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A scoping review of the sustainable development goals and indigenous peoples: direction for a post-2030 agenda

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Abstract
In this paper, we present the results of a scoping literature review that was conducted to assess the ways in which the Sustainable Development Goals (SDGs) are (mis)aligned with the needs, values, and rights of Indigenous peoples. Despite purported commitments to engage Indigenous peoples, those efforts proved ineffectual, resulting in the erasure of Indigenous cultures and dereliction of Indigenous rights. Yet the literature shows that Indigenous communities and organizations are mobilizing self-determined movements, empowered by the United Nations Declaration on the Rights of Indigenous Peoples, that challenge the universality of the SDG framework. This includes developing their own goals and indicators to inform development priorities and to mitigate the detrimental governance effects of global goal setting. In developing these goals and indicators themselves, Indigenous peoples are challenging the normalizations of the SDGs by offering their own conceptions of sustainability and the cultural virtues that can inform self-determined forms of development.

Keywords Indigenous, Sustainable development goals, Culture, Governance, 2030 Agenda

1 Introduction

In 2015, the United Nations (UN) launched an ambitious mission to concomitantly improve livelihoods, grow economies, and protect the environment. Years in the making (2012–2015), the 2030 Agenda for Sustainable Development was born and includes 17 Sustainable Development Goals, 169 targets, and 232 indicators that together set a course for global prosperity [48]. Compared to its predecessor, the Millenium Development Goals (MDG) (2000–2015), the SDGs are intended to present a more equitable and realistic framework for sustainable development. Firstly, the SDGs commit to the principle of 'leaving no one behind' by striving to improve well-being and eliminate the socio-economic disparities between all people. This includes critical attention on the world's most vulnerable, aiming to achieve good health and well-being for all [42]. Secondly,

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the SDGs are intended to be rooted in the principles of human rights. By adopting a rights-based approach, the SDGs aim to recognize the diverse needs and circumstances of different groups within and between countries [68]. Thirdly, the SDGs represent the outcome of extensive stakeholder engagement and public dialogue that took place during their development.

Unlike the MDGs, the SDGs sought the active involvement of Indigenous peoples [59]. The involvement of Indigenous peoples was considered particularly warranted given their shared history of marginalization and poor socioeconomic and health conditions compared to non-Indigenous populations [42]. For example, despite comprising only 6% of the world's population, Indigenous peoples account for 19% of those living in extreme poverty [24]. As noted by the Special Rapporteur of the United Nation's Human Rights Council on the Rights of Indigenous Peoples, the SDGs provide an opportunity for Indigenous peoples to see their desire for self-determined development come to fruition [42]. The deliberate inclusion of Indigenous peoples therefore was important in extending the scope of the SDGs, which span multiple dimensions of sustainability [25, 62].

Despite this seeming progress, the SDGs have not escaped criticism, with the practical, conceptual, and ideological foundations that informed the SDGs being scrutinized by Indigenous peoples and scholars alike. As 2030 draws near, and as plans are made for a post-2030 global agenda [3], it is important to identify the challenges that have been encountered with respect to Indigenous peoples, or we will again risk perpetuating the errors committed in previous development frameworks.

It was with this need in mind that we performed a scoping review of the SDG literature, identifying insights and lessons offered as they relate to Indigenous peoples. The purpose of the review was to characterize the current state of knowledge on the SDGs and Indigenous peoples, including the consolidation of critiques. Overall, we sought to identify where SDGs are (mis)aligned with the needs and lived realities of Indigenous peoples with the intention to inform a post-2030 agenda that more accurately reflects and advances Indigenous rights and interests.

Following this introduction, we review the origin and intent of the 2030 Agenda for Sustainable Development and the formative roles played by the Open Working Group (OWG) and Indigenous Peoples Major Group (IPMG) in eliciting Indigenous input. Following this section, we describe the methods that were used in our review. This includes the designated search terms, citation screening, and qualitative and quantitative analyses. Section three presents our results and is organized under the themes of engagement, leaving no one behind, and Indigenous rights. Section four then presents new Indigenous-specific goals and indicators that have been proposed in the literature. In section five, our conclusion, we discuss some of the key findings and the implications for a post-2030 SDG agenda.

1.1 The 2030 agenda for sustainable development

The 2030 Agenda for Sustainable Development was initiated in 2012 at the United Nations Conference on Sustainable Development in Rio de Janeiro, Brazil. During the conference, UN Member States committed to identifying a set of universal development goals that could respond to the pressing environmental, political, and economic challenges of the world. This commitment was made on the heels of the expiring Millennium Development Goals (MDG) that aimed to eradicate poverty, while improving health,

education, and food security of developing nations. The imperative of the 2030 Agenda was, however, more ambitious as it would span multiple dimensions of social, economic and environmental sustainability and apply to all UN Member States.

Tasked with its development, the Open Working Group (OWG) was established by the UN General Assembly. Membership of the OWG followed as a constituency-based system of representation that included 30 member states or groups of member states, for instance a shared seat held by Canada, Israel, and United States. The mandate of the OWG, which was outlined in Rio + 20—The Future We Want [60], includes developing modalities to ensure the full participation of relevant stakeholders, such as civil society, expertise from the scientific community, volunteer groups and foundations, migrants and families, as well as older persons and persons with disabilities. In addition to these stakeholder groups, the OWG identified Major Groups whose unique perspectives and diversity of experiences would be sought. Major Groups include Women, Children and Youth, Non-Governmental Organizations, Local Authorities, Workers and Trade Unions, Business and Industry, the Scientific and Technological Community, Farmers, and Indigenous Peoples. The inclusion of Major Groups was considered necessary to ensure the priorities and diversity of challenges faced by people worldwide would be accounted for in the final goal formation [60].

As each Member State decided how to engage Major Groups within their respective regions, it was agreed that input from the Indigenous Peoples Major Group (IPMG) would be facilitated by two Organizing Partners (OPs)—Indigenous Peoples International Centre for Policy Research and Education (Tebtebba) and the International Indian Treaty Council (IITC). In these roles, Tebtebba and IITC served as consultative bodies that would engage Indigenous communities and their respective local and regional authorities. A global and regional list-server was maintained and used to elicit suggestions and recommendations that were compiled by the OPs. Those recommendations were then submitted to the Indigenous Peoples Major Group for final review and submission to the Open Working Group for consideration in the Sustainable Development Goals and the 2030 Development Agenda. Such recommendations include, for example, the inclusion of cultural diversity as a critical dimension of sustainability and calls to remove obstacles that impede the full realization of the Indigenous right of self-determination [7].

Following three years of global consultation, Transforming Our World: the 2030 Agenda for Sustainable Development was endorsed by all 193 UN Member States during the UN Sustainable Development Summit in New York, in September 2015 and took effect on January 1, 2016. Although not without its detractors, many of whom were critical of its universalist agenda and the propagation of neoliberal interests [1], the 2030 Agenda has been heralded as a stunning achievement for its transformative ambition [35] that effectively marries the complex dimensions of economic, social, and environment sustainability [27].

2 Methods

2.1 Literature search

Our research team includes Indigenous and Settler scholars, who together conducted a scoping review of peer-reviewed publications and grey literature. Scoping reviews differ from systematic literature reviews in important ways. Whereas systematic literature

reviews are useful for answering clearly defined questions (for example, how have the SDG's advanced Indigenous rights in the Global North compared to the Global South) scoping reviews are useful for answering much broader questions (such as identifying general themes pertaining to Indigenous peoples in the SDG literature). Given the difference in objectives, and therefore the methodologies employed, scoping reviews have different evaluative and reporting elements [58].

Our scoping review was limited to academic and grey literature that was published in English between 2015 and 2022. Our search used the following terms: "Sustainable Development Goal*" OR "SDG*" AND "Indigenous" OR "First Nation*" OR "Aboriginal*" OR "Indigenous Peoples". In our review, we adopted the definitional criteria for Indigenous peoples that has been set out by the United Nations Permanent Forum on Indigenous Issues [59], which includes those who: (1) self-identify as Indigenous peoples at the individual level and accepted by the community as their member; (2) maintain historical continuity with pre-colonial and/or pre-settler societies; (3) have strong links to territories and surrounding natural resources; (4) retain distinct social, economic or political systems; (5) practice distinct language, culture and beliefs; (6) form non-dominant groups of society; and (7) are resolved to maintain and reproduce their ancestral environments and systems as distinctive peoples and communities.

Our initial search of academic sources included the titles, abstracts, and keywords of records that are indexed on the Web of Science (WoS). From this publication list, the respective citations were scanned to identify other potentially relevant sources in Google Scholar. We then conducted a snowball search, where author lists were used to identify other published work that might align with our focus.

For the grey literature search, relevant websites and repositories were identified. Indigenous organizations were reviewed, including the Indigenous Peoples Major Group for Sustainable Development, Indigenous Navigator, and the United Nations Permanent Forum on Indigenous Issues. The websites of other international organizations, including the UN online library, were then identified and searched. Finally, the national government websites of Canada, USA, Australia, and New Zealand were searched for relevant publications.

Our decision to include only English language sources does, however, introduce potential language bias [26] that can result in an incomplete review of the research landscape [36]. Although the exclusion of non-English publications can impose generalizable limitations [10], the findings of Nussbaumer-Streit et al. [40] that the exclusion on non-English sources has minimal effect on the overall conclusions helped alleviate our concerns of bias. However, we were also aware that the exclusion of non-English publications could underrepresent the experiences of Indigenous peoples [14], thereby obscuring the diversity of perspectives [5], and potentially reinforcing colonial linguistic dominance [37]. However, because our research team includes Indigenous and Settler scholars, are multinational, and gender diverse, we are confident our efforts have effectively minimized those risks. We do, however, acknowledge that some measure of bias is unavoidable and encourage future studies, when adequate linguistic capacities and funding resources are available, to include non-English sources. To support those efforts, we include a detailed and transparent description of our review procedures that can inform future studies that are more linguistically inclusive.

2.2 Screening

The screening stage of our review involved scanning titles, keywords, and abstracts of each record. If a given record focused on the relationship between Indigenous peoples and the SDGs, the record was saved and advanced to the second screening stage, which involved a full text review. Any sources that identified an alignment or misalignment between the SDGs and Indigenous peoples (i.e., livelihoods, culture, rights) were retained. This also included papers that proposed new Indigenous-SDGs or indicators. Two researchers reviewed each source independently and then compared their findings. In cases where the two researchers came to different conclusions, the reasons for the discrepancy were noted, and a third researcher conducted an independent review. This process was reiterated until each article in the list (N = 91) was unanimously approved by the research team. Following this stage, ten records were excluded, leaving 81 records retained for analysis.

2.3 Analysis

Quantitative and qualitative analyses were conducted on each article. Our analysis was guided by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses for Scoping Reviews (PRISMA-ScR) Checklist [58]. The PRISMA-ScR checklist offers a systematic approach to evaluating publications for relevancy, by discerning the main concepts used, the theories and methodologies employed, recommendations in findings, and noted gaps in the literature. Applied here, 15 criteria were adapted from the PRISMA-ScR Checklist and were used to evaluate our source material (Table 1).

The quantitative data were exported into Excel for analysis where simple descriptive analysis in the form of tables and graphs was produced. Pivot tables were created for specific quantitative variables such as geographic focus, Indigenous group, specific SDGs, and reference to the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP). The qualitative data were exported into NVivo 12 for analysis. The analysis focused on identifying, describing, and explaining patterns that emerged from the

Table 1 Evaluation criteria for scoping review (adapted from Ricco et al. 2018)

1	What is the geographical focus of the study (country, region, community)?
2	What Indigenous Peoples, groups or organizations are involved (i.e., Inuit, Māori)?
3	What is the purpose/objective of the study?
4	What SDG(s) are examined or referenced by the authors?
5	How do the authors describe the relationship between the SDGs and Indigenous Peoples?
6	Do the authors describe or explain the challenges/limitations of existing SDGs and/or their associated indicators? If YES, what are those challenges/limitations?
7	Do the authors give reason as to why these challenges/limitations exist?
8	Do the authors discuss the implications of those challenges/limitations?
9	What methods did the authors use to identify those challenges/limitations?
10	Do the authors propose *adjustments* to existing SDGs and/or associated indicators? If Yes, what are those proposed adjustments?
11	Do the authors propose *new* SDGs and/or associated indicators? If Yes, what are those new goals/indicators and what is the purported utility?
12	If adjustment to existing goals/indicators or new goals/indicators are suggested, were those goals/indicators validated by Indigenous people? If Yes, how did validation occur?
13	If adjustments or new goals/indicators are proposed, do the authors identify method(s) of measurement and/or data needs?
14	Do the authors reference UNDRIP framework? If Yes, in what ways?
15	Do the authors offer any recommendations that could inform a post-2030 development agenda? If YES, what are their recommendations?

data to understand the relationship between Indigenous peoples and the SDGs. Three levels of coding were undertaken to generate themes from the publications. First, we used NVivo to produce a word count of the most frequently used words to help generate initial themes. The software generated word list was further re-categorized to generate the first level coding. The second level of coding involved manual coding in NVivo to identify patterns and emergent themes/categories based on the objectives of the study. The third and final level of the coding involved combining the automatic coding with the manual coding to arrive at the final categories or themes that form the basis for the descriptive results.

3 Results

3.1 Geographical and goal coverage

Our review identified 81 records that were published between 2015 and 2022. These publications have global coverage with representation from 57 countries. While all 17 SDGs garnered attention, those receiving the greatest focus were SDG 1: No Poverty, SDG 2: Zero Hunger, and SDG 3: Good Health and Well-being. Conversely, SDG 11: Sustainable Cities and Communities, SDG 9: Industry, Innovation and Infrastructure, and SDG 17: Partnerships for the Goals received the least attention in the published literature (Table 2).

Out of the 23 papers that suggested changes to the SDGs, 11 (47.8%) indicated that the proposed changes had been validated by Indigenous peoples and/or organizations. Most common examples of validation include direct proposals by Indigenous groups themselves (e.g., [67]) participatory workshops with Indigenous communities (e.g., [9, 41]), surveys administered to Indigenous communities and organizations [12], interviews and focus group discussions with Indigenous leaders, Elders and administrators of Indigenous organizations (e.g., [34, 53]).

3.2 Indigenous engagement

Despite the purported inclusion of Indigenous peoples in the planning and development of the SDGs, critics note that the final output failed to reflect the priorities of Indigenous

Table 2 Coverage of SDGs and indigenous peoples in the published records (N = 81)

Sustainable development goal (SDG)	No. (%) of records
SDG 1 no poverty	19 (23%)
SDG 2 zero hunger	18 (22%
SDG 3 good health and well-being	15 (19)%
SDG 4 quality education	10 (12%)
SDG 5 gender equality	6 (7%)
SDG 6 clean water and sanitation	13 (16%)
SDG 7 affordable and clean energy	5 (6%
SDG 8 decent work and economic growth	11 (14%)
SDG 9 industry, innovation and infrastructure	4 (5%)
SDG 10 reduced inequalities	8 (10%)
SDG 11 sustainable cities and communities	2 (2%)
SDG 12 responsible consumption and production	5 (6%)
SDG 13 climate action	12 (15%)
SDG 14 life below water	8 (10%)
SDG 15 life on land	14 (17%)
SDG 16 peace, justice, and strong institutions	7 (9%)
SDG 17 partnership for the goals	4 (5%)

peoples and the issues that are of greatest concern [8]. Acknowledging that Indigenous concerns are as diverse as the cultures that inform them, the concerns most frequently cited in the literature focused on food (e.g., [52]) and water insecurity (e.g., [46, 49]), standards of living (e.g., [51]), discrimination and service access (e.g., [24]), territorial sovereignty (e.g., [29]), and the impacts of climate change and the challenges of preserving way of life on the land (e.g., [31]).

From the outset of goal setting, some Indigenous peoples indicated a sense of alienation, suggesting that to be included required conformity to the values and interests of the framers [32]. As Mulindwa Mulindwa [38] notes, the framers of the SDGs failed to heed the lessons of the MDGs, where diverse realities, needs, and concerns of Indigenous peoples went unaccounted for. Others have noted that the engagement of Indigenous peoples was not only ineffectual but rather openly resistant to Indigenous participation, which was made apparent through the withholding of funding, resourcing, and other exclusionary tactics [54].

Some have attributed the exclusion of Indigenous peoples to the influence of a small number of nations that, while claiming to be acting in the global interest, were motivated most by their own political and economic agendas [65]. The International Social Science Council (ISSC) found few opportunities for Indigenous peoples to engage in the framing of the SDGs, let alone act as agents of change alongside governments [22]. Menton et al. [33] attributes this to the governance of the SDG process, where there are no institutional mechanisms that allow for the challenging of economic and geopolitical structures, which remain the root cause of economic inequalities and historical injustices. Unable to challenge the entrenchment of state power, Indigenous peoples have been left with few opportunities to contest existing hegemonic institutions. While SDG 17 advances the goal of partnerships building between governments, private sector, and civil society, the goal, according to some, has been coopted by those with processual influence, which has effectively pushed Indigenous voices to the margines and far removed from the centre of participatory power [43]. This has left little opportunity for Indigenous peoples to engage in the SDG process [23], resulting in the deliberate muting of their contributions [57]. The consequences of this exclusion have been the negating of opportunities for Indigenous peoples to advance self-determined forms of development [11] that are grounded in their own conceptualizations of sustainability [44].

3.3 Leaving no one behind

In the absence of meaningful Indigenous involvement in the development of SDGs (including their worldviews and conceptual understandings of development), the final selection and wording of the SDGs has been criticized for conveying a more dominant and colonial narrative [4, 8, 22, 28]. Cummings et al. [8] found that developed countries and corporate interests had a significant influence on the final language and ultimate shaping of the SDGs. This most often involved the exclusion of transformative and participatory language in favour of techno-scientific-economic discourse. In South Africa, Lyon and Hunter-Jones [28] found that dominant neoliberal discourses that have long served as structural impediments for Indigenous peoples were simply recast as the 'new' SDGs. Other critics have suggested that because the SDGs assume a narrow, top-down approach to development [39] they have simply reinforced existing power structures [68] that are focused on growth-oriented development rather than well-being [65].

Conceptualized in this way, SDGs prioritize economic growth at the expense of other non-material forms of human development [66]. This not only obscures Indigenous conceptualizations of sustainability but serves to conceal cultural diversity [66] and Indigenous ontologies [4, 18]. Indigenous views of sustainable development, which may be grounded in Indigenous rights and governance, resilient livelihoods, equity in shared resources, and the incorporation of sustainable knowledge systems [9, 11] are then relinquished against material measures of national and international development [68], and made synonymous with modernization [4]. Those Indigenous values that transcend the individual and corporeal to a kin-centric relationship with the environment [4] then become misaligned with the entrenched technocracy of the SDGs [8].

In this regard, van Norren [65] questions the ubiquitous nature of 'development' as a universal value and notes that culture, reciprocity, interconnectedness, and service are fundamental themes in some Indigenous cultural traditions yet are largely unacknowledged in the SDGs. Specific to Micronesian societies, Stumpf and Cheshire [55] argue that SDGs fail to adequately reflect how community institutions function, and particularly how Indigenous land rights form the cornerstone of sustainability in Micronesian society. Other examples include the omission of Te Ao Māori's elements of spirituality, culture, and community [12], Pacific Islanders' sense of connections between people and place, and in Africa and Latin America, where state efforts to improve sanitation services (SDG 2) fail to account for cultural norms [57].

Failing to consider culture as a fundamental dimension of Indigenous sustainability is not surprising given that culture is referenced only five times amidst the array of goals, targets, and indicators. Any notion of cultural sovereignty as a critical dimension of sustainability has gone unrecognized [45]. In the few instances that culture is referenced, it is treated as a means to an end rather than a value of intrinsic worth [68]. In the absence of culture in the SDGs, emphasis is then placed on statistical measures, which Schulz [50] suggests has been used to reinforce negative stereotypes and propagate characterizations of Indigenous deficiency. Yap and Watene [68] offer similar criticisms where the use of quantitative indicators often depict Indigenous peoples in Australia and Aotearoa New Zealand as 'underperforming', which has led to the imposition of targeted interventions designed to improve the conditions of Indigenous communities based on the preferred outcomes of government.

3.4 Indigenous rights

Whereas some scholars were optimistic that the inclusion of human rights principles in the SDGs would afford greater opportunities for Indigenous peoples to engage in and benefit from the SDGs, most have come to accept that the collective rights to "land, health, education, culture and ways of living" will likely not be achieved [63]. Despite the rights of Indigenous peoples being recognized by most nation states, and fortified in UNDRIP [63], those rights have largely been dislocated from the SDG framework [19], leaving Indigenous peoples to pursue their rights-based agenda through other national and international fora [43].

Yet the exclusion of Indigenous rights in the SDGs has in effect compounded the existing threats Indigenous peoples confront in the arrogation of Indigenous lands and practices. Some authors suggest that the SDGs are being used by public and private interests to legitimize the continued incursion into and control of Indigenous territories, either

through the dislocating effects of resource extraction [16, 50] or conservation efforts. For instance, Menton et al. [33] have argued that the creation of parks and exclusion zones may be viewed as positive outcome of SDGs 14 and 15, they are also having a countervailing effect on Indigenous peoples through their displacement from traditional lands and livelihoods. Such dislocation may then create or compound conditions of poverty and the loss of place-based knowledge and traditions [45]. Hope [17] for example, has noted that in Bolivia, the implementation of the SDGs as a unifying national agenda has spurred local opposition to national development schemes that threaten their cultural and land-based livelihoods. In the Arctic, green energy transitions (SDG 7) have put at risk the livelihoods of Sami reindeer herders and have undermined their territorial rights [41]. As was the case with the MDGs, the framers of the SDGs proved resistant to accept Indigenous peoples as rights holders [68], including the inherent Indigenous right to land and ancestorial territories. Yet, land and territorial rights are crucial to the economic, cultural and spiritual well-being of Indigenous peoples and continue to serve as guideposts towards a self-determined future [21, 30]. Treated as mere 'stakeholders' and parcel to the 'public interest', the SDGs have had disempowering effects, where the legacies of colonial encounters continue to manifest in Indigenous communities today [42]. Employed in this way, Indigenous peoples find themselves in the inescapable position of being left behind [6, 67, 68].

3.5 Reforming the SDGs

In light of these deficiencies, some Indigenous organizations and scholars have called for the development of more contextually and culturally appropriate SDGs that reflect the unique needs, perspectives, and experiences of Indigenous peoples [42]. For example, Nilsson and Larsen [41] propose that each of the 17 SDGs should be adjusted to more accurately represent Indigenous interests, while van Norren [65] suggested that the entire SDG framework needs to be reformulated and cleansed from its colonial bias. This would include, for example, replacing the SDG priorities of development and economic growth with nature, relationships, and wellbeing while expanding the scope of the SDGs by considering all forms of sentient life [65]. Conceptualization through a cultural rather than an economic lens is seen by some as a necessary first step towards the Indigenization of the SDGs and creating a truly inclusive framework that is representative of Indigenous rights and worldviews [65, 66].

To that end, Indigenous communities and organizations are mobilizing self-determined movements, empowered by UNDRIP, that challenge the universality of the SDG framework. This includes developing their own goals and indicators to inform development priorities and to mitigate the detrimental governance effects of global goal setting. In developing these indicators themselves, Indigenous peoples are challenging the normalizations of the SDGs by offering their own conceptions of what it means to be 'sustainable' and the cultural virtues that can inform self-determined forms of development. Below we provide examples of Indigenous-inspired indicators that have been offered towards the improvement of SDGs 1 through 4, which received the greatest attention in the published literature.

For SDG 1—No Poverty, two themes emerged in the literature concerning the eradication of Indigenous poverty. The first theme is centered on the notion of 'good living' which is considered necessary to broaden the conceptualization of Indigenous poverty

[32, 65]. The concept of good living accounts for the multi-dimensionality of poverty and its cascading effect on housing security, environmental health, human health, job security, and childhood education [42]. It was suggested that the Multidimensional Poverty Index (MPI) would be a more relevant measure of Indigenous poverty given its inclusion of indicators that better reflect the ways in which poverty is experienced in Indigenous communities [42].

The second theme focused on the inclusion of Indigenous access and ownership to land and natural resources [2, 21]. Indigenous territorial rights are considered a fundamental requirement to ending poverty, which can be tracked by: the proportion of the total adult Indigenous population with secure tenure rights to lands and resources, with indicators measuring (a) legally recognized documentation of Indigenous territorial rights, (b) the proportion of Indigenous populations who perceive their rights to land as secure, by sex and by type of tenure, and (c) countries that ensure Indigenous peoples' land rights are recognized and respected in law [21]. While tracking these indicators will require the disaggregation of national data [21], and ultimately the availability of adequate funding for Indigenous engagement and on-going participation, such investment is justified on the basis of UNDRIP and the agreed-to principle of free, prior, and informed consent. Through these mechanisms a more holistic anti-poverty approach can be derived that is more suited for ending the complex and intergenerational forms of poverty that have long plagued Indigenous communities (Table 3).

For SDG 2—Zero Hunger, three recommendations were offered as to how it can be made more relevant to Indigenous peoples. These include the right for Indigenous people to control their own food supply [32], looking beyond agriculture by including hunting, fishing, gathering, and herding as forms of food production [41], and ensuring secure access to land, property, and natural resources [50]. Each of these recommendations is premised on Indigenous autonomy over their economic lives and maintaining a food supply that is derived from ancestorial estates. A new indicator should therefore be introduced that tracks the availability of legal frameworks that guarantee Indigenous access and ownership of food-related resources. Mendoza [32] suggests that it is also

Table 3 Proposed changes to SDG 1

Key considerations to make SDG 1 relevant to Indigenous concerns, including means of implementation
• Account for living well [32]
• Link in Gross National Happiness to track progress in reorienting towards more meaningful societal traits rather than strictly economic progress [65]
• Recognizing that Indigenous peoples are distinct groups with specific rights and accounting for the fact that they are uniquely impacted by different situations [64]
• Legal recognition for Indigenous peoples' collective land rights, and track progress through new indicators [64]
• Ensure that Indigenous peoples give free, prior and informed consent for development projects impacting them, while also creating a system for filing grievances [64]
• Make sure that there are enough resources for programmes that work towards dealing with Indigenous peoples' challenges with poverty, food security, health, and self-determination [64]
• Ensure Indigenous peoples' effective participation [64]
Proposed new indicators/targets
• Percentage of women, men, Indigenous peoples, and local communities (IPLCs) with secure rights to land, property, and natural resources measured by:
a. Percentage with legally documented or recognized evidence of tenure, and
b. Percentage who perceive their rights are recognized and protected [21, pp. 4]
• Number of countries with a legal framework that includes special measures to guarantee Indigenous peoples' rights to land and natural resources [21, pp. 4]
• Use of the Multidimensional Poverty Index (MPI) to measure Indigenous poverty [46]

important to account for whether Indigenous peoples have sufficient access to their territories, irrespective of rights. This includes being properly consulted with necessary consent given to resource extraction projects and conservation policies that may effectively undermine Indigenous rights. Tracking these indicators will again require the compilation and disaggregation of national data on Indigenous access and use of land and natural resources [20, 50], as they support Indigenous land-based economies [53]. Nilsson and Larsen [41] suggested that, in the Arctic Indigenous context, there should be better data to capture information covering subsistence and traditional economies, while further tracking Indigenous harvesting rights as a central component of Indigenous food security (Table 4).

For SDG 3—Good Health and Wellbeing, key considerations include the need to consider culture as it frames Indigenous conceptions of health and well-being [32, 63, 65]. To better account for the cultural conceptions of health, new targets and indicators are proposed that track births that include intercultural practitioners as part of the health team [20]. Other suggestions include measuring Indigenous access to birthing centres and the availability of culturally sensitive pre- and post-natal care [42]. A starting point is to first identify the proportion of healthcare workers who are Indigenous, and what proportion of non-Indigenous health care practitioners have received cultural training [42]. Advancement towards this goal will require investment in the training of Indigenous healthcare workers who have an emic understanding of their respective culture-health nexus (Table 5).

Regarding SDG 4—Quality Education, it has been suggested that it needs to extend beyond ensuring that people receive equal access to every level of education, to include the unique needs and requirements for Indigenous access to culturally informed educational services [20]. The primary recommendation that emerged for SDG 4 is the need for intercultural education [32]. This involves re-centering culture in the educational journey by going beyond the teleological to include personal growth rooted in cultural values. To be achieved, Indigenous educators and institutions are best placed to ensure cultural relevance [41, 50], and the preservation of Indigenous language through self-determined delivery [56]. This also includes tracking the achievements of Indigenous

Table 4 Proposed changes to SDG 2

Key considerations to make SDG 2 relevant to Indigenous concerns, including means of implementation
• Account for food sovereignty and autonomy, as well as the unique aspects of Indigenous economies [32]
• Include fishing, hunting, and herding as systems of food production [45, p. 6]
• Ensure Indigenous peoples' rights to their lands and national resources [54]
Proposed new indicators/targets
• Percentage of women, men, Indigenous peoples, and local communities (IPLCs) with secure rights to land, property, and natural resources [21, pp. 4]
• Number of countries with a legal framework that includes special measures to guarantee indigenous peoples' rights to land and natural resources [21, pp. 4]
• Status and trends in traditional occupations [21, pp. 4]
• Prevalence of moderate or severe food insecurity in the population [57]
Proposed modifications to indicators
• Modify indicator 2.1.2, which measures food security, to be conscious of different cultures, including those in which there may be resistance to reporting food insecurity and/or food is acquired by a variety of means. The proposed indicators are as follows:
a. Percentage of households in the community that report having a stable food supply throughout the year. Food supply can be subsistence-based, bought, or a result of exchange
b. Average length of time after a disaster for which households in the community have access to an emergency supply of culturally valued food [57, pp. 1801]

Table 5 Proposed changes to SDG 3

Key considerations to make SDG 3 relevant to Indigenous concerns, including means of implementation
• Explicit consideration of culture [63]
• Account for Indigenous intercultural health [35]
• Develop a holistic conception of health that includes physical, emotional, mental, and spiritual health [65]
• There needs to be a better understanding and way of tracking the complex issues of violence against women that is seen in remote Indigenous communities [46]
Proposed new indicators/targets
• Target 3.1: Proportion of births attended by an intercultural health team (including traditional birth attendants) [21, pp. 6]
• Targets 3.1 or 3.2: Tracking the number of Indigenous communities with birthing centres and "the proportion of Indigenous women who are able to access prenatal care and give birth locally" [46, pp. 24]
• Target 3c: The proportion of non-Indigenous health practitioners who have taken cultural safety training and the proportion of the health workforce that is Indigenous [46, pp. 25]

Table 6 Proposed changes to SDG 4

Key considerations to make SDG 4 relevant to Indigenous concerns, including means of implementation
• Encapsulate a deeper understanding of education that involves a more holistic view of education as a journey rather than simply as the task of reproducing knowledge [65]
• Account for Indigenous intercultural education by considering Indigenous educational institutions and Indigenous bilingual teachers [35]
• Recognize culture as being of great importance [45, 54, 65]
• Target 4.5.1: Needs further methodological development [63]
Proposed modifications or additions to the indicators/targets
• Target 4.1: Add ecological knowledge and practice to the list of core competencies to be tracked as a marker of success in education [57]
• Target 4.5: Measures of parity should include indexes that compart Indigenous and non-Indigenous educational achievement [21]
• Target 4.7: The indicator ought to set knowledge targets on different topics, including issues of Indigenous rights [21]
• Track the rate of ancestral language speakers in Indigenous populations [45]
• Track the proportion of people who leave their home community to attend school [45]

learners who either by choice or by necessity leave their home communities to access educational opportunities elsewhere [41] (Table 6).

Other SDGs that have drawn criticism include SDG 5, Gender Equality. While some optimism was found that SDG 5 could help inspire a more nuanced understanding of gender that is more akin to Indigenous conceptions [65], SDG 5's conflation of sex and gender have proven problematic for some Indigenous peoples who do not adhere to binary identities [42]. While target 5.c calls for policies and legislation that advances gender equality and empowerment, corresponding indicators need to be expanded to include non-binary measures [21]. By affording no room for Indigenous or identity-based genders, the relevance of SDG 5 for Indigenous peoples is greatly diminished.

In addition to making changes to existing SDGs, others have suggested the need to expand the SDG framework. Poole [45, pp. 58], for example, suggests that SDG 18 should be added, and include the goal to, "Protect, promote, and engage biocultural heritage to reinforce and support sustainable interconnections between diverse human societies and their distinct environments." Hanspach et al. [13] also suggest the need for a new SDG 18 that accounts for the importance of culture in preserving biodiversity. This includes the inclusion of traditional ecological knowledge to preserve diverse ecosystems and biodiversity, including rare and endangered species that may be under threat from the deleterious effects of changing climate [69]. The inclusion of Indigenous ontologies can then spur new ways of thinking about sustainability and appropriate forms of development [34]. Degai and Petrov [9] go further in suggesting the addition of five new

goals, including SDG 18: Sustainable Governance and Indigenous rights, SDG 19: Resilient Indigenous Societies, Livelihoods and Knowledge Systems, SDG 20: Life on Ice and Permafrost, SDG 21: Equity and Equality in Access to Natural Resources, and SDG 22: Investment in Youth and Future Generation. These new SDGs are considered necessary to confront colonial legacies and the need to Indigenize the entirety of the SDG framework to bring about transformative change.

4 Conclusion

The literature reviewed in this study reveals the ways in which the SDGs are misaligned with the needs, values, and rights of Indigenous peoples. Despite purported commitments to engage Indigenous peoples, the ultimate framing of the SDGs, not unlike its predecessor the MDGs, ultimately excluded Indigenous voice in the design and implementations of the SDGs, resulting in the erasure of Indigenous cultures and dereliction of Indigenous rights.

Despite these deficiencies, some optimism remains that the SDGs can still be used to address the challenges Indigenous peoples face, including poverty, limited access to basic services, food insecurity, gender inequality, and gaining equitable and culturally informed access to education and healthcare services. This optimism is reflected in proposals to expand existing SDGs targets and indicators, as well as proposals of entirely new SDGs that better reflect the realities of Indigenous peoples. Potentially transformative, these new goals and indicators are rooted in Indigenous culture and advanced through the exercising of Indigenous rights.

Admittedly, the prospects for transformative change will not be unproblematic and will likely require the dismantling of deeply entrenched prejudices that have long perpetuated conditions of inequality [47]. In fact, it is probable that no tangible global actions will be taken before the current agenda lapses in 2030. Many of the difficulties raised in this review are deeply and historically embedded in non-Indigenous institutions, and not easily annulled. This being the case, it will be important that any successor to the SDGs considers and responds to the deficiencies noted above. In the meantime, it is within the capacity of willing states to act by adopting Indigenous inspired goals and indicators, which can be used alongside the existing SDG framework. Again, this will require meaningful engagement with Indigenous peoples that exceeds the tokenism that has historically defined such efforts. A substantial part of the challenge is the acceptance by states that the inclusion of Indigenous peoples also entails the upholding of individual and collective rights of Indigenous peoples [19]. Indeed, if the inclusion of Indigenous peoples is ineffectual, and absent of rights-based recognition, it is likely that the unique needs and interests of Indigenous peoples will continue to go unaccounted for [6], and their exclusion will again be perpetuated [15, 19, 38]. However, through effective political mobilization, spurred by the empowering effects of UNDRIP, Indigenous peoples are making important strides towards Indigenizing the next global iteration of SDGs by making sure they are properly localized in the realities of Indigenous peoples. Through those efforts, we may be one step closer to achieving the very intent of the SDGs: one that affirms a global commitment to leaving no one behind, guided by fulsome respect for human rights, and placing utmost value on the cultural diversity that enriches us all [61].

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DN, DR and TR led the writing of the main manuscript; LM and BL advanced the conceptual design of the study and reviewed and commented on early drafts. BB provided methodological oversight on the scoping review.

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