



Original Research

Youth response to climate change: Learning from Indigenous land-based camp at the Northern Saskatchewan Indigenous Communities, Canada

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ABSTRACT

This paper represents Youth's involvement in land-based learning in Indigenous culture camps (LLICP) in a powerful and innovative approach to addressing the pressing global issue of climate change. Following Indigenist and relational approaches, we (Indigenous and non-Indigenous youth and educators) explore the critical aspects of this initiative, highlighting its significance and potential impact. Indigenous communities have long held a deep connection with the land and possess traditional knowledge that is invaluable in combating climate change. The LLICP initiative involves organizing cultural camps designed for youth from diverse backgrounds to learn from Indigenous elders and community leaders about the vital relationship between the environment and Indigenous cultures. The LLICP provides a unique opportunity for young people to engage with Indigenous wisdom, traditional practices, and land-based teachings. Through Indigenous elders and knowledge-keepers guidelines, we learned a holistic understanding of sustainable living, biodiversity conservation, and the importance of preserving ecosystems. Our learning helped us, particularly our youths, to become proactive stewards of the environment and advocates for climate action. The LLICP fosters cross-cultural understanding and collaboration, encouraging a sense of unity among youths. The LLICP inspires innovative solutions to climate-related challenges and empowers youth to take leadership roles in their communities, advocating for sustainable policies and practices. The LLICP offers a powerful means of engaging young people in the fight against climate change while respecting and honoring Indigenous knowledge and heritage. It is a promising step towards a more sustainable and resilient future for all.

Introduction

Youth's involvement in land-based learning in Indigenous culture camps (LLICC) offers many learning benefits. LLICP can also bridge formal education in Western schools and informal, traditional Indigenous education. Children's activities with the land can build children's learning capability regarding who they are and what they need to do. The LLICC refers to building relationships with people, land, plants, and animals as vital for understanding science¹. With meaningful implications for youth participation in climate change response in our everyday practices, youth and children must learn the importance of the land and their relationships with it.^{2,3} Youth land-based learning activities are essential for climate change because land-based learning helps grow

awareness of how to protect land, plants, and animals and our responsibilities. LLICC is also beneficial to know the importance of protecting our land and reducing the impact of climate change.

LLICC is critical for Indigenous climate change research as it is deeply rooted in the interconnected relationship between Indigenous communities' land-based culture and practice.^{4–10} These camps provide a holistic and experiential approach to education, fostering a profound understanding of the environment, ecosystems, and the impacts of climate change on Indigenous territories. Through direct engagement with the land, Indigenous peoples can draw on traditional knowledge passed down through generations, gaining insights into environmental changes and adaptation strategies. LLICC learning provides a distinctive viewpoint that seamlessly blends spiritual, cultural, and ecological

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aspects, enhancing the depth and nuance of climate change research. Individuals from non-Indigenous backgrounds, including decolonial researchers, can help ILICC knowledge to develop responsibility for the land, creating a meaningful connection with Indigenous territories and communities within the land they are living on.^{8,11} Therefore, research studies,^{5,10–12} indicate that ILICC is not exclusive to any particular group; instead, it is a valuable resource for everyone seeking a more inclusive and holistic understanding of their relationship with the land and its Indigenous inhabitants.

By centering Indigenous knowledge and practices in these camps, all researchers can collaboratively develop sustainable solutions that respect the cultural context and contribute to the resilience of Indigenous communities in the face of climate challenges.

LLICC helps critical meaning as it represents a bridge between generations, connecting Indigenous youth and community members with their ancestral heritage. It serves as a vibrant tapestry of cultural preservation, enabling the transmission of languages, traditions, and the wisdom of the land from Elders and Knowledge-keepers to future generations. In these camps, participants acquire practical skills and cultivate a profound understanding of the environment, instilling a sense of responsibility and stewardship for the land. Beyond education, these experiences promote holistic well-being, healing, and the strengthening of cultural identity. Moreover, they empower Indigenous communities to exercise sovereignty and self-determination, reasserting control over their lands and resources. LLICC is a testament to resilience¹, community building, and the enduring connection between Indigenous peoples and the land that sustains them.

While LLICC plays a significant role in youth capacity building for responding to climate change actions, limited studies have focused on this potential aspect, particularly for Black, Indigenous, and people of colour (BIPOC) communities' youth.

While commendable, the youth response to climate change faces notable gaps that impede its effectiveness.^{13,14} One significant challenge lies in limited access to decision-making processes and inadequate representation in policy formulation, hindering the translation of youth enthusiasm into tangible influence on climate-related agendas.¹³ Land-based educational disparities further exacerbate the issue, with uneven access to comprehensive climate education hindering the ability of young individuals to comprehend and address environmental challenges fully.^{11,15–18} Closing these gaps requires concerted efforts to enhance youth involvement in decision-making, provide financial support for initiatives, and ensure widespread access to quality climate education. Therefore, there is an urgent need for more research on how youth can take responsibility for climate change resilience through land-based activities taught in LLICC. This paper aims to fill these gaps by exploring how the land-based activities in the Indigenous cultural camps we attended have helped shape who we are today and how our efforts respond to climate change. To achieve these goals, we organized this paper into five parts: first, we discuss the relationship between land-based learning, climate change, and youth responsibilities; second, we situate ourselves regarding who we are and why we are writing this paper; third, we discussed our theoretical framework and methods; fourth, situating a case study, we explained how land-based learning activities could enrich children's climate change understanding and practice, from a youth's perspective; finally, we discussed how the activities we took part in during the Indigenous culture camp could help youth to educate and take responsibilities for climate change solutions.

¹ We used the term resilience from the Indigenous perspective as the enduring strength of communities to adapt, regenerate, and maintain cultural integrity in the face of historical traumas, ongoing challenges, and environmental changes.⁵¹

Situating self

Situating ourselves in this research is essential for learning responsibility, creating our belongingness, creating our reflective learning, promoting reflexivity, and building strong relationships with Indigenous communities. It is a part of our ongoing decolonial and relational responsibility toward conducting respectful, equitable, and beneficial research.^{2,5}

Prarthona Datta-1: I am a racialized youth studying in grade 10 at Central Memorial High School. My work interests include anti-racism, youth actions to build climate change resilience, children's land-based learning activities, youth-led cross-cultural community gardens, and land-based art activities (dance, music and art). I have been involved in anti-racist community activities to reduce the impact of climate change for ten years since I was a child because my parents were community activists and scholars. They inspired me to participate in the University of Saskatchewan's student residence's community garden, where I lived for ten years, from 2010 to 2020. I grew up with land-based education, learning from Indigenous elders and knowledge who visited our community garden every year. I also attended many Indigenous cultural camps with my family to learn about land-based education from Indigenous elders and knowledge Keepers in response to climate change. These opportunities taught me about my responsibilities for climate change. I am a 16-year-old second-generation youth. I am a Bangladeshi-Canadian intersectional youth because I am a community gardener, dancer, singer, and artist. My intersectional identities have helped me to understand who I am today in this Indigenous land.

Ranjan Datta 2: is a settler of color who has lived in Treaty 6 and 7 territories for the last 13 years. As a racialized scholar, I have developed a strong understanding of decolonial and anti-racist research frameworks in his 17 years conducting research with Indigenous and non-Indigenous communities in Canada and South Asia, and my current program of research supported by his existing network of Indigenous, visible minority immigrants and refugee, and Black communities, scholars, students, practitioners, and professionals in Canada and beyond. Research is a lifelong responsibility for me.

Kevin Lewis: I am a founder of Indigenous land-based (kâniyâsihk) Culture Camps and initiator of the Cree Immersion School at Ministikwin Lake Cree Nation. I am an Indigenous academic who brought what he learned about educating back to his community. I am committed to land-based learning and Cree education and hopes to ensure his programs provide young and old people with a culturally responsive education.

Margot Hurlbert: 4 I am a settler and a descendant of many generations of settlers in Canada and America. Born in Kinistino, Saskatchewan, I come from a family with rural connections to the land, and a deep respect for Indigenous knowledge and advancing and supporting Treaty relations.

Our positionality enables us to navigate the complexities of engaging with Indigenous communities, fostering trust, and conducting respectful, equitable, and beneficial research to all involved.

The connection between land-based learning, climate change, and youth

Youth participation in an LLICC plays a significant role in understanding climate change adaptation and their self-determination. Although many vital issues are interconnected with climate change and youth activities, in the following, we will explore relationships between land-based learning and activities, climate change and youth activities. We divided this section into two main themes, including land-based learning to reduce the impact of climate change and youth responsibilities to reduce the impact of climate change. Land-based learning is pivotal in addressing the complex nexus of climate change and youth involvement in this critical issue. In an era of unprecedented environmental challenges, connecting young people with the land provides a profound avenue for understanding the impacts of climate

change on ecosystems, communities, and traditional ways of life. By engaging in land-based education, youth gain firsthand knowledge of the changing natural world and are equipped with the tools to become informed stewards of the environment.

Indigenous land-based learning serves as an important bridge between environmental education, climate change awareness, and youth self-determination.^{2,19,20} Engaging young people in hands-on experiences within natural environments not only imparts practical skills but also fosters a deep connection to the land.²¹ This connection, rooted in Indigenous wisdom and sustainable practices, allows youth to comprehend the intricate balance of ecosystems and the profound impacts of climate change on the environment. Through activities like traditional land-based camp, and cultural immersion, youth gain a holistic understanding of their relationship with the land, enabling them to become stewards of the environment and advocates for climate action.²²

In the face of the escalating climate crisis, land-based learning emerges as a transformative tool for building resilience and adaptive capacities among the younger generation.²³ By immersing youth in experiential learning on the land, they not only witness the immediate effects of climate change but also develop a sense of responsibility and urgency to address these challenges.²⁴ Land-based education equips youth with practical skills and knowledge to implement sustainable practices, inspiring them to become active participants in climate solutions.^{25,26} This connection between land-based learning, climate change, and youth empowerment is crucial in nurturing a generation that understands the intricacies of environmental issues and is motivated to take meaningful action for a sustainable future.

Land-based learning offers a unique platform for intergenerational knowledge transfer. Indigenous communities, in particular, have long relied on land-based practices to sustain their ways of life.^{26,27} By involving youth in these traditions, communities ensure the preservation of ancestral knowledge and a continuation of sustainable practices. Relational learning to the land becomes a powerful tool for transmitting cultural heritage, fostering a sense of identity, and inspiring a commitment to environmental stewardship among the younger generation. Land-based learning serves as a dynamic conduit for instilling a deep respect for nature, cultural appreciation, and a shared responsibility for mitigating the impacts of climate change.²⁸

Land-based learning from Indigenous elders and knowledge-keepers can help teach youth about our relationships with the land and the importance of connecting with the land.²⁹ Land-based learning can challenge Western perspectives and help create children's belongingness with the land and understanding the importance of Indigenous rights, traditional culture, and practice (Datta, 2020). Indigenous land-based stories can also help to teach children about their identity and their responsibility as part of decolonization.³⁰ Learning land-based education based on Indigenous knowledge and teachings can create our belongingness with the land and people. Indigenous land-based learning is significant for us because it teaches us how to grow a connection with the land and understand that the land is part of us, so we should treat it with respect and kindness as we do ourselves.

The nexus between land-based learning, climate change, and the voice of immigrant youth forms a crucial intersection where cultural diversity meets environmental awareness.^{31,32} Engaging immigrant youth in land-based education imparts practical knowledge of ecosystems and provides a unique platform for cultural exchange and integration.²⁷ As these youth explore their connection to the land, they grapple with climate change's impacts, often drawing parallels between their experiences in different regions and the environmental challenges they face. The voice of immigrant youth in this context becomes a dynamic force, bringing forth perspectives that reflect both their cultural backgrounds and a shared concern for the environment. Through land-based learning, immigrant youth not only gain environmental literacy but also amplify their voices as advocates for sustainable practices, contributing diverse insights to the global dialogue on climate change and fostering a sense of interconnectedness between cultural identity

and environmental responsibility.

The effects of climate change are becoming more severe; as a result, more young people are joining the campaign for meaningful change.³³ More children and youth have become involved in addressing climate change by joining existing environmental organizations and creating their own. We can learn that since children are in charge of the world's future, they must get an early start by getting involved in issues that affect the world. Youth can provide a fresh viewpoint on situations that adults are unaware of. Some issues need to be brought to children's attention, which will only happen once the children are given a voice. Youth can actively protect and enhance the environment, essential in preventing climate change. Bandura and Cherry³⁴ say that despite the efforts of the older generations to slow global warming, the world is becoming hotter by the year. Their innovative methods have laid the groundwork for a vibrant youth environmental movement. Youth have emphasized the failure of previous generations and the importance of their role. Youth are now holding adults accountable and proposing inventive and practical answers. Elsen and Ord³⁵ say that recently young activism has taken the lead. Youth activism has always been an essential part of change-making and an important social change aspect.³⁶ We have learned that young people are crucial in raising awareness, establishing educational programmes, developing sustainable lifestyles, protecting the environment, supporting renewable energy, and implementing environmentally friendly behaviors.

Land-based learning and youth responsibilities to reduce the impact of climate change are deeply interconnected with youth understanding the climate change crisis, its impacts, and how to take responsibility to reduce its effects. As seen in the above discussion, youth can significantly reduce climate change in their everyday practices. Everyone and everything is impacted by climate change. As a result, everyone has a role to play in reversing its effects and reducing its impact. Land-based learning allows youth to learn beneficial tools to help with this goal. Land-based learning helps to keep the land safe and healthy by instilling respect for not just the land but also the living things that reside on it, such as plants, animals, insects, and people. Learning about the land helps to teach youth the importance of taking care of our natural resources, such as water, which is a crucial need for all living things to survive.

Therefore, the connection between land-based learning, climate change, and youth is pivotal in shaping a generation attuned to environmental stewardship.^{37,38} Land-based learning offers a hands-on approach, immersing young people in the intricacies of ecosystems and fostering a profound connection to the land.³⁹ In this paper, we highlighted how an Indigenous-led land-based cultural camp allows Indigenous and non-Indigenous communities to learn about land-based initiatives to deal with the climate crises. In this study the LLICC, both Indigenous and non-Indigenous youth, gained a comprehensive understanding of the immediate impacts of climate change, cultivating a sense of responsibility and urgency to address environmental challenges.

Learning from Indigenous knowledge-keepers and elders through land-based activities in Indigenous cultural camps

In the summer of 2023, we had the opportunity to participate in two Indigenous cultural camps. The Indigenous cultural camps were at Water Gathering at kaniyāsīhk Culture Camp in Northern Saskatchewan in July 2023. Parents encouraged their children to attend these Indigenous cultural camps to learn more about why land-based practices should be used more in everyday practice to help me understand who we are while benefiting the land. We enjoyed learning about the land through land-based activities, which helped us understand the differences between land-based and Western knowledge. We were able to learn from Indigenous knowledge-keepers and Elders, along with my sisters and parents, helping to create many instances of knowledge transfer and learning.

Theoretical frameworks and methods

We chose both Indigenist and Relational theoretical frameworks for this research as they have many benefits. Firstly, these frameworks prioritize cultural sensitivity and respect, ensuring that research conducted with Indigenous communities is ethical and informed in honouring, relational and respectful ways. Secondly, these theoretical frameworks emphasize decolonization² efforts, allowing for a more equitable and balanced approach to knowledge production, which is crucial in addressing historical injustices.^{5,11,40} Additionally, the relational aspect of these frameworks encourages a holistic understanding of complex issues, recognizing the interconnectedness of various factors and perspectives. This fosters a more inclusive and comprehensive analysis, often vital in addressing multifaceted social and environmental challenges. Thus, choosing Indigenist and relational theoretical frameworks helped us to promote ethical research practices and enrich the depth and breadth of scholarly investigations, ultimately leading to more informed and culturally respectful outcomes. We used a relational theoretical framework to understand activities in Indigenous cultural camps and their positive impact on us, as well as to learn about youth and the meanings of climate change and actions.⁴⁰ Relational meanings of land, nature and sustainability need to understand traditional experiences, culture, and customs. Following both theoretical frameworks, we used the Indigenous land-based camp research methodology.

We used LLICC as a critical research methodology. The LLICC represents a relational and holistic method of reconnecting Indigenous communities with their ancestral lands, fostering cultural revitalization, and promoting sustainable environmental relationships.^{41,42} As a methodology is an immersive educational experience where Indigenous and non-Indigenous youth and community members engage in traditional practices, storytelling, and skills passed down through generations. By grounding cultural teachings in the land, these camps transmit essential knowledge and instill a deep respect for Indigenous knowledge and practice.⁵ Following LLICC research methodology, we used the following research methods: traditional storytelling, intergenerational conversation, and animal processing.

Listening to traditional storytelling is a crucial method for youth. Storytelling is an effective communication tool for youth. Storytelling is a creative teaching method that allows students to move beyond standard classroom tactics and into beneficial teaching techniques (Davidhizar et al., 2003). For example, we learned many stories through the land-based activities in Indigenous cultural camps, stories of Indigenous elders and knowledge-keepers, and stories from Indigenous hunters, women, and children. These methods have helped us to learn and understand our responsibilities to help the earth by reducing the impact of climate change. These methods have helped us better understand the land, animals, insects, and plants.⁴³ We also used this method to showcase how land-based activities helped the meanings of environmental education and its implications (Fig. 1).

We used intergenerational conversation as an essential method for sharing land-based stories and climate change. Many different people of varying generations were teaching stories about the importance of land-based education. For example, Elders, hunters, medicine women, and youth shared stories about the importance of traditional plants, food sovereignty, learning from the land, the importance of non-humans, responsibilities in education, decolonizing how we learn, and bridging Western and traditional learning.⁴⁴

Using animal processing as a method was beneficial for youth in connecting learning to practice. Activities including beaver processing, fish processing, hide tanning, and the medicine walk allowed storytelling and knowledge transfer opportunities. Youth were able to learn from the experiences of the Indigenous people practicing land-based



Fig. 1. Shows our collective deep listening learning from Indigenous land-based educator.

activities, helping to understand its significance.⁴⁵ Stories about mental health, food sovereignty, and climate change were discussed in an informal setting, with discussions often occurring (Fig. 2).

During the gathering, we sought permission, and the Indigenous author (Dr. Kevin Lewis) clarified at the outset of the camp our intention to utilize photographs for our academic publication. All Elders, Knowledge-keepers, and participants willingly granted consent. Furthermore, they recommended sharing our learning reflections with Indigenous and non-Indigenous audiences, elucidating the significance of Land-Based Indigenous Cultural Camps (LBICC) during the current climate crisis era. Adhering closely to institutional research ethics, we conscientiously followed Indigenous community protocols at every stage, encompassing pre-camp preparations, the camp itself, post-camp activities, and the development of the manuscript.

Our relational theoretical method empowers and teaches us who we are and who we need to be to decrease the impacts of pollution, global warming, and climate change. It also helps to create action to take collective responsibility for climate change through land-based solutions.

Findings from learning reflections

In our findings, we have discussed five themes about the land-based learning that took place at Indigenous cultural camps to help us understand and learn many new things about the land, animals, plants, ourselves, and climate change. These include stories of learning through the importance of the processing of beaver, the importance of processing



Fig. 2. It shows youth learning from an Indigenous medicine person.

² The term decolonization refers as lifelong learning, unlearning, and relearning responsibility.⁴⁴

fish, the importance of the medicine walk with an Indigenous medicine woman, the importance of hide tanning, and the importance of berry picking. These themes have helped us learn about our responsibilities for the land, plants, animals, and climate change.

Learnings from an Indigenous medicine walk. At the Water Gathering Cultural Camp, we went on a Medicine walk with a medicine woman. She taught us about the importance of medicine through storytelling about her life and learnings. She showed us her collection of medicines and taught us about many specific ones so we could utilize them in times of need. She laid out all her medicines, explaining each and telling us when we should use each. This medicine woman told her story about how she was diagnosed with cancer, but the pure medicines that came directly from the land helped her improve much more than any Western medication did. After she explained the medicines she had already pre-collected, we walked around the land to look at the medicines that were all around us. I did not realize how many medicines were growing everywhere, and I did not even realize it. If I had not learnt about those medicines, I would have continued looking at the plants on the ground, thinking they were just shrubs. It was fascinating to learn about the natural medicines all around us. The medicine woman also explained how when picking a medicine, she always offers the land something in return, such as tobacco. She also told us she does not want to make a book with her medicines because it is easy to confuse two different plants where one can harm someone while the other does good.

Through her stories, we learned how Indigenous medicines can replace all Western ones directly from the land. A lot of Western food and medicines can negatively impact our health. However, Indigenous food and medicine come from the land, and Mother Earth provides us with everything we need to be healthy. From her medicine walk, we learnt how to show respect to the plants on the land because of how much they can help us when we are in need. In Western education, there is only human-based learning; there is no connection with the land or relationships with animals, insects, and plants. The relationships created with other living things also teach us to be compassionate. It pushes us to look beyond our needs and imagine those of others who are a part of ourselves. Western education only sometimes teaches skills that will help students in their everyday lives.⁴⁶ It is essential to relate learning with everyday practices because learning from the land creates relations with the land and people. It allows for meaningful learning with the land to take place. It would happen with related knowledge from the land about Indigenous teachings through connections with animals, plants, insects, and soil.

Learnings from processing fish. When we first arrived at the Indigenous cultural camp in Grandmother's Bay, we saw many people of all generations processing the fish. The fish had just been caught a few hours prior, and there was a whole bucket full of different kinds of fish, such as sucker, white fish, and walleye. After watching how the other children were learning to take off the scales and skin, then filet, I also went to learn. I had a walleye; however, I did not know that and did not know how to process the fish alone. A knowledge keeper saw me struggling and came to help me. He showed me how to do one side and then let me try on the other. As he showed me how to cut the fish, he explained how he did not know how to cut fish when he was younger, but then he recalled what his mother used to do. The Elder explained how all parts of the fish, even the head, can be used. The head can be used as soup, and the bodies with all the bones were given as food to the birds.

Intergenerational conversation was essential for sharing land-based stories, self-determination, and resiliency. The Elders and knowledge-keepers shared their ancestors' land-based sustainable culture and practice with us by explaining the importance of traditional plants, growing food, learning from the land, the importance of non-humans and learning responsibilities in education as a youth. Cutting the fish myself helped us learn where our food was coming from; often, when I'm at home in winter, I eat fish from the grocery store. However, we do not know all the steps to cook and serve the fish. I only saw the process of my parents driving to the store and buying it. However, when processing

the fish, we learned about the different steps. We saw how everyone worked together to catch the fish, cut it, cook it as a community, and then eat it together.

Learnings from berry picking. My younger sister and I walked around the river, looking at all the plants around the Indigenous cultural camp. We started by picking some flowers and creating a bouquet. We sat by the dock, and while sitting there, we noticed some bushes. As we came closer, we realized they were wild raspberries. There were countless bushes. I helped my sister pick them, and we ate them together and collected a few for our parents so they could see the beautiful berries we found. Walking towards them, we looked down and saw more berries; when we took a closer look, we realized they were blueberries. We were surprised to see yet another different kind of berry, and they were all ready to be picked. We ate some and collected a few to add to our collection to give to our parents. I looked around to see if there was anything else and saw another bush with Saskatoon berries. I was excited and amazed by all the different wild berries growing and was happy to see my sister looking so happy picking them for herself and others, too. As we walked around observing the plants, insects and animals, we were excited to see all the bushes of raspberries growing around the river. We saw all different types of insects, including butterflies, bees, mosquitoes, and dragonflies.

All these living things contribute to the life cycle, and everything has a purpose. The bees helped the flowers we were picking bloom, and with that, the bees made their honey. The mosquitoes bite us and then have more offspring, and then the dragonflies eat the mosquitoes. Different animals and humans eat the berries, and the bushes get the water from the rain and even the river that the bushes grow beside. Through collecting berries with my sister, we could see and explain to my sister the importance of every living being. Seeing the different plants, insects, berries, and animals, we could see their connection in real life. Observing the different living things around us while collecting our berries allowed us to see how animals and plants interact with one another and the land. It helped us connect our Western and non-Western knowledge because we found similarities and differences between our education in science at school and what we saw just walking around the Indigenous cultural camp. It is important to see the interaction of different living things to foster respect towards them. Since we respect the living things on the land, we do not want to hurt them; instead, we want to protect them. When the land is protected, climate change does not impact the land as harshly. If everyone saw living things like we did when collecting berries, the land would not suffer from so much pollution and global warming. People must play their role in reversing the impact of climate change, and berry picking with my sister helped us realize that.

Learnings from beaver processing. While at the Water Gathering Cultural Camp, a woman was processing a beaver. I had never seen it before because most of the meat I had eaten all my life came from the supermarket; I had never seen a beaver being processed. First, she showed us how she skinned the beaver to preserve the skin, teaching us how to respect the animal. She explained that to be respectful to the animal, it was never to touch the table, only its fur. She maneuvered the beaver to ensure it was always on top of the fur the entire time she was processing. Afterwards, she showed us how she took the organs and other guts out of the beaver; the organs that could be eaten were saved for consumption, and the rest was put to the side to be fed to other animals. She showed us as she checked if the beaver was healthy enough to eat. Unfortunately, once she checked the liver, it was clear that the beaver was sick and inedible. It was probable that the reason for this was water pollution or the trauma the animal endured when being killed. However, she continued to process her beaver to show everyone the different parts of the beaver and what parts are used for clothing, accessories, or food. For example, she explained how she used the two teeth to make a pair of unique earrings because having beaver teeth is quite a rare accessory.

As the woman processed her beaver, she explained the importance of being self-sufficient regarding the food we eat and why land-based

learning is so important. She explained how Western foods have created severe health crises and helped to develop poor lifestyles. However, Indigenous food is much healthier, promoting longer and healthier lives. All their food is cultivated directly from the land with no added fertilizers or preservatives. She wants to teach the younger generation more about her way of life because it is important for physical and mental wellness. For her, processing her meat helped her overcome her mental issues, and she wants to teach her learning to pass on education to the next generation. Being self-sufficient is a way to help reduce the impacts of climate change and the mental health issues it imposes.

Learnings from hide tanning. At the Indigenous Water Gathering cultural camp, we had the opportunity to observe the processing of an elk hide. We listened to the hide processors as they explained how the elk is skinned and then frozen to be processed into hide later. We could see the frozen fur as it thawed and melted, and then we saw the beginning of the process, where they hung the rawhide onto the frame. They had many different tools for each part of the process, and it was interesting to see how incisions were made all around the hide and then strung up on a large, empty, square frame. As a community, many different people came forward to help scrape the hide, and as more time went on, the hide slowly began to look smooth. While we were watching people scrape the hide, it seemed quite easy; however, when my parents went to help, I realized how difficult it was. My parents rarely scrape hides, so it was more difficult for them than for people familiar with the process. After being scraped, the elk hide was left to dry. In the meantime, a brain solution was formed on another hide that was already dry and ready for the next step. The brain solution contained the brain from the animal, fat, and soap. The woman processing the hide explained how the animal's brain is enough for the entire hide. We found it interesting how something that we would have thought was not used for anything is utilized to soften the elk's tough skin. We would not have thought the brain could create the soft hide we felt. Hides can be used to make clothing such as moccasins and blankets; if the brain solution is not added, it can be made into drums.

Throughout the process, we listened as the hide processors explained how every part of the animal is utilized; nothing goes to waste, even things that would not be expected, such as the brain, nose, and tongue. The tools used to scrape the hide are also made from animal parts, such as bones. People all worked together as a community to produce the soft hide at the end. As seen beforehand, scraping the hide is strenuous and can be a form of exercise. I saw how much effort had to go into the hide in order for the end result to be a success. Indigenous people, before colonization, were much healthier because of the day-to-day exercises incorporated into daily life and because of the natural meats being consumed. Meat processed and sent to grocery stores consumes large amounts of fossil fuels, severely harming the land when produced. However, those carbon emissions are no longer in the equation when hunting directly from the land.

Responsibilities for non-Indigenous youth

From Indigenous-led land-based camps, non-Indigenous youth, particularly immigrant youth, in Canada have many responsibilities towards the land and Indigenous peoples as they navigate and contribute to their adopted communities:

Cultural respect and understanding. Immigrant youth should actively seek to understand and respect the land-based cultures, traditions, and histories of Indigenous peoples in the land they are living. It includes acknowledging the unique relationships that Indigenous communities have with the land and appreciating the significance of these connections.

Environmental stewardship. We learned that adopting sustainable practices and environmental stewardship is a shared responsibility. Immigrant youth can engage in land-based learning and practicing, support Indigenous initiatives, and participate in Indigenous community efforts that promote Indigenous land-water rights, non-human rights,

and environmental justice.

Land acknowledgment and education. We also learned that immigrant youth can play a role in acknowledging the traditional territories of Indigenous peoples during everyday learning and practice. They can actively educate themselves and others about successful Indigenous stories, history and ongoing challenges faced by Indigenous communities, fostering a greater understanding and appreciation for Indigenous perspectives.

Collaborative initiatives. Collaborating with Indigenous communities on various projects related to environmental conservation, cultural preservation, or community development demonstrates a commitment to building respectful and mutually beneficial relationships. This can involve participating in joint initiatives, workshops, and events that promote cultural exchange and understanding.

Solidarity with Indigenous rights. We learned that immigrant youth can use their voices to advocate for the rights of Indigenous peoples. This may involve supporting initiatives that address issues such as land rights, environmental protection, and social justice, actively participating in discussions that amplify Indigenous voices, and standing in solidarity with Indigenous communities.

Participation in reconciliation efforts. Read and learn Canada TRC calls for action in everyday practice.⁴⁷ Actively engaging in reconciliation efforts is essential. Immigrant youth can support initiatives that promote healing, understanding, and reconciliation between Indigenous and non-Indigenous communities, contributing to the ongoing process of truth and reconciliation in Canada.

We actively learned that by embracing these responsibilities, immigrant youth can contribute to the collective efforts of building a harmonious and inclusive Canada that respects the land and honors the diverse cultures that call it home.

Discussion and conclusion

To understand land based learning activities and climate change, we discuss our learning experiences with two critical aspects: learning responsibilities and land-based activities. Only a few studies have focused on the importance of land-based activities through Indigenous cultural camps.^{6,18,48,49} There are few perspectives from immigrants and people of color, even though land-based cultural camps play a crucial role in helping young people improve their capacity to respond to climate change actions. More studies are needed to understand how land-based activities might help youth become resilient to climate change. Our study showcases that by examining how the land-based activities we participated in at the Indigenous cultural camps have influenced who we are today and how our efforts can reduce the impact of climate change.

We have learned many new things through land-based activities, such as community building, climate justice, relationships with the land, people, responsibility, and stories. To understand land-based activities and climate change, we must learn our responsibilities, build relationships, and participate in activities. We must do all we can to keep the land and living things safe and healthy. To do this, we need to know our responsibilities to take action. We learned all this from everything I have discussed in this paper, including beaver processing, fish processing, hide tanning, medicine walks, berry picking, and climate change, all through the Indigenous cultural camps. As many studies have suggested, land-based learning is a critical aspect and tool to challenge Western education methods to reduce climate change's impact.² The teaching in these Indigenous cultural camps helped us to understand what we need to do to take action and what can change in our lives to help decrease the impacts of climate change. The land-based activities in the Indigenous cultural camps in Northern Saskatchewan have been a great learning space for us; it was a place to learn freely with the land around us.

As seen in the Indigenous cultural camp activities, children had many opportunities to learn from their parents, grandparents from different cultures and nationalities, Indigenous elders and knowledge-keepers, and other children. We also have seen how creating intergenerational

and transnational learning spaces helps build relationships with people, land, plants, and animals in response to climate change actions. Participating in activities such as fish processing and hide tanning allowed us to see where our food and clothing come from, creating a relationship to foster respect and care towards our land, water, animals, insects, and plants. Learning about land at Indigenous cultural camps allowed youth to become more aware of their responsibilities to reduce the impact of climate change by caring for the land.⁵⁰ Many talks were about the importance of land-based activities for youth concerning climate change. This is partly because of the ability to bring focus to important issues such as self-sufficiency, unhealthy foods, unclean water, and pollution. However, climate change has many reasons why it is worsening. Land-based activities are important in reducing climate change; however, more people need to take action.

Moreover, land-based learning empowers youth to participate in climate change mitigation and adaptation efforts actively. It instills a deep sense of responsibility and commitment to preserving the planet and recognizing their local environments' cultural and ecological significance. Youth become advocates for sustainable practices, environmental justice, and the protection of indigenous knowledge. In essence, land-based learning serves as a transformative platform, forging a profound connection between youth, climate change, and the land. It equips young individuals with the skills needed to address the pressing challenges of our time but also fosters a sense of belonging to the Earth, inspiring them to work tirelessly towards a more sustainable and resilient future.

Institutional ethics and data availability

This research followed the ethical approval of Mount Royal University (MRU), AB, Canada and Cree First Nations. Data cannot be made available due to ethical restrictions imposed by the MRU Human Participants Ethics Committee. A de-identified dataset is available to appropriately qualified researchers upon request from the corresponding author or the MRU Human Participants Ethics Committee Chair.

CRedit authorship contribution statement

Prarthona Datta: Writing – original draft. **Ranjan Datta:** Writing – review & editing, Writing – original draft, Supervision, Resources, Methodology, Formal analysis, Conceptualization. **Kevin Lewis:** Project administration, Investigation. **Margot Hurlbert:** Resources.

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