

## ARTICLE OPEN



# Analysing engagement with Indigenous Peoples in the Intergovernmental Panel on Climate Change's Sixth Assessment Report

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Indigenous Peoples' advocacy and contributions to climate action have drawn international attention, including from the Intergovernmental Panel on Climate Change (IPCC). This article assesses to which degree the IPCC's Sixth Assessment Report (AR6) recognises the role and knowledge systems of Indigenous Peoples. Through a content analysis of the Working Groups I, II, and III reports and the Synthesis Report, we found an increasing number of references related to Indigenous Peoples and their knowledge systems. However, the IPCC still perpetuates a reductionist approach that reinforces harmful stereotypes. Overcoming this weakness requires greater reflexivity and concrete actions, including consistent recognition of Indigenous Peoples' rights, refraining from merely portraying Indigenous Peoples as vulnerable and adopting a strengths-based approach, ensuring ethical and equitable application of Indigenous Peoples' knowledge systems, and involving Indigenous Peoples from the scoping process. By implementing these measures, the IPCC can improve its partnership with Indigenous Peoples in preparation for AR7.

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## INTRODUCTION

For decades, Indigenous Peoples from all seven socio-cultural regions of the world have demanded participation in international climate processes<sup>1</sup>. In addition to requesting for a seat at the decision-making table, they have denounced how the current multilateral climate governance regime reproduces the ongoing legacy of colonialism. Worldwide, colonial dynamics of marginalisation have pushed Indigenous Peoples into increased climatic vulnerability and made them targets of policies that—supposedly intended as responses to the climate crisis—violate their rights and alter their territories<sup>2,3</sup>.

Indigenous Peoples' movements denounce such inequity and provide consistent evidence of their capacity to contribute to climate action<sup>4</sup>. For example, increasing evidence demonstrates that Indigenous knowledge strengthens the understanding of human–environment relationships, which increases the effectiveness, sustainability and equity of adaptation measures<sup>5–7</sup>. Concerning mitigation, Indigenous Peoples' contributions are substantial. Among them, we can highlight the generation of renewable energy solutions<sup>8</sup> and the conservation of ecosystems crucial for carbon sequestration<sup>9,10</sup>. Although recognition of the contributions by Indigenous Peoples is increasing in the multilateral sphere, there is still a significant gap when it comes to ensuring meaningful participation in climate policy<sup>11,12</sup>. All over the world, Indigenous Peoples experience denial of their right to self-determination as they continue to be represented mainly through third parties—states, academics, multilateral agencies and NGOs—that reproduce inequalities in the exercise of knowledge and power<sup>2</sup>.

To understand the barriers that deny Indigenous actors from engaging, it is necessary to look at the various power relations

that shape climate policy, one of these being the production and assessment of scientific evidence. In these processes, Indigenous Peoples continue to be excluded due to several factors, including inequalities in access to non-Indigenous education and scientific expertise, and the historical undervaluing of the values that shape Indigenous Peoples' knowledge<sup>5</sup>.

The Intergovernmental Panel on Climate Change (IPCC) is the principal global body for assessing climate change evidence and one of the most authoritative actors for international science, environmental governance and climate politics<sup>13,14</sup>. It comprises three Working Groups (WG): WGI examines the physical science of past, present, and future climate change; WGI assesses the vulnerability of socio-ecological systems, climate change consequences and adaptation options; and WGIII focuses on climate change mitigation. These WGs develop and refine metrics for evidence evaluation in the assessment reports, including measures of confidence (i.e., level of agreement and quality of evidence) and levels of uncertainty. This process has been designed primarily to evaluate peer-reviewed scientific, technical and socio-economic quantitative evidence, making it less applicable to qualitative evidence and non-applicable to scientific evidence of non-positivist tradition<sup>15</sup>. This positivist framework has undermined the legitimacy of Indigenous Peoples' knowledge which, together with the historical marginalisation of Indigenous Peoples, has led to a structural exclusion from the IPCC reports<sup>5,16</sup>.

The IPCC mandate calls for neutral and policy-relevant reports, not prescriptive ones. This policy neutrality has not always successfully communicated the meaning of climate change to people<sup>17,18</sup>. Nevertheless, IPCC reports greatly influence climate policy by defining the problem, deciding what issues to prioritise, what responses to promote and which actors to validate<sup>14,19</sup>.

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However, the IPCC has also been subject to constant criticism<sup>20,21</sup>, which is directed at its governance structure, procedures and practices<sup>22</sup> and how the information is produced<sup>23,24</sup> and approved by the states<sup>15,25</sup>. Environmental activists claim that the IPCC is too conservative<sup>26</sup>. Other critics point out that the institution is highly politicised and compromised by conflicts of interest<sup>21</sup>. Some authors have pointed out that the IPCC diminishes epistemological diversity<sup>19</sup> and highlights ‘solutions’ that maintain the paradigm of ‘progress’—i.e. economic growth—the main driver of emissions<sup>25</sup>. Among these ‘solutions’ are those the fossil fuel industry promotes, such as carbon markets and negative emissions technologies or geoengineering with unknown consequences<sup>13,15</sup>.

To strengthen its legitimacy, the IPCC has constantly reformulated its procedures<sup>20,22</sup> and progressively adopted an open approach to diversity<sup>27</sup>. The increasing inclusion of Indigenous-related content and Indigenous authorship demonstrates this progress<sup>28</sup>. However, there is a long way to go in terms of institutional reflexivity, diversity and rights-based approaches<sup>16,20,27</sup>.

The Paris Agreement has also opened up many questions regarding the role of the IPCC. The promotion of a polycentric climate governance regime based on differentiated and voluntary contributions has increased the calls for more prescriptive, solutions-oriented assessments<sup>14,29</sup>. These calls raise the question of who will be in charge of identifying, implementing and verifying the success of such solutions while also demanding caution to refrain from reproducing existing inequities. Regarding Indigenous Peoples, the Paris Agreement calls for Parties to respect their rights and consider their knowledge systems. In this context, Parties gradually have decided to engage Indigenous Peoples in climate governance—including significant financial pledges. Against this backdrop, observing how the IPCC reports consider and position Indigenous Peoples and their knowledge systems in the Sixth Assessment Report (AR6) is crucial.

Although the literature on the IPCC has grown exponentially<sup>21,23</sup>, studies analysing how the reports consider Indigenous Peoples are still scarce. In analysing AR5, Ford et al.<sup>28</sup> found that the engagement with Indigenous Peoples’ representatives was marginal, and the coverage was broad and limited. The IPCC did not adequately observe the diversity and complexity of Indigenous Peoples’ situations facing climate change, let alone their distinct contributions from around the world. Through a collaboration between Indigenous and non-Indigenous authors and aiming to strengthen Indigenous Peoples’ agency in climate governance, we build on this study to analyse how the IPCC considers and positions Indigenous Peoples and their knowledge in AR6. In pursuit of this goal, we examine each IPCC WG report and Synthesis Report, paying particular attention to if and how they consider the wealth and diversity of Indigenous knowledge systems. Based on these findings, we discuss whether or not this recognition meets the Indigenous movements’ demands for meaningful engagement in climate policy.

Since 1988, the IPCC has gone through six assessment cycles. During these cycles, the IPCC produces Assessment Reports (AR), which currently are composed of four elements: three WG reports—with chapters that, defined at the beginning in plenaries with the States, address different issues—and a Synthesis Report—an overview of the information provided by the three WG reports. All these documents contain a Summary for Policymakers (SPM)—a negotiated summary with policy-relevant findings—and each WG report also includes a Technical Summary (TS)—a detailed summary with technical information. In addition, the IPCC has also produced 14 special reports (SR)—which provide detailed information on specific topics demanded by the countries in IPCC plenaries—and six Methodology Reports—which offer practical guidelines.

The first and second assessment reports (FAR in 1990 and SAR in 1995) completely ignored Indigenous Peoples<sup>30</sup>. While mentions of Indigenous Peoples have increased since the third assessment report (TAR) of 2001, most WGI and WGII reports continue to omit considerations or evidence derived from Indigenous knowledge systems. The fourth assessment report (AR4) in 2007 was the first to highlight the value of Indigenous knowledge. AR5 in 2014 added to this by recognising the importance of collaboration between disciplines. Due to their highly interdisciplinary character, Indigenous knowledge systems began to gain progressive attention<sup>16</sup>. Since AR5, Indigenous-focused content has increased and become more specific<sup>28,31</sup>, and SRs have included different sections dedicated to Indigenous knowledge. For instance, the SR on Global Warming of 1.5 °C from 2018 emphasises the high vulnerability of Indigenous Peoples and provides evidence of the importance of including their knowledge in climate action.

The main advances can be seen in WGII and the 2019 Special Reports—The Ocean and Cryosphere in a Changing Climate (SROCC) and Climate Change and Land (SRCCL). The SROCC moved a step forward by highlighting the role of Indigenous knowledge systems in climate change research and action and allowing Indigenous Peoples’ representatives to contribute to the writing<sup>32</sup>. It also included concrete and contextualised examples from Indigenous knowledge<sup>5</sup>. However, the report also recognises that much of this knowledge cannot be fully understood through the scientific literature<sup>30</sup>. The SRCCL provided strong evidence of the positive role of Indigenous Peoples’ territories in conservation and carbon sequestration, making a significant call for securing and recognising land tenure. Indigenous Peoples reacted widely to this report, including an online response from a group of Indigenous Peoples organisations in the form of a statement demanding respect for their rights<sup>33</sup>.

During 2020 and 2021, IPCC authors joined the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) to examine the synergies and trade-offs between climate action and biodiversity conservation<sup>34</sup>. The first joint report of this collaboration highlighted the need for transformative change, which must be driven through a system-wide reconfiguration of societal structures and institutions. This transformative change pushes us to look critically at the world-views, values and beliefs that have caused these interconnected problems<sup>35</sup>. The urgency of engaging Indigenous Peoples’ values and knowledge systems into the debate became evident. However, as has been the case previously, this report was led and written only by non-Indigenous scientists. Indigenous scholars and knowledge holders were not invited to contribute or review the work<sup>30</sup>.

As can be seen, the consideration of Indigenous Peoples within the IPCC process has increased in recent years. Nevertheless, a rights-based approach is still far from being achieved as no procedures or guidelines exist for ethical and equitable engagement<sup>16</sup>. The predominant narrative in IPCC reports positions Indigenous Peoples as vulnerable—without delving into the historical and institutional colonial processes of marginalisation and inequality that produce such vulnerability<sup>28</sup>. Furthermore, Indigenous Peoples have tended to be presented as a homogenous sector principally mentioned when listed together with other vulnerable groups, such as women and persons with disabilities. In addition to having a disempowering effect, this generalisation produces a pan-Indigenous narrative that fails to acknowledge and respect the diversity and distinction between Indigenous Peoples. Their knowledge, when recognised, has typically been presented as context-specific practices that align with hegemonic climate agendas<sup>5</sup> and not as a component of knowledge systems with their own validation processes<sup>36,37</sup>. As a result, Indigenous Peoples’ distinct worldviews, perspectives and

paradigms about human–nature relationships are still undermined.

**RESULTS**

**References to Indigenous Peoples in AR6**

Between 2021 and 2023, the IPCC has presented the four parts of the AR6 corresponding to its Sixth Assessment Cycle. This section summarises the language and content related to Indigenous Peoples found in these documents, which correspond to the contributions of the WGI, WGII and WGIII, and the Synthesis Report (Table 1).

**References to Indigenous Peoples in WGI**

The WGI full report has 20 references related to Indigenous Peoples, found in three chapters: Chapter 1: Framing, Context and Methods; Chapter 10: Linking Global to Regional Climate Change; and Chapter 12: Climate Change Information for Regional Impact and for Risk Assessment. The SPM has no reference, and the TS briefly references Indigenous knowledge. The word Indigenous is always written in lowercase.

These references find that Indigenous Peoples’ knowledge complements scientific information on the evidence for climate change—following the acknowledgement stated by the Special Report on Global Warming of 1.5 °C<sup>38</sup>. The report also highlights that Indigenous Peoples’ knowledge has played a growing function in climatology, recognising the contribution of oral traditions to instrumental data. Despite this recognition, the report believes that ‘integrating’ them with science is still a challenge. The report also mentions that Indigenous knowledge is at risk because Indigenous knowledge holders are ‘passing away’.

The report also discusses how to generate information to promote more effective climate policies. It points to the need to gather diverse evidence, including from Indigenous Peoples and collaborations between Indigenous Peoples and climate scientists. For the transmission of this information to be reliable and credible—primarily when it deals with risks—its delivery must effectively involve Indigenous Peoples, taking into consideration ‘their values, beliefs and interests’ and knowledge.

Regarding Indigenous Peoples’ vulnerability, the report briefly outlines specific threats such as increased wildfire, reduced ice that hinders hunting and fishing, and the rain on snow that makes grazing difficult. There is no mention of Indigenous Peoples’ rights.

**References to Indigenous Peoples in WGII**

The WGII full report mentions the word Indigenous 1130 times. Of these references, 17 are in the SPM, 948 in the chapters and 165 in the cross chapters. All chapters (18) and 5 (of 7) cross chapters have references related to Indigenous Peoples. The TS mentions Indigenous Peoples 94 times. The word Indigenous is mostly written in upper case.

In this report, the IPCC claims to have made a significant effort to engage natural, ecological, social and economic sciences. Among its principles is acknowledging the interdependence between climate, ecosystems and biodiversity, and human societies. The SPM recognises “the value of diverse forms of knowledge such as scientific, as well as Indigenous knowledge and local knowledge in understanding and evaluating climate adaptation processes and actions to reduce risks from human-induced climate change”<sup>39</sup>. The IPCC explains that the new report has paid increased attention to the knowledge of Indigenous Peoples and Indigenous scholars and strengthened the focus on social justice.

All chapters in the WGII report mention Indigenous Peoples. However, the attention and treatment are different

**Table 1.** References to indigenous peoples in AR6.

	Number of references		Type of references					
	Full report	Technical summary	Summary for policy makers	Recognises Indigenous Peoples’ vulnerability	Acknowledges indigenous knowledge systems	Acknowledges Indigenous Peoples’ contributions	Refers to Indigenous Peoples rights	Acknowledges Indigenous Peoples’ demands
WGI	20	1		X	X			
WGII	1113	94	17	X	X	X	X	X
WGIII	62	1	12	X	X	X		X
Synthesis report	24	n/a	11	X	X	X	X	X

(Supplementary Table 1). Some chapters—e.g. Chapters 1, 4 and 14—allow us to understand the situation of Indigenous Peoples facing climate change from a more situated and, in some cases, more critical perspective. All these chapters capitalise on the word Indigenous, and some strongly highlight the relevance of respecting their rights. In contrast, others—such as Chapters 2 and 13—have more vague and spaced references and present the word Indigenous in lowercase letters.

Despite the differences between the chapters, there is consistency in the main message: Indigenous Peoples are among the most vulnerable groups to climate change. Furthermore, the WGII recognises that Indigenous Peoples are experiencing irreparable damage to their languages, knowledge systems and livelihoods due to the loss of biodiversity and ecosystem services. It further finds that all these biophysical impacts and cultural losses diminish the otherwise strong adaptive capacity of Indigenous Peoples. This situation is particularly difficult for remote communities with high levels of endemism, whose territories face severe disruption.

According to the WGII, the vulnerability of Indigenous Peoples is produced and exacerbated by historical marginalisation and structural inequity—like gender, income, and class. Colonialism's structural legacy is reflected in vulnerability to biophysical impacts and maladaptation practices that reinforce inequalities and risk exposure. Particular emphasis is given to the cultural and financial consequences of the relocation of Indigenous Peoples, which disrupt cultural and spiritual bonds to their territories, their livelihoods, and sense of place.

Due to their vulnerability and historical marginalisation, WGII notes that the participation of Indigenous Peoples in climate governance is an ethical and essential requirement. This engagement is further supported by the extensive evidence presented across the report regarding the contributions of Indigenous Peoples and their knowledge systems, which, according to Chapter 1, do not have a unified definition because this depends on each people's right to self-determination. For ease of reference, these contributions to adaptation can be organised into five key areas:

1. *Indigenous Peoples' knowledge is crucial to the resilience of social-ecological systems:* Indigenous Peoples' resilience is rooted in centuries of interaction with and adaptation to environmental change and ecosystem functions. It is associated with better management, conservation, and biodiversity sustainability and, therefore, fundamental to developing so-called 'nature-based solutions' (NbS). NbS are most successful when they are context-specific and tailored to Indigenous territories' ecological and cultural conditions.
2. *Indigenous Peoples' knowledge is fundamental to risk reduction:* Indigenous Peoples possess information about past events to understand, assess and facilitate awareness of risks and consequences. This improves their understanding and influences behaviours that generate new solutions to present issues, promoting societal transformation.
3. *Indigenous Peoples' knowledge enhances the effectiveness of local adaptation measures:* Their place-based, intergenerational and holistic characteristics contribute to climate action by overcoming siloed approaches that characterise institutional adaptation responses. Evidence indicates that the co-management and community-based biodiversity management by Indigenous Peoples also supports more equitable, effective, and durable adaptation outcomes.
4. *Knowledge of Indigenous Peoples is a fundamental element of climate justice:* Indigenous Peoples' engagement in decision-making provides new and historically contextualised approaches to addressing inequity and injustice. In addition, applying Indigenous Peoples' customary and traditional justice systems enhance equity in adaptation policy processes, reducing vulnerability and increasing resilience.

5. *The involvement of Indigenous Peoples is a prerequisite for achieving sustainable food and water systems:* Evidence demonstrates that Indigenous Peoples' practices that support biodiversity and ecosystem integrity enhance food and water security. The effectiveness of adaptation options related to water and food is enhanced when genuinely engaging with Indigenous Peoples and their knowledge systems.

In light of this evidence, WGII acknowledges Indigenous Peoples' climate justice movements and calls for more flexible and rights-based climate governance. To avoid maladaptation, this governance must challenge the values and interests that underpin hegemonic adaptation and mitigation practices to date, pursue long-term goals and assess the risks and trade-offs of possible responses. It also must strengthen collaboration and Indigenous Peoples' decision-making capacity and leadership, support Indigenous Peoples' rights, jurisdiction and self-determination and amplify Indigenous Peoples' knowledge-based adaptation.

### References to Indigenous Peoples in WGIII

The WGIII report contains 74 references related to Indigenous Peoples, including 12 in the SPM and the remaining 62 in 10 of 17 chapters, plus 1 in the TS. The word Indigenous is written more often in lower than upper cases.

Throughout the report, Indigenous Peoples are superficially listed together with other vulnerable groups, such as women and poor populations. This framing of 'vulnerable' is a result of the WGIII review of the intersectional impacts on Indigenous Peoples and how inequality reinforces existing inequalities and limits Indigenous Peoples' climate action options. These limiting factors include (i) environmental legislation that dispossesses, or limits, Indigenous Peoples' access to their lands, resources, and territories; (ii) impacts of resource extraction, renewable energy development, and forest exploitation and illegal logging; (iii) the imposition of a 'modern' food system that has negatively impacted Indigenous farming systems; and (iv) their experience of economic vulnerability and marginalisation due to their proximity to 'sacrifice zones', areas most affected by extreme weather events, and unequal access to energy, food, and water. Above all, Indigenous Peoples are directly affected by attempts to violently silence their voices through high repression, criminalisation, and even death.

In the context of mitigation, WGIII identifies positive and negative impacts on Indigenous Peoples. On the one hand, Indigenous Peoples are recognised as disproportionately impacted by mitigation strategies such as carbon sequestration and greenhouse gases reduction linked to Agriculture, Forestry and Other Land Use (AFOLU), conservation and protected areas, and Reducing Emissions from Deforestation and forest Degradation (REDD+) projects. On the other hand, despite structural barriers, Indigenous Peoples influence mitigation actions, including through international negotiations and participation in land-based mitigation measures and forest governance. One specific reference included the role of 'providing' 'property rights' to Indigenous Peoples through community forest management (CFM) has reduced emissions from deforestation in tropical forests over the past two decades. Despite these positive and negative references, the WGIII recognises many knowledge gaps concerning Indigenous Peoples' contributions to mitigation and calls for additional collaborations on policy-relevant research.

The report also highlights how Indigenous Peoples are responding to the climate crisis, especially those of Indigenous youth. These responses uplift their denunciation of ongoing socio-ecological injustices, land claims, and a deep spiritual and cultural commitment to environmental protection. Indigenous Peoples' knowledge, technologies, and governance principles are recognised positively, highlighting the contributions of their knowledge



to biodiversity and ecosystem conservation, which is intertwined with climate resilience and quality of life, human well-being, and sustainable development. It provides specific examples of how Indigenous techniques for managing land, soils, and biodiversity and improving food security can help in climate action, as well as a brief recognition of the specific role of Indigenous women in sharing and applying this knowledge. Finally, an emphasis on the role of Indigenous Peoples' contribution to transformative change is highlighted clearly in Chapter 17, where aspirations to 'achieve the good life' can learn from Indigenous Peoples and enable humanity to make sense of and imagine new futures, increase critical thinking, and promote agency and new coalitions.

The WGIII report recognises the relevance of human rights and Indigenous Peoples' rights highlighted in the preamble of the Paris Agreement. It states that the obligations this agreement references are to be understood as recognition of the self-determination of Indigenous Peoples. This extends to the inclusion of Indigenous Peoples in climate governance—which is often dependent on State processes—as the report highlights that adequate, equitable and articulated climate governance, based on the collaboration of diverse actors and ideas, including Indigenous Peoples, improves mitigation management. Effective participation in which Indigenous Peoples enjoy 'veto power', access to climate finance and sharing benefits builds resilience and facilitates social transformation and systemic change.

The report concludes that climate change mitigation requires reducing emissions and better understanding and addressing the adverse local impacts of climate change on Indigenous Peoples. Accordingly, climate change mitigation requires addressing power relations and considering existing inequalities through applying a climate justice approach.

### References to Indigenous Peoples in the Synthesis Report

The longer report of the Synthesis Report has 24 references related to Indigenous Peoples, and the SPM has 11. All these references capitalise the word Indigenous.

Quite in line with what is presented in the WGII report, the Synthesis Report refers to the unique vulnerability of Indigenous Peoples stemming from colonialism's legacy. Indigenous Peoples are severely affected by climate change's biophysical impacts and the negative impacts of certain policies and maladaptive practices.

The Synthesis Report highlights the role of Indigenous Peoples' participation, knowledge, and advocacy. In addition to promoting climate action, Indigenous Peoples, and the respect for their rights, contribute to the effectiveness of climate policy.

### DISCUSSION

Compared with previous IPCC cycles<sup>5,28</sup>, the AR6 can be considered a step forward regarding the recognition and inclusion of the contributions of Indigenous Peoples. It goes beyond the focus on vulnerability by paying more attention to the growing evidence of the multiple benefits of recognising Indigenous Peoples as equal contributors in climate science and policy. However, there remain limitations to an ethical, value-based and epistemological commitment to Indigenous Peoples.

First, references to Indigenous Peoples were inconsistent across Working Groups. The Working Groups operate independently from one another. This may be why there is no consensus on whether to capitalise the words Indigenous and Peoples despite the importance of doing so—i.e. to respect the unique status of Indigenous Peoples as nations and collective subjects who enjoy the right to self-determination under international law. Capitalisation of both words in English—a language that capitalises demonyms—is a hard-fought advocacy win by Indigenous Peoples at the United Nations<sup>40</sup>. Hence unanimous resolutions of both the UN General Assembly<sup>41</sup> and the Human

Rights Council<sup>42</sup> correctly apply such capitalisation, and the IPCC ought to have done the same throughout AR6.

Except for some chapters in WGII, Indigenous Peoples continue to be presented as a homogenous sector and as merely another group within civil society, omitting their unique position as collective rights holders to lands, territories and resources recognised by the United Nations<sup>16</sup>. Homogenisation reinforces and further traps Indigenous Peoples between the state/non-state binary legal framework of the UNFCCC<sup>43</sup>. The references are often presented without acknowledging the diversity of Indigenous Peoples from the seven socio-cultural regions of the world, not to mention the vast diversity within these regions. This approach is reproduced by the Synthesis Report, which only refers to the Arctic when mentioning Indigenous Peoples<sup>44</sup>. By not taking a distinction-based approach, the reports promote a rather pan-Indigenous narrative that fails to acknowledge and respect the diversity and distinction between Indigenous Peoples and generalises their situation. For example, WGIII mentions that community forest management implies the provision of 'property rights', a situation that is not reflected in many contexts where Indigenous Peoples struggle to have access to the land and the concept of community management has strengthened state control, like in Nepal and Tanzania<sup>45</sup>. Another example is the overemphasis given to forest-dwelling communities, especially in WGIII. Indeed, we identified an outright error during our review of the first draft, which gave the impression that 80% of lands occupied by Indigenous Peoples have forest cover—a figure that only applies to Latin America and the Caribbean<sup>46</sup>. After communicating with one WGIII co-chair, the Bureau approved a revision in the final version (see [https://www.ipcc.ch/report/ar6/wg3/downloads/report/IPCC\\_AR6\\_WGIII\\_Errata.pdf](https://www.ipcc.ch/report/ar6/wg3/downloads/report/IPCC_AR6_WGIII_Errata.pdf)). As evident at COP26 in 2021, pledges of political and financial support tend to focus primarily or even exclusively on benefiting Indigenous Peoples living in territories with forest cover—and only those from so-called developing countries—ignoring ecological and human inter-relationships of different regions and ecologies. On the contrary, Indigenous Peoples and their respective lands, water, ice, and territories are extremely diverse—from savannah to tundra, coast to high mountains—and exist in developed and developing countries<sup>10</sup>.

The WGs and the Synthesis Report also fall short of considering intersectional identities among Indigenous Peoples. Indigenous women, who tend to be pushed to decide between identifying themselves as 'women' or 'Indigenous' in adaptation policies<sup>47</sup>, are mentioned briefly, as well as elders and children. Failing to cover such intersectionality adequately ignores the different but complementary roles that women, men, Elders, children and youth play in the intergenerational transmission of Indigenous knowledge<sup>48</sup>. This omission will have policy implications that may increase existing inequalities<sup>49</sup>. By contrast, voices from the Indigenous movements regularly highlight how their vital knowledge strengthens the understanding of climate change and interconnected environmental impacts<sup>50</sup> and the unique adaptations needed in diverse social, family, wellness, and cultural spheres<sup>51–53</sup>.

Across the WGs, the incremental consideration of diversity falls short of what is required to improve climate science and produce legitimate and authoritative climate knowledge for policy decision-making<sup>27,54</sup>, although even the Synthesis report emphasises that Indigenous knowledge improves risk reduction, justice, and decision-making processes<sup>44</sup>. The standardisation of references to Indigenous Peoples and the inclusion of diversity cannot be approached as box-ticking; instead, it must transform how we understand and address the problem<sup>25</sup>.

Second, as has been the case in previous IPCC reports<sup>28</sup>, Indigenous Peoples continued to be represented mainly as 'vulnerable.' Each report discusses the causes and, in some cases, the underlying factors of their vulnerability, such as inequality and

marginalisation. WGII even takes a significant step by acknowledging—for the first time in the history of the IPCC—the structural and ongoing impacts of colonialism—a recognition that is also included in the Synthesis Report. However, there is no in-depth analysis of how colonialism in its different forms influences how Indigenous Peoples experience climate change impacts, nor how climate change adaptation and mitigation actions are influenced by colonial narratives<sup>55</sup>. The absence of this consideration does not align with calls to address mitigation policies' impacts on adaptation, such as those made by the UN Special Rapporteur on Human Rights and Climate Change<sup>56</sup>.

The portrayal of Indigenous Peoples as passive victims or harbingers of climate change impacts is not exclusive to the IPCC<sup>57,58</sup> (Cameron 2012; Indigenous Climate Action 2021). This perspective overlooks the ways that Indigenous Peoples have been observing, adapting, and living reciprocally with their lands, waters, and ice for millennia<sup>59,60</sup>. Cultural, spiritual, and social connections of Indigenous Peoples to the land and waters may increase exposure and sensitivity to climate change impacts, but they also provide unique sources of strength, knowledge, understanding and resilience<sup>61–63</sup>. Greater reflexivity from the IPCC necessitates authors, and political actors, to explore how climate policy, knowledge, and action either reinforce or challenge colonial legacies<sup>20</sup>.

There is some consideration of policy malpractice in WGII and, to a lesser extent, in WGIII. However, there are limited references to, and critical analysis of, internationally adopted mechanisms to address these impacts, like the Cancun Safeguards—the safeguards established by the UNFCCC when undertaking REDD+ activities. The WGIII report, for instance, omits the situation many communities face in countries where Indigenous Peoples lack recognition of tenure rights, as in most African countries<sup>45</sup>, nor does it uphold the minimum standards contained within the UN Declaration on the Rights of Indigenous Peoples (UNDRIP). The conflation of the core right of Free, Prior, and Informed Consent (FPIC) to a 'veto power' disrupts years of advocacy by Indigenous Peoples to address this misunderstanding. It also avoids discussing the rationale behind upholding Indigenous Peoples' right to decide in their territories, i.e. the violation of Indigenous Peoples' rights through land displacement (land grabbing) or carbon colonialism, as is the case of windmills in Sámi territory<sup>56</sup>. As a result, no reflection is presented on how mitigation projects, specifically REDD+, demand different approaches, depending on the context, to reduce the risk of land dispossession and disputes.

Without a commitment to a strengths-based approach, as well as a thorough understanding of the human rights risks and interrelated climate change and policy impacts facing Indigenous Peoples, the contributions of Indigenous Peoples will be overlooked, reducing their ability to inform just and effective climate action, as the Synthesis Report concludes.

Third, although references to and acknowledgement of Indigenous Knowledge Systems grew compared to previous assessment cycles, three main shortcomings remain regarding their treatment. These problems can be attributed to a misunderstanding of what Indigenous knowledge is, an inability to discuss respectful knowledge co-production frameworks and the near absence of Indigenous scholars across AR6.

Indigenous knowledge is 'a unique knowledge system that comes with its own evaluation and validation processes'<sup>37</sup>. While there is great diversity, Indigenous knowledge systems are place-based<sup>64</sup>, provide guidance for how to act in reciprocity and relationships with the natural world<sup>37,65,66</sup>, and are embedded in cultural frameworks of respect, reciprocity, and responsibility<sup>67,68</sup>. Despite this depth, non-Indigenous science continues to be positioned as superior in AR6, reinforcing a misunderstanding that conceives it as an objective and impartial practice, detached from the values that promote it in the first place<sup>54</sup>. This diminishment fails to recognise how Indigenous Peoples worldwide offer

fundamental knowledge on addressing climate change from a holistic approach<sup>69</sup>.

The IPCC continues to equate Indigenous knowledge with local knowledge because it dismisses the complexities and nuances of Indigenous Peoples' intrinsic and multi-layered relationships with their lands, territories and resources<sup>16</sup>. From these relationships stem complex knowledge systems that shape not only local practices, but also perspectives, worldviews, and customary institutions and laws that regulate, among others, communal tenure, land- and water-based practices, biodiversity management, and territorial rights. Besides being diverse and dynamic, these legal traditions are crucial to nature conservation and responses to climate change<sup>30</sup>. An example of this is the customary institution *Shagya* practised by the Tumba and Nubriba Peoples in Nepal, which, through seven principles of non-violence, has contributed to sustainable land management and biodiversity richness despite the impacts of climate change<sup>70</sup>. If the IPCC aims to support Indigenous climate leadership and governance, these customary laws, legal systems, and institutions must be recognised and understood on their own terms<sup>37</sup>. Moreover, the right of Indigenous Peoples to exercise their laws will only be possible by reversing 'the colonial asymmetry which denied and disregarded Indigenous legal traditions'<sup>71</sup>.

Nevertheless, rather than acknowledge the equal validity of Indigenous knowledge systems to non-Indigenous sciences, the AR6 speaks primarily of 'integrating' Indigenous knowledge—despite problems with integration being well-discussed in the literature<sup>37,72,73</sup>. Although even the WGII recognises in Chapter 1 that integration is generally interpreted as the mere inclusion of Indigenous Peoples' knowledge in strategies guided by non-Indigenous science rather than as horizontal collaboration, other WGII chapters and the SPM continue using this term. Furthermore, AR6 avoids discussing the conflicts around research and power imbalances that adopt extractive approaches and exclude Indigenous Peoples and their knowledge holders<sup>74</sup>. It also omits numerous frameworks for knowledge co-production and practices of knowledge co-existence that Indigenous Peoples have developed worldwide—e.g., "Etuaptmumk" or Two-Eyed Seeing in Mi'kmaw; "Two Row Wampum" or Kaswentha in Haudenosaunee; "Two Ways" or Ganma in Yolngu; "Double Canoe" or Waka Taurua in Māori<sup>75</sup>. These shortcomings call for strengthening the right to self-determination<sup>37</sup> and Indigenous Peoples' sovereignty over their knowledge systems<sup>76</sup>, an issue completely overlooked in AR6.

Not only were Indigenous knowledge systems sidelined throughout AR6, but there was also a clear absence of Indigenous authorship, reproducing the colonial marginalisation of Indigenous Peoples, knowledge systems, and voices. Furthermore, chapters have little recognition of Indigenous Peoples' contributions. The Inuit Circumpolar Council (ICC), the international representative body of the Inuit, has within the international Indigenous movement pioneered work on the equitable recognition of Indigenous knowledge within the IPCC. But despite gaining IPCC observer status in 2020 as the first representative organisation of Indigenous Peoples<sup>16</sup>, the reports do not refer to this. Also, despite the participation of ICC as an expert reviewer, a contributing author of the WGII report, and a member of the Canadian delegation to plenary sessions<sup>16</sup>, which is reflected in the quality of the WGII cross-chapter paper 6, none of these contributions are explicitly recognised.

Furthermore, Indigenous authors must identify through their respective States rather than by their Indigenous People, nation, or socio-cultural region. This situation contradicts UNDRIP articles 2 and 3, infringing on Indigenous Peoples' self-determination and identification rights. An unwelcoming environment for Indigenous authors limits the IPCC-recognised role of Indigenous Peoples in transformative change. Furthermore, there remains a complete absence in AR6 of substantial engagement about how this

transformative change needs to address colonial relations and be predicated on Indigenous values and worldviews<sup>77</sup>. The appropriate engagement of these worldviews and values highlights the importance of effectively including indigenous authors. While there are certain common characteristics to Indigenous values and worldviews—such as a deep relationship to land, water, territories and resources, and a holistic understanding of the natural world and our place in it—no universal definition or elements comprise them—in the same way as there is no single definition of Indigenous knowledge as highlighted by the WGII. Indigenous Peoples' values and worldviews are rooted in the diverse experiences of each people and their relationship to their territories. To be understood, they must be lived by the people who hold and live this knowledge. This process calls for processes of decolonisation within the IPCC that challenge values and worldviews that have been considered universal<sup>37</sup> and open the space for diversity. Although decolonisation processes are difficult and complex, existing experiences in climate policy show that institutional learning leads to better outcomes<sup>78</sup>.

Fourth, the concrete inclusion of Indigenous Peoples and their contributions was marginal. While AR6 notes that collaboration with Indigenous Peoples strengthens climate science and results in more effective policies, the evidence does not fully explain how this is achieved. There are limited examples of specific contributions of Indigenous Peoples, including a complete absence of Indigenous Peoples' leadership in mitigation initiatives and collaborative partnerships<sup>79</sup>. References generally only mention institutional measures incorporating Indigenous Peoples' participation at some stage. As such, the AR6 does not reflect the extensive and growing research on Indigenous-led initiatives, like those on renewable energy solutions<sup>8</sup> and protecting, conserving, and restoring lands and waters<sup>80</sup>. They also do not delve more profound into the multiple benefits—beyond climate policy targets—of Indigenous Peoples' participation and knowledge in climate policy and research<sup>2,61,62,81,82</sup>. For example, research among the Mapuche People in Chile highlights how the participation of Indigenous communities contributes to addressing counterproductive policy patterns and imagining new futures<sup>83</sup>.

Also striking is the lack of reference to Indigenous Peoples' participation at different levels of climate policy, despite the increasing engagement of Indigenous Peoples in national climate pledges<sup>11</sup>. Climate governance demands greater coherence and verification of its measures<sup>84</sup>. Accordingly, it is crucial that the IPCC further include Indigenous Peoples-led climate policy, science and knowledge and explore how Indigenous Peoples contribute to implementing, reporting, monitoring and verifying climate actions, as in Canada through the bilateral roundtables that engage the Assembly of First Nations, Inuit Tapariit Kanatami, and Metis National Council, the national Indigenous organisations<sup>81</sup>. This analysis becomes even more critical in the wake of the Paris Agreement, which, by giving rise to polycentric climate governance, calls for a shift towards more prescriptive assessments<sup>13,29</sup>.

As can be observed, the IPCC has a long way to go with regard to the full and respectful recognition of Indigenous Peoples. Being a contested institution, the IPCC must be open to reflecting on its limitations<sup>20</sup>, starting with the structures that constrain climate action, which, after all, are the same ones that obstruct Indigenous Peoples' participation. Colonialism has made and continues to make Indigenous Peoples worldwide vulnerable to climate change and, in some cases, the negative impacts of climate policy. To avoid reinforcing colonialism, the IPCC must look closely at the relationship between climate vulnerability and inequity while better examining the diverse yet coherent responses that Indigenous Peoples are deploying to overcome the feedback loops of these barriers. Furthermore, these responses must be observed in relation to Indigenous values, worldviews and laws, as they allow us to understand the importance of, and how to,

holistically transform society to ensure urgent, just and effective responses to human-induced climate change.

To stop the reproduction of extractive practices that decontextualise Indigenous Peoples' knowledge and perpetuate their generalisation and marginalisation, the IPCC must also observe the conditions in which climate research is conducted, including the four points discussed above. This analysis will only be possible by creating permanent, differentiated and right-based mechanisms that allow the engagement of Indigenous Peoples' representatives, knowledge holders and scholars at all levels. The operationalisation of this engagement calls for additional research, conducted by Indigenous Peoples, or as co-production, on the inclusion (or barriers) of Indigenous Peoples in IPCC procedures and practices.

In this way, we offer the following recommendations to AR7: (i) ensure consistent references to Indigenous Peoples across all Working Group and Special reports; (ii) avoid generalisation and characterisation of Indigenous Peoples as vulnerable. Instead, focus and embed an appropriate strengths-based approach; (iii) ensure the wealth and diversity of Indigenous knowledge systems are fully understood and applied ethically and equitably; and (iv) include Indigenous Peoples from all socio-cultural regions as authors and contributors and their contributions in all proposed working topics.

All these recommendations are not just about appointing Indigenous authors. They require that Indigenous Peoples have a voice in the scoping process—including the plenaries—to bring in their concerns and thoughts on how the assessments should be conducted, how the diverse evidence should be presented, and how Indigenous knowledge systems should be approximated and considered in the production of the report.

The engagement of Indigenous Peoples in IPCC processes can contribute to the institutional transformation it has been called for and will allow for more reflexivity on its procedures and structures. Reflexivity will strengthen IPCC's legitimacy and allow it to offer more equitable and contextualised recommendations for climate action. The effective inclusion of Indigenous values, and their contributions to the decolonisation of climate research and policy, can also reduce the influence of states and industries that promote false solutions and obstruct climate action. Only in this way can we overcome unequal structures and thus give Indigenous Peoples the place they deserve in climate governance.

## METHODS

### Document analysis of AR6

This study took as a starting point a collaboration between Indigenous and non-Indigenous authors tailored to discuss the recognition given to Indigenous Peoples in AR6 WGI and WGII reports, which resulted in two briefings notes<sup>85,86</sup>. It also draws on the experience of some of the authors as contributing authors to WGI and WGII, and observers of the IPCC—RC participated as contributing authors in WGI, DS and JPM participated as IPCC observers in the AR6 and contributing authors of WGII, and GR and JPM participated as members of Canada's delegation in the approval plenaries of Working Groups I, II, and III.

We conducted a document analysis of the WGI, WGII, and WGIII reports and the Synthesis Report of the AR6. Document analysis is based on the principle that documents contain latent meanings, which we can access through how they present or omit specific issues<sup>87</sup>. Mentions or lack thereof of Indigenous Peoples allow us to access the values, interests and purposes of those who commissioned and produced these reports and their awareness and interest in recognising Indigenous Peoples<sup>28</sup>.

We coded the four full reports (FR)—including their SPM and TS—by searching for the word Indigenous. We cleaned the data by excluding references that did not directly refer to Indigenous



Peoples—such as indigenous species and indigenous energies—and those in the indexes and bibliography. During coding, we noticed that some of the references mentioned colonialism and its relation to the vulnerability of Indigenous Peoples. Because the description of Indigenous Peoples as vulnerable has predominated in IPCC reports<sup>28</sup>, and this recognition is unprecedented, we searched for the word colonial(ism). We incorporated these references into the analysis of how the IPCC problematises Indigenous Peoples' vulnerability.

We conducted an inductive content analysis with references to Indigenous Peoples ( $n = 1356$ ) and colonialism ( $n = 45$ ). Four categories emerged: (i) Indigenous Peoples' vulnerability; (ii) Indigenous Peoples' knowledge and contributions; (iii) Recognition of Indigenous Rights; and (iv) Alignment with Indigenous Peoples' demands. These categories allowed us to identify the key messages and treatment of Indigenous Peoples and their knowledge systems in the AR6. As the bulk of references appeared in the WGII report ( $n = 1130$  or 83%), we reviewed each chapter in detail, classifying the references to Indigenous Peoples' contributions to climate policy and adaptation into five subcategories: (i) resilience; (ii) risk reduction; (iii) local adaptation; (iv) climate justice; and (v) sustainable food and water systems.

### Reporting summary

Further information on research design is available in the Nature Research Reporting Summary linked to this article.

### DATA AVAILABILITY

The datasets are available from the corresponding author on reasonable request.

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## AUTHOR CONTRIBUTIONS

R.C. conducted the coding. R.C., G.R., D.S.D., S.T., and J.P.M. were involved in discussions of the results and their interpretation. All authors contributed to the writing.

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## COMPETING INTERESTS

The authors declare no competing interests.

## ADDITIONAL INFORMATION

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