

Toward decolonizing sustainability research: a systematic process to guide critical reflections

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Abstract

With growing attention to the ethical and equity implications of Western-based approaches to research, the urgency of decolonizing research has emerged as a critical topic across academic disciplines, including the field of sustainability. The complexity and messiness of this endeavour, however, may translate into uncertainty among researchers about how and where to start. This is partly due to a lack of guidance, training, and accountability mechanisms through Western academic institutions. In this paper, we advance a three-step process that systematically guides critical reflection toward respectful engagement of local and Indigenous communities, as well as other marginalized groups, by drawing on the literature and on learnings from a recent graduate student-led initiative. The process we develop aims to provide a pragmatic starting point for decolonizing research and a counterpoint to conventional modes of research. Such a process will not only foster accountability, respect, and reciprocity but also movement toward locally relevant, context-appropriate, and action-oriented research outcomes. Our three-step process also challenges Western-based and extractive research practices and seeks to facilitate a shift in mindset about the purpose of research and how to approach it.

Key words: sustainability research, decolonization, critical reflections, Indigenous knowledge, local knowledge, positionality

1. Authors' positionality statements

Lowine Hill is from Guadeloupe, a small archipelago that is geographically and culturally Caribbean but administratively French. One of her main visible identities is that of a woman—depending on where she is located, people tend to add a racial qualifier (i.e., black woman, woman of colour). Her decolonized vision of sustainability research is from the perspective of the colonized: it is about respect, accountability, and emancipation of bodies and minds. It is about creating her own narrative, away from the essentialized vision that exists for people who share some of her identities. While she has not been directly on the receiving end of research protocols, she has had to design and apply these protocols to people who look like her, both as a climate change adaptation practitioner and in academia.

Sarah Ghorpade is a Canadian settler of European descent whose perspective on this work is shaped by a recognition of the privileges afforded by certain aspects of her identity. To Sarah, decolonization entails challenging dominant mindsets, narratives, and hierarchies of knowledge. She believes that listening, learning, introspection, and mutual trust and respect are central to processes of decolonization. Through work with Indigenous communities in the nonprofit sector, she has developed a reflexive and reciprocal approach toward research and community engagement.

Madu Galappaththi is originally from Sri Lanka, a tropical island with a history of colonization for over four centuries. Madu's point of view on decolonization is shaped by her lived experiences and academic training acquired in various cultural settings. In her research, she works with diverse local communities across South Asia, including Sri Lankan communities that share her ethnic and cultural identities. She is committed to bringing a decolonized, feminist, and action-oriented approach to research with an aim to foster respectful and reciprocal partnerships with the communities she works with.

2. Introduction

"Colonialism is not a historical event, but an ongoing set of relations that still characterize the common sense of professional science. As more scientists come to realize that science has power relations that do not serve all people equally, we are left trying to understand how we might change the way science is done" (Max Liboiron 2021).

Colonialism was founded on ideas of domination and subjugation of people and environments (Smith 2021). In the early phases of colonization, the goal of enriching the "empire" was accomplished through global expansion of natural resource extraction and cash crop production, with little

to no concern for the environment or the wellbeing of local and Indigenous peoples (Ashcroft et al. 2000). The linkages between colonial history and current environmental crises are increasingly being recognized (Kothari 2006; Ferdinand 2019; Stewart 2020; Abimbola et al. 2021). In fact, the current era is often referred to as the “Plantationocene”, which attributes the environmental crises directly to the legacies of the colonial plantations and the associated domination of colonial powers over nature and people (Ferdinand 2019). Current research practice has emerged as a direct legacy of such history and is largely based on Eurocentric worldviews and associated colonial ideologies, including implicit assumptions about the primacy of Western knowledge systems (Chilisa 2019; Kovach 2021; Smith 2021). The notion of the “Plantationocene” also implicates the centering of Western knowledge as universal knowledge and the associated delegitimization of Indigenous knowledge as major factors contributing to these environmental crises. Despite increasing recognition of the role of the hierarchization of knowledge in these environmental crises, such tendencies continue in academic research today, including in the field of sustainability (Gram-Hanssen et al. 2022; Trisos et al. 2021). Here, we understand sustainability in its broadest sense, referring to the complex and “wicked” challenges impacting linked social and ecological systems (Rittel and Webber 1973).

The manifestation of colonial ideas within sustainability research practice may take both subtle and overt forms. Sustainability research is still largely an extractive process and one that is anchored in hierarchies of power, privileges, and “otherness” (see Chilisa 2019; Wong et al. 2020; Trisos et al. 2021; Gram-Hanssen et al. 2022). This is demonstrated, for example, through the continued use of language in social science and ecological research that reflects and reinforces unfavourable power dynamics such as “research subjects”, “beneficiaries”, or “laboratories” in reference to communities. Such practices also tend to exclude non-Western, non-white voices and experiences, overlook local cultural practices and identities, and may even result in harmful effects on communities (Datta 2018b; Ignace et al. 2023). While research may be driven by good intentions, such as a desire to help or to promote social justice, researchers are not formally obligated within their institutions to demonstrate accountability, respect for local norms and customs, or cultivate reciprocal relationships with research communities.

Additionally, the recognition of the inherent legitimacy and value of “Other” knowledge systems and forms of expertise (i.e., those of Indigenous, historically marginalized and oppressed groups) is lacking within such institutional contexts, as Western-based knowledge systems and scientists are given power and primacy (Chilisa 2019). This manifests, for instance, as the overrepresentation of technocratic, Western knowledge systems within international climate change debates. Academics and activists alike have raised concerns that the epistemological and normative framings of knowledge integrated within the Intergovernmental Panel on Climate Change (IPCC) assessments are dismissive of other ways of knowing and doing (i.e., local and Indigenous knowledge) (Ford et al. 2016; Abimbola et al. 2021). With growing atten-

tion to issues with the existing paradigm, the urgency of decolonizing research and knowledge more widely has emerged as a critical topic both across and outside academic disciplines.

Decolonization *sensu stricto* entails the dismantling of power hierarchies, political ideologies, and associated narratives that de-centre “Other”, non-Western ways of knowing and understanding the world (Fanon 1952; Smith 2021; Datta 2018b; Stewart 2020). However, decolonization in reality is an ongoing, multifaceted, and, at times, a destructive process, and not an end point itself. For instance, Frantz Fanon’s pioneering work *Peau noire, masques blancs* (black skin, white masks) contested the alleged universality of Western social science and knowledge in general (Fanon 1952; Gordon 2008). More recent scholars have also demonstrated that the decolonization of knowledge, or epistemological decolonization, requires a rupture, renewal, disconnect, and re-appropriation of the colonizer’s knowledge (Fanon 1952; Renault 2018). When applied to research, “meaningful decolonizing practices are not all about theory or all about action, but they are all about praxis and the reflexivity that is necessary for the integrity of research and of the researcher themselves” (Smith 2021). This epistemological decolonization process therefore requires researchers to first reflect critically on how their own identities, social positions, power, and privilege influence the research process. By challenging conventional ways of doing research and addressing the prevailing status quo that perpetuates and reproduces inequalities, this can provide a pathway to overcome systemic barriers to social justice and develop a research praxis that is reciprocal rather than extractive in nature.

The purpose of this paper is to advance a three-step process that systematically guides critical reflection toward respectful engagement of local communities (e.g., Indigenous, racialized, and other historically marginalized and oppressed communities) by drawing on the literature and on learnings from a graduate student-led initiative. Through this process, we encourage sustainability researchers, particularly those in the early stages of their research journey, to examine how power and social position manifest in research practices and to devise concrete actions toward respectful and reciprocal research, ultimately contributing to broader efforts to decolonize research. Drawing from the work of Tilley (2016), Datta (2018b), and Smith (2021), we define respectful research as context-relevant and culturally appropriate research that confronts conventional Western-centric ways of doing research to address power hierarchies and prevailing status quos that may reproduce inequalities. Within a respectful research paradigm, reciprocity is a key element in moving away from the extractive nature of conventional research practices.

Through the three-step process presented in this paper, we aim to provide a starting point for the development of a personalized approach to research that is a counterpoint to conventional modes of research and is context-relevant, culturally appropriate, and centred on local perspectives. In doing so, we do not intend to downplay the complexity involved in decolonizing research or to suggest a straightforward process to follow. Rather, we suggest that the steps presented

here provide an entry to wider reflections on challenging current norms of research praxis. While the process is intended for graduate students and early-career researchers engaging with sustainability issues (hereafter we refer to both of these groups as early-career researchers), it has broad relevance and applicability to any researcher working with local communities, including Indigenous and other marginalized communities.

The need for developing a broader initiative around decolonizing methodologies emerged as a result of dialogue among graduate students of the Environmental Change & Governance Research Group of the University of Waterloo, Canada, on the issues of social inequality, injustice, racism, and power imbalances within the context of research. While there had been an existing level of awareness of these issues as they relate to our research on environmental governance, they took a more prominent space during events that took place in the summer of 2020: the violent murder of George Floyd at the hands of police and the subsequent awakening of mainstream society to the reality of systemic racism and its far-reaching and devastating consequences (see [Clarke 2022](#)). It was within this context that we began reflecting on the manifestations of colonialism and racism within sustainability research practices. Building on this reflection, the authors developed the three-step process presented below. The development and refinement of the process were informed by both peer-reviewed and grey literature, our lived experiences, and discussions with scholars from across the globe.

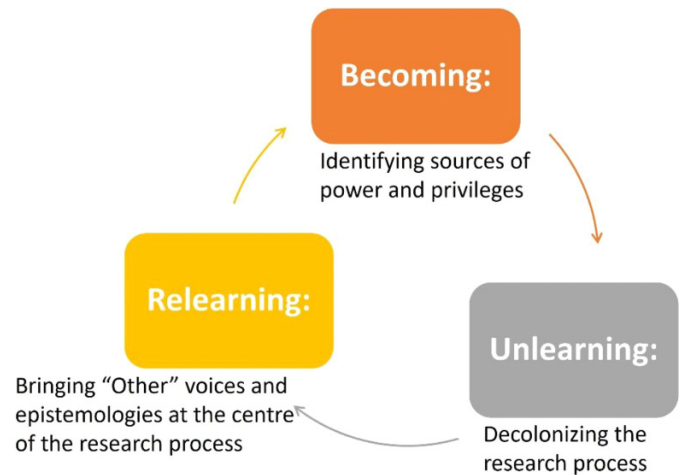
The subsequent sections of this paper are structured as follows. First, we introduce the three-step process in detail. We then discuss the application of these steps in the context of sustainability research, with emphasis on the key questions that can guide critical reflection under each step. We conclude the paper by highlighting the ways in which the three-step process can facilitate fundamental changes in researcher mindsets and research practices.

3. Toward decolonizing sustainability research: a three-step process

We co-developed a three-step process ([Fig. 1](#)) to systematically guide critical reflection toward respectful engagement of local communities, including Indigenous and other marginalized communities. The initial conceptualization of the process steps was based on a narrative review of literature that focused on the broad research question “how does the notion of decolonization apply to research in sustainability?” A subsequent in-depth thematic development of key ideas and concepts that could guide a process of critical reflection was also conducted.

This initial three-step process was first introduced to graduate student researchers as part of a student-led learning initiative at the Faculty of Environment of the University of Waterloo during a workshop series conducted in March 2021. The series included three interactive workshops attended by 25 graduate student participants from across environmental disciplines, from sustainable resource management to geography, planning, and sustainable economic development. The

Fig. 1. The three-step process to critical reflection.



workshops were designed to support a collective exploration of the meaning of decolonization in the context of ongoing graduate studies and explore ways to apply this understanding within their research. Participants were informed of our intention to refine the initial three-step process by grounding subsequent reflections on the discussion emerging from the workshop, and were invited to collaborate on future work related to further developing the process, including through acknowledgement in a potential publication. Throughout this process, we maintained an emphasis on practical steps to help graduate students move toward decolonizing their research processes within the institutional limitations and time constraints of a typical graduate program.

Reflecting on the discussions and observations following the workshops, we further refined the initial process steps. Simultaneously, we organized a speaker series (four virtual sessions) with the aim of directly interacting with scholars working within Canadian and international contexts, whose work informed the initial conception of the three-step process. Through our reflections from the workshops, insights gained through our interactions with the speakers, and ongoing review of the literature and dialogue among ourselves, we further developed each of the three steps of the process. This included expanding on the initial discussion questions to ultimately develop the key questions presented in [Table 1](#). We then adapted the finalized three-step process to suit a broader range of pedagogic endeavours through designing a graduate eLearning course titled “Decolonizing methodologies for sustainability research”, which we delivered in the Winter 2022 term.

Step 1: becoming: identifying sources of power and privilege

Scholars such as [Wolf \(1996\)](#), [Muhammad et al. \(2015\)](#), and [Maclean et al. \(2022\)](#) posit that positionality refers to the social and political context that creates the various elements of an individual that comprise their identity—for example, race, gender, ability, and socio-economic status. Further, positionality encompasses the set of experiences, discourse, and

Table 1. Key questions to guide critical reflections.

Process step	Key questions
Becoming—Positionality and our own epistemological position	<p>How do I construct the "Self"; i.e., what are the identities and values that embody who I am?</p> <p>How do I construct the "Other"? Within the research space, how do I view others; i.e., what similarities and differences can I identify between myself and others?</p> <p>What biases and assumptions do I have about others?</p> <p>Do these ideas about "Others" impact how I treat them; how I understand their lived experiences; or how I foster connections with them?</p> <p>How do power and privilege manifest within my research design and process? What might be some visible and invisible sources of power in my relationship with research participants? What hierarchies exist between me as a researcher and community members?</p> <p>How do the aspects identified above influence the normative assumptions underlying my research? How might these assumptions influence my methodologies, interpretation/analysis, and reporting of results?</p> <p>(How) do any of the above characteristics set the conditions for my research to be colonial in nature, where I might take from the community without giving anything in return, or I might neglect to ensure that my research benefits the community/participants?</p> <p>Which place do the participants occupy in my research process? How much do I value their knowledge, culture and practice, and sovereignty over the knowledge they hold?</p> <p>How do participants/communities benefit from my research?</p>
Unlearning—Being critically aware of our own tacit assumptions and expectations and assessing their relevance for making an interpretation	<p>What are the pre-existing beliefs, biases, and assumptions that the knowledge we currently hold is based upon? Are there any problematic elements associated with this knowledge?</p> <p>How can we reduce the influence of old/obsolete knowledge on how we do research? This includes knowledge related to Euro- and Western-centric approaches to current research and knowledge creation, and on ideas about the purpose of research, my roles/responsibilities as a researcher, and to whom I am accountable.</p> <p>Will my research distort or romanticize bodies of knowledge? (e.g., being aware of tendencies in conservation literature to oversimplify relationships between Indigenous communities and nature, and to romanticize islanders and fishing-based livelihoods)</p> <p>How can I broaden my understanding that research is value-laden and contextually sensitive; and that knowledge produced is partial and contestable as it may represent multiple realities and interpretations of phenomena being studied?</p> <p>Based on the above aspects, what elements of my research process need to be unlearned, changed, and challenged?</p>
Relearning—Broadening perspectives and challenging hierarchies of knowledge	<p>How might broadening disciplinary boundaries (interdisciplinarity) and non-disciplinary perspectives help me in the relearning process?</p> <p>How can I develop a better understanding of the histories, traditions, cultures, and contexts of the community within which I am conducting research? How can I challenge commonly held knowledge (rationalities) emerging from these practices?</p> <p>How can we move away from seeing "Others" as research subjects and instead reposition them as questioners, critics, theorists, knowers, collaborators/partners, and communicators? How can I explore Indigenous/local/traditional/other forms of knowledge on an equal footing in my research? How can I weave them together to enhance our understanding of a particular issue and develop action pathways for change?</p>

practices that emerge from social identities (Tien 2019). In the context of sustainability research, positionality therefore entails the position of power and privilege that researchers often possess in relation to the "researched".

Conventionally, the influence of researchers' lived experiences and social identities on how research is conducted is rarely given epistemological recognition. However, the formation of knowledge is "situational"—a reflection of socially constructed realities and the researcher's subjectivity and social positionings, despite the usual narrative of science being "neutral" (Hopkins 2007; Saltelli et al. 2020; Secules et al. 2021). A critical approach to transdisciplinary sustainability research would encourage researchers to recognize their social positionings, for instance, in relation to race, class, power, gender, and privilege, and reflect on how the institu-

tionalization of their social identities affects how they design, implement, and analyze research (Hopkins 2007).

Identifying sources of power and privilege is to critically examine how researcher positionality and rationalities may influence our methods, analysis, interpretation, reasoning, and recommendations, and what impacts they have for the communities we work with. Current research paradigms often put scientists in a position of power over research participants, and this imbalance can emerge at various stages throughout the research process, including through relationships with participants, ownership of data and its interpretation and conveyance in written output, and the overall construction of knowledge, which may or may not be useful to the researcher (Wolf 1996; Muhammad et al. 2015; Maclean et al. 2022).

Through the first step of the three-step process, we seek to encourage current and future researchers to interrogate their own epistemological position: how researchers perceive and position themselves relative to research participants, particularly with respect to the construction of the “Self” and the “Other”. Here, one’s “Self” entails the identities and values that embody who they are, whereas the “Other” refers to the window through which one’s subjectivity emerges within the research space (Datta 2018b; Chilisa 2019). The “Other” represents a person that is different from oneself, and is often perceived in relation to mainstream identity norms (e.g., white, cis-, able-bodied, European, or North American). The practice of “Othering” is a dynamic, contextual process that typically reinforces positions of power and subordination (see Spivak (1985) who coined the term). Through such reflection, we also identify which of these characteristics constitute the “gaze of the colonizer”, wherein “the researcher comes in, takes what he wants, and leaves when he feels like it” (Beld 1994).

Several tools are available to explore one’s positionality; here we used both a social identity wheel developed by the University of Michigan Literature, Science, and the Arts Inclusive Teaching (2021) and a social identity map (Jacobson and Mustafa 2019). Both tools could be used interchangeably, and both are starting points to conceptualize positionality and to explicitly reflect on the implications of social identities and their perceptions for our research. Positionality impacts a researcher’s insider-outsider status within the research circles and communities with whom they work. Positionality also relates to the political dimension of fieldwork and the flow of knowledge, i.e., supports the power hierarchies conducive to the conduct of parachute research—wherein “outsider” researchers (often from the Global North), do their research in a community and leave without investing in human capacity or infrastructure (de Vos 2020).

Understanding a researcher’s social position is also an important starting point to gain a deeper awareness of the power relations imbued in research processes. Power in research emerges within three interrelated dimensions: (i) power differences stemming from different identities and positionalities of the researcher and the researched (e.g., gender, race, class, and nationality); (ii) power exerted during the research process, such as the power to define relationships with participants, which can give rise to unequal exchange and exploitation; and (iii) power exerted during the post-fieldwork period, i.e., the power to create narratives through writing and representing (Wolf 1996). All three dimensions enable the dominance of Western knowledge systems and reinforce structural inequalities. In this context, positionality can create a consciousness about one’s ideological assumptions and biases and how they emerge within fieldwork, data ownership, and knowledge creation.

Confronting positionality and power in research also requires epistemological decolonization, or decoloniality; that is, reflection on who holds the knowledge and who decides what type of knowledge is recognized as valid (Ndlovu-Gatsheni 2013; Trisos et al. 2021). As researchers engaged in pursuing epistemological decolonization, we have the ethical responsibility to spearhead collaborative efforts to engage in difficult, and sometimes uncomfortable, discussions about

the ways that social injustices may be perpetuated in our research projects and ways to facilitate this shift in power.

Step 2: Unlearning: decolonizing the research process

For researchers seeking to decolonize the research process, unlearning is a critical step in rethinking, reframing, and re-constructing our epistemologies and practices. “Unlearning” is a process of intentionally “reduce[ing] the influence of old knowledge for the sake of creating new knowledge and/or patterns of thinking” (Grisold et al. 2017). “Old knowledge” refers to knowledge that may be obsolete or hindering in that it prevents the capacity for creating or acquiring new knowledge (Casillas et al. 2010; Grisold et al. 2017). Within Western-based academia, unlearning is required to reduce the influence of obsolete or hindering knowledge related to conventional approaches to research and knowledge creation. This entails examining the types of knowledge, knowledge systems, and epistemologies given primacy within the research process, as well as those that are marginalized or discarded. It involves acknowledging the pre-existing beliefs, biases, and assumptions (i.e., preconceptions) about research communities on the part of both the researcher and those involved in past knowledge creation to which researchers are exposed via literature and curricula, for example, through distorted bodies of literature and romanticized or oversimplified images of communities. It also involves confronting the historical and ongoing application of extractive methodologies rooted in colonialist ideologies and unjust and exploitative practices (Held 2019).

As researchers, unlearning enables us to analyze and critique current ways of doing research and, in the process, recognize how our assumptions (internalized and prevailing) and expectations may shape interpretations and reasoning. Unlearning, therefore, is a transformative process that involves questioning current research epistemologies and practices and preparing our minds for new ways of thinking, new ideas, and new perspectives to conduct research that is respectful and built on reciprocity and trust (Tilley 2016). An open and forthright unlearning process also entails critically examining the knowledge we hold: understanding it in terms of the political and social context in which it was created; recognizing the importance of values in the knowledge creation process; and acknowledging the biases, beliefs, and preconceptions involved in its creation and interpretation. The conduct of sustainability research is a value-laden process: knowledge production is partial and contestable, hence representing multiple realities and interpretations of the phenomena being studied (Temper et al. 2019; Duggan and Sokini 2021). As with becoming, unlearning also requires confronting the role of power as it relates to the various elements of the research process; e.g., the power held by researchers to frame problems, create narratives, and determine what research questions are important and what knowledge is legitimate to answer them.

Though unlearning is a prerequisite for decolonizing the research process, it is not an end in itself but a step toward learning and ultimately toward fundamentally changing our

approach to research. Unlearning is also not a one-time exercise applied to past knowledge creation but rather a mindset shift and commitment to ongoing reflexivity and reflection on the bodies of knowledge on which one draws and on how a researcher's position of power relative to communities of study manifests in the research process. Unlearning is therefore necessary with respect to normative ideas about the purpose of research, accountability, and our positions as researchers relative to community members.

Step 3: Relearning: bringing “Other” voices and epistemologies to the centre of research processes

Relearning is about intentionally bringing “Other” voices and epistemologies into the centre of the research process from the margins (Chilisa 2019; Smith 2021). There are several important considerations that are central to the process of relearning. First, relearning requires us to think beyond disciplinary boundaries to include interdisciplinary, transdisciplinary, and non-disciplinary perspectives that draw heavily on Indigenous and local knowledge. In doing so, the aim is to design research that enables us to challenge the hierarchies of knowledge and narratives (e.g., romanticized notions, false ideals) emerging from conventional research practices. To this end, the co-existence, legitimacy, and complementarity of diverse forms of knowledge and the need to appropriately bridge such forms of knowledge are increasingly being recognized as critical to better understanding current sustainability issues (Ban et al. 2018; Held 2019). However, an important aspect of bridging diverse knowledge systems is to move away from the mere “incorporation” or “assimilation” of other forms of knowledge into Western knowledge and instead to bridge the knowledge in ways that safeguard the authenticity and integrity of knowledge systems (Wilson 2008; Held 2019; Henri et al. 2021; McGregor 2021). Various Indigenous frameworks such as Two-Eyed Seeing and Kaupapa Māori Theory (Reid et al. 2020; Moko-Painting et al. 2023) and discipline-specific approaches exist to guide the process of how knowledge systems can be broadened (see Singeo and Ferguson (2022) for principles for international research based on Palauan epistemology in the context of marine conservation, and Duggan and Sorkin (2021) for guiding questions and tools for inter-cultural conservation research).

Second, relearning requires the development of an understanding of the histories, cultures, traditions, place-based connections, and socio-political landscapes within which research is conducted (Ban et al. 2018; Stewart 2021). Such an understanding will enable us to contextualize and foreground research in the contemporary realities, struggles, and colonial legacies of the communities participating in the research while actively moving away from potentially harmful ways of doing research (e.g., perpetuating pre-existing inequalities, reinforcing past and ongoing injustices, and even undermining the rights of community members). A thorough contextual understanding will also help build meaningful relationships on the ground, enable the co-creation of research priorities, and lay the foundations for reciprocity in context-relevant ways (Ban et al. 2018).

Third, relearning requires us to move away from perceiving “Others” as research subjects and thereby reproducing the hierarchies and ideologies and conventional research practices associated with colonialism. Rather, “Others” should be repositioned as experts, partners, questioners, critics, theorists, knowers, collaborators, and communicators in recognition of the value and legitimacy of the various forms of knowledge and lived experiences that they hold and on their own terms (Ndlovu-Gatsheni 2017). Such an approach to de-centering the researcher will require shifts in both mindsets and practices and enable us to value and consider diverse perspectives and knowledge systems with equal footing alongside the dominant (Western-centric) forms of knowledge (Datta 2018b; Chilisa 2019).

Lastly, relearning requires broadening our research methodologies and tools to enable exploration of how we come to know, for example, through diverse modes of knowledge dissemination, sharing, and ways of acquiring (McGregor 2004). Broadening methodologies will not only improve the ethics of engagement but will also help co-create more respectful and relational spaces where the participants can articulate complex ideas, concepts, values, and understandings in ways in which they feel comfortable (Gram-Hanssen et al. 2022). For example, exploring oral and visual forms of knowledge sharing through storytelling, art, poetry, oral traditions, metaphorical sayings, proverbs, artifacts, spiritual teachings, and ceremonies may allow us to hear the voices or expertise of research participants in culturally sensitive ways (Datta 2018a; Chilisa 2019; Gram-Hanssen et al. 2022). This approach also challenges us to reflect on what is generally considered legitimate or valid forms of knowledge (e.g., written modes of research vs. oral traditions), practice deep listening, and better align research methods with the forms of knowledge transmission relevant to communities. In doing so, we interrogate associated hierarchies of knowledge and challenge the colonial mould that continues to shape the way we devise research methods.

4. Application

The questions presented in Table 1 were developed by the authors over the course of the initiative. Key questions were first presented to workshop participants to guide discussion, and these were further refined and expanded based on reflections following the workshops, an ongoing review of the literature, and dialogue amongst ourselves. The aim was to use the questions as a guide to facilitate a deeper reflection among researchers on their own identities, privileges, and positionality; to explore the meaning of decolonization in the context of their work; and to identify ways to apply these understandings within their own research. In the process, researchers unpack the sources of power and privilege within themselves toward fostering greater accountability, responsibility, reciprocity, and compassion in the research process. The overall process is iterative and calls for humility, reflection, action planning, and adjustment toward ultimately shifting mindsets and approaches to research. Self-reflection on the part of the researcher, both with respect to their own positionality and their research design and practices, was at

the core of this initiative. However, it is critical that such reflection be accompanied by a commitment to the translation of learnings and insights derived at each stage of the process into tangible actions.

The below section captures our reflections, reactions, and observations that emerged over the course of the initiative.

Social awareness is key to understanding the power that researchers bring to their work when constructing knowledge (Campbell and Gregor 2002; Jacobson and Mustafa 2019). We reflected on our positionality through the social identity wheel (Michigan University 2021) to examine the complexity of one's own identity/identities toward understanding how privilege and positionality impact our research practices in subtle and overt ways. According to researchers from the College of Literature, Science, and the Arts at the University of Michigan, the social identity wheel is an activity that "encourages students to identify social identities and reflect on the various ways those identities become visible or more keenly felt at different times, and how those identities impact the ways others perceive or treat them" (Michigan University 2021, p. 1). Like the social identity map, the social identity wheel enables researchers to think about the dynamics and complexities of their position, their relationship with the "researched", and the power imbued within this relationship (Jacobson and Mustafa 2019). Rather than the essentialized notions of identities based on innate characteristics, we reflected on the situational nature of their identities and the assumptions, biases, and life experiences that can derive from these identities.

As a core tenet of participatory action research, this exercise provided a good segue into discussion on how power dynamics can impact their research processes. In practice, some of us might be in the awkward position of the traditional "Other" researching on "Othered" communities using historically colonial methods (see Chilisa 2019). Some of us may have to grapple with the perspectives of settler colonialism and acknowledge the privileges that social positions have afforded us within research circles (Held 2019; Galappaththi et al. 2021). Particularly within the Canadian research context, decolonization discussion should therefore be broadened to include the research done in other countries by Canadian and international students and the perspectives of researchers who may have their own lived experiences of colonization and marginalization (insider-outsider perspective).

In the unlearning step, the guiding questions took us through a process of identifying the elements of our research that needed to be "unlearned". This included an examination of our own research projects as well as the bodies of literature on which we often draw in developing foundational knowledge. This step also permitted us to apply the learnings from the Becoming step to reflect on the ways in which we hold power as researchers, shaping how we interpret findings and the knowledge ultimately produced. For example, researchers hold the power to identify research questions and objectives and to select methods and methodologies—all of which typically occur prior to engagement with the community in which research is being conducted. A key insight from this discussion was centred on how this timeline, which prioritizes institutional procedures over trust and relation-

ship building, potentially reinforces unequal power relations between researchers and communities. For early-career researchers in particular, the requirement to follow such timelines presents a challenge to ensuring the relevance of research to communities and adherence to local norms and customs in the data collection process, despite the best intentions of the researcher.

The entangled relationship between power and past and ongoing knowledge creation also raised questions about assumptions, biases, and expectations around the legitimacy and validity of knowledge. While Western academic constructs and knowledge produced in peer-reviewed journals are perceived as inherently legitimate, Indigenous knowledge may be perceived as needing validation against Western knowledge systems. Thus, deconstructing hierarchies of knowledge has also become important as part of the decolonization process. The concept of unlearning also brought to the forefront philosophical questions about the nature and purpose of research, and associated practical questions about the roles, responsibilities, and accountability of researchers. We explored these questions through the concept of research ethics by analyzing and contrasting a standard University Ethics template with a set of research guidelines (Guidelines for Ethical Aboriginal Research (GEAR), Noojmowin Teg Health Centre 2003) developed by First Nations communities in partnership with community agencies in the Manitoulin area, Ontario, Canada. We noted the lack of formal requirements on the part of the university to ensure benefit to participants as a stark contrast to the GEAR guidelines, which identify the delivery of benefits to the community, including future generations, as central to the research process.

Finally, action planning was at the core of the relearning step, with the aim of systematically devising strategies and specific actions to bring "Other" voices and epistemologies into the centre of the research process. This activity involved not only thinking beyond disciplinary boundaries (interdisciplinary and transdisciplinary) and non-disciplinary perspectives but also understanding the histories and challenging common knowledge emerging from these practices (rationalities). Further action planning was guided by a reflection on how our research could be informed by frameworks, traditions, knowledge, and perspectives from various sources, including the cultural context in which research takes place, to facilitate open, safe, and respectful spaces for mutual learning.

5. Discussion

As early-career researchers, understanding the meaning of decolonization and applying it to our research can be a daunting process. The purpose of developing this three-step process was to provide a clear, actionable pathway that goes beyond decolonization as a metaphor (Tuck and Yang 2012); that is, to identify current manifestations of colonization through our position as researchers and our research practices, and identify and mitigate actions that may further settler colonialism. Ultimately, this framework aims to leave early-career researchers better equipped to do research that is respectful, context-relevant, and culturally appropriate. In iteratively de-

veloping the process, our reflections coalesced around the four themes described below, which may provide a basis for ongoing dialogue and action on decolonizing sustainability research.

a. Building greater accountability

Current sustainability research practices display critical weaknesses in terms of accountability and reciprocity, particularly toward the communities and ecosystems within which they are situated. Beyond the ethics protocols and corporate image requirements, there are generally no formal requirements or incentives on the part of research institutions for students and researchers to consider respect, oversight, best practices, successes, and lessons learned. Ethics protocols required by universities may also not align with, and may even conflict with, local norms, customs, or community protocols for research (Wong et al. 2020).

However, promising signs of change are present in the increasing use of research paradigms, such as participatory action research, that seek to encourage “the researched” as active participants in the construction of academic knowledge (Zavala 2013), as well as in the growing body of literature on decolonizing academic research, including in climate research, ecology, and natural sciences (e.g., Baker et al. 2019; Held 2019; Gram-Hanssen et al. 2022; Wong et al. 2020). Additionally, an increasing number of tools are available through which to formalize responsibilities and benefits for all parties involved in the research. In Canada, for example, in addition to the aforementioned GEAR, training on data sharing with Indigenous communities is available through the Ownership, Control, Access, and Possession principles (OCAP principles; First Nations Information Governance Centre 2014).

The guiding questions for reflection (Table 1) may serve as a starting point to identify the needs and the ethical parameters (beyond those given by universities, which fall short) that are needed to establish accountability and reciprocity within one’s research. While ideally, universities work toward the development of ethics protocols that are more meaningful to local communities, early-career researchers seeking to decolonize their own research practices may need to turn to other strategies to go beyond the acknowledgement of ethical imbalances toward taking accountability for their own actions in the research process.

b. Reciprocity is the goal

Conventional research practices have been criticized for preserving and reinforcing hierarchies of knowledge and practices and promoting approaches that decontextualize knowledge and essentialize knowledge holders. Practices such as parachute research (de Vos 2020) and overall extractive research methodologies stemming from the disconnect between the values and objectives of local and Indigenous communities and those of Western-trained researchers often lead to a general lack of trust on the part of communities. Reciprocity is about creating mutually beneficial opportunities that fairly balance rights, duties, and interests (Fard 2016). The principle of reciprocity is funda-

mental to the decolonization process as a breakaway from the one-sided, extractive process that characterizes traditional research practices. It is also important to stress that reciprocity goes beyond typical equity, diversity, and inclusion work; diversity without appreciation and equity and inclusion without power do not lead to the desired outcomes that decolonization advocates.

Knowledge co-creation—defined here as the “collaborative process of bringing a plurality of knowledge sources and types together to address a defined problem and build an integrated or systems-oriented understanding of that problem” (Armitage et al. 2011)—is often cited as an inclusive and equitable form of research that aims to dismantle the hierarchies of knowledge. However, non-academic knowers often take part in the co-production process without clarity on the benefits to be delivered to them or their communities and with little to no remuneration, as it is generally contrary to funding policies to remunerate research participants (Gradin 2017).

Reciprocity pushes the concept of knowledge co-production a step further: it is a model in which research participants explicitly benefit, either directly or indirectly, from the research being done (Gradin 2017). Accountability can foster mutual learning and benefits, and provide the basis for the creation of a reciprocal relationship between researchers and participants. It must also be noted, however, that reciprocity is not a simple and easy way to fix the power differential that occurs between researchers and research participants; these differentials do not disappear with participation (Cooke and Kothari 2001; Gillan and Pickerill 2012). In addition, there is a risk that researchers framing their work as “mutually beneficial” only do so as a way to leverage research funding without proper accountability measures in place (Wong et al. 2020). Thus, scrutiny of the principle of reciprocity is crucial to curbing such potential problems.

c. Sensitivity to the diverse identities of researchers is key

While the role of Indigenous Peoples and First Nations is rightfully central to any work related to decolonization in Canada, researchers with their own experience of colonization, marginalization, and oppression outside of the Canadian context may feel invisibilized within these discussions. This is exacerbated when decolonization research narratives do not encompass research done in other countries by Canadian researchers, leading to a lack of reflexivity or awareness about the potential to reproduce colonial tendencies through the research process in such settings (Galappaththi et al. 2021). This is not to suggest that researchers belonging to racialized and/or marginalized communities should be held to different standards or that they are not obligated to be accountable for their work; rather, a nuanced approach to decolonizing research is sensitive to the diverse identities, lived experiences, and positionalities of all researchers.

d. Institutional limitations can hinder the process

Doing decolonial work in institutions that are modelled after colonial ideologies can seem counterproductive or can even seem to support a trajectory that perpetuates unjust power hierarchies and exacerbates some of the

social justice issues encountered in environmental governance today. While we do not imply that all projects and teachings at the university are inherently colonial in nature, it is important to acknowledge that for early-career researchers in particular, it can be difficult to address some of these institutional barriers, and attempting to do so may even create negative experiences during their research journey.

Institutional limitations, such as program timelines and funding requirements (see also [Absolon and Dion 2017](#)) and the need to convince supervisors, committee members, and institutions about the necessity of decolonizing mindsets alongside practices (see also [Held 2020](#)), can hinder decolonization action. Although collaborative research practice inherently has a political element that emerges through the various relational and accountability components, there is limited guidance on how to go about overcoming such obstacles. Our hope is that this framework encourages an ongoing process of critical reflection with the aim of taking responsibility for the various contributions of study participants ([Datta 2018b](#)) while adhering to relevant timelines and other institutional guidelines.

6. Concluding thoughts

Efforts to decolonize research entail context-relevant, respectful, and culturally appropriate actions that enable researchers to identify and challenge systemic barriers to social justice, to challenge traditional ways of doing research, and to address prevailing status quos that reproduce inequalities. The three-step process presented in this paper represents a formalization of a reflection process and a pragmatic starting point, targeted at early career researchers and developed by early career researchers, to “embed” decolonization within sustainability research. Recognizing that decolonization in the context of research is about fundamental shifts in mindsets and practices, rather than reaching a definitive endpoint, we do not present this framework as a straightforward formula to follow or as a means to an end. Rather, the framework and accompanying guiding questions are meant to encourage an approach to research based on the continuous and ongoing reflection of researchers themselves and on the purpose and aims of research, including a more respectful consideration of the needs and perspectives of local and Indigenous communities.

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