

GUST CSD Policy Brief

Sustainability in motion: Ethical, social, and ecological dimensions of non-native species introductions and human migration

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Highlights:

- Comparing migrants to non-native species oversimplifies migration and risks overlooking humanitarian considerations.
- Biosecurity focuses on ecological and socio-economic risks, whereas migration policies must balance security, economics, and human rights.
- Misapplying invasion science terms like 'invasive' in socio-political contexts risks dehumanising migrants.
- Respectful language and greater awareness can prevent conflating biological invasions with human migration.
- Scientists and policymakers should engage in dialogue to address global challenges without misleading comparisons.

Keywords:

Biosecurity, Cultural assimilation, Ethnocentrism, Ecological resilience, Globalisation, Sociopolitical dynamics, Transdisciplinary research

SDGs:

10, 14, 15, 16, 17

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Bridging ecology and humanity in migration discourse

The intersection of invasion science and human migration discourse presents complex ethical, social, and political considerations. Although terms such as 'invasion' are primarily used within ecological contexts, concerns have been raised about their misuse in and potential influence on political and media discussions surrounding migration (Sax et al. 2022). There is a possibility that such terminology, if misinterpreted, could shape public perceptions and contribute to narratives that justify restrictive immigration policies (Schlaepfer et al. 2011). While biological invasions and human migration both involve movement and establishment, their underlying drivers, consequences, and ethical dimensions are distinct (Davis et al. 2011). Conflating these separate processes risks oversimplifying migration's socio-political complexities and may contribute to narratives that do not fully reflect the nuances of human movement.

The role of language in shaping perceptions

Language plays an important role in shaping public discourse. Terms such as 'invasion' and 'alien' in invasion science carry specific ecological meanings but may evoke unintended connotations when applied outside this context (Tassin and Kull 2015). If similar terminologies are adopted in migration discussions, they could influence perceptions by associating human movement with adversarial imagery (Bortolus and Schwindt 2022). While direct linguistic crossover is unlikely (Bortolus 2012), careful consideration of language use can help ensure that public discussions on migration remain clear, constructive, and meaningful (Vogelaar 2021). Media professionals and policymakers should

remain mindful of word choices to avoid unintentional associations that could reinforce negative stereotypes (Soto et al. 2024).

Ethical considerations in ecology and human migration

The ethical frameworks guiding biological invasions and human migration are inherently different. Ecological management strategies typically prioritise the protection of biodiversity and socio-economic stability, sometimes involving the control or containment of species considered harmful (Vimercati et al. 2022). These approaches, however, are specific to ecological and socio-economic contexts and are not applicable to human migration, which involves individuals with agency, rights, and cultural identities (Switzer and Angeli 2016). Human migration occurs for diverse reasons, including economic opportunities, displacement due to conflict, and environmental change (Smirnov et al. 2023). It is essential that migration policies uphold human rights and dignity and are not framed in ways that reduce human movement to an ecological phenomenon (Davis et al. 2011).

Understanding the differences in movement and impact

Although both biological invasions and human migration involve movement, their causes and effects differ. Non-native species introductions often result from unintentional transport through global trade or deliberate introduction for economic or aesthetic purposes (Seebens et al. 2017). In some cases, they can lead to ecological disruptions, biodiversity loss, or economic costs, which may be severe (Diagne et al. 2021). By contrast, human migration is driven by a complex interplay of social, economic, and environmental factors, with migrants

actively contributing to host societies in multiple ways (Dustmann and Frattini 2014). While migration policies should address integration challenges, it is important to recognise and embrace the broader socio-economic benefits that migrants bring (Ottaviano and Peri 2013).

The importance of precise and neutral language

Equivocating biological invasions with human migration may lead to misleading and erroneous analogies that do not reflect the complexities of human movement (Carens 2008). Unlike non-native species, humans have agency and rights, and migration is influenced by legal, economic, and humanitarian considerations (Stephen 2018). To ensure clarity in public discourse, it is important that ecological terminology is used appropriately within its intended scientific context and is not extended to migration in ways that could lead to misunderstanding (Howard 2019).

Policy approaches for distinct challenges

Governance frameworks should reflect the specific challenges posed by each issue. Biosecurity policies should remain focused on managing ecological risks, without being conflated with migration policy (Hulme 2014). Migration governance, meanwhile, must balance security, economic needs, and humanitarian obligations while upholding international human rights standards (Alexander 2013). Interdisciplinary collaboration between invasion scientists, social scientists, and policymakers can help ensure that discussions remain context-appropriate and evidence-based (Vilà et al. 2021).

Recommendations for clear and effective communication

- Policymakers, scientists, and media professionals should ensure that terminology used in discussions of migration is contextually appropriate and does not unintentionally frame

migration in adversarial terms (Soto et al. 2024).

- Collaboration between ecologists, social scientists, and policymakers can provide more comprehensive insights into global movement patterns (Bortolus and Schwindt 2022).
- Biosecurity strategies should remain focused on ecological challenges (e.g., Kunming-Montreal Global Biodiversity Framework), while migration policies should be developed with a focus on economic and humanitarian priorities (Huddleston et al. 2015).
- Public engagement and education initiatives can help clarify distinctions between biological invasions and human migration, fostering a more nuanced understanding (Schlaepfer 2018).
- Migration discussions should emphasise the contributions of migrants to host societies rather than framing them in security terms (Nathan 2014).

Toward inclusive and evidence-based policy

Recognising the distinctions between invasion science and human migration helps ensure that discussions remain accurate and constructive. By using precise and neutral language, fostering interdisciplinary dialogue, and developing policy approaches grounded in both ecological integrity and human rights, policymakers can address global challenges in an informed and inclusive manner.

Relevance to Sustainable Development Goals

The environmental, social, economic, and cultural dimensions of biological invasions and human migration transcend all SDGs. For example, Ahmed et al. (2025) explore the conceptual similarities and differences between biological invasions and human migration, underscoring the imperative for inclusive policies to mitigate inequalities (SDG 10). The study advances efforts to

protect all ecosystems and curb biodiversity loss by scrutinising the dynamics of non-native species introductions through an ecological and a socio-political lens (SDGs 14/15). It further advocates for enhanced governance frameworks and evidence-driven policymaking to address ecological and socio-political challenges, reinforcing peace, justice, and institutional resilience (SDG 16). The research, rooted in interdisciplinary and international collaboration, exemplifies the critical role of global partnerships in addressing transboundary environmental issues, promoting shared accountability for sustainable development (SDG 17).

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