



Sustainable Development & the Canadian Mountain Network:

Supporting the Sustainable Development Goals in the Context of Mountain Systems and Partnerships Based on Indigenous and Western Ways of Knowing

APRIL 2021

Prepared by the **Mount Arrowsmith Biosphere Region Research Institute**
for the **Canadian Mountain Network**

MA&RRI



ACKNOWLEDGEMENTS

The Canadian Mountain Network (CMN) received a once-in-a-generation opportunity to position Canada as a global leader in mountain systems research at a time when Canada's mountain systems are undergoing rapid and uncertain change. This opportunity was made possible by the support of a five-year, \$18.3 million grant from the Networks of Centres of Excellence (NCE) program. This funding program has leveraged possibilities for a wide range of research and development activities, including the assessment of CMN's contributions to the United Nations Sustainable Development Goals.

The Mount Arrowsmith Biosphere Region Research Institute (MABRRI) is grateful to CMN for providing us with the opportunity to conduct this research project, allowing us to apply and build on our knowledge of the Sustainable Development Goals. All the primary research and report writing was conducted by MABRRI researchers, under the supervision of MABRRI Research Director, Dr. Pamela Shaw, and was supported by MABRRI Regional Research Institute Manager Graham Sakaki. We would

like to thank Claire Stewart for her creative skills in designing this document. A gracious thank you is extended to Matthew Berry, CMN Strategic Advisor and Nicole Oliver, CMN Programs Manager, for their support and guidance throughout the project. We would also like to thank each of the CMN researchers who generously took time to meet with us and provide valuable information for this study.

This project addresses research initiatives within the region presently known as Canada, however, we would like to acknowledge that Indigenous peoples have been in relationship with this land since time immemorial. This longstanding and deeply rooted relationship illustrates that Indigenous knowledge is fundamental in understanding sustainability through a holistic lens. While this report has been written with an academic approach, it is important to note that Indigenous knowledge has informed many perspectives, and that the continuous braiding of knowledge systems is an ongoing learning process.



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01 INTRODUCTION

RECOGNIZING THE CANADIAN MOUNTAIN NETWORK'S ROLE IN THE SDG AGENDA

Established in 2019, the Canadian Mountain Network (CMN) aims to support the resilience and health of Canada's mountains, peoples, and places¹. Through research partnerships based on Indigenous and Western ways of knowing, decision-making and actions are informed by multilateral and multidisciplinary perspectives in a way that best suits the sustainability of mountain systems². By engaging in collaborative, interdisciplinary research that addresses issues and relationships between mountain environments, economies, and society, CMN is committed to advancing sustainable mountain development³.

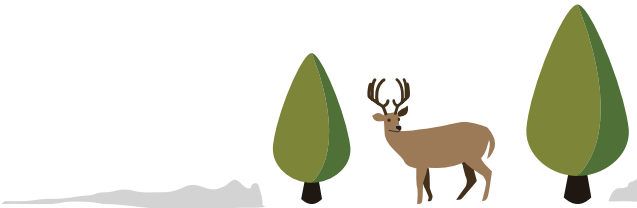
Outlined by the United Nations (UN), the 17 Sustainable Development Goals (SDGs) act as a blueprint to achieve a more sustainable future for all⁴. These goals are a call to all nations to increase efforts toward social, economic, and cultural prosperity, while simultaneously caring for and protecting our planet⁴. Working towards this agenda, the Government of Canada developed the Federal Sustainable Development Strategy (FSDS), which focuses on Canada's commitments to

achieving a more sustainable nation, with the global SDGs in mind⁵. The FSDS is comprised of 13 goals which focus on the environmental dimensions of the SDGs, specifically supporting 12 out of 17 SDGs⁵. CMN has realized its role in helping Canada maintain and inform these commitments by demonstrating that the nation's mountains are foundational to sustainable development. Mountain systems and mountain research are of critical global importance; however, only two of the SDGs explicitly address mountains. Achieving national and global sustainable development requires increased awareness and understanding of the importance and vulnerability of mountain systems. Therefore, CMN called upon the Mount Arrowsmith Biosphere Region Research Institute to identify the linkages between its research and initiatives and the SDGs.



“ Given the global significance of our country's iconic mountain systems, we believe that CMN can take a leadership role in supporting Canada's efforts to achieve mountain-related SDGs. ”
CMN Strategic Plan (2019)³

Highlighting and reporting on these linkages aims to showcase the role of mountain systems and collaborative research in a sustainable future, while also demonstrating the significance of CMN's work towards Canada's FSDS and the Global Agenda.



UNITED NATIONS SUSTAINABLE DEVELOPMENT GOALS

Each Goal is broken down into targets and indicators.

*For example: **SDG 15—Life On Land***

Target 15.4 By 2030, ensure the conservation of mountain ecosystems, including their biodiversity, in order to enhance their capacity to provide benefits that are essential for sustainable development¹³.

Indicator 15.4.1 Coverage by protected areas of important sites for mountain biodiversity¹⁴.

“ [The SDGs] recognize that ending poverty and other deprivations must go hand-in-hand with strategies that improve health and education, reduce inequality, and spur economic growth—while tackling climate change and working to preserve our oceans and forests. ”

United Nations (2015)¹²



169 TARGETS

247* INDICATORS

*The number of indicators fluctuates as the SDG indicator framework is reviewed annually by the United Nations Statistical Commission¹⁴.



UNITED NATIONS SUSTAINABLE DEVELOPMENT GOALS

The SDGs build on the momentum put in place by the Millennium Development Goals (MDGs), which were eight goals developed in 2000 that aimed to reduce extreme poverty, as part of the 2015 Agenda^{4,5}. In 2012, world leaders gathered at Rio+20, the UN Conference on Sustainable Development⁶. Rio+20 led to development of the outcome document, *The Future We Want*, that renewed a global vision for sustainable development, launching a process to develop the next set of goals to follow the 2015 Agenda^{6,7}. At the 2015 UN Sustainable Development Summit, over 150 world leaders gathered and adopted *Transforming our World: the 2030 Agenda for Sustainable Development*^{6,8}. This 15-year Agenda contains the 17 SDGs that aim to achieve a more sustainable future for all⁵. With 169 targets, the SDGs have a broader scope than the MDGs by addressing the root causes for poverty and the interconnectedness of the roles of economic growth, social inclusion, and environmental protection in global sustainable development⁸.

As part of Agenda 2030, the **SDGs call all world nations—regardless of economic status—to take action** towards fostering the social, economic, and cultural prosperity of their citizens while simultaneously caring for and protecting the earth⁸. The overarching principle of the 2030 Agenda is to *Leave No*

One Behind, which means that achievement of global sustainable development should reflect inclusive and equitable participation in, contribution to, and benefit from the 17 SDGs⁹.

Five years following the adoption of the SDGs, the UN Secretary-General determined that progress has been made, but not at a rate that would meet all 17 Goals by 2030^{5,10}. In 2020, the **Decade of Action** was initiated to dramatically urge all nations and sectors of society to increase their efforts to achieve the SDGs and accelerate sustainable solutions to the world’s urgent issues⁹. At the start of the Decade of Action, the COVID-19 pandemic induced a global crisis demonstrating that the achievement of the SDGs has become more urgent and apparent, with upscaled mobilization for collective action⁹. However, data shows that even before the onset of COVID-19, progress was not on track to meet the SDGs by 2030¹¹.



THE SUSTAINABLE DEVELOPS GOALS IN THE CONTEXT OF MOUNTAIN SYSTEMS

As mountains cover 26.5% of the Earth's surface and 24% of Canada's landmass, these regions are essential to sustainable development^{14,15}. Mountains play a significant role in providing natural resources, supporting biodiversity, and housing 15% of the global population, including many Indigenous communities^{16,17}. This importance is recognized in the Rio+20 outcome document, *The Future We Want*, and as the SDGs were developed from Rio+20, mountains are incorporated in some Goals³. However, only three SDG targets—6.6, 15.1, and 15.4—explicitly mention mountains. Even so, greater understanding and protection of mountains and the vulnerability of their systems and communities is critical in continuing to provide ecosystem goods and services depended upon by humanity and nature.

While the explicit focus of the SDGs is not related to mountain systems, the topics covered by the SDGs are all impacted by mountains in some way. Therefore, the SDGs can be framed in the context of mountain systems to acknowledge that these diverse and resilient, yet fragile, systems need greater protection and acknowledgement to mobilize the achievement of sustainable development.

Climate Action: Over **600 glaciers have disappeared** due to climate change, making mountain systems exceptionally sensitive³⁵.

13

Clean and Affordable Energy: Renewable energy sourced from mountain systems can reduce reliance on harmful energy consumption²⁸. With **hydropower providing one fifth of all electricity worldwide**, some countries rely exclusively on this renewable energy source²⁷.

7

Gender Equality: While women play important roles in mountain communities, they face inequalities. Women and girls often **lack basic rights**, have **limited access to education** and land ownership, and are at a greater **risk of malnutrition**²⁵.

5

Zero Hunger: Climate variability, harsh terrain, and social and political marginality make mountain peoples vulnerable to food insecurity^{19,20}. In 2017, **346 million rural mountain people experienced food insecurity**²⁰.

2

Life below water: Mountainous watersheds connect marine and freshwater systems. Marine ecosystems can be **vulnerable to pollution and contamination** carried through these watersheds, especially in coastal and small island mountain regions³⁶.

14

Sustainable Cities and Communities: Although nearly **1 billion** people live in mountain regions, Indigenous peoples have resided there since time immemorial²⁴. **Communities are becoming increasingly vulnerable** to societal and environmental change, increasing the need to embrace and preserve traditional knowledge²⁶.

11

Industry, Innovation, and Infrastructure: Mountain systems provide **unique opportunities for advancing research**, particularly through the scope of understanding sustainable management of linked social-ecological systems³¹.

9

Partnerships for the Goals: **Mountains** require collaboration and knowledge sharing since they **occupy more than half of national territory** in 53 countries²⁶.

Reduced Inequalities: Indigenous mountain communities face **marginalization, displacement, and encroachment**²³. Women, children, and the elderly are more vulnerable to mountain disasters and hazards as men migrate for better income³¹.

Quality Education: Although Indigenous mountain peoples are **custodians of traditional place-based knowledge**, they often have to leave their mountain communities to pursue further education^{22;23}.

Peace, Justice, and Strong Institutions: Lengthy conflicts and injustices, such as violence against Indigenous women and girls, are common in remote mountainous zones. **Indigenous women are 3 times more likely to be killed** by a stranger than non-Indigenous women are^{38;39}.

Good Health and Well-being: Although mountains promote people's welfare through cultural significance and recreation, many communities face barriers to good health and well-being²¹. Only **29%** of the rural mountain population **live in areas with accessible health care services**²⁰.

Decent Work and Economic Growth: Economic opportunities, such as **15-20% of global tourism**, are provided by mountain regions²⁹. Yet, mountain communities are facing economic challenges due to globalization³⁰.

Clean Water and Sanitation: Mountains provide **60-80% of global freshwater resources** supplying **over half** of the world's population²⁷. However, climatic and societal changes are creating an imbalance of water supply and demand²⁶.

Life on Land: With **more than 50% of the world's biodiversity hotspots** concentrated in mountains, impacts from human activity and climate change have made sustainable management and protection of mountain biodiversity a global priority^{34;37}.

Responsible Consumption and Production: **Mountain goods and services** are both critical for environmental health and foundational to many economic sectors, **supporting billions** of individuals^{32;33}.

No Poverty: More than **90%** of the world's mountain dwellers live in developing countries, with many living below the poverty line²⁰. In 2017, **459 million rural mountain people** had limited access to infrastructure and services²¹.

17

10

4

16

3

6

12

1

15

8

SUSTAINABLE MOUNTAIN SYSTEMS AND THE UN DECLARATION

The United Nations Declaration on the Rights of Indigenous Peoples (the UN Declaration) is currently the most comprehensive international instrument addressing the human rights of Indigenous Peoples⁴⁰. The Government of Canada endorsed the Declaration in 2016 and introduced a proposed bill to advance and provide a framework for full implementation of the UN Declaration in 2020^{41,42}. The UN Declaration holds cultural integrity at its core, and promotes respect and recognition of the human rights of Indigenous Peoples as a necessary step towards reconciliation.

The UN Declaration and the SDGs portray similarities by promoting human rights standards and fundamental freedoms. **Out of 169 SDG targets, disparities experienced by Indigenous Peoples are explicitly addressed only twice**⁴³. Therefore, this project turned to addressing the UN Declaration as a supplementary framework to demonstrate connections between the UN and CMN research initiatives. This approach aims to showcase the meaningful work of CMN researchers, while raising awareness for the fact that sustainable development cannot be achieved while leaving Indigenous peoples behind.

Approximately 1,670,000 individuals in Canada self-identify as Indigenous, making up 4.9% of Canada's total population in 2016⁴⁴. Although the overall well-being of Indigenous Peoples has reportedly improved in recent years, it continues to fall behind the well-being of non-Indigenous peoples in Canada⁴⁴. Rural and remote areas, such as mountain regions of western and northern Canada, face higher barriers to labour markets, education, and public health. The overarching SDG framework focuses on reducing inequalities, which is of particular relevance to Indigenous Peoples⁴⁴. Therefore, both the UN Declaration and the SDGs are necessary frameworks for ensuring that sustainable mountain development is equitable with Indigenous communities who inhabit these regions.

Articles of the UN Declaration that align with CMN research initiatives are identified throughout this report. While most CMN initiatives directly or indirectly connect to the UN Declaration, only initiatives that have shown direct connections based on the information collected for this study are identified. Although some research projects and initiatives may not indicate connection to the UN Declaration in this report, CMN may contribute to some Articles in ways not yet reported on.

“ *There should be a Sustainable Development Goal based on Indigenous Knowledge, as it relates to sustainability. Many cultural aspects of land cannot currently be captured in the existing SDGs.* ”

William Snow, Principal Investigator

CMN'S PROGRESS TOWARDS THE SDGS

CMN's values, goals, and research priorities address the urgent importance of mountains in Canada, but how do they align with and contribute to the global agenda for the SDGs? As a collaboration between CMN and MABRRI, this report answers this question by identifying the linkages between CMN initiatives and research and the SDGs.

OBJECTIVE

Identify, celebrate, and report on how CMN is advancing the United Nations Sustainable Development Goals.

Note: (1) This project cannot be considered an exhaustive assessment of CMN's SDG contributions, as access to information varied. All data on research projects was collected during initial stages; therefore, SDG alignment is subject to change throughout each project's duration. COVID-19 may have also altered the timeline and intentions for several projects.

(2) Most information pertaining to the details of individual CMN research projects was obtained through personal communication with researchers. However, communication with CMN researchers was variable, sometimes information about research projects to be obtained through CMN website information and internal documents.

METHODS:



Desktop review: A review of the CMN website and online information about research projects and initiatives was conducted to collect preliminary data.



Survey: An online survey was distributed to the Principal Investigators of each CMN research project to gain an understanding of how researchers view their projects in the context of the SDGs.



Semi-Structured Interviews: 15 interviews were conducted with Principal Investigators, Investigators, and Collaborators from the CMN research projects.



Data analysis: SDGs were localized to fit the scope of Canadian mountain research

- All information was coded using qualitative data analysis software
- The SDG targets and UN Declaration Articles were coded to corresponding CMN information

LOCALIZING THE SDGS FOR CANADIAN MOUNTAIN RESEARCH

Connections between the SDGs and CMN efforts were made based on alignment with SDG targets. As the SDGs guide an international agenda, many of the targets are broad in scope, have international foci, and speak to concerns specific to developing countries. While CMN is a research network, its focus and values are based on inclusion, equity, reconciliation, and collaboration. Therefore, targets that address broad and international scales and may

not typically be considered applicable to a Canadian research network were localized rather than omitted. For example, targets that speak to support for development and inclusion of developing countries were instead approached through the lens of the respective Canadian communities to ensure that all CMN efforts are addressed accordingly. Appendix A discusses targets that were localized in further detail.

A stylized illustration of a mountain landscape. The background features a dark blue mountain peak under a light blue sky with white clouds. In the foreground, there are rolling green hills with various types of trees (coniferous and deciduous). A blue river flows through the landscape. A black bear is walking on a hill, and two deer are in the lower left. The text is overlaid on a white rectangular box in the center.

04 SUPPORTING THE SDG AGENDA THROUGH CANADIAN MOUNTAINS: NETWORK-WIDE EFFORTS

Enhancing Research and Innovation connects to

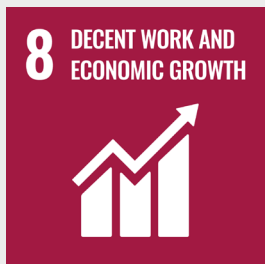


Targets 9.5 9.c

Learning and Gainful Employment connects to



Targets 4.4 4.5 4.6 4.7



Targets 8.3 8.4 8.5 8.6

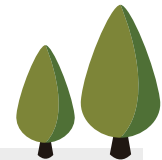
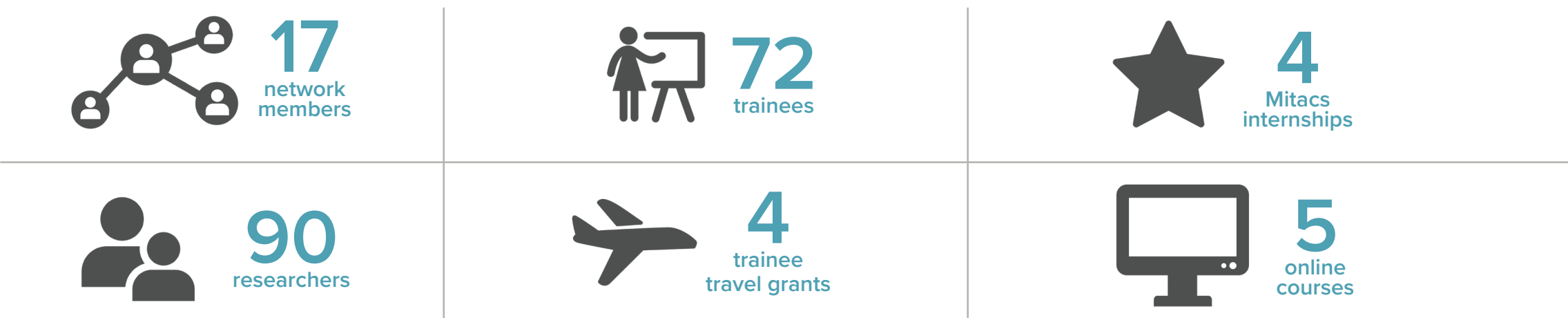
ENHANCING RESEARCH AND INNOVATION

As Canada’s first formal research organization dedicated to advancing the understanding of mountain systems, CMN most strongly supports SDG 9 targets that speak to enhancing research capacities and promoting innovation. By fostering research partnerships that support the resilience and health of Canada’s mountain systems, CMN aims to become a leading information hub for mountain systems researchers and knowledge users¹⁸. In 2019, the Network was awarded a \$18.3 million grant from the NCE program, which has funded 16 research projects across Canada¹⁶. Through solutions-oriented research, these projects are enhancing knowledge mobilization and delivering a variety of innovative approaches to better understand Canadian mountain systems². In addition, CMN strives to contribute to an increasing number of Canadian researchers by enhancing research training opportunities, which supports Target 9.5.

SUPPORTING RESEARCH ADVANCES THROUGH LEARNING AND GAINFUL EMPLOYMENT

Through the diverse network of members and researchers, CMN is training a variety of skilled mountain systems researchers, including Indigenous, non-Indigenous, academic, and non-academic trainees¹⁶. Trainees are provided with diverse opportunities, working with both Indigenous and Western knowledge systems and research approaches¹⁶. These opportunities will help to develop strong intercultural awareness and benefits of improved employment opportunities - all of which advance education and employment targets of SDGs 4 and 8. Through the coalition of Highly Qualified Personnel (HQP) for CMN’s NCE program, the multidisciplinary nature of the Network is advancing unique learning opportunities to maximize trainee possibilities for integration into a multisectoral workforce¹⁶.

CMN FUNDING SUPPORTS¹⁶



Climate Change and
Ecosystem Protection
connects to



Targets **6.6**



Targets **13.3** **13.b**



Targets **15.1** **15.3** **15.4**
15.5 **15.9** **15.a**

BUILDING KNOWLEDGE AND CAPACITY FOR CLIMATE CHANGE AND ECOSYSTEM PROTECTION

Through its research priorities, CMN is situated in a position where understanding climate change and enhancing the capacity for environmental protection, restoration, and conservation provide strong ties to SDG 13 and SDG 15 targets. As mountain systems prominently house freshwater ecosystems and sources, many CMN knowledge mobilization initiatives and research projects address Targets 6.3 and 6.6 as they relate to supporting the protection, conservation, and restoration of water-related ecosystems.



4
CMN
podcast
episodes

have discussed topics relating to protection for biodiversity & wildlife conservation⁴⁸.



3 of 4
Mitacs internships

funded by CMN address biodiversity¹⁶.

Enhance an understanding of the impacts of rapid environmental, economic, and social change on the resilience of mountain systems; and

2 out of 5

CMN Goals are to

Enhance funding for mountain systems research by improving public and policymaker understanding and appreciation of the importance of mountain systems¹⁸.



CMN is coordinating the Yukon Territory's development of **ALCES Online**—a decision-support tool for cumulative effects assessment of risk associated with land use and climate change⁴⁵.

CMN
is providing financial
support for

Fire with Fire

A two-year collaborative project that is working to mobilize Indigenous and scientific knowledge of fire to inform innovative practices for local, regional, and provincial climate change adaptation⁴⁹.



**MOUNTAIN
LEGACY
PROJECT**

The Mountain Legacy Project

A collaborative project that is offering a unique data set to assess Canadian Rocky Mountain landscape change over the last century. Repeat photography of historical surveys aims to inform solutions and strategies for ecological restoration⁴⁷.

Strengthening
Indigenous Partnerships
connects to



Targets **10.2** **10.3** **10.6**



Targets **11.3** **11.4**



Targets **17.6** **17.16**

PROMOTING DIVERSITY AND
STRENGTHENING INDIGENOUS PARTNERSHIPS

CMN is uniquely expanding on academic approaches to research by prioritizing funding and support for Indigenous-led research projects, with an emphasis on braiding knowledge systems². This focus strongly influences CMN’s progress towards targets under SDGs 10, 11, and 17. For example, Targets 10.2, 10.3, and 10.6 are well-represented by CMN’s acknowledgement of existing inequities in access to funding that create barriers for Indigenous research. CMN aims to reduce this barrier by advocating for greater access to government funds, in addition to growing its own commitments to Indigenous research funding¹⁶.

As CMN’s purpose is to “support the resilience and health of Canada’s mountain peoples and places through research partnerships based on Indigenous and Western ways of knowing that inform decision-making and action”, the conservation and protection of Canada’s cultural and natural heritage is built into the Network’s operations¹⁸. These efforts, that relate to Targets 11.3 and 11.4, also advance equity and respectful partnerships as addressed in Targets 10.6, 17.6, and 17.16, by creating an ethical space in which mutual respect and collaboration exists between Indigenous and Western ways of knowing and doing.

In addition to these SDG targets, it should be recognized that CMN’s work addresses several Articles from the UN Declaration. By advocating for bringing Indigenous knowledge and Western science together in research partnerships to inform and enhance decision-making, CMN is providing an ethical space in its governance, management, and programs to support the leadership of Indigenous individuals and communities¹⁶.

“[We are] supportive of the broad and innovative way in which CMN has interpreted the concept of Highly Qualified Personnel (HQP). Elders and youth are both considered HQP and those who may not have access to university education are participating in the project work and are able to be considered HQP.”

CMN Researcher

For the first time in the NCE program, CMN has provided the opportunity for Indigenous organizations to directly apply for research funding alongside academics².

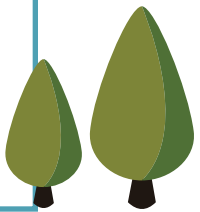
Such projects received **32%** of funding, supporting **6** Indigenous-led projects¹⁶.

CMN’s work addresses the following UN Declaration Articles:

3, 11.1, 13.1, 13.2, 14.3, 15.1, 18, 19, 20.1, 23, 25, 26.3, 27, 29.1, 31.1, 35

1 of 4
Research Priorities

directly relates to promoting diversity and strengthening Indigenous partnerships: *Exploring how Indigenous Peoples apply Indigenous culture and knowledge to decision-making within mountain systems¹⁸.*



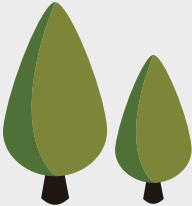
Transparency Through
Public Access
connects to



Targets **16.6** **16.7** **16.10**

TRANSPARENCY THROUGH PUBLIC ACCESS TO INFORMATION AND PARTICIPATORY GOVERNANCE

Relating to Target 16.7, the governance structure of CMN holds inclusive and participatory decision-making at its core and is informed by both Indigenous and Western ways of knowing. As support for Indigenous-led research is historically uncommon within academic research, aspects of Indigenous-led research remain underdeveloped¹⁸. CMN is maintaining accountability to its members by acknowledging the anticipated learning curve and its associated challenges with this new and more inclusive approach to governance and research¹⁸. The transparency of this recognition, in addition to public availability of the Network’s governance structure and financial statements, advances CMN’s contribution to Targets 16.6 and 16.10.



Partnerships for
Knowledge Mobilization
connects to



Targets **17.1** **17.6** **17.8**
17.14 **17.16**

PARTNERSHIPS FOR KNOWLEDGE MOBILIZATION

In its essence, CMN has strong ties to SDG 17 and a number of its targets. The success of sustainable development and implementation of the SDGs relies on collaborative partnerships and stakeholder engagement⁴⁹. Similarly, the success of valuable mountain systems research and knowledge mobilization relies on a diverse and collaborative community of Indigenous and non-Indigenous researchers, and is supported by a co-production of knowledge¹⁸. In respecting that different people have different ways of knowing, doing, and being, building trusting relationships and sharing knowledge are considered core objectives of CMN¹⁸.



17
network
members

made up of **13** educational institutions and **4** Indigenous-led conservation initiatives¹⁶.



41 **2**
guests seasons⁴⁸

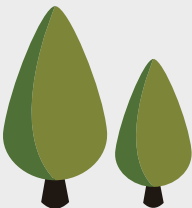
The **Canadian Mountain Podcast** is a knowledge mobilization initiative produced as a partnership with the Journalism Program at **Mount Royal University**¹⁶.

CMN is a member of:

The International Mountain Society, publisher of the *Mountain Research and Development Journal*, whose goal is to advance knowledge and disseminate information about mountain research and development⁵⁰; and

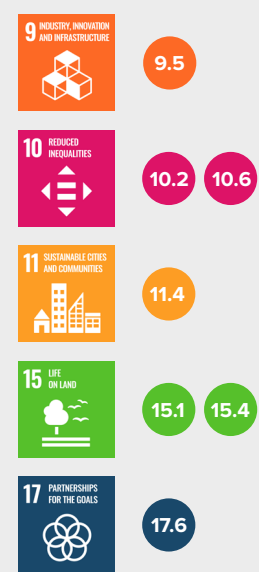


The **Sharing Multi-Network Resources for Trainee Success** Seminars (SMRTS) Program —a professional development initiative between 14 research institutes and national provincial networks aimed at providing the best possible programming to trainees⁵¹.



This project is connected to the following UN Declaration Articles:
15.1, 18, 31.1

Canadian Mountain Assessment touches on the following targets:



The CMA was formed with the intention of **tracking Canada's progress on SDGs**, with the most well-represented likely being SDGs **3, 4, 10, 11, 13, 15, and 17**.

NATIONWIDE PROJECT HIGHLIGHT: CANADIAN MOUNTAIN ASSESSMENT

Across Canada, there has yet to be a coherent, continental-scale assessment of the Nation's mountain systems. The Canadian Mountain Assessment (CMA) is responding to the need for such an assessment by examining and evaluating existing knowledge to determine what is known, what is not known, and what needs to be known about mountain systems in Canada⁴⁹. In addition to addressing the need for this information, this assessment is developing and **advancing a more holistic approach** by weaving Indigenous and Western scientific knowledge together. This will produce a wholesome state of knowledge regarding the environmental, social, cultural, and economic status of Canadian mountains.

Through a nationwide survey, Canadians have shared their perspectives of how the CMA should be structured, allowing the assessment to be useful and relevant for all stakeholders.

In addition to ensuring the information collected and disseminated through the assessment is **inclusive and valuable across all communities** and stakeholder groups, the governance, methodology, and structure of the CMA was

developed through thoughtful partnerships. **Indigenous, scientific, and government partners are working collaboratively** to ensure that the variety of stakeholder values and interests are also represented in the assessment⁵². These collaborations also enhance the opportunity to raise the profile of mountains in Canada to an international level, which is important for including Canada in the conversation of **sustainable development for mountains**. In addition to meeting certain SDG targets through the development of the CMA governance, methodology, and structure, this project was formed with the intention of tracking Canada's progress on SDGs as well as the Paris Agreement⁵².

The CMA prioritizes an inclusive and representative collaboration of knowledge; therefore, the assessment aims to serve as a tool for **Indigenous communities to document their knowledge** about mountain areas, which will be respectfully braided with findings from Western science perspectives. Not only is the CMA advancing an inclusive assessment of existing knowledge about mountains, but it also provides a platform to build community networks among Canadian mountains, ensuring Indigenous voices are heard.



“There is an opportunity for every SDG topic to appear in the assessment.”
Graham McDowell, Project Leader

A stylized landscape illustration featuring a dark blue mountain peak in the background, white clouds, and a blue river flowing through a green valley. The valley is populated with various green trees, a black bear, and two deer. The text is overlaid on a white rectangular area in the center.

05 SUPPORTING THE SDG AGENDA THROUGH CANADIAN MOUNTAINS: CMN RESEARCH PROJECTS



The Shútagot'ine Cultural Landscape Project (p27)

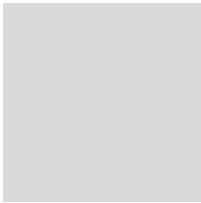
Collapsed caribou fence used to channel caribou towards a corral, Mackenzie Mountains, NWT.

Photo: Tom Andrews.



Hunters returning to their boat on the Deh Cho (Mackenzie River), NWT

Photo: Alan Emery, Unsplash

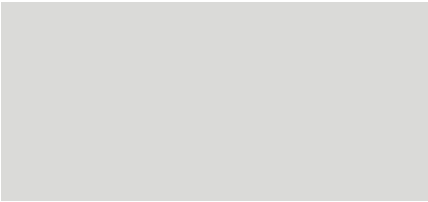
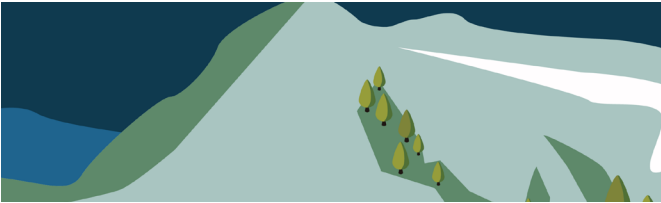


The Shútagot'ine Cultural Landscape Project (p27)

Boulder and pole fence used to entrap Dall's sheep, Mackenzie Mountains, NWT.

Photo: Glen MacKay, GNWT.

NORTHWESTERN CANADA



Kluane National Park Reserve, Yukon

Photo: Kalen Emsley, Unsplash



● Kluane First Nation, Yukon

BRINGING RESEARCH HOME: RECLAIMING RESEARCH TO TELL THE STORY OF CLIMATE CHANGE IN THE KLUANE FIRST NATION TRADITIONAL TERRITORY

Bringing research home aims to enhance Kluane First Nation's (KFN) capacity to actively **advance and participate in research** within their Traditional Territory. By developing a KFN Research Protocol, the project aims to develop more personal and community-situated relationships between KFN and researchers. The development of a **community-centred protocol** will ensure that research projects are culturally appropriate, follow KFN protocols, and are oriented toward KFN priorities. As knowledge mobilization is at the core of this project, results and outputs of this study will be publicly available, shared widely, and applicable to other First Nations.

Following Indigenous Methodologies, this project utilizes a participatory approach guided by Indigenous ways of knowing and relies on input from members of KFN for every stage of the research. To develop a research framework that is **inclusive and community-led**, perspectives of local community members are being captured through ongoing engagement as they are integral to the development of ethical research protocols for the KFN Territory. Working towards an approach that allows all citizens to be directly involved with research

inherently includes capacity-building for youth through **training and employment**. Research training opportunities will also be provided to community members, which will enhance the inclusion of KFN members as **partners in the research** taking place in their Territory.

The KFN Traditional Territory has experienced drastic effects of climate change, and as those who hold local and relevant knowledge to the most pressing issues, KFN participation in research is vital to enhancing the capacity for management and mitigation efforts related to climate change. To improve knowledge dissemination and raise awareness for **localized climate change research**, students are building *The Atlas*, an innovative mapping tool and database. The publicly available interactive map will locate climate change research projects within the Traditional Territory and allow community members and researchers to share knowledge and information.

This project is connected to the following UN Declaration Articles:

3, 13.1, 15.1, 18, 31.1

SUPPORTED TARGETS



gain **employment** and **applied research experience**

In 2018 and 2019, the **Kluane Lake Research Summit** was hosted to facilitate discussions and partnerships while allowing KFN members to **share their priorities and protocols** with the researchers.



- Kluane Lake, Yukon
- West Moberly and Saulteau First Nations, British Columbia

As defined by Mi'kmaq Elder Albert Marshall, **Two-Eyed Seeing** combines the strengths of both Indigenous and Western ways of knowing as a framework for reconciling and collaborating, for the benefit of all^{54;65}.

EFFECTS OF CLIMATE CHANGE AND HUMAN ACTIVITIES ON MOUNTAIN SPECIES AND ECOSYSTEMS

To address urgent challenges and needs of mountain communities and knowledge users, *The Effects of Climate Change and Human Activities on Mountain Species and Ecosystems* is taking a land-based and place-based approach to **connecting Indigenous and scientific researchers**.

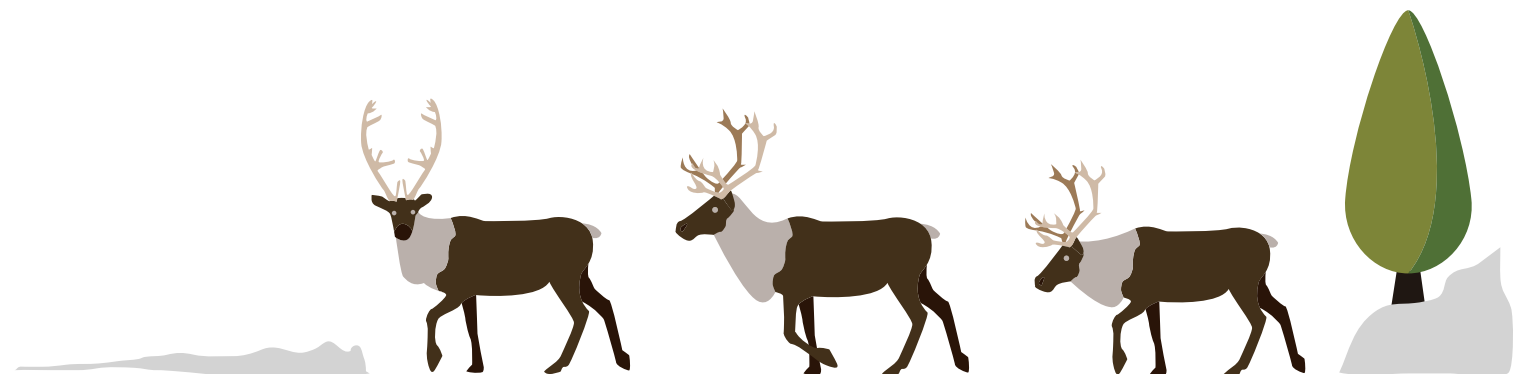
Through two projects, collaboration of Indigenous and scientific knowledge will work to restore mountain caribou populations to ecologically and culturally significant numbers, while shifting classic Western science to a Two-Eyed Seeing approach⁵³. To ensure effective knowledge transfer, **place-based training** will be provided to academic and Indigenous partners, which also aims to identify how to best braid Indigenous and Western ways of knowing. Utilizing long-term data from the **Community Ecosystem Monitoring Program**, researchers aim to understand how **mountain species and ecosystems are responding to climate change**⁵³. Overall, the project aims to inform governance frameworks and evidence-based policy by identifying traditional measures to **recover declining caribou populations** and restore habitat through Indigenous-led conservation.

SUPPORTED TARGETS



This project is connected to the following UN Declaration Articles:

13.1, 18, 29.1, 32.1





● Yukon, Northwest Territories, British Columbia, Quebec, and Newfoundland & Labrador

“It’s time to advance Indigenous protected areas and support them as it’s been proven worldwide that Indigenous knowledge sustains biodiversity on our planet.”

Norma Kassi,
Principal Investigator



trained in applied research

EXPLORE, DESCRIBE, AND DEVELOP A METHODOLOGY TO BEST ACCOUNT INDIGENOUS PERSPECTIVES ON THE VALUE OF LAND GUARDIANSHIP IN MOUNTAIN REGIONS AND THE CONTRIBUTIONS TO THE BIODIVERSITY AND WELLBEING OF THEIR NATIONS

Since time immemorial, Indigenous communities have cohabitated in mountain environments, acting as stewards of the land. With the ever-growing concerns of environmental change, there is an increasing need for Land Guardians, especially in Canada’s northern mountain regions. This project aims to respond to this need by improving an understanding of the effectiveness of **Indigenous Land Guardian, Stewards and Monitoring programs**. While examining the impacts of these programs on mountain systems and communities, the development of a Land Guardian framework aims to revitalize traditional Indigenous knowledge that is essential to the **conservation and protection** of critically important mountain systems.

To strengthen intergenerational knowledge transfer, this project will also focus on providing community-based research training opportunities for Indigenous youth. Youth will learn how to design and deliver community-based, **Indigenous-led research projects** that address urgent community needs, while also engaging in **partnerships with**

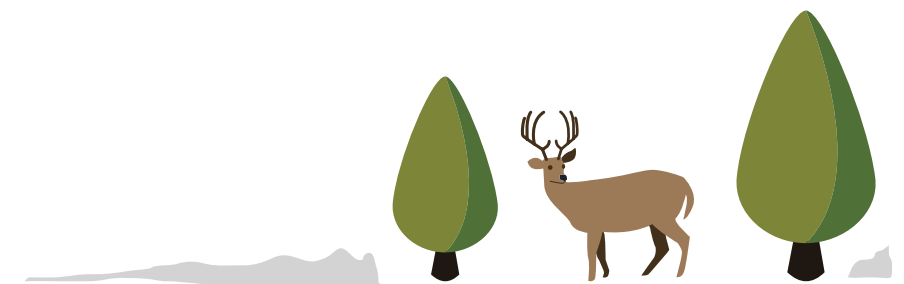
Western knowledge. Through community-based engagement, youth will connect and learn about traditional histories, people, and protocols that are fundamental to their communities. Additionally, the training will use a land-based, place-based approach in which traditional knowledge recognizes environmental importance and the relationship Indigenous peoples have with the land.

Following the training, youth will be supported in assisting their communities in developing a research project to address **community-identified needs**. It is also anticipated that the training will encourage youth to pursue further studies and employment opportunities. As a result, the project will have trained a new generation of land-based leaders. With Indigenous land-based leaders working towards conservation and stewardship, there is potential for a **positive economic shift** within Indigenous communities. Overall, this project will advance the role of both Indigenous and Western ways of knowing, and create opportunities for **interdisciplinary and intercultural learning**.

This project is connected to the following UN Declaration Articles:

3, 13.1, 14.2, 14.3, 23, 25, 29.1, 31.1

SUPPORTED TARGETS





● Taku River Tlingit Traditional Territories, British Columbia and Yukon

ŁINGÍT KUSTEEYÍ (TLINGIT WAY OF LIFE): REVITALIZING TLINGIT LAW FOR LAND AND WILDLIFE

Initiated in 2017 in partnership with West Coast Environmental Law, the *Łingít Kusteeyí (Tlingit Way of Life): Revitalizing Tlingit Law* project aims to revitalize and articulate Tlingit laws as a method to rebuild the relationship between wildlife and humans in Taku River Tlingit First Nation (TRTFN) Traditional Territory. As an Indigenous-led and community-led project, all research and activities are guided by the community through ongoing engagement. This project has taken an innovative approach to revitalizing traditional laws by adapting the *Revitalizing Indigenous Law for Land, Air and Water (RELAW) methodology* to fit the context of the community, ensuring there are safe spaces for citizens to engage with their laws⁵⁶. RELAW is a **collaborative** approach to researching Indigenous laws in a way that supports Indigenous communities in deciding how to develop and implement legal principle⁵⁶. To ensure the research is truly community-oriented, both researchers and community members are being trained on the RELAW approach to enhance **participatory involvement** in the project.

The main objective of this project is the development of a **TRTFN Wildlife Protocol and Policy that is rooted in Tlingit traditional practices, perspectives, and law**. The protocol and policy will combine Indigenous and

Western ways of life by **revitalizing traditional customs** to guide wildlife interactions in TRTFN Territory, while also supporting governance of wildlife management from the provincial government and other First Nations. The research team is working to ensure that the laws will be made explicit for both Indigenous and non-Indigenous community members and that non-Indigenous wildlife management practices align with those of TRTFN. Additional outcomes of this project will be the development of **educational materials** such as posters, videos, and story books, which will educate Tlingit citizens and the public on Tlingit laws and stories.

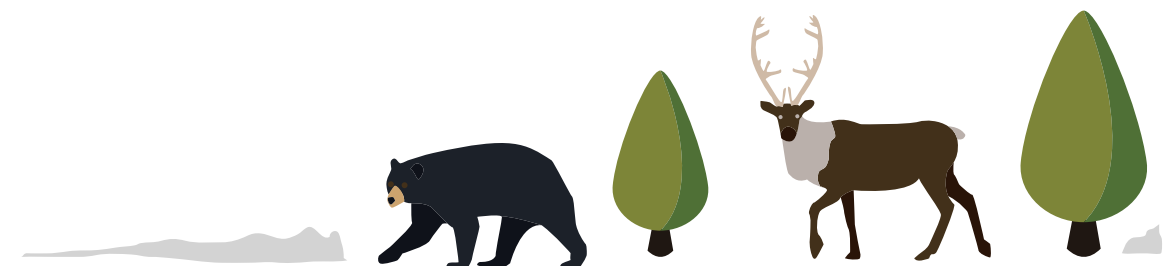
SUPPORTED TARGETS



This project is connected to the following UN Declaration Articles:

11.1, 13.1, 25, 27, 29.1, 32.1, 34

Tlingit Law camps will connect youth, Elders, and knowledge holders to strengthen their connections to traditional laws.





● Yukon, Northwest Territories,
British Columbia, and Alberta



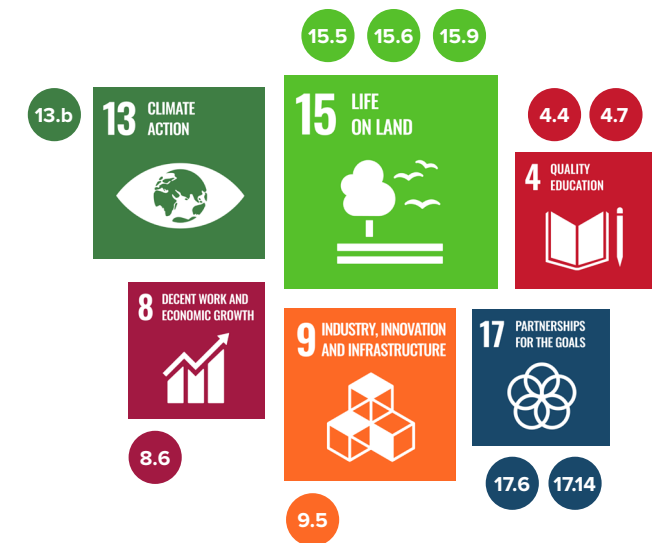
LONG-TERM MONITORING OF HARVESTED MOUNTAIN UNGULATES TO IMPROVE THEIR CONSERVATION AND SUSTAINABLE USE

Analysis of horn measurements that are collected across several decades seeks to understand the effects of selective harvesting, climate change, genetic diversity, and habitat quality on mountain ungulates. In particular, examining mountain sheep and mountain goats, the research team conducting this long-term monitoring aims to determine if selective hunting and harvesting leads to the evolution of smaller horn sizes, which can impact the species both genetically and ecologically. Developing a better understanding of what anthropogenic factors may influence the evolution of these species has the potential to **influence local conservation and management policies** leading to a more sustainable hunting of mountain ungulates. As the research team is also analyzing how proximity of protected areas may affect long-term changes in horn size, they will be able to identify interjurisdictional issues which may lead to a more **cohesive approach** for sustainable hunting. Horn growth in mountain ungulates is also known to correlate to annual vegetation productivity; therefore, in addition to examining the long-term data as a representation of hunting impacts, it will be further utilized to determine if horn growth increments can provide a record of the effects of climate change. This **innovative approach** to the potential examination of past climate effects

could provide further understanding of how long-term trends in onset of seasonal changes affect mountain ungulates, and potentially enhance the capacity for **climate-related management**.

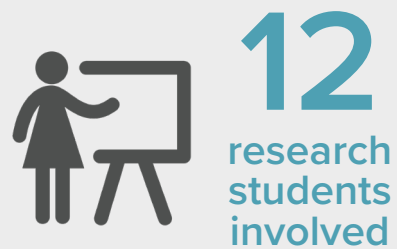
Knowledge dissemination of the impacts of selective hunting on mountain ungulates is a core component of this project. Initially, knowledge will be shared through enhancing **research, training, and employment** opportunities for students. Students will gain hands-on research experience in many aspects of the project including analyzing the genetic architecture of horn size and observing mountain ungulates in their habitat. To disseminate information more widely, one of the project outputs is the **development of a training manual** that will address the variety of biological factors that can affect horn growth, as well as outline correct species aging methods. Collaborative efforts between hunters, guides, and Indigenous communities will produce scientific and popular articles to further emphasize the importance of correct horn increment measurements.

SUPPORTED TARGETS





● Kluane Lake, Yukon



3 PhD students

4 master's students

5 undergraduate students
+ more for upcoming field seasons

2 Indigenous youth from
Kluane First Nation

MINERAL DUST DYNAMICS AND CLIMATE CHANGE AT HIGH LATITUDE MOUNTAINOUS REGIONS

To **improve local and regional climate models**, *Mineral Dust Dynamics and Climate Change at High Latitude Mountainous Regions* is researching mineral dust emissions from pro-glacial mountain systems to identify the impacts of mineral dust depositions on polar landscapes, as well as quantify the climatic variables that control dust emissions. In the high latitude Kluane Lake region, mineral aerosols in the atmosphere can have various **direct and indirect environmental impacts**, such as increasing melting of snow and ice, and accelerating climate change. Therefore, researching the linkages between glacial systems, mineral dust emissions, and climate change will have significant impacts on enhancing capacity for climate-related management. Data on dust emissions produced from glacially induced landscape change aims to be integrated into Canada's Fourth Generation Atmospheric General Circulation Model (AGCM4/CanAM4) to enhance data by correlating landscape changes with anticipated climate change. James King, Principal Investigator noted, "one thing that is unique about this project is the instrumentation at the Kluane Lake Research Station that is part of the NASA network for looking at the aerosol contribution in the atmosphere". This instrumentation **provides more accurate data to the NASA network**, as it is located in a

unique high latitude, dust-sourced region.

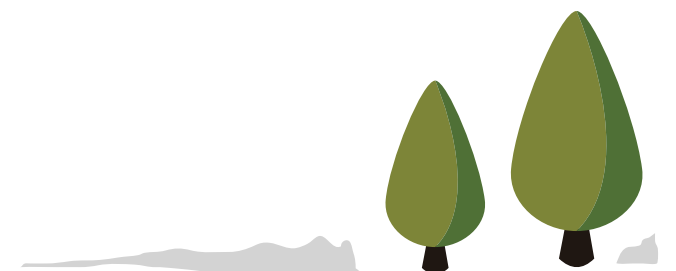
In addition to the large-scale impacts, this research also aims to provide perspective to the local communities of Kluane First Nation and Champagne and Aishihik First Nation in terms of the expected landscape and ecosystem changes that may occur with projected climate change. This insight, which is **inclusive of both Indigenous and Western perspectives**, can help these communities to mitigate future impacts of climate change by enhancing resilience to change and increasing capacity for **ecosystem management**.

Research on dust emissions through this project also demonstrates the **interconnectedness between human and environmental health**. Engaging with local community members, analyzing historical data, and implementing **new research methods** has identified that dust emissions are a key community concern. This project is investigating both the amount of dust in the atmosphere as well as the composition of the dust in Southwest Yukon. Both of these factors will provide valuable information for air quality standards, applicable to both **community and ecosystem health**.

SUPPORTED TARGETS



This project is connected to the following UN Declaration Articles:
15.1, 18, 27, 31.1





- Norman Wells and Tulí t'a communities, Sahtu region (Northwest Territories)
- Ross River (Tu Łidlini) community, Yukon



gain **employment** and **applied research experience**

1 PhD student

1 master's student

NÍO NĘ P'ĘNĚ—TRAILS OF THE MOUNTAIN CARIBOU: RENEWING INDIGENOUS RELATIONSHIPS IN CONSERVATION

At the headwaters of the Mackenzie Mountains, Níó Nę P'ęnę, an important mountain caribou habitat has been a site of cohabitation for Dena of Tulí t'a, Norman Wells, and Tu Łidlini in harmony with the environment for thousands of years. This land, once rich with biodiversity, now faces significant **threats from climate change** and land degradation. In response to these urgent challenges, *Níó Nę P'ęnę - Trails of Mountain Caribou* is a project of reclamation and collaboration that addresses community concerns for the ability to **maintain ways of life among ongoing environmental impacts**. The combination of Indigenous Methodologies and scientific inquiry through collaboration and knowledge sharing between local Dene communities, Guardians, and researchers is foundational to this project.

The ultimate drive for the *Níó Nę P'ęnę* project is to showcase biocultural significance in order to protect biodiversity and halt habitat degradation, with a specific focus on conservation of mountain systems. The inclusion of diverse knowledge sources works to enhance **inclusive representation within research and development**, and works to support Dene communities in achieving more equitable and sustainable use of their traditional lands and resources. **Bringing together traditional knowledge and science**

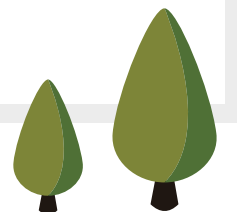
will develop improved understanding of the main regional concerns, including mountain caribou population dynamics, the effects of climate change, increased human activity, and landscape changes. This collaborative research aims to develop an **Indigenous framework for land protection** in such a way that Dene language, ways of life, and law strongly persist in coexistence with caribou.

As the nature of Dene ways of life is holistic, this project regards the **well-being of community members** to be synergistic with the well-being of environmental systems. With the development of a land protection framework, a goal of this project is to **utilize research** to enhance the quality of life for Dene community members by providing an increased number of **opportunities for gainful employment**. Involvement from all community members is also at the forefront of gathering information; community values, both ecologic and economic in nature, are guiding the work that needs to be done to achieve social, environmental, and economic well-being. Specifically, **knowledge holders are providing invaluable insight** about the landscape in terms of the history, traditional place names, and how wildlife dynamics have changed over time.

This project is connected to the following UN Declaration Articles:

1.1, 13.1, 14.3, 15.1, 18, 24.2, 25, 29.1, 31.1

SUPPORTED TARGETS





- Lil'wat Nation/Squamish-Lillooet Regional District, British Columbia
- Nunavut

THE MOUNTAIN RISK KNOWLEDGE EXCHANGE - BUILDING RISK MANAGEMENT CAPACITY AND RESILIENCE IN MOUNTAIN COMMUNITIES

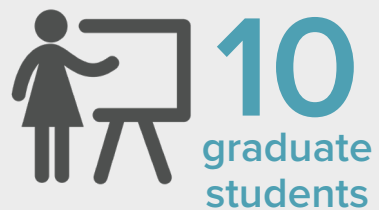
By developing an **interactive, dynamic, and publicly accessible data hub**, the *Mountain Risk Knowledge Exchange* is introducing a new approach to mountain risk management. This information aims to address the limitations that currently exist with monitoring mountain hazards to mitigate their effects in the face of **environmental change**. To increase the **resiliency of mountain communities** to natural hazards in Canada's north, such as avalanches, this project will foster awareness and understanding in those who are most affected—citizens of mountain communities. This innovative approach to **mountain community planning** will utilize modern technology to **integrate knowledge from local Indigenous and non-Indigenous communities**, Western geotechnical perspectives, and citizen-science monitoring initiatives. In full recognition of the various ways of knowing and learning, a **community-based approach** will ensure that community engagement is a strong component of the hazard planning, monitoring, mitigation, and education efforts that will be incorporated into the platform.

Much of the information gathered for the *Mountain Risk Knowledge Exchange* will be a product of student work. In particular, providing **experiential learning opportunities for Indigenous students** is a key component of this project that works toward **enhancing employment and education opportunities**.

This project is connected to the following UN Declaration Articles:

14.2, 15.1, 18, 31.1

SUPPORTED TARGETS



gain **applied research experience**





● Mackenzie Mountains, Yukon and Northwest Territories

“Sustainable development should consider impacts to cultural landscapes and diverse ways of life.”

Glen MacKay,
Principal Investigator



gain **employment**
and **applied research**
experience

3 Indigenous students

1 master's student

THE SHÚTAGOT'INE CULTURAL LANDSCAPE PROJECT

Through **inclusive methodologies**, the *Shútagot'ine Cultural Landscape Project* is working with the community of Tulita to preserve cultural landscapes and values in the Shútagot'ine homeland. Guided by Shútagot'ine Elder knowledge, a main goal of this project is to **restore Shútagot'ine place names** and designate official cultural place names for some locations in the Northwest Territories.

Additionally, the project aims to influence future **conservation planning and management** by investigating the Shútagot'ine archaeological sites of alpine ice patches and wooden caribou fences; sites which are at **high risk of impacts from climate change** related processes such as forest fires and rapid glacial melt. Not only are the archaeological ice patches vulnerable to environmental loss, they also contain culturally-significant artifacts. Wood caribou fences provide insight into historic wildlife management practices and Shútagot'ine ways of life. Documenting and characterizing the preserved fence features aims to promote conservation of important cultural places and strengthen an understanding of Shútagot'ine land and resource use.

With aerial imagery, 3D animations of the caribou fences and ice patches will be created, helping to facilitate conversations with

Shútagot'ine Elders and share the importance of cultural places. Utilizing ESRI Story Map, an accessible and interactive map will showcase cultural place names, the significance of cultural artifacts, and the unique methods used to collect such information. These activities utilize modern technology and encompass an **innovative approach to sharing research findings and information** to the public.

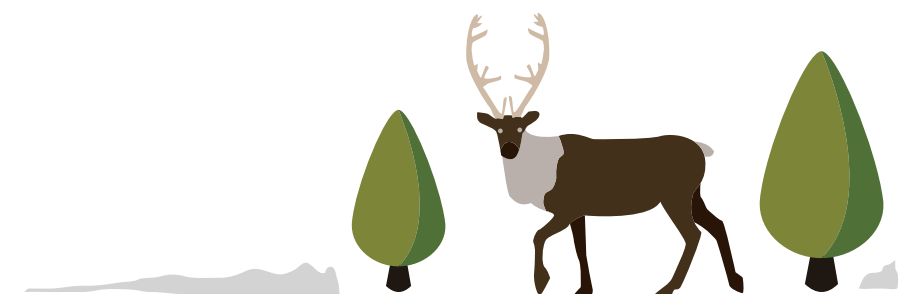
As a component of this project, training for Indigenous students aims to provide exposure to a multidisciplinary approach to understanding mountain environments through **both traditional knowledge and Western scientific perspectives**. Each year, one student will be involved with the field studies, learning about mountain cultural landscapes and archaeological field techniques. The project team hopes this **training will lead to a new generation of researchers and resources managers** that have a complete and culturally sensitive understanding of the environment.

SUPPORTED TARGETS



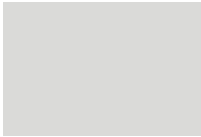
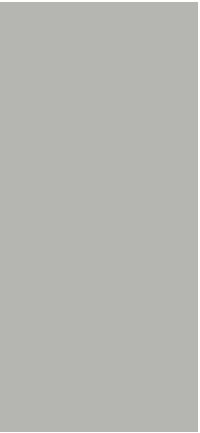
This project is connected to the following UN Declaration Articles:

11.1, 13.1, 15.1





From the Mountains to Our Tables (p30)
 Sampling Athabasca River water, Jan. 2021. Vincent St.Louis and Hayley Drapeau (*MSc graduate student*).
Photo: Jessica Serbu.

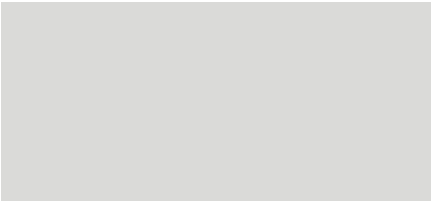


From the Mountains to Our Tables (p30)
 Jessica Serbu (*PhD student, University of Alberta*) measuring river flows. Sydney Enns (*summer undergraduate research assistant, University of Alberta*) taking notes.
Photo: Vincent St.Louis.

WESTERN CANADA

Bison Herd
Photo: Cale Benefield, Unsplash.

The View From 2117 (p33)
 Mount Arrowsmith
Photo: Arrowsmith Media.





● Banff National Park, Alberta

ENHANCING THE REINTRODUCTION OF PLAINS BISON THROUGH THE INCLUSION OF CULTURAL MONITORING AND TRADITIONAL KNOWLEDGE IN BANFF NATIONAL PARK

Guided by traditional knowledge, *Enhancing the Reintroduction of Plains Bison in Banff National Park* will provide insight into wildlife and land management, while also **documenting traditional knowledge** for conservational and educational purposes. Led by Stoney Nakoda First Nation through a **Cultural Monitoring methodology**, the research team will observe Plains Bison populations and habitat following their reintroduction to Banff National Park in 2017. Cultural Monitoring increases the capacity for environmental problem-solving beyond the scope of Western science-based approaches by **incorporating local knowledge** in monitoring ecosystem changes.

In addition to the ecological significance of enhancing the reintroduction of Plains Bison, work undertaken in this project demonstrates cultural significance in a variety of ways. Some project outcomes include producing videos and materials that will be used for outreach and education, to **raise cultural awareness**. For example, some activities include providing training for both Indigenous technicians and Parks Canada staff to increase knowledge on culturally-specific and technical data collection methods. Additionally, the reintroduction of the Plains Bison in Banff National Park has revitalized spiritual quality and connection to

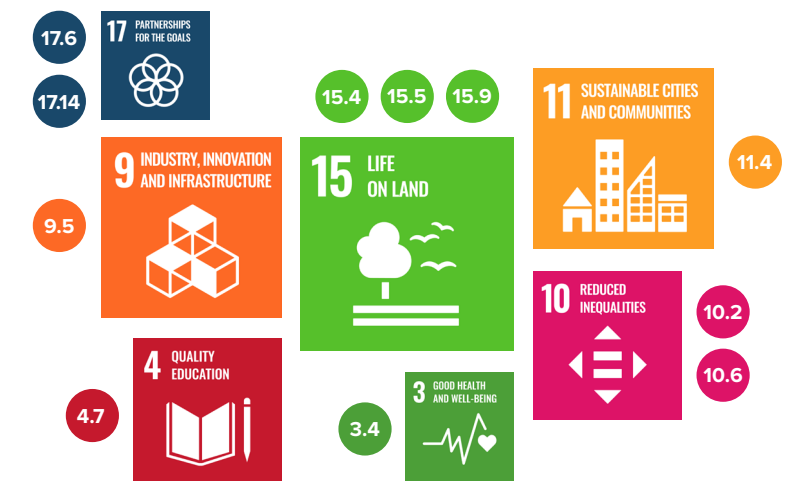
the landscape, **improving the well-being of the Stoney Nakoda Peoples**.

Looking forward, research findings will provide recommendations for an **agreement between Stoney Nakoda First Nation and Parks Canada** to collectively address future issues related to wildlife management, landscape changes, and biodiversity loss. Videos and educational materials from this project will be shared with Parks Canada, other wildlife managers and policy makers, Mount Royal University's Institute for Environmental Sustainability, and the Conservation through Reconciliation Partnership as a pathway to incorporate cultural monitoring and traditional knowledge into **wildlife management and policies**.

This project is connected to the following UN Declaration Articles:

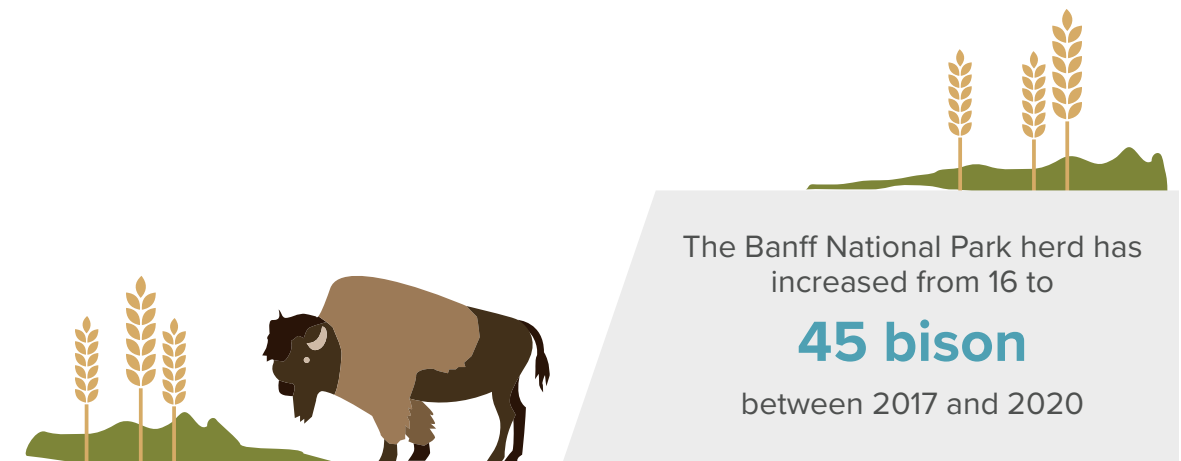
15.1, 25, 29.1, 31.1, 32.1

SUPPORTED TARGETS



“Seeing the landscape return to its natural state is important for our well-being. Not only knowing these places exist but seeing the biodiversity thriving.”

William Snow,
Principal Investigator





● Banff National Park and Jasper National Park, Alberta

FROM THE MOUNTAINS TO OUR TABLES: FRESHWATER SECURITY IN THREE CANADIAN EASTERN ROCKY MOUNTAIN WATERSHEDS

Research focusing on the headwaters of the Bow, North Saskatchewan, and Athabasca Rivers is engaging a unique approach to understanding the collective impacts of climate change and pollutants on **watershed health**. This project is enabling the **initiation of longitudinal data**, an invaluable contribution to the monitoring and subsequent preservation of freshwater ecosystems within the Rocky Mountains, as glaciers feeding them retreat. By specializing in research near the headwaters of glacially sourced freshwater systems, data will be delivered on a multitude of factors that are integral to supporting policy development for both environmental and **human health**, such as climate change, biodiversity loss, water quality, and **water-food-economic security**. In particular, suitable thermal habitats for mountain fish, along with the diversity and functioning of algal, microbial, and invertebrate communities, are being evaluated as measures that provide valuable insight to the overall **quality of ecosystems** supported by the rivers. Furthermore, monitoring changes in glacial surface temperatures aims to enable the prediction of changes to future glacial melting to enhance the capacity for **climate-related management and resilience**.

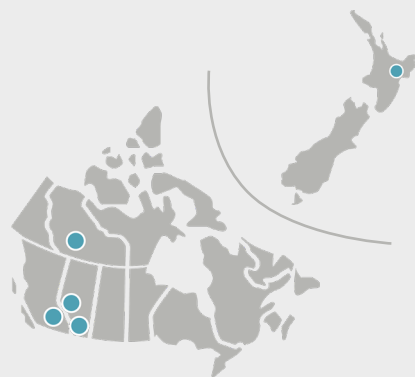
The **employment of student researchers** is foundational to data collection and field work associated with this project, which also fosters the development of employable skill sets, delivers education on research for sustainability, and enhances the overall capacity for research and knowledge dissemination. Additionally, collaborative and **inclusive approach** is being taken for all research efforts, ensuring that there is **participatory involvement** from scientists, local governments, and both Indigenous and non-Indigenous communities.



gain **employment**
and **applied research**
experience

SUPPORTED TARGETS





• Locations Below



Community Engagement among Parks and Protected Areas

— Nakoda peoples —

(Morley, AB)
Banff, Jasper, and Yoho
National Parks

— Dene and Metis peoples —

(Fort Providence, NWT)
Mackenzie Bison Sanctuary
Edézhíé Protected Area
Dehcho Region

— Tuhoe peoples —

(Ruatahuna, Aotearoa, New Zealand)
Urewera **National Park**

INDIGENOUS LAND RIGHTS IN CANADA AND NEW ZEALAND: SUSTAINABLE PROTECTED AREAS IN RURAL AND MOUNTAIN ENVIRONMENTS

Through **Indigenous Methodologies** adapted to local protocols, *Indigenous Land Rights in Canada and New Zealand* is focusing on the impacts that parks and protected areas have had on Indigenous communities. With the development of parks and protected areas, displacement that was forced upon Indigenous Peoples led to consequences on education, well-being, food security, and cultural continuities. This project is comparing federal park systems, **Indigenous Protected and Conserved Areas**, and parks under Indigenous management frameworks across the communities of Morley (Alberta), Fort Providence (North West Territories), and Aotearoa (New Zealand), respectively. This comparison will allow researchers to learn from the communities about productive and respectful ways to structure parks and protected areas through **Indigenous involvement and perspectives**. With oral history interviews from knowledgeable land users and sharing circles with Elders as the primary data collection methods, the research team will examine: how Indigenous communities are responding to rural change; the level of involvement Indigenous communities have had in decision-making for development and environmental management of their lands; and how parks and tourism economies shape Indigenous

livelihoods and influence the decisions for **land development in traditional territories**.

With three field sites, student researchers are fundamental to the project as they conduct on-the-ground research and can work to **build relationships with the communities**. Collectively, researchers, students, and community members will develop creative approaches to disseminate knowledge to the respective communities and a wider audience. This participatory approach will also provide training opportunities for community members, by supporting inclusive involvement in various research stages.

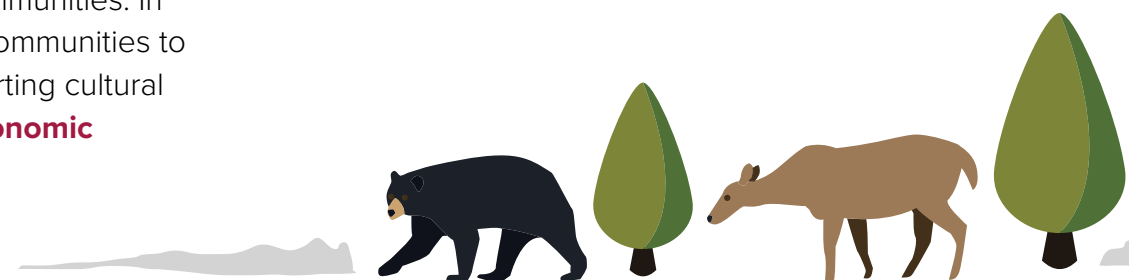
An outcome of this project will be an improved understanding of how land management can be more sustainable to **protect biodiversity** and enhance the capacity for **climate-related resilience**. Ultimately, research across parks and protected areas in Canada and New Zealand will outline best practices and legal frameworks for land management tailored to the needs of Indigenous communities. In turn, this will help Indigenous communities to develop their land while supporting cultural continuities and **increasing economic opportunities**.

SUPPORTED TARGETS



This project is connected to the following UN Declaration Articles:

3, 18, 26.2, 29.1, 32.1





● Okanagan Basin, British Columbia

MANAGING GROUNDWATER RESOURCES IN MOUNTAINOUS AREAS: PLANNING FOR AND ADAPTING TO DROUGHT CONDITIONS

Based in the Okanagan Valley, *Managing Groundwater Resources in Mountainous Areas* is developing an indicator tool to estimate the impacts of drought on groundwater to **strengthen water management and capacity for drought resilience**. Much like other regions of drier climate, the Okanagan Valley faces increased pressures on freshwater resources, needing improved management and protection for water use efficiency. By providing insight to aquifer susceptibility to low groundwater levels, the indicator will enable decision-makers to plan for drought and ensure **water-use efficiency** and freshwater availability for drinking water, **agriculture**, and aquatic ecosystem services.

Understanding the **sustainability of water sources for both humans and the environment** is important for enhancing capacity for climate action and addressing the challenges that continued climatic changes have on worsening drought conditions. This project aims to identify aquifers in the Okanagan that are susceptible to drought, and whether the years in which water levels reach severe lows correlate to climate extremes. Therefore, a potential outcome of this work is the implementation of data in policy-based **climate change action and management**.



gain **employment**
and **applied research**
experience

2 master's students

2 undergraduate students

In addition to focusing on the needs of communities in drought-susceptible regions, this project is also investigating the impacts of summer drought on the vulnerability of aquatic habitats. In particular, efforts toward **protecting freshwater ecosystems** are directed at identifying the threshold of insufficient water levels that support aquatic habitats. The research methods being utilized demonstrate an innovative approach to combining a variety of perspectives and tools that will develop a **new model of combined watershed and aquatic habitat data**.

SUPPORTED TARGETS





● Mount Arrowsmith Biosphere Region, British Columbia

Vital Signs® reports utilize community-driven data and local knowledge to measure the vitality of a community. The reports often support community strategies to improve quality of life⁵⁷.



gain **employment** and **applied research experience**

THE VIEW FROM 2117: HUMAN ACTIONS, CONSEQUENCES, AND PERSPECTIVES ON MOUNTAIN REGIONS

Through studying governance models, pre-colonial demographics, sense of place, and ecosystem and community health, this project is examining the ways in which human behaviour, regulatory regimes, and societal change impacts mountain environments and communities within the UNESCO designated Mount Arrowsmith Biosphere Region (MABR). The research team anticipates that this project will lead to **lessened human-induced impacts on natural systems** and improved policy and regulatory frameworks.

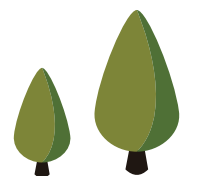
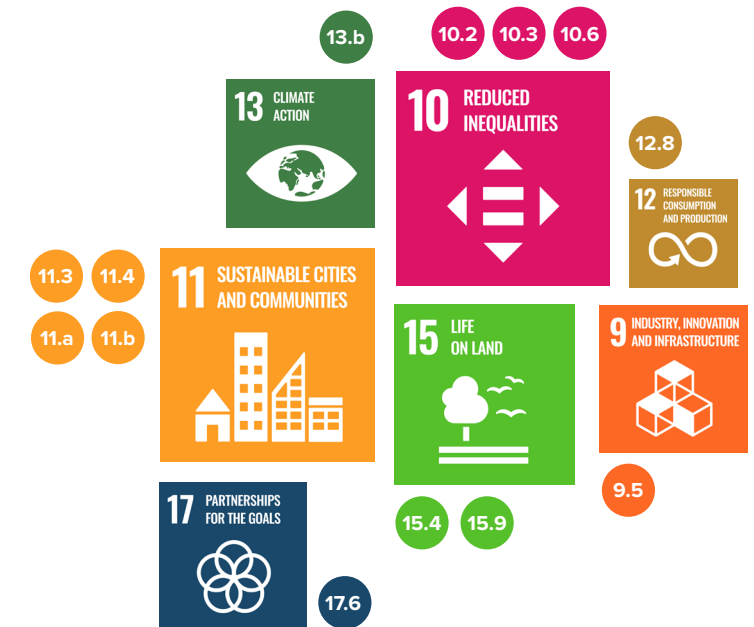
By analyzing successful governance models around the world, this study aims to develop a best practices approach for a **participatory and inclusive governance model** that can be adopted by local governments, other biosphere reserves, and mountain communities. To provide holistic recommendations, an archival review is being conducted to understand how Indigenous communities were structured and planned prior to colonization within the MABR. The research team anticipates that this review will **address gaps in equitable rights and reconciliation** by sharing and understanding the history of Indigenous communities. In addition to analyzing existing governance models and their gaps, an ecosystem analysis is being undertaken in the MABR to identify the

impacts of climate change on local flora and fauna. This collective information will provide recommendations to local governments on how they can better **incorporate the environment into community planning**. An improved understanding of local governance and environmental change also aims to guide policy development towards incorporating local knowledge of **sustainable relationships between community and environment**.

To identify the current state of community health within the MABR, census and survey data is being utilized to produce a Vital Signs® report, based on indicators such as income, gender, housing, arts and culture, education, and health care. A deeper understanding of community health is also being determined through a sense of place and nature-relatedness study to indicate the psychological connection between people and the environment within the region. This study is taking an **innovative approach** by using a revised, standardized sense of place scale and a nature-relatedness scale. Collectively, the Vital Signs® report and the sense of place study will provide decision-makers with valuable information on how to meet the needs of their communities in pursuing social, cultural, economic, and environmental sustainable development.

This project connects to UN Declaration Article **27**

SUPPORTED TARGETS





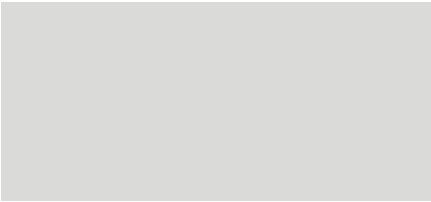
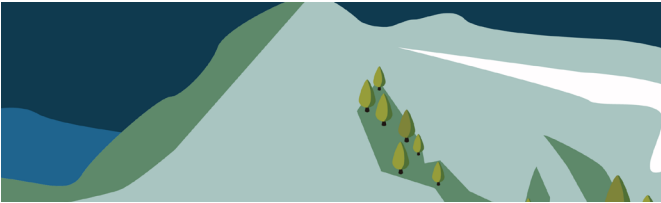
Mont Orford Ski Resort
Photo: Alexandra Caron, Unsplash.



Newfoundland and Labrador
Photo: Erik Mclean, Unsplash.

EASTERN CANADA

Parc national du Mont-Orford
Photo: Thomas Lardeau, Unsplash.



Newfoundland and Labrador
Photo: Erik Mclean, Unsplash.



● Mealy Mountains National Park Reserve and Rigolet, Labrador



Monitoring Mentors program

Connects youth and mentors for training in science, environmental monitoring, and land-based learning:

3 mentors

1 youth coordinator

7–10 Inuit youth

2 master's students

1 PhD student

MOBILIZING MOUNTAIN METRICS THAT MATTER: INUIT-LED ENVIRONMENT AND HEALTH MONITORING IN THE MEALY MOUNTAINS NATIONAL PARK RESERVE

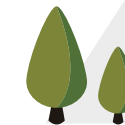
To enhance capacity for climate-related resilience as well as facilitate intergenerational knowledge transfer, the community of Rigolet is leading a monitoring program to better understand the local impacts of climate change as they relate to the community's well-being. The objectives of this monitoring are to: identify climate-health related monitoring metrics that are most important to Inuit peoples; broaden **community-driven health-monitoring** and data analysis systems; gauge how Inuit health and well-being is affected by current climate alterations; and enhance climate-health awareness among mountain communities⁶⁸. To achieve these objectives, this project will develop a **community-managed database** housed within the [eNuk app](#). This technological application has been created as a tool for ongoing monitoring of climate and environmental conditions, based on perceptions of Rigolet community members, and linked to the associated regional health implications⁵⁹. This innovative approach of responding to environmental and health indicators of climate change acts not only as a monitoring system, but also enhances the **accessibility to communications and scientific technology** for the northern, remote community of Rigolet.

Understanding the connections between environmental change and community well-being stems from Inuit knowledge⁵⁸. The sharing, protecting, and celebrating of Inuit knowledge and science is what drives the aspects of this project that aim to better inform communities on how to enhance resilience and **adapt to the severe impacts of climate change**. A major focus of sharing Inuit wisdom involves facilitating **knowledge transfer between generations** of the community.

The **participatory structure** of this project is making a significant contribution towards the movement of **Indigenous-led research**. Simultaneously, the collaboration of land-based knowledge, cultural perspective, and inclusive health research **builds capacity** to inform public policy, raise awareness of the relationship between environmental and human well-being, enhance resiliency of mountain communities, and contribute to important datasets⁵⁸.

This project is connected to the following UN Declaration Articles:

13.1, 18, 21.1, 23, 24.2, 25, 29.1, 29.3, 31.1



A gateway to the **Mealy Mountains National Park Reserve**, the community of **Rigolet** is an autonomous area claimed by Inuit in Newfoundland and Labrador⁶⁰.

SUPPORTED TARGETS





● Mont-Orford region, Quebec



Receiving **training** and **hands-on applied research experience** in the **tourism industry**:

- 1 undergraduate student
- 3 master's students
- 3 doctorate students
- 1 postdoctoral researcher

CO-CREATION OF A GOVERNANCE STRUCTURE: THE CASE OF RECREO-TOURISM DEVELOPMENT IN MONT-ORFORD

Responding to the tourism-related **challenges of climate change**, the *Co-creation of a Governance Structure* is developing an opportunity to shift to an innovative and **sustainable approach to mountain tourism**. Based in the Parc national du Mont-Orford area, this action-based research project seeks to strengthen the local economy through participatory and community-based mountain recreo-tourism development. With **social innovation**, this project will involve ongoing knowledge building and transfer between the community and researchers; together, they will **co-create an innovative governance model** to support the development of a sustainable all-season tourist destination. The infusion of academic, community, and industry personnel into the planning process amplifies the notion of sustainability, fostering partnerships, and bolstering valuable experience within the participating population. In particular, **training opportunities** for community partners will ensure long-term sustainability of the project by creating a **community-oriented framework**. This recreo-tourism governance model will focus on establishing partnerships for sharing information, with the intention of being a transferable model to other communities worldwide. Ultimately, the *Co-creation of a Governance Structure* will **strengthen the local economy** of the Parc national du Mont-Orford area, while also enhancing the capacity for climate-related management as well as **conserving mountain ecosystems**.

SUPPORTED TARGETS



06 SUMMARY





SDGS ALIGNING WITH THE CANADIAN MOUNTAIN NETWORK

As highlighted in this report, the contributions that CMN is making towards the global SDG agenda are noteworthy and impactful. Ultimately working towards supporting sustainable mountain systems and an inclusive and participatory approach to social, cultural, and ecological mountain research, CMN demonstrates the interconnectedness of the various components of sustainable development. The *2030 Agenda for Sustainable Development* states that the integrated nature of the SDGs plays a critical role in ensuring the goal of transforming our world for a more sustainable future is realized⁹. In many cases among CMN research projects and initiatives, where a connection to environmental SDGs exists, connections to social and cultural SDGs also exist, and vice versa. These connections are all rooted in collaborative and respectful partnerships, bringing together various mountain communities, Indigenous and non-Indigenous researchers, and multilateral ways of knowing and doing.



13
out of
17
SDGS

strong connections to 8 SDGs and still making progress on the other 5 SDGs

In only two years, CMN research, knowledge mobilization, and partnership facilitation has contributed to 13 out of 17 SDGs. These initiatives are key in elevating Canadian mountain research and raising Canada’s profile in sustainable development. CMN’s contributions to the SDGs have a strong focus on the environmental component of sustainability, which are at the forefront of Canada’s FSDS; however, CMN demonstrates true, holistic sustainability research by leaving no one or no component of sustainability behind.

“[We] can’t talk about food, livelihoods, and health without understanding how aspects like climate and environmental change contribute to and shape those discussions.”
Courtney Mason, Principal Investigator

SDGS ALIGNING WITH THE CANADIAN MOUNTAIN NETWORK

Through its values, research priorities, and efforts to achieve its goals, CMN supports a variety of the SDGs through its structure, governance, partnerships, and initiatives. Overall, CMN aligns with the following SDGs (larger icons indicate greater proportions of direct alignment):



Note: Although data collected through this project made minimal or no connections to SDGs 1, 2, 7, and 14, CMN may contribute to these goals in ways not yet reported on.

07 MORE INFORMATION

United Nations Sustainable Development Goals: <https://sdgs.un.org/goals>

The UN Declaration: <https://www.un.org/development/desa/indigenouspeoples/declaration-on-the-rights-of-indigenous-peoples.html>

Mount Arrowsmith Biosphere Region Research Institute: <https://mabrri.viu.ca>

Canadian Mountain Network: <https://canadianmountainnetwork.ca>

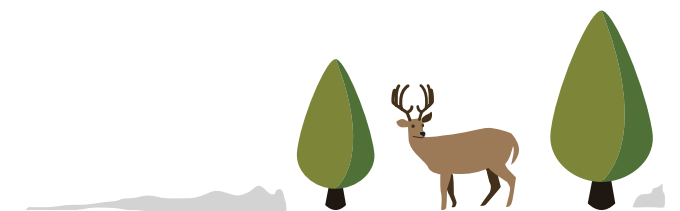
Canadian Mountain Assessment: <https://canadianmountainnetwork.ca/canadian-mountain-assessment/>

Mountain Legacy Project: <http://mountainlegacy.ca/about/>

Mountain Research and Development Journal: <https://www.mrd-journal.org>

SMRTS: <https://agewell-nce.ca/training/smrts-seminars-program>

ALCES Online: <https://www.online.alces.ca>



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APPENDIX A: SDG TARGETS AND REFRAMING APPROACH FOR LOCALIZATION TO CMN

To fit the context of CMN, some targets were reframed to a localized scope for Canadian research. This appendix provides rationale for targets that were localized. Many targets did not require reframing and therefore do not have an explanation for the localized approach. Targets displayed in blue were addressed in this report.

Goal	Targets	Localized approach for CMN
SDG 1	1.1 By 2030, eradicate extreme poverty for all people everywhere, currently measured as people living on less than \$1.25 a day	
	1.2 By 2030, reduce at least by half the proportion of men, women and children of all ages living in poverty in all its dimensions according to national definitions	
	1.3 Implement nationally appropriate social protection systems and measures for all, including floors, and by 2030 achieve substantial coverage of the poor and the vulnerable	
	1.4 By 2030, ensure that all men and women, in particular the poor and the vulnerable, have equal rights to economic resources, as well as access to basic services, ownership and control over land and other forms of property, inheritance, natural resources, appropriate new technology and financial services, including microfinance	
	1.5 By 2030, build the resilience of the poor and those in vulnerable situations and reduce their exposure and vulnerability to climate-related extreme events and other economic, social and environmental shocks and disasters	
	1.a Ensure significant mobilization of resources from a variety of sources, including through enhanced development cooperation, in order to provide adequate and predictable means for developing countries, in particular least developed countries, to implement programmes and policies to end poverty in all its dimensions	
	1.b Create sound policy frameworks at the national, regional and international levels, based on pro-poor and gender-sensitive development strategies, to support accelerated investment in poverty eradication actions	
SDG 2	2.1 By 2030, end hunger and ensure access by all people, in particular the poor and people in vulnerable situations, including infants, to safe, nutritious and sufficient food all year round	
	2.2 By 2030, end all forms of malnutrition, including achieving, by 2025, the internationally agreed targets on stunting and wasting in children under 5 years of age, and address the nutritional needs of adolescent girls, pregnant and lactating women and older persons	
	2.3 By 2030, double the agricultural productivity and incomes of small-scale food producers, in particular women, indigenous peoples, family farmers, pastoralists and fishers, including through secure and equal access to land, other productive resources and inputs, knowledge, financial services, markets and opportunities for value addition and non-farm employment	
	2.4 By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality	
	2.5 By 2020, maintain the genetic diversity of seeds, cultivated plants and farmed and domesticated animals and their related wild species, including through soundly managed and diversified seed and plant banks at the national, regional and international levels, and promote access to and fair and equitable sharing of benefits arising from the utilization of genetic resources and associated traditional knowledge, as internationally agreed	
	2.a Increase investment, including through enhanced international cooperation, in rural infrastructure, agricultural research and extension services, technology development and plant and livestock gene banks in order to enhance agricultural productive capacity in developing countries, in particular least developed countries	
	2.b Correct and prevent trade restrictions and distortions in world agricultural markets, including through the parallel elimination of all forms of agricultural export subsidies and all export measures with equivalent effect, in accordance with the mandate of the Doha Development Round	
	2.c Adopt measures to ensure the proper functioning of food commodity markets and their derivatives and facilitate timely access to market information, including on food reserves, in order to help limit extreme food price volatility	

SDG 3	3.1 By 2030, reduce the global maternal mortality ratio to less than 70 per 100,000 live births	
	3.2 By 2030, end preventable deaths of newborns and children under 5 years of age, with all countries aiming to reduce neonatal mortality to at least as low as 12 per 1,000 live births and under5 mortality to at least as low as 25 per 1,000 live births	
	3.3 By 2030, end the epidemics of AIDS, tuberculosis, malaria and neglected tropical diseases and combat hepatitis, water-borne diseases and other communicable diseases	
	3.4 By 2030, reduce by one third premature mortality from non-communicable diseases through prevention and treatment and promote mental health and well-being	As this is the only target that mentions mental health and well-being, this target was approached with a greater focus on promoting mental health and well-being.
	3.5 Strengthen the prevention and treatment of substance abuse, including narcotic drug abuse and harmful use of alcohol	
	3.6 By 2020, halve the number of global deaths and injuries from road traffic accidents	
	3.7 By 2030, ensure universal access to sexual and reproductive health-care services, including for family planning, information and education, and the integration of reproductive health into national strategies and programmes	
	3.8 Achieve universal health coverage, including financial risk protection, access to quality essential health-care services and access to safe, effective, quality and affordable essential medicines and vaccines for all	
	3.9 By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination	This target was approached through a broader research lens looking at air, water, and soil quality rather than the number of deaths associated with air, water, and soil quality.
	3.a Strengthen the implementation of the World Health Organization Framework Convention on Tobacco Control in all countries, as appropriate	
	3.b Support the research and development of vaccines and medicines for the communicable and noncommunicable diseases that primarily affect developing countries, provide access to affordable essential medicines and vaccines, in accordance with the Doha Declaration on the TRIPS Agreement and Public Health, which affirms the right of developing countries to use to the full the provisions in the Agreement on Trade-Related Aspects of Intellectual Property Rights regarding flexibilities to protect public health, and, in particular, provide access to medicines for all	
	3.c Substantially increase health financing and the recruitment, development, training and retention of the health workforce in developing countries, especially in least developed countries and small island developing States	
	3.d Strengthen the capacity of all countries, in particular developing countries, for early warning, risk reduction and management of national and global health risks	

SDG 4	4.1 By 2030, ensure that all girls and boys complete free, equitable and quality primary and secondary education leading to relevant and effective learning outcomes	
	4.2 By 2030, ensure that all girls and boys have access to quality early childhood development, care and preprimary education so that they are ready for primary education	
	4.3 By 2030, ensure equal access for all women and men to affordable and quality technical, vocational and tertiary education, including university	This target was approached through a broader perspective to include ensuring equal access to education and training for all Indigenous and non-Indigenous youth, women, and men.
	4.4 By 2030, substantially increase the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship	
	4.5 By 2030, eliminate gender disparities in education and ensure equal access to all levels of education and vocational training for the vulnerable, including persons with disabilities, indigenous peoples and children in vulnerable situations	This target was approached through a broader perspective, looking at eliminating disparities of all types to ensure equal access to education and training for all peoples.
	4.6 By 2030, ensure that all youth and a substantial proportion of adults, both men and women, achieve literacy and numeracy	
	4.7 By 2030, ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and appreciation of cultural diversity and of culture's contribution to sustainable development	
	4.a Build and upgrade education facilities that are child, disability and gender sensitive and provide safe, non-violent, inclusive and effective learning environments for all	
	4.b By 2020, substantially expand globally the number of scholarships available to developing countries, in particular least developed countries, small island developing States and African countries, for enrolment in higher education, including vocational training and information and communications technology, technical, engineering and scientific programmes, in developed countries and other developing countries	
	4.c By 2030, substantially increase the supply of qualified teachers, including through international cooperation for teacher training in developing countries, especially least developed countries and small island developing States	
SDG 5	5.1 End all forms of discrimination against all women and girls everywhere	
	5.2 Eliminate all forms of violence against all women and girls in the public and private spheres, including trafficking and sexual and other types of exploitation	
	5.3 Eliminate all harmful practices, such as child, early and forced marriage and female genital mutilation	
	5.4 Recognize and value unpaid care and domestic work through the provision of public services, infrastructure and social protection policies and the promotion of shared responsibility within the household and the family as nationally appropriate	
	5.5 Ensure women's full and effective participation and equal opportunities for leadership at all levels of decision-making in political, economic and public life	This target was approached through a broader perspective to include all genders and non-binary individuals.
	5.6 Ensure universal access to sexual and reproductive health and reproductive rights as agreed in accordance with the Programme of Action of the International Conference on Population and Development and the Beijing Platform for Action and the outcome documents of their review conferences	
	5.a Undertake reforms to give women equal rights to economic resources, as well as access to ownership and control over land and other forms of property, financial services, inheritance and natural resources, in accordance with national laws	
	5.b Enhance the use of enabling technology, in particular information and communications technology, to promote the empowerment of women	
	5.c Adopt and strengthen sound policies and enforceable legislation for the promotion of gender equality and the empowerment of all women and girls at all levels	

SDG 6	6.1 By 2030, achieve universal and equitable access to safe and affordable drinking water for all	
	6.2 By 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations	
	6.3 By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally	The context of this target was expanded to include research that aims to improve water quality.
	6.4 By 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity	To fit the context of this project, this target was approached to include research on water-use efficiency.
	6.5 By 2030, implement integrated water resources management at all levels, including through transboundary cooperation as appropriate	
	6.6 By 2020, protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes	To fit the context of this project, this target was approached to include research on water-related ecosystems that will impact policies for conservation and management of water-related ecosystems.
	6.a By 2030, expand international cooperation and capacity-building support to developing countries in water- and sanitation-related activities and programmes, including water harvesting, desalination, water efficiency, wastewater treatment, recycling and reuse technologies	
	6.b Support and strengthen the participation of local communities in improving water and sanitation management	
SDG 7	7.1 By 2030, ensure universal access to affordable, reliable and modern energy services	
	7.2 By 2030, increase substantially the share of renewable energy in the global energy mix	
	7.3 By 2030, double the global rate of improvement in energy efficiency	
	7.a By 2030, enhance international cooperation to facilitate access to clean energy research and technology, including renewable energy, energy efficiency and advanced and cleaner fossil-fuel technology, and promote investment in energy infrastructure and clean energy technology	
	7.b By 2030, expand infrastructure and upgrade technology for supplying modern and sustainable energy services for all in developing countries, in particular least developed countries, small island developing States and landlocked developing countries, in accordance with their respective programmes of support	

SDG 8	8.1 Sustain per capita economic growth in accordance with national circumstances and, in particular, at least 7 per cent gross domestic product growth per annum in the least developed countries	
	8.2 Achieve higher levels of economic productivity through diversification, technological upgrading and innovation, including through a focus on high-value added and labour-intensive sectors	
	8.3 Promote development-oriented policies that support productive activities, decent job creation, entrepreneurship, creativity and innovation, and encourage the formalization and growth of micro-, small- and medium-sized enterprises, including through access to financial services	This target was approached in a broader context to include research or training opportunities that intend to increase employment opportunities.
	8.4 Improve progressively, through 2030, global resource efficiency in consumption and production and endeavour to decouple economic growth from environmental degradation, in accordance with the 10Year Framework of Programmes on Sustainable Consumption and Production, with developed countries taking the lead	As the scope of CMN does not focus on resource consumption and production, this target was approached by considering research initiatives that aim to lead to decoupling of economic growth from environmental degradation.
	8.5 By 2030, achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value	
	8.6 By 2020, substantially reduce the proportion of youth not in employment, education or training	This target was approached in a broader context, with data including community members, general public, students, and youth who had access to employment, education, and/or training.
	8.7 Take immediate and effective measures to eradicate forced labour, end modern slavery and human trafficking and secure the prohibition and elimination of the worst forms of child labour, including recruitment and use of child soldiers, and by 2025 end child labour in all its forms	
	8.8 Protect labour rights and promote safe and secure working environments for all workers, including migrant workers, in particular women migrants, and those in precarious employment	
	8.9 By 2030, devise and implement policies to promote sustainable tourism that creates jobs and promotes local culture and products	This target was approached through a broader, research-based lens. Data that spoke to conducting research to strengthen local economies was coded to this target.
	8.10 Strengthen the capacity of domestic financial institutions to encourage and expand access to banking, insurance and financial services for all	
	8.a Increase Aid for Trade support for developing countries, in particular least developed countries, including through the Enhanced Integrated Framework for Trade-related Technical Assistance to Least Developed Countries	
	8.b By 2020, develop and operationalize a global strategy for youth employment and implement the Global Jobs Pact of the International Labour Organization	
SDG 9	9.1 Develop quality, reliable, sustainable and resilient infrastructure, including regional and transborder infrastructure, to support economic development and human well-being, with a focus on affordable and equitable access for all	
	9.2 Promote inclusive and sustainable industrialization and, by 2030, significantly raise industry's share of employment and gross domestic product, in line with national circumstances, and double its share in least developed countries	
	9.3 Increase the access of small-scale industrial and other enterprises, in particular in developing countries, to financial services, including affordable credit, and their integration into value chains and markets	
	9.4 By 2030, upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, with all countries taking action in accordance with their respective capabilities	
	9.5 Enhance scientific research, upgrade the technological capabilities of industrial sectors in all countries, in particular developing countries, including, by 2030, encouraging innovation and substantially increasing the number of research and development workers per 1 million people and public and private research and development spending	For the context of this project, this target was approached without the focus on developing countries. Applicable data was considered as any initiative that supports the enhancement of research, regardless of monetary value.
	9.a Facilitate sustainable and resilient infrastructure development in developing countries through enhanced financial, technological and technical support to African countries, least developed countries, landlocked developing countries and small island developing States	
	9.b Support domestic technology development, research and innovation in developing countries, including by ensuring a conducive policy environment for, inter alia, industrial diversification and value addition to commodities	This target was approached without the focus on developing countries and mainly considered innovative use and development of research-based technology.
	9.c Significantly increase access to information and communications technology and strive to provide universal and affordable access to the Internet in least developed countries by 2020	For the context of this project, this target was approached without the focus on developing countries, with most data focused on access to information rather than access to the internet.

SDG 10	10.1 By 2030, progressively achieve and sustain income growth of the bottom 40 per cent of the population at a rate higher than the national average	
	10.2 By 2030, empower and promote the social, economic and political inclusion of all, irrespective of age, sex, disability, race, ethnicity, origin, religion or economic or other status	
	10.3 Ensure equal opportunity and reduce inequalities of outcome, including by eliminating discriminatory laws, policies and practices and promoting appropriate legislation, policies and action in this regard	
	10.4 Adopt policies, especially fiscal, wage and social protection policies, and progressively achieve greater equality	
	10.5 Improve the regulation and monitoring of global financial markets and institutions and strengthen the implementation of such regulations	
	10.6 Ensure enhanced representation and voice for developing countries in decision-making in global international economic and financial institutions in order to deliver more effective, credible, accountable and legitimate institutions	This target was approached with a generalized scope of looking at enhanced representation and voice in decision-making at all levels and aspects. The focus was shifted away from developing countries and applicable data included inclusive research-based decisions in addition to economic matters.
	10.7 Facilitate orderly, safe, regular and responsible migration and mobility of people, including through the implementation of planned and well-managed migration policies	
	10.a Implement the principle of special and differential treatment for developing countries, in particular least developed countries, in accordance with World Trade Organization agreements	
	10.b Encourage official development assistance and financial flows, including foreign direct investment, to States where the need is greatest, in particular least developed countries, African countries, small island developing States and landlocked developing countries, in accordance with their national plans and programmes	
	10.c By 2030, reduce to less than 3 per cent the transaction costs of migrant remittances and eliminate remittance corridors with costs higher than 5 per cent	
SDG 11	11.1 By 2030, ensure access for all to adequate, safe and affordable housing and basic services and upgrade slums	
	11.2 By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons	
	11.3 By 2030, enhance inclusive and sustainable urbanization and capacity for participatory, integrated and sustainable human settlement planning and management in all countries	
	11.4 Strengthen efforts to protect and safeguard the world's cultural and natural heritage	
	11.5 By 2030, significantly reduce the number of deaths and the number of people affected and substantially decrease the direct economic losses relative to global gross domestic product caused by disasters, including water-related disasters, with a focus on protecting the poor and people in vulnerable situations	For the context of this project, this target was approached by looking at any and all impacts that disasters may have on people.
	11.6 By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management	Data applicable to this target was considered based on the impacts that poor air quality have on communities.
	11.7 By 2030, provide universal access to safe, inclusive and accessible, green and public spaces, in particular for women and children, older persons and persons with disabilities	
	11.a Support positive economic, social and environmental links between urban, peri-urban and rural areas by strengthening national and regional development planning	This target was approached in a broader context by incorporating data that spoke to building capacity to reduce human-caused environmental impacts and mobilizing knowledge links between natural and built systems.
	11.b By 2020, substantially increase the number of cities and human settlements adopting and implementing integrated policies and plans towards inclusion, resource efficiency, mitigation and adaptation to climate change, resilience to disasters, and develop and implement, in line with the Sendai Framework for Disaster Risk Reduction 2015–2030, holistic disaster risk management at all levels	Data for this target was considered applicable through any efforts that enhance support for policies and plans towards inclusion, resource efficiency, mitigation and adaptation to climate change, and resilience to disasters.
	11.c Support least developed countries, including through financial and technical assistance, in building sustainable and resilient buildings utilizing local materials	

SDG 12	12.1 Implement the 10Year Framework of Programmes on Sustainable Consumption and Production Patterns, all countries taking action, with developed countries taking the lead, taking into account the development and capabilities of developing countries	
	12.2 By 2030, achieve the sustainable management and efficient use of natural resources	
	12.3 By 2030, halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses	
	12.4 By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimize their adverse impacts on human health and the environment	
	12.5 By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse	
	12.6 Encourage companies, especially large and transnational companies, to adopt sustainable practices and to integrate sustainability information into their reporting cycle	
	12.7 Promote public procurement practices that are sustainable, in accordance with national policies and priorities	
	12.8 By 2030, ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature	
	12.a Support developing countries to strengthen their scientific and technological capacity to move towards more sustainable patterns of consumption and production	
	12.b Develop and implement tools to monitor sustainable development impacts for sustainable tourism that creates jobs and promotes local culture and products	This target was approached through a research lens by including data that spoke to research efforts that will promote accountable and sustainable tourism.
SDG 13	12.c Rationalize inefficient fossil-fuel subsidies that encourage wasteful consumption by removing market distortions, in accordance with national circumstances, including by restructuring taxation and phasing out those harmful subsidies, where they exist, to reflect their environmental impacts, taking fully into account the specific needs and conditions of developing countries and minimizing the possible adverse impacts on their development in a manner that protects the poor and the affected communities	
	13.1 Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries	This target was approached more broadly, by considering any risk-reduction efforts and research related to climate-related impacts.
	13.2 Integrate climate change measures into national policies, strategies and planning	This target was approached without focus on the national level, incorporating data that spoke to any research or organization that aims to impact or influence climate change policies, strategies or planning at any level.
	13.3 Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning	The scope of this target was expanded to also include education and awareness raising on the science of climate change and all types of climate-related impacts.
	13.a Implement the commitment undertaken by developed-country parties to the United Nations Framework Convention on Climate Change to a goal of mobilizing jointly \$100 billion annually by 2020 from all sources to address the needs of developing countries in the context of meaningful mitigation actions and transparency on implementation and fully operationalize the Green Climate Fund through its capitalization as soon as possible	
	13.b Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalized communities	This target was approached in a broader context to include any research or strategies that will enhance the capacity for climate-related knowledge, management, and research at any level.

SDG 14	14.1 By 2025, prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution	
	14.2 By 2020, sustainably manage and protect marine and coastal ecosystems to avoid significant adverse impacts, including by strengthening their resilience, and take action for their restoration in order to achieve healthy and productive oceans	
	14.3 Minimize and address the impacts of ocean acidification, including through enhanced scientific cooperation at all levels	
	14.4 By 2020, effectively regulate harvesting and end overfishing, illegal, unreported and unregulated fishing and destructive fishing practices and implement science-based management plans, in order to restore fish stocks in the shortest time feasible, at least to levels that can produce maximum sustainable yield as determined by their biological characteristics	
	14.5 By 2020, conserve at least 10 per cent of coastal and marine areas, consistent with national and international law and based on the best available scientific information	
	14.6 By 2020, prohibit certain forms of fisheries subsidies which contribute to overcapacity and overfishing, eliminate subsidies that contribute to illegal, unreported and unregulated fishing and refrain from introducing new such subsidies, recognizing that appropriate and effective special and differential treatment for developing and least developed countries should be an integral part of the World Trade Organization fisheries subsidies negotiation	
	14.7 By 2030, increase the economic benefits to small island developing States and least developed countries from the sustainable use of marine resources, including through sustainable management of fisheries, aquaculture and tourism	
	14.a Increase scientific knowledge, develop research capacity and transfer marine technology, taking into account the Intergovernmental Oceanographic Commission Criteria and Guidelines on the Transfer of Marine Technology, in order to improve ocean health and to enhance the contribution of marine biodiversity to the development of developing countries, in particular small island developing States and least developed countries	
	14.b Provide access for small-scale artisanal fishers to marine resources and markets	
	14.c Enhance the conservation and sustainable use of oceans and their resources by implementing international law as reflected in the United Nations Convention on the Law of the Sea, which provides the legal framework for the conservation and sustainable use of oceans and their resources, as recalled in paragraph 158 of “The future we want”	

SDG 15	15.1 By 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and drylands, in line with obligations under international agreements	
	15.2 By 2020, promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests and substantially increase afforestation and reforestation globally	
	15.3 By 2030, combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land degradation-neutral world	The scope of this target included considering any research that aims to better understand landscape changes, how to mitigate them, and how to restore degraded land.
	15.4 By 2030, ensure the conservation of mountain ecosystems, including their biodiversity, in order to enhance their capacity to provide benefits that are essential for sustainable development	This target was approached through a broader, research perspective to include any data that spoke to research or initiatives that will impact future conservation of mountains and their ecosystems.
	15.5 Take urgent and significant action to reduce the degradation of natural habitats, halt the loss of biodiversity and, by 2020, protect and prevent the extinction of threatened species	This target was approached through a broader, research perspective to include any data that spoke to research or initiatives that are studying species and biodiversity to influence future conservation and management.
	15.6 Promote fair and equitable sharing of the benefits arising from the utilization of genetic resources and promote appropriate access to such resources, as internationally agreed	
	15.7 Take urgent action to end poaching and trafficking of protected species of flora and fauna and address both demand and supply of illegal wildlife products	
	15.8 By 2020, introduce measures to prevent the introduction and significantly reduce the impact of invasive alien species on land and water ecosystems and control or eradicate the priority species	
	15.9 By 2020, integrate ecosystem and biodiversity values into national and local planning, development processes, poverty reduction strategies and accounts	This target was approached to also include research that will influence planning, strategies, and policies.
	15.a Mobilize and significantly increase financial resources from all sources to conserve and sustainably use biodiversity and ecosystems	
	15.b Mobilize significant resources from all sources and at all levels to finance sustainable forest management and provide adequate incentives to developing countries to advance such management, including for conservation and reforestation	
	15.c Enhance global support for efforts to combat poaching and trafficking of protected species, including by increasing the capacity of local communities to pursue sustainable livelihood opportunities	
SDG 16	16.1 Significantly reduce all forms of violence and related death rates everywhere	
	16.2 End abuse, exploitation, trafficking and all forms of violence against and torture of children	
	16.3 Promote the rule of law at the national and international levels and ensure equal access to justice for all	
	16.4 By 2030, significantly reduce illicit financial and arms flows, strengthen the recovery and return of stolen assets and combat all forms of organized crime	
	16.5 Substantially reduce corruption and bribery in all their forms	
	16.6 Develop effective, accountable and transparent institutions at all levels	
	16.7 Ensure responsive, inclusive, participatory and representative decision-making at all levels	
	16.8 Broaden and strengthen the participation of developing countries in the institutions of global governance	
	16.9 By 2030, provide legal identity for all, including birth registration	
	16.10 Ensure public access to information and protect fundamental freedoms, in accordance with national legislation and international agreements	
	16.a Strengthen relevant national institutions, including through international cooperation, for building capacity at all levels, in particular in developing countries, to prevent violence and combat terrorism and crime	
	16.b Promote and enforce non-discriminatory laws and policies for sustainable development	

SDG 17	17.1 Strengthen domestic resource mobilization, including through international support to developing countries, to improve domestic capacity for tax and other revenue collection	For the context of this project, this target was approached without the international focus on developing countries. Data was considered applicable through efforts that support resource mobilization to enhance mountain research.
	17.2 Developed countries to implement fully their official development assistance commitments, including the commitment by many developed countries to achieve the target of 0.7 per cent of gross national income for official development assistance (ODA/GNI) to developing countries and 0.15 to 0.20 per cent of ODA/GNI to least developed countries; ODA providers are encouraged to consider setting a target to provide at least 0.20 per cent of ODA/GNI to least developed countries	
	17.3 Mobilize additional financial resources for developing countries from multiple sources	
	17.4 Assist developing countries in attaining long-term debt sustainability through coordinated policies aimed at fostering debt financing, debt relief and debt restructuring, as appropriate, and address the external debt of highly indebted poor countries to reduce debt distress	
	17.5 Adopt and implement investment promotion regimes for least developed countries	
	17.6 Enhance North-South, South-South and triangular regional and international cooperation on and access to science, technology and innovation and enhance knowledge-sharing on mutually agreed terms, including through improved coordination among existing mechanisms, in particular at the United Nations level, and through a global technology facilitation mechanism	This target was approached through the perspective of partnerships that promote knowledge sharing and cooperation without a specific international focus.
	17.7 Promote the development, transfer, dissemination and diffusion of environmentally sound technologies to developing countries on favourable terms, including on concessional and preferential terms, as mutually agreed	
	17.8 Fully operationalize the technology bank and science, technology and innovation capacity-building mechanism for least developed countries by 2017 and enhance the use of enabling technology, in particular information and communications technology	This target was approached without the focus on developing countries.
	17.9 Enhance international support for implementing effective and targeted capacity-building in developing countries to support national plans to implement all the Sustainable Development Goals, including through North-South, South-South and triangular cooperation	
	17.10 Promote a universal, rules-based, open, nondiscriminatory and equitable multilateral trading system under the World Trade Organization, including through the conclusion of negotiations under its Doha Development Agenda	
	17.11 Significantly increase the exports of developing countries, in particular with a view to doubling the least developed countries' share of global exports by 2020	
	17.12 Realize timely implementation of duty-free and quota-free market access on a lasting basis for all least developed countries, consistent with World Trade Organization decisions, including by ensuring that preferential rules of origin applicable to imports from least developed countries are transparent and simple, and contribute to facilitating market access	
	17.13 Enhance global macroeconomic stability, including through policy coordination and policy coherence	
	17.14 Enhance policy coherence for sustainable development	This target was approached through the perspective of partnerships that promote cohesion for sustainable development management and policies without an international focus.
	17.15 Respect each country's policy space and leadership to establish and implement policies for poverty eradication and sustainable development	
	17.16 Enhance the Global Partnership for Sustainable Development, complemented by multi-stakeholder partnerships that mobilize and share knowledge, expertise, technology and financial resources, to support the achievement of the Sustainable Development Goals in all countries, in particular developing countries	This target was approached by considering partnerships that share knowledge, technology, and financial resources to support SDG achievement without an international focus.
	17.17 Encourage and promote effective public, public-private and civil society partnerships, building on the experience and resourcing strategies of partnerships	
	17.18 By 2020, enhance capacity-building support to developing countries, including for least developed countries and small island developing States, to increase significantly the availability of high-quality, timely and reliable data disaggregated by income, gender, age, race, ethnicity, migratory status, disability, geographic location and other characteristics relevant in national contexts	
	17.19 By 2030, build on existing initiatives to develop measurements of progress on sustainable development that complement gross domestic product, and support statistical capacity-building in developing countries	

APPENDIX B: THE UNITED NATIONS DECLARATION ON THE RIGHTS OF INDIGENOUS PEOPLES

Article	Description
1	Indigenous peoples have the right to the full enjoyment, as a collective or as individuals, of all 8 human rights and fundamental freedoms as recognized in the Charter of the United Nations, the Universal Declaration of Human Rights and international human rights law.
2	Indigenous peoples and individuals are free and equal to all other peoples and individuals and have the right to be free from any kind of discrimination, in the exercise of their rights, in particular that based on their Indigenous origin or identity
3	Indigenous peoples have the right to self-determination. By virtue of that right they freely determine their political status and freely pursue their economic, social and cultural development.
4	Indigenous peoples, in exercising their right to self-determination, have the right to autonomy or self-government in matters relating to their internal and local affairs, as well as ways and means for financing their autonomous functions.
5	Indigenous peoples have the right to maintain and strengthen their distinct political, legal, economic, social and cultural institutions, while retaining their right to participate fully, if they so choose, in the political, economic, social and cultural life of the State
6	Every Indigenous individual has the right to a nationality.
7	1. Indigenous individuals have the rights to life, physical and mental integrity, liberty and security of person. 2. Indigenous peoples have the collective right to live in freedom, peace and security as distinct peoples and shall not be subjected to any act of genocide or any other act of violence, including forcibly removing children of the group to another group.
8	1. Indigenous peoples and individuals have the right not to be subjected to forced assimilation or destruction of their culture. 2. States shall provide effective mechanisms for prevention of, and redress for: (a) Any action which has the aim or effect of depriving them of their integrity as distinct peoples, or of their cultural values or ethnic identities; (b) Any action which has the aim or effect of dispossessing them of their lands, territories, or resources; (c) Any form of forced population transfer which has the aim or effect of violating or undermining any of their rights; (d) Any form of forced assimilation or integration; (e) Any form of propaganda designed to promote or incite racial or ethnic discrimination directed against them.
9	Indigenous peoples and individuals have the right to belong to an Indigenous community or nation, in accordance with the traditions and customs of the community or nation concerned. No discrimination of any kind may arise from the exercise of such a right.
10	Indigenous peoples shall not be forcibly removed from their lands or territories. No relocation shall take place without the free, prior and informed consent of the Indigenous peoples concerned and after agreement on just and fair compensation and, where possible, with the option of return.
11	1. Indigenous peoples have the right to practise and revitalize their cultural traditions and customs. This includes the right to maintain, protect and develop the past, present and future manifestations of their cultures, such as archaeological and historical sites, artefacts, designs, ceremonies, technologies and visual and performing arts and literature. 2. States shall provide redress through effective mechanisms, which may include restitution, developed in conjunction with Indigenous peoples, with respect to their cultural, intellectual, religious and spiritual property taken without their free, prior and informed consent or in violation of their laws, traditions and customs
12	1. Indigenous peoples have the right to manifest, practise, develop and teach their spiritual and religious traditions, customs and ceremonies; the right to maintain, protect, and have access in privacy to their religious and cultural sites; the right to the use and control of their ceremonial objects; and the right to the repatriation of their human remains 2. States shall seek to enable the access and/or repatriation of ceremonial objects and human remains in their possession through fair, transparent and effective mechanisms developed in conjunction with Indigenous peoples concerned.
13	1. Indigenous peoples have the right to revitalize, use, develop and transmit to future generations their histories, languages, oral traditions, philosophies, writing systems and literatures, and to designate and retain their own names for communities, places and persons. 2. States shall take effective measures to ensure that this right is protected and also to ensure that Indigenous peoples can understand and be understood in political, legal and administrative proceedings, where necessary through the provision of interpretation or by other appropriate means.

14	1. Indigenous peoples have the right to establish and control their educational systems and institutions providing education in their own languages, in a manner appropriate to their cultural methods of teaching and learning.
	2. Indigenous individuals, particularly children, have the right to all levels and forms of education of the State without discrimination.
	3. States shall, in conjunction with Indigenous peoples, take effective measures, in order for Indigenous individuals, particularly children, including those living outside their communities, to have access, when possible, to an education in their own culture and provided in their own language.
15	1. Indigenous peoples have the right to the dignity and diversity of their cultures, traditions, histories and aspirations which shall be appropriately reflected in education and public information
	2. States shall take effective measures, in consultation and cooperation with the Indigenous peoples concerned, to combat prejudice and eliminate discrimination and to promote tolerance, understanding and good relations among Indigenous peoples and all other segments of society.
16	1. Indigenous peoples have the right to establish their own media in their own languages and to have access to all forms of non-Indigenous media without discrimination.
	2. States shall take effective measures to ensure that State-owned media duly reflect Indigenous cultural diversity. States, without prejudice to ensuring full freedom of expression, should encourage privately owned media to adequately reflect Indigenous cultural diversity.
17	1. Indigenous individuals and peoples have the right to enjoy fully all rights established under applicable international and domestic labour law.
	2. States shall in consultation and cooperation with Indigenous peoples take specific measures to protect Indigenous children from economic exploitation and from performing any work that is likely to be hazardous or to interfere with the child's education, or to be harmful to the child's health or physical, mental, spiritual, moral or social development, taking into account their special vulnerability and the importance of education for their empowerment.
	3. Indigenous individuals have the right not to be subjected to any discriminatory conditions of labour and, inter alia, employment or salary.
18	Indigenous peoples have the right to participate in decision-making in matters which would affect their rights, through representatives chosen by themselves in accordance with their own procedures, as well as to maintain and develop their own Indigenous decision-making institutions.
19	States shall consult and cooperate in good faith with the Indigenous peoples concerned through their own representative institutions in order to obtain their free, prior and informed consent before adopting and implementing legislative or administrative measures that may affect them.
20	1. Indigenous peoples have the right to maintain and develop their political, economic and social systems or institutions, to be secure in the enjoyment of their own means of subsistence and development, and to engage freely in all their traditional and other economic activities.
	2. Indigenous peoples deprived of their means of subsistence and development are entitled to just and fair redress.
21	1. Indigenous peoples have the right, without discrimination, to the improvement of their economic and social conditions, including, inter alia, in the areas of education, employment, vocational training and retraining, housing, sanitation, health and social security.
	2. States shall take effective measures and, where appropriate, special measures to ensure continuing improvement of their economic and social conditions. Particular attention shall be paid to the rights and special needs of Indigenous elders, women, youth, children and persons with disabilities.
22	1. Particular attention shall be paid to the rights and special needs of Indigenous elders, women, youth, children and persons with disabilities in the implementation of this Declaration.
	2. States shall take measures, in conjunction with Indigenous peoples, to ensure that Indigenous women and children enjoy the full protection and guarantees against all forms of violence and discrimination.
23	Indigenous peoples have the right to determine and develop priorities and strategies for exercising their right to development. In particular, Indigenous peoples have the right to be actively involved in developing and determining health, housing and other economic and social programmes affecting them and, as far as possible, to administer such programmes through their own institutions.
24	1. Indigenous peoples have the right to their traditional medicines and to maintain their health practices, including the conservation of their vital medicinal plants, animals and minerals. Indigenous individuals also have the right to access, without any discrimination, to all social and health services.
	2. Indigenous individuals have an equal right to the enjoyment of the highest attainable standard of physical and mental health. States shall take the necessary steps with a view to achieving progressively the full realization of this right.
25	Indigenous peoples have the right to maintain and strengthen their distinctive spiritual relationship with their traditionally owned or otherwise occupied and used lands, territories, waters and coastal seas and other resources and to uphold their responsibilities to future generations in this regard.

26	1. Indigenous peoples have the right to the lands, territories and resources which they have traditionally owned, occupied or otherwise used or acquired.
	2. Indigenous peoples have the right to own, use, develop and control the lands, territories and resources that they possess by reason of traditional ownership or other traditional occupation or use, as well as those which they have otherwise acquired.
	3. States shall give legal recognition and protection to these lands, territories and resources. Such recognition shall be conducted with due respect to the customs, traditions and land tenure systems of the Indigenous peoples concerned.
27	States shall establish and implement, in conjunction with Indigenous peoples concerned, a fair, independent, impartial, open and transparent process, giving due recognition to Indigenous peoples' laws, traditions, customs and land tenure systems, to recognize and adjudicate the rights of Indigenous peoples pertaining to their lands, territories and resources, including those which were traditionally owned or otherwise occupied or used. Indigenous peoples shall have the right to participate in this process.
28	1. Indigenous peoples have the right to redress, by means that can include restitution or, when this is not possible, just, fair and equitable compensation, for the lands, territories and resources which they have traditionally owned or otherwise occupied or used, and which have been confiscated, taken, occupied, used or damaged without their free, prior and informed consent
	2. Unless otherwise freely agreed upon by the peoples concerned, compensation shall take the form of lands, territories and resources equal in quality, size and legal status or of monetary compensation or other appropriate redress.
29	1. Indigenous peoples have the right to the conservation and protection of the environment and the productive capacity of their lands or territories and resources. States shall establish and implement assistance programmes for Indigenous peoples for such conservation and protection, without discrimination.
	2. States shall take effective measures to ensure that no storage or disposal of hazardous materials shall take place in the lands or territories of Indigenous peoples without their free, prior and informed consent
	3. States shall also take effective measures to ensure, as needed, that programmes for monitoring, maintaining and restoring the health of Indigenous peoples, as developed and implemented by the peoples affected by such materials, are duly implemented.
30	1. Military activities shall not take place in the lands or territories of Indigenous peoples, unless justified by a relevant public interest or otherwise freely agreed with or requested by the Indigenous peoples concerned.
	2. States shall undertake effective consultations with the Indigenous peoples concerned, through appropriate procedures and in particular through their representative institutions, prior to using their lands or territories for military activities.
31	1. Indigenous peoples have the right to maintain, control, protect and develop their cultural heritage, traditional knowledge and traditional cultural expressions, as well as the manifestations of their sciences, technologies and cultures, including human and genetic resources, seeds, medicines, knowledge of the properties of fauna and flora, oral traditions, literatures, designs, sports and traditional games and visual and performing arts. They also have the right to maintain, control, protect and develop their intellectual property over such cultural heritage, traditional knowledge, and traditional cultural expressions.
	2. In conjunction with Indigenous peoples, States shall take effective measures to recognize and protect the exercise of these rights.
32	1. Indigenous peoples have the right to determine and develop priorities and strategies for the development or use of their lands or territories and other resources.
	2. States shall consult and cooperate in good faith with the Indigenous peoples concerned through their own representative institutions in order to obtain their free and informed consent prior to the approval of any project affecting their lands or territories and other resources, particularly in connection with the development, utilization or exploitation of mineral, water or other resources.
	3. States shall provide effective mechanisms for just and fair redress for any such activities, and appropriate measures shall be taken to mitigate adverse environmental, economic, social, cultural or spiritual impact.
33	1. Indigenous peoples have the right to determine their own identity or membership in accordance with their customs and traditions. This does not impair the right of Indigenous individuals to obtain citizenship of the States in which they live.
	2. Indigenous peoples have the right to determine the structures and to select the membership of their institutions in accordance with their own procedures.
34	Indigenous peoples have the right to promote, develop and maintain their institutional structures and their distinctive customs, spirituality, traditions, procedures, practices and, in the cases where they exist, juridical systems or customs, in accordance with international human rights standards.
35	Indigenous peoples have the right to determine the responsibilities of individuals to their communities.
36	1. Indigenous peoples, in particular those divided by international borders, have the right to maintain and develop contacts, relations and cooperation, including activities for spiritual, cultural, political, economic and social purposes, with their own members as well as other peoples across borders.
	2. States, in consultation and cooperation with Indigenous peoples, shall take effective measures to facilitate the exercise and ensure the implementation of this right.

37	1. Indigenous peoples have the right to the recognition, observance and enforcement of treaties, agreements and other constructive arrangements concluded with States or their successors and to have States honour and respect such treaties, agreements and other constructive arrangements.
	2. Nothing in this Declaration may be interpreted as diminishing or eliminating the rights of Indigenous peoples contained in treaties, agreements and other constructive arrangements.
38	States in consultation and cooperation with Indigenous peoples, shall take the appropriate measures, including legislative measures, to achieve the ends of this Declaration.
39	Indigenous peoples have the right to have access to financial and technical assistance from States and through international cooperation, for the enjoyment of the rights contained in this Declaration.
40	Indigenous peoples have the right to access to and prompt decision through just and fair procedures for the resolution of conflicts and disputes with States or other parties, as well as to effective 27 remedies for all infringements of their individual and collective rights. Such a decision shall give due consideration to the customs, traditions, rules and legal systems of the Indigenous peoples concerned and international human rights.
41	The organs and specialized agencies of the United Nations system and other intergovernmental organizations shall contribute to the full realization of the provisions of this Declaration through the mobilization, inter alia, of financial cooperation and technical assistance. Ways and means of ensuring participation of Indigenous peoples on issues affecting them shall be established.
42	The United Nations, its bodies, including the Permanent Forum on Indigenous Issues, and specialized agencies, including at the country level, and States shall promote respect for and full application of the provisions of this Declaration and follow up the effectiveness of this Declaration.
43	The rights recognized herein constitute the minimum standards for the survival, dignity and well-being of the Indigenous peoples of the world
44	All the rights and freedoms recognized herein are equally guaranteed to male and female Indigenous individuals.
45	Nothing in this Declaration may be construed as diminishing or extinguishing the rights Indigenous peoples have now or may acquire in the future.
46	1. Nothing in this Declaration may be interpreted as implying for any State, people, group or person any right to engage in any activity or to perform any act contrary to the Charter of the United Nations or construed as authorizing or encouraging any action which would dismember or impair, totally or in part, the territorial integrity or political unity of sovereign and independent States.
	2. In the exercise of the rights enunciated in the present Declaration, human rights and fundamental freedoms of all shall be respected. The exercise of the rights set forth in this Declaration shall be subject only to such limitations as are determined by law and in accordance with international human rights obligations. Any such limitations shall be non-discriminatory and strictly necessary solely for the purpose of securing due recognition and respect for the rights and freedoms of others and for meeting the just and most compelling requirements of a democratic society.
	3. The provisions set forth in this Declaration shall be interpreted in accordance with the principles of justice, democracy, respect for human rights, equality, non-discrimination, good governance and good faith.

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