalities in leadership, expertise, or labour markets, but they could reduce reliance on narrow invitation networks and make exclusionary patterns easier to identify and address.

Several limitations should be noted. This study relies on binary gender coding based on publicly available information and therefore cannot capture the full spectrum of gender diversity or the intersectional inequalities that may shape access to speaking opportunities. The findings should therefore be read as a baseline map of gendered visibility, rather than a comprehensive account of inclusivity in climate governance. Future research could build on this baseline mapping by examining the speaker selection processes and lived experiences that cannot be captured by programme-level data. A longer observation period would also make it possible to assess seasonal patterns and changes in speaker composition over time.

Conclusion

Overall, this study finds that sustainability forums in Taiwan remain markedly male-dominated. Across organisers, session types, and thematic areas, women consistently accounted for a minority of speakers, with particularly low representation in energy- and technology-focused discussions. Although most events included at least one woman, all-male panels remained common, indicating that gender imbalance persists even in highly visible and influential climate governance spaces.

Gender-composition analysis is a relatively simple methodological tool, yet it offers a clear and scalable way to document patterns of visibility and exclusion in influential governance spaces. Applied comparatively, this approach enables cumulative analysis across conferences and forums, making it possible to trace how professional authority is distributed and reproduced across cases and contexts.

While this study is grounded in Taiwan, the patterns it documents are unlikely to be unique. Across many political contexts, sustainability forums and climate conferences have become increasingly central governance arenas at a time when commitments to gender equality, diversity, and inclusive climate action are being contested rather than consolidated. In settings marked by the rollback of gender equality initiatives, the politicisation of climate expertise, and growing resistance to diversity and inclusion, questions of who appears on climate stages take on renewed significance. Gender imbalance in these arenas should therefore not be understood as a marginal or symbolic concern, but as a diagnostic indicator of how inclusive—or exclusionary—climate governance is becoming under conditions of political backlash and institutional strain.

Supporting information

S1 Appendix. List of sustainability-related conferences, forums, and summits included in the dataset. The appendix provides the date, event name, and organiser(s) for the 61 publicly advertised sustainability-related events held in Taiwan between July and December 2024.
(DOCX)

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