

Developing a Sustainable Knowledge Economy in the Northwest Territories:

A Hotì ts'eeda Discussion Paper



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Hotì ts'eeda
NORTHWEST TERRITORIES
SPOR SUPPORT UNIT



About Hotì ts'eeda

Hotì ts'eeda is a research support centre for community members, organizations and researchers involved in Northwest Territories health and health research.

Our vision is to support health research and training that is rooted in Dene Naowo, Inuvialuit and Metis knowledge and responds to the needs of patients, communities and governments. Hotì ts'eeda exists to revitalize and celebrate culture, improve capacity for individuals and families and support taking an evidence-based approach to policy. It is about moving control and ownership of research back to Indigenous peoples and communities.

We aim to connect researchers and communities, build capacity and contribute to a health system that is culturally competent and inclusive of Indigenous methodologies and ways of knowing. We do this by acting as a connector: connecting researchers with communities, Indigenous organizations, and NWT health research priorities.

Hotì ts'eeda is a Strategy for Patient-Oriented Research (SPOR) SUPPORT Unit led by the Canadian Institutes of Health Research (CIHR). SPOR's aims are to engage patients as partners in health research, ensure that health research is relevant to patients' and policy-makers' priorities, and ensure that research results are used to improve healthcare systems and practices.

Visit www.nwtspor.ca for more information about Hotì ts'eeda.

Contact us at communications@nwtspor.ca with any inquiries or requests for further information.



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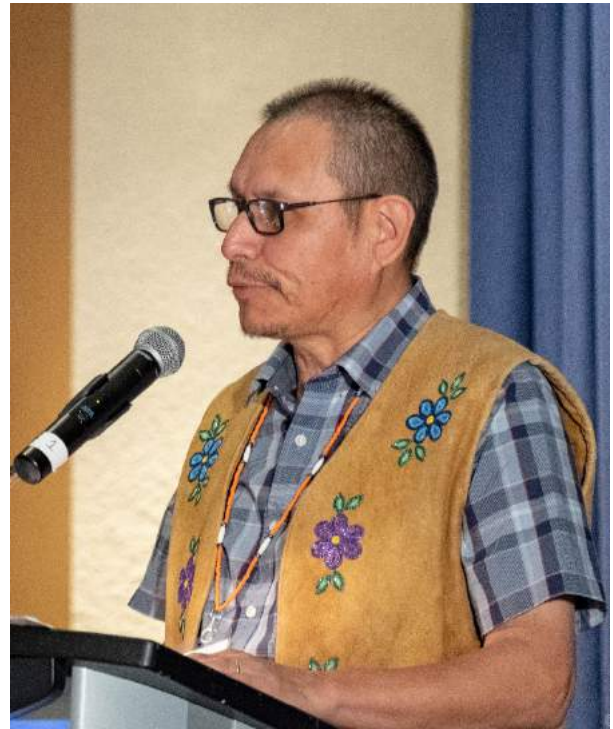
Message from the Chairperson of Hotì ts'eeda's Governing Council

This paper is released at a time when there is much discussion about the future of Aurora College and the prospect of establishing a polytechnic/university in the NWT. It attempts to broaden the conversation, by seeing a renewed Aurora College/new polytechnic within the broader context of the Knowledge Economy in the NWT.

For too long, research and associated education and training have been viewed as activities that are remote from the NWT economy and have little or no day to day impacts in the lives of NWT residents. Meanwhile, small Indigenous NWT communities that have had negative experiences of research in an era prior to land claims and self-government are now increasingly engaging as leaders and partners with universities and NWT-based Knowledge Economy organizations.

Research provides much-needed capacity transfer between communities and researchers, opportunities for Indigenous peoples to address issues of local priority, and jobs that put food on the table for many families, and that can become pathways to educational and knowledge development opportunities and stable employment. Many such opportunities come as a result of the big efforts by a growing cohort of small, research- and training-focused organizations, led by entrepreneurial and highly qualified Northerners who would in other jurisdictions likely be working in or would be supported by universities. Their visions have led to made-in-the-NWT innovations in health research, On-the-Land programs, Indigenous cultural resurgence, Northern agriculture, and youth sexual health, to name but a few areas.

Hotì ts'eeda has a mandate to connect researchers with communities to promote



better health research and health research capacity, by rooting research approaches in Dene Naowo, Inuvialuit, and Metis Indigenous knowledge. In so doing, Hotì ts'eeda has begun to identify barriers and facilitating factors to undertaking health research in the NWT. To advance this work, Hotì ts'eeda's Scientific Director, in this paper, assesses the context for NWT health research and thinks about how it can be improved. The paper explores ways that barriers and facilitating factors are part of a wider pattern of the circumstances and realities that can grow or impede the NWT Knowledge Economy. Part of that analysis includes recognizing that social determinants of health—the conditions in which people live that contribute to their health—are linked to economic opportunity. Research into NWT residents' health and social determinants of health, such as housing, climate change, disease, and colonization impacts, is essential for understanding how we as NWT residents

can make better decisions and take actions leading to healthier lives.

Economic opportunities provided by research, education and training—in terms of jobs, capacity building, and pathways for education and employment—make a significant difference in the lives of small NWT communities.

Understanding research as an end in and of itself, or seeing an NWT polytechnic as an organization that will function somewhere off by itself, impoverishes how research or a polytechnic might be understood in relation to their larger decolonizing, capacity building, and economic significance for the NWT. The Knowledge Economy is an ecosystem made up of various organizations, people, and activities. It produces knowledge, uses knowledge, and is

an economic driver. This discussion paper aims to educate, inform, raise issues, and propose actions that will broaden the conversation about research, a polytechnic, and role of Knowledge Economy players, and their relationship to each other, within the NWT Knowledge Economy.

A handwritten signature in black ink, appearing to read 'JBZ', is written on a light-colored rectangular background.

John B. Zoe LLD (Hon.), Chairperson

Executive Summary

This discussion paper has three main parts. It starts with a description of the NWT Knowledge Economy (KE), focusing on a discrete part: the ecosystem of actors involved in activities related to research, education and post-secondary training. Part of the purpose of the paper is to recognize that research, and post-secondary education and training initiatives, have significant potential to provide economic opportunities in small communities, and must be regulated, managed, and fostered with their economic impact in mind. It sees the KE primarily through the lens of a growing cohort of non-Government of the Northwest Territories (GNWT) organizations and initiatives, established and operated by highly qualified NWT residents in response to local and territorial needs in areas such as health research, agriculture, land protection, Indigenous culture and resurgence, and NWT youth.

It then describes how the current situation relates to the larger NWT KE, with a particular focus on the potential for an NWT polytechnic as an “anchor institution” that could act as a catalyst for growing the Knowledge Economy and amplifying the impact and reach of KE actors by providing specific supports, such as institutional affiliations and access to physical infrastructure and highly qualified personnel and students that a polytechnic would attract. This section also imagines how that could work in concrete ways.

The third section identifies specific actions that could be taken by key KE players who have both authority and resources they can deploy to foster an NWT KE to its full economic potential. The GNWT has a primary role in the KE; to date, it has chosen to link much of its KE investment to resource extraction, which to some extent amplifies the “resource curse” approach to economic development in a context where resource extraction is declining. However, the GNWT is poised to make significant investment in the KE by establishing a polytechnic and this paper provides ideas and insights intended to contribute to conceiving of a polytechnic as a key player within a KE vision, linked to a growing cohort of NWT-based KE organizations, rather than as a discrete organization operating on its own.

Indigenous Governments have inherent authorities and possess resources through self-government and land claims agreements, and have a greater level of recognition by Canada of their rights and priorities in an era of reconciliation. The paper describes how Indigenous Governments have recognized research and training as social, educational, and economic opportunities for their members, and therefore have led the way in understanding the importance of the KE activities on their lands.

The federal government and its national academic funding agencies, municipalities, southern universities, industry and the private sector, and philanthropic organizations all have a role to play in the NWT KE. Their investments and policy choices will be crucial to realizing KE priorities of, and benefits to, NWT residents. The paper identifies specific actions and principles for them to consider if they wish to foster the KE in the NWT.

Introduction

There is a KE in the Northwest Territories (NWT) that will grow and provide significant economic benefits across the territory in the coming decades. It will meet its full potential if essential KE participants foster its sustainability and coherence through actions aimed at achieving specific targets and goals.

While the GNWT is best positioned to play a significant role in fostering NWT KE cohesion through legislative and policy incentives, actions on the part of Indigenous Governments, the federal government, southern universities, the private sector and municipalities will be essential for growing this economic sector and fostering its sustainable benefits.

The purpose of this paper is to identify issues, questions, and possibilities to consider for effectively fostering a sustainable KE in the NWT. This analysis looks at the NWT KE with a focus on research and post-secondary education and training, primarily through non-GNWT organizations and initiatives involved in research and post-secondary education across a variety of sectors. It looks at how these organizations and initiatives and related players currently contribute to the KE and how these contributions can be leveraged through strategic collaboration, and raises questions and issues about creating circumstances that would allow them to flourish and increase their ability to become drivers of economic development and economic opportunity for residents in all NWT communities. This paper is meant to spark ideas and discussion, to contribute ideas for consideration with respect to policy and legislative improvements for fostering the KE, and to contextualize and broaden the current discussions about major KE elements such as the establishment of an NWT polytechnic¹ by situating its potential impact and reach in relation to non-GNWT research and education organizations and initiatives within the broader NWT KE.

The paper is structured to answer the following questions:

1. What is the Knowledge Economy and why does it matter?
2. What does the Knowledge Economy currently look like in the NWT?
3. In considering the current situation of the Knowledge Economy in the NWT, what actions might foster and maximize NWT Knowledge Economy potential, which would in turn increase the economic opportunities to NWT communities?

What is a Knowledge Economy?

Academic literature refers to both a knowledge economy and a knowledge-based economy. The two labels tend to be used interchangeably.² This paper uses the term Knowledge Economy (KE), not to privilege either perspective, but to recognize that the term Knowledge Economy is most commonly used. While definitions of a KE vary, economists Powell and Snellman describe the KE as a distinct dimension of an economy, namely one where:

“The key component of a knowledge economy is a greater reliance on intellectual capabilities than on physical inputs or natural resources.”³

Economists have recognized knowledge as a form of capital since the early 1900’s when Austrian political economist Joseph Schumpeter is credited with identifying the importance of “new combinations of knowledge”⁴ as central to economic innovation. Knowledge, and its associated ideas and innovation, is important for capitalist economies to function and grow. From the first industrial revolution to the present technological age, knowledge is at the heart of economic changes shaping everyday lives and choices.

In Canada, understandings of KE have crystallized in various ways. Rooted in extraction and export of natural resources, the Canadian economy is seen primarily as a non-renewable resource-based economy (mining, forestry, oil and gas). This has resulted in what economists call a “resource curse”: reliance on short-term gains of non-renewable resource extraction to drive the economy, and a focus on supporting that part of the economy, at the expense of less easily developed economic sectors that have sustainable, longer-term profitability. As a result, other economic sectors that may not be as quickly or highly profitable, do not receive the attention and investment they would otherwise merit. Consequently KE experts Florida and Spencer view the resource extraction focus as shortsighted, since “in today’s economy, the real sources of sustained prosperity and rising living standards are knowledge, innovation and creativity. Canada has neglected the development of its knowledge-based economy.”^{5,6}

It appears that the NWT’s reliance on GDP as the main measure used in government policy making and economic management may amplify the effects of the “resource curse” with respect to the KE.⁷ As pointed out by Florida and Spencer (2015), the two types of economies can co-exist and can certainly benefit one another—neither must be sacrificed to further their mutual development. In the NWT, resource extraction-based economic sectors have received significant attention with respect to economic activity tracking, legislative and policy governance, and investment in resource extraction-related education and training.⁸ This reality highlights the consequent heightened influence of that sector’s players on the governance of that economic sector, due to the perceived importance of the natural resource extraction sector to the NWT economy. It also illustrates how the non-renewable resource sector has contributed to developing the KE, for example by virtue of the establishment of organizations such as the Mine Training Society—an example of how the KE and resource extraction sectors can be mutually beneficial and, through such initiatives, provide economic opportunity.

While resource extraction has in many respects been a driving force for aspects of NWT KE development, the same “resource curse”-oriented lens can restrict the full potential of a KE. The

perception of the KE as primarily serving the extractive resource sector could slow its evolution toward serving a wider range of economic sectors in the NWT.

What does the Knowledge Economy Look Like in the NWT?

The NWT KE is based on intellectual capital: people who have knowledge and skills that are used to undertake research or initiatives to generate ideas or innovations, often unique to the Northern context.

This section provides a sample list of non-GNWT organizations and activities that are part of the NWT KE, primarily focused on research and training. This list is not exhaustive; this section does not survey technological or capital infrastructure that make significant contributions to fostering the KE, and does not include a variety of government KE organizations. This focus provides an understanding of types of KE elements developed mainly outside of GNWT and therefore mostly unrelated to the resource extraction sector. Such organizations and initiatives have developed in response to needs and opportunities in NWT communities across a broad range of sectors, through the efforts of individual researchers, NGOs, universities, and partnerships between various players.

A hallmark of the NWT KE is the number of innovations driven by NWT-specific circumstances. These include its sheer size of over one million km² characterized by a cold climate and a small population of approximately 44,500 people spread across 33 communities, many of which are without year-round road access. Almost half of the population lives in Yellowknife, while a slight majority live in a mix of regional centres and small Indigenous communities. Colonization impacts have created significant socio-economic gaps and challenges, and climate change and lack of transportation infrastructure shape its economy, as does dependence on resource extraction sectors. The NWT is without a critical anchor institution for its KE, in that it lacks an independent university degree-granting institution. Its existing college, which has for various reasons been prevented from harnessing the KE resources offered by the population and infrastructure of the NWT's capital city and the strengths of the NWT's regional centers of Hay River, Norman Wells and Inuvik, stands to be transformed into a post-secondary institution with the ability to harness that untapped potential.⁹

Examples of KE activities include:

- Planning and doing research, and translating the results into plain language for policy makers and decision-making;
- Using Indigenous knowledge as a basis for programs and services;
- Doing on-the-land programs: education, healing, research, *etc.*;
- Designing unique health service approaches for remote and rural communities;
- Innovating cold climate and green energy generation and efficiency measures;
- Establishing internet/communications technology-based solutions (*i.e.* telehealth; e-learning) to more effectively deliver programs to rural and remote communities; and,
- Providing university-level education drawing on NWT-specific strengths (*e.g.* Indigenous governance, Indigenous languages, wildlife management, cold climate and climate change studies, *etc.*).

The GNWT employs a variety of graduate-level trained researchers and has a leadership role in science and research in the NWT. For example, the GNWT has a Geosciences Laboratory and Aurora Research Institute, which conduct and facilitate research in the NWT. In addition, the GNWT employs graduate-level trained staff who conduct research in a variety of areas. Aurora College provides college and some university-level programs, in addition to trades certifications. It has also partnered with private industry and Indigenous Governments to provide targeted training. Social and economic developments and opportunities over the last two decades have resulted in a burgeoning KE sector, as evidenced by a variety of KE-based organizations and initiatives located primarily in or near NWT regional centers and in the capital.

A number of (not an exhaustive list) KE organizations and initiatives operating as part of Indigenous Governments, as registered societies, or as NGOs include¹⁰:

- Hotì ts'eeda;
- Institute of Circumpolar Health Research;
- Northern Farm Training Institute;
- FOXY;
- Arctic Indigenous Wellness Foundation;
- Mine Training Society;
- College Nordique;
- Tł̨chq̨ Research and Training Institute;
- The National Modern Treaties Implementation Research Project, hosted by Tł̨chq̨ Government;
- Dechinta Centre for Research and Learning;
- The Wilfrid Laurier Yellowknife Research Office;
- University of Alberta Faculty of Public Health Yellowknife office;
- Inuvialuit Regional Corporation Project JEWEL Evaluation and other research initiatives;
- Gwich'in Tribal Council Culture and Heritage Division.
- Ganah Khoonatan (Teetl'it Land-Based project);
- Dene Nahjo;
- NWT Association of Communities climate change mitigation and adaptation initiative; and,
- Indigenous Guardians program.

The above list gives a sense of the different foci of organizations and initiatives in the NWT that are part of the KE—and there are many more not mentioned here. Land claim-based co-management boards for the Gwich'in, Sahtu, and Tł̨chq̨ regions, and for the NWT as a whole, employ western scientists and Indigenous knowledge holders, and some regularly conduct, commission, and draw from academic and Indigenous Knowledge research. Those boards are another example of KE organizations.

While co-management boards are established as independent entities under their respective land claims and must remain so, almost all of the other organizations and programs included in the above list could be affiliated with, or connected to/supported by, a polytechnic if one existed in the NWT. It is also important to note that there are other government and private sector organizations (such as the Inuvik Satellite Facility) and NGOs (such as the Inuvik Community Greenhouse, and greenhouses in

other NWT communities) that could and sometimes do partner closely with research institutions as part of their programming and development, and which might contribute to the viability of departments of a NWT polytechnic or university.

In addition, there are many community-based research projects that are undertaken in partnership with NWT communities. With respect to health research, the [Hotì ts'eeda website](#) lists numerous successful projects. These projects include a wide range: from research on the relationship between *H.pylori* bacteria and stomach cancer, to working with youth on mental health issues in fly-in Indigenous communities, to developing culturally appropriate practices to cancer screening. Each of these involve partnerships with university researchers, and provide local employment and involvement in doing research, building capacity and ensuring research addresses community priorities.¹¹

Have we hit a tipping point?

A number and variety of organizations and initiatives employ highly qualified staff and generate millions of dollars in research funding each year, much of it spent in small Indigenous communities. The organizations involved often struggle to pay operational costs not permitted under funding agreements, and are challenged by lack of infrastructure (office, training space) to meet their needs. Are there economic opportunities in meeting these challenges, such as building infrastructure? Particularly in the NWT capital, where economic potential has been stifled by lack of a much-needed purpose-built college/university campus, how might these needs relate to the physical design of a polytechnic?

Indigenous Governments often employ Indigenous Knowledge holders as well as graduate-level trained researchers, and in any event, staff at every level of their organizations work directly with researchers. Often individual residents in communities become “go-to” people for researchers, providing guidance, ideas and connections that enable research projects to succeed. Indigenous Governments and residents of small NWT communities provide significant in-kind contributions to researchers through not only un-compensated staff time and facilities, but also through providing *de facto* cultural competency training to researchers: educating them on the community, its protocols and cultural norms in ways that require researchers to decolonize their own beliefs and norms around working with communities—training essential for researchers to be able to build trust and relationships, which are the bedrock of best research practice in the NWT.

Among the list of KE organizations and initiatives, a number are funded and supported, in part, by national academic research funding councils. KE organizations create dozens of full-time, part-time and seasonal jobs in communities across the NWT and on the land. These are positions that usually involve research partnerships and activities with individuals in NWT communities, who benefit through employment and skill development opportunities. Currently, there is no mechanism used to track research spending or the socio-economic impact of such organizations and initiatives as a discrete KE sector within the NWT economy. Tracking spending and impacts could assist in understanding how to foster KE success. However, anecdotally it is clear that such organizations use a combination of highly

qualified personnel from both Indigenous Knowledge and western science backgrounds and in turn work with residents and knowledge holders in ways that build capacity for both researchers and residents, provide employment and contribute more broadly through sharing research results that can often inform policy and program development and innovation.

The Current Situation: Ideas, Questions and Possibilities

The Knowledge Economy as an Economic Sector

The NWT KE can be characterized as a fragmented, developing economic sector, which is not tracked as a distinct contributor to NWT GDP but is likely embedded to some degree in sectors that *are* tracked (i.e. Information and Cultural Industries; Professional, Scientific and Technical services; Educational services; and aspects of other sectors).¹² While GDP is one measure of the economy, it does not tell the story of how research and related activities provide economic opportunity to residents, particularly in small NWT communities, or connect with other economic sectors in terms of economic value. Taken together, these sectors become a significant part of the NWT Economy as measured by GDP.¹³ Perhaps as a result of KE activities not being tracked as a distinct economic sector with growth potential, and without clear information about the role of research and related activities, clear incentives and supports are not currently in place which could foster the research and training element of the KE's growth and coherence. This is to be expected in a new and growing economic sector. However, actions can be taken to monitor, govern and incentivize the KE through specific legislation, policies, and processes or mechanisms within organizations and government departments which interface with KE elements, such as research project design and approval.

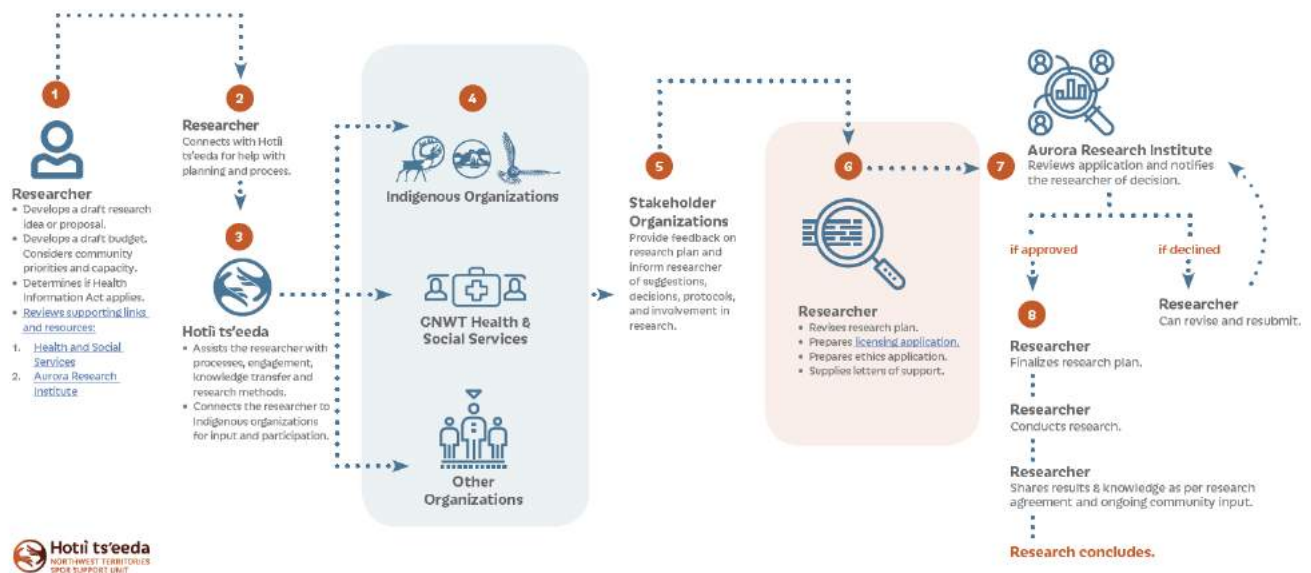
Currently, the NWT KE is without policy and legislative incentives similar to those provided for other economic sectors such as energy, resource extraction, or tourism, just three of many possible examples.¹⁴ Consider that the NWT does not have a KE strategy or road map. Even so, discussion of a post-secondary education governance framework and post-secondary institution renewal efforts have been explicitly linked to a broader conception of a KE by the GNWT.¹⁵ However, the GNWT does have planned KE interventions targeting existing GNWT priorities, most significantly, a commitment to renewing Aurora College, potentially as a polytechnic. In addition, the GNWT itself has engaged in creation of research-focused KE outside of the college, owing to the fact that its own needs and highly qualified personnel merit partnerships such as the one between the Department of Environment and Natural Resources and Wilfrid Laurier University, which has brought funding and research support, and a Wilfrid Laurier office in Yellowknife. These and other actions such as research being done on Protected Areas, including research on Indigenous Knowledge, could also support efforts in economic sectors such as Indigenous eco-tourism, and associated development and protocols around Indigenous Knowledge collection, use, and accessibility, in partnership with Indigenous Governments.

These efforts, along with a focus on KE development actions which, while linked almost exclusively to extractive industries, could also be understood as first steps toward targeted actions that could benefit the KE more broadly.¹⁶ The steady decline of Aurora College as noted in its foundational review¹⁷, the cancellation of its in-demand programs, and the unexplored economic potential for a NWT post-secondary institution harnessing the considerable KE strengths (*i.e.* Indigenous Knowledge and PhD holders, a thriving creative class, KE based organizations) situated in the NWT's regional centres, small communities and capital city, point to the need for a broader conversation and consideration of how the GNWT and other players can take actions supporting NWT KE coherence, growth and sustainability.

Notably, many Indigenous Governments have taken a leadership role with respect to KE governance and policy, by developing research policies and protocols, and issuing other strategies and plans that clearly articulate needs related to research and training elements of the NWT KE.¹⁸ Notably, some policies and approaches, such as the 2004 Dehcho First Nations Indigenous Knowledge Policy¹⁹, and the 2004 Gwich'in Social and Cultural Institute Traditional Knowledge Policy – Guidelines²⁰ explicitly recognize the economic benefits and importance of research for local residents, and therefore factor in that reality as a practical consideration for the conduct of research.²¹ Several Indigenous Governments have mapped their internal research processes as a way to achieve clarity both for their own organizations and researchers seeking partnerships with them.²² For Indigenous Governments, there are significant social, individual skill development and economic incentives for fostering respectful research partnerships despite the fact that demands on Indigenous Governments must compete with many other priorities.

HOW TO SET UP A HEALTH RESEARCH PROJECT IN THE NWT

Connect with the right partners, gather community input and obtain approval for your research in the Northwest Territories.



Organizations Involved in Research in the NWT: Approvals Process Mapping

Organizations involved in research and approvals should have a well-defined internal process that should be guided in part by the following questions.

1. Does the organization have a research process map?
2. Does the review process include one person responsible and with authority to ensure that research proposals are reviewed in a timely way?
3. Is the purpose of the review well-defined in relation to the organization's interests and values, including the goal of ensuring suggestions for improving viable proposals, and ensuring proposals meet ethical and OCAP standards and requirements?
4. Does the review include an assessment of the potential social and economic benefits and impacts of the project to the partner organization/community, so that reviewers understand potential social and economic impacts?
5. Are there defined service standards and timelines for each official involved in reviewing research proposals?
6. How do researchers give the organization feedback on the approvals process?
7. How does the organization report to the public on the research it has approved?
8. How does the organization ensure that researchers undertake knowledge translation *i.e.* report back to communities and policy makers about results?

K-12 and Lifelong Learning: A Fundamental KE Input

Recognition of the role of technology and innovation in all sectors has introduced a commonly held value of the importance of “lifelong learning” to foster optimal economic performance. Technological competence of workers is necessary; ongoing adaptation to technological change for program and service delivery continues to grow in practicality. There is commonplace recognition of the benefits of lifelong learning that underscores the importance of education for the KE.

The importance of K-12 education systems to produce excellence in basic knowledge and skill in areas such as reading and math cannot be underestimated. While not all workers will be knowledge workers *per se* (*i.e.* those having university and graduate-level education, or having their expertise as Indigenous Knowledge holders formally recognized), most would benefit from being capable of building on basic knowledge to function effectively in an economy increasingly shaped by technological innovation. Currently the NWT is challenged to achieve K-12 education targets, particularly for Indigenous youth in communities outside of Yellowknife.²³ While this paper does not address K-12 education, which is arguably the most important foundation for a sustainable NWT KE over the long term, it is an economic input that will require specific and sustained action to ensure a viable NWT KE.

Lifelong learning means greater importance of, and opportunity for, post-secondary training. In the NWT, a well-planned and situated polytechnic would both drive and produce economic demands and

outputs. Across Canada and the world, colleges, polytechnics, and universities play important roles in creating and growing local economies and regional KEs. Post-secondary institutions are catalysts for local industry partnerships and innovation and secondary economic sector development, and attract both students and highly qualified staff who become contributing members of the local community and economy.²⁴

In the NWT, an established practice of decentralized post-secondary education and training and educational innovations responsive to local needs and circumstances, such as mobile training units and more recently developed E-learning (such as the program available in the Beaufort Delta primary and secondary schools²⁵), are an advantage to developing a KE vision and consequent actions that would be partly based on experience in K-12 and post-secondary delivery innovation.

An NWT Polytechnic: Potential Catalyst for KE Coherence and Resource Leveraging

The recent Aurora College Foundational Review, and the subsequent response from the GNWT Department of Education, Culture and Employment²⁶, suggests the establishment of a polytechnic. Given the endorsement of the Minister of Education for this recommendation, this section considers potential KE impacts of the establishment of a polytechnic with respect to addressing current challenges around fragmentation and effectiveness outlined above. It assumes a vision that would see a polytechnic take advantage of the assets offered by the NWT's capital city, while ensuring that the strengths of NWT regional centres and communities are also leveraged. Given that a significant amount of academic research is conducted with the support and partnership of Indigenous Governments, it would only make sense for a polytechnic to advance its purpose effectively by leveraging the strengths of Indigenous Governments located in regional centres and small communities in meaningful ways, and advance its purpose by partnering with the various KE organizations and initiatives participating in the NWT KE. To effectively "grow the pie" that is the NWT KE, it would not make sense to under-leverage the significant strengths offered by the NWT's capital city, by not considering how the many resources there could help to grow the KE, and to plan for infrastructure needs of a polytechnic as well as the many KE organizations located in the capital.²⁷

Implications of Fragmentation for Individual KE Organizations



Figure 1: Current Fragmentation Between NWT Knowledge Economy Organizations and Initiatives

Figure 1 provides examples of KE organizations that have been established in the NWT over the last two decades. Arguably, if an NWT polytechnic were in place, the non-GNWT organizations depicted here could add to the strengths of a polytechnic—either by becoming programs within academic departments or operating as affiliated institutes or campuses. Most of the non-GNWT organizations in the figure have their own Boards of Directors; finance, administration, and HR functions; and, are sometimes in competition for scarce funding. Many partner with NWT communities or Indigenous Governments and organizations on different projects and lack formal opportunities for connecting and collaborating together that a post-secondary catalyst organization, such as a polytechnic, could provide. NWT KE organizations and initiatives have developed in direct response to needs and circumstances in the NWT. Founders, host organizations, and their staff have had to develop entrepreneurial and creative approaches to doing their work, accessing funds, connecting with NWT research and training needs and engaging in partnerships with communities and southern institutions.

A Polytechnic as an Anchor KE Institution: Implications for KE Coherence



Figure 2: Potential Affiliations/Partnerships and Program Areas of an NWT Polytechnic Based on Existing Knowledge Economy Organizations, Initiatives, and Research Activities

Figure 2 provides an illustrative possible example of the role of a polytechnic as a catalyst for the NWT KE. A polytechnic could provide administrative and financial support to KE organizations and initiatives by making those organizations affiliates or campuses, ensuring that expertise is focused on research and programming instead of administration. Affiliation relationships could see academic funding grants being administered by the polytechnic on behalf of the affiliated organizations, and the polytechnic consequently receiving significant additional funding provided under the federal Research Support Fund²⁸—designed to provide funds to post-secondary institutes to cover the costs of research grant administration. Highly qualified personnel in affiliated organizations could focus on doing research and training, while governance, finance, and administration responsibilities would be taken on by the polytechnic. Affiliates in turn could provide highly qualified staff to teach and research with the polytechnic, and polytechnic staff and students could be involved in research and capacity building in NWT communities.

The fragmented and dispersed nature of the research and training elements of the KE applies to their institutional separation, activities represented, and with respect to relationships that do not exist across the types of subject matter focus of each organization or initiative. For example, multiple small-scale training, education, and research entities exist that may focus on different subject matter areas

(health, mining, climate change), but that could benefit from cooperative relationships to leverage their existing funding. Were the NWT KE anchored by a robust and well-respected post-secondary institution, affiliated organizations could focus their resources and talent fully on programming, rather than dividing resources between programs and administration, while being positioned to take advantage of partnerships and synergies offered by a common institutional base.



Figure 3: Illustrative Examples of Relationship/Supports: Polytechnic – Affiliates - Partnerships

The above figure is intended to illustrate and imagine how the relationship between a polytechnic and affiliated KE organizations and initiatives might be mutually supportive and beneficial. It also indicates why it would likely be counter-productive for a polytechnic to fully “take over” existing KE players, by incorporating them into the polytechnic, instead of simply providing critical supports rooted in formal institutional affiliations. It would also be counter-productive for a polytechnic and existing KE organizations to work in isolation. NWT KE organizations have developed over the last two decades to meet the needs of NWT communities that Aurora College was, for various reasons, not in a position to meet. Establishing a polytechnic would provide both an opportunity and a challenge to determine how mutually beneficial relationships might be developed in ways that preserve the authenticity, local responsiveness, and social, intellectual, and economic impact of KE organizations’ programming, while benefitting from the infrastructure, resources, and “big organization”-specific opportunities that a polytechnic might offer. Ensuring that the polytechnic’s governance structure centres Indigenous Knowledge, decolonization and reconciliation, and protects academic freedom will be essential for existing and future KE organizations and initiatives to willingly affiliate and partner with a polytechnic.

Need for Catalyst for Partnership, Professional Development and Sharing Knowledge

A NWT polytechnic could provide professional opportunities and physical spaces for sharing knowledge within and across disciplines, fostering research partnerships, and providing students with mentorship and exposure to research and education opportunities. There are for example, “innovation hubs” at southern institutions that bring together various organizations and academics who can then create partnerships and opportunities that isolation cannot foster. While many non-GNWT KE organizations are located in Yellowknife, there is currently no permanent or purpose built post-secondary infrastructure. This has meant that there is no permanent and adequate dedicated physical space for students, researchers and community members to gather together and literally have a space to establish permanence of networking and knowledge creation activities. This is in direct contrast with the purpose-built campuses in Fort Smith and Inuvik, which would necessarily continue to be utilized. Informal networks among independent researchers exist, both within Yellowknife and across the NWT. However, although both the College and the GNWT employ a variety of academic researchers throughout their organizations, in the absence of a comprehensive KE strategy, neither has been in a position to put in place academic knowledge exchange, networks or collegial development with a view to fostering the KE. Efforts are made by individuals to connect with one another and with students working in their fields. As a result, significant opportunities for professional development, potential partnerships within and between disciplines and organizations (including those that could result in obtaining research funding for NWT projects) and knowledge sharing among researchers and communities are missed, due to lack of an organization active in fostering a productive academic research dimension of the KE. Thus the potential benefits of a KE “anchor institution” such as a polytechnic could have significant implications for fostering KE growth and coherence.

The above diagrams and brief discussion are intended to highlight issues and ideas for the potential of a NWT polytechnic to act as a catalyst for bringing coherence to, and decreasing fragmentation of, research- and training-oriented organizations and initiatives with respect to their ability to focus on their work rather than administrative tasks, and work together and with other partners more effectively. Other impacts and outcomes of a polytechnic’s establishment are potentially wide-ranging in other areas such as local economic and social impacts, as discussed in a recent university establishment feasibility study completed by the City of Yellowknife.²⁹

Fostering the Knowledge Economy: A Shared Responsibility

This section provides an overview of current approaches, as well as potential actions and considerations for major players in the NWT KE. This section is intended to promote discussion about ideas for consideration for KE participants seeking to foster a sustainable NWT KE.

Government of the Northwest Territories: Current Approach and Potential Leadership

As mentioned previously, the nascent NWT KE is not tracked as a distinct economic sector.³⁰ GNWT strategies, agendas and policies relating to science and research do not situate research and training as an economic development tool or as a source of employment or income in small NWT communities suffering from low and/or mainly seasonal wage employment. Without an explicit and focused policy governance framework, or an effective institutional catalyst, the NWT KE lacks definition and coherence.³¹ However, the GNWT has begun to make promising progress on fostering the NWT KE. For example, its most recent mandate document commits to specific actions developing the KE. The GNWT mandate goal with respect to the KE is:

“Making strategic investments in infrastructure, resource development, workforce development, and the knowledge economy.”³²

The GNWT further develops this commitment through the following description of actions that it will undertake, which bears quoting in full:

“We will develop and foster the knowledge economy by:

- Completing the Mackenzie Valley Fibre Optic Link in order to help modernize the economy and enable growth in all economic sectors.
- Implementing the NWT Geological Survey Strategic Plan, including carrying out Slave Province geoscience studies, ensuring the availability of high quality geoscience knowledge to promote the successful exploration for and discovery of NWT mineral resources, and defining permafrost conditions that may impact future infrastructure development.
- Implementing the Resources and Energy Development Information (REDI) initiative to increase public awareness and understanding of NWT renewable and non-renewable mineral and energy resources and the means by which they can be developed in a responsible and sustainable manner.
- In partnership with other organizations, supporting the creation of a central repository that supports knowledge dissemination, research, and best practices for northern farming conditions, and promoting innovative farm practices and northern based greenhouse and related technologies.
- Building upon the research vision developed in the GNWT Knowledge Agenda: Northern Research for Northern Priorities and other strategic instruments, to support the generation of knowledge (e.g. traditional and local knowledge and western science) and innovation to enhance decision-making and sustainable economic opportunities.

- Supporting the development and growth of post-secondary institutions and programs available in the NWT.
- Researching the feasibility of creating a Northern Centre of Excellence to promote and support research, innovation, and use of traditional Indigenous knowledge, and foster partnerships with universities, governments, and other organizations.”³³

Living up to these commitments would make a significant contribution to developing the NWT KE. However, it is clear that there is much more that is possible as the KE vision develops, including actions that will foster coherence and create conditions in which the KE can embrace its full potential. Those actions, were the GNWT willing, could be informed by consulting with non-GNWT KE organizations currently struggling with barriers to optimal performance.

The GNWT has a specific and significant role to play in the KE. Two key aspects of that role include creating a legislative, and policy environment conducive to the KE’s growth and sustainability, and continuing to establish necessary physical infrastructure. An important feature of sustainability in the case of the NWT is the two-fold need for both decolonization and cultural competency, fostered primarily through the leadership and collaboration of Indigenous Governments and communities. Another important feature will be investment in research and training capability, in the form of: establishing new and leveraging existing built infrastructure, establishing a post-secondary institution as a KE catalyst, program delivery innovation, and strategic funding investment on a leveraged basis to qualified NWT organizations and residents undertaking research in the NWT. In addition, there is potential for the GNWT to update and enhance its internal research management and approval processes, including facilitating public access to data and information held by GNWT organizations. Embracing research as a source of economic opportunity for small communities will require transparent and accountable internal processes that demonstrate a commitment to ensuring communities are in control of research, that they are provided assistance with resources to work with researchers to design and conduct it, and that the government does not unintentionally create barriers for researchers by failing to process approvals in a timely manner.

Legislative and Policy Innovations

Current gaps in government legislation and policy could be closed, and thereby foster both KE benefits *and* the cohesion among the fragmented parts that is fundamental to maximizing KE benefits.

Knowledge Economy growth through improving existing KE governance tools

The GNWT will be able to promote growth by:

- Tracking KE data for evidence-driven actions;
- Updating and improving KE related legislation such as the *Scientists Act*, the *Education Act*, and the *Health Information Act*;
- Creating internal accountability mechanisms to ensure research support;
- Renewing and delivering on key literacy and numeracy targets in education;
- Establishing a uniquely responsive decentralized polytechnic university that leverages the strengths of all regions of the NWT as a basis for strengthening the social and economic goals of NWT society;
- Partnering with Indigenous Governments and KE players to ensure federal tri-council funding is allocated directly to NWT institutions; and
- Commitment to Indigenous Ownership, Control, Accessibility and Possession principles, Indigenous data sovereignty, and cultural competency as core values of the NWT Knowledge Economy governance.

The GNWT has several pieces of legislation in place and planned that (will) impact the development of the NWT KE.

The *Scientists Act* and regulations have been in place for decades. A renewed *Scientists Act* could help to foster a thriving KE. Renewal could include provisions relating to the following broad policy goals:

- Requiring that researchers provide information about funding amounts, sources, and expenditures, including employment and training of NWT residents, by community and discipline, as a basis for tracking economic and social impacts;
- Ensuring that there is a plan in place to analyze and report data accessible to the public;
- Creating provisions to ensure that National Tri-council ethical standards are adhered to, Indigenous ethical standards and protocols are observed and respected, and Ownership, Control, Access and Possession (OCAP®) principles are incorporated as minimum research standards;
- Creating internal standards for GNWT Departments to ensure that research project proposals are dealt with accountably, efficiently, and effectively, and with a view to the economic benefits of research;
- Requiring that all NWT Ethics review processes include representatives appointed by Indigenous Governments when research is being undertaken with their members or on their lands.

In many NWT communities, research has been viewed by residents as an industry whose hallmark was exploitation of Indigenous populations by researchers who were never heard from once their research was done—except as experts on the people who had hosted them. As Indigenous peoples have gained

greater control of their lands and governance, a progressive shift has occurred toward Indigenous Governments and communities driving research approaches that respect OCAP® principles and provide capacity building, local employment and professional development for community members, as well as providing evidence to inform Indigenous Governments and organizations' programs and initiatives.

Increasing local control and economic benefits of research outside of Yellowknife beyond current levels as a result of the above actions could boost local economies and create positive social impacts. As mentioned previously, KE spending as a distinct sector is not tracked in part because it is viewed as such a small percentage of GDP; however, research spending value in terms of cash infusions into local economies, increases in meaningful employment and valuable skillsets at the local level, and associated positive social and psychological effects are currently unknowable and inaccessible to policy makers. Were KE tracked as a distinct element of the NWT economy, these measures could possibly render the value of the KE sector as competitive with positive impacts of participation in the resource extraction sector.

What is on the line when reviewing research projects?

How would the GNWT's and other organizations' internal review and approval processes look if research projects were understood as sources of income, employment and bases for Indigenous Governments having information to help them make program and policy decisions? What accountability requirements, timelines and coordination would be put in place that are different from the processes in place now?

One of the current difficulties with measuring the economic and social impacts of KE organizations and initiatives in the NWT is the lack of data about these activities. Statistical agencies in Canada that currently collect data on the economy have an opportunity to track such data; governments have an opportunity to use economic measures other than Gross Domestic Product (GDP). GDP has been increasingly embattled by various critiques in recent years as a measure that is unable to accurately capture the economic value of social well-being.³⁴ This is particularly relevant to the NWT, where economic development is often analyzed by Indigenous communities as not only with respect to monetary benefit but also with respect to social and environmental cost and impacts, an approach that increasingly gaining traction world-wide. Governments manage what they track. Without tracking what is spent on research and the KE more broadly, and understanding who benefits and how, governments cannot understand the true impact of and potential for the KE or confidently estimate how they should invest in fostering it.

Government of Canada: Current Approach and Potential Leadership

Tri-council (Social Sciences and Humanities Research Council (SSHRC), Canadian Institutes of Health Research (CIHR), National Science and Engineering Council (NSERC)) research funding and associated initiatives are an untapped NWT KE resource. A university degree-granting post-secondary institution with accredited staff and programs; partnerships between Indigenous Governments, southern universities and the private sector; and NWT organizations working cooperatively to seek cooperation

and partnership with tri-council funders to assist in the furthering an NWT KE vision, could result in substantial increases in new funding provided to organizations throughout the NWT. The NWT stands to gain millions of dollars per year in research funding and consequent knowledge creation, potential for policy innovation, local employment, consequent positive social impacts and capacity building among NWT residents. For example, establishment of a polytechnic would position the NWT to accomplish a national first: offering Canada Research Chairs in Northern studies located in Northern Canada.

The federal Northern Policy Framework/Arctic Strategy should address the economic potential of the NWT KE, possibly through a broader pan-Northern lens. This could assist Canada in understanding how its investments fit within this economic sector in each of the territories, and provide investments that promote each territory's KE.

Federal Departments and Agencies

Targeted, Innovative Investment by Federal Departments and Agencies

Working in partnership with federal funders, Indigenous Governments and the GNWT have the potential to access targeted funding for Northern research and Research Chairs that can be placed at NWT organizations; ensure strategic investments in ways to grow the NWT KE, by leveraging existing infrastructure and programs through strategic investment of existing federal program funds in NWT institutions; and working in partnership to ensure federal tri-council funds are spent in the NWT to build the NWT KE.

The federal government and its academic funding councils can support the development of the NWT KE and the capacity required to undertake research in the NWT in ways that respect OCAP® principles through the following actions:

- **Ensuring that Indigenous Governments have access to Research Support Funding** that will enable to them to respond to, engage with and participate in research about their lands and people. In recognition of the administrative costs and requirements for doing research, the funding councils provide universities and other eligible organizations with additional funding, usually a proportion of research funds awarded, to undertake the administrative tasks associated with carrying out research. Indigenous Governments are constantly asked to field research requests and partner in research, and are generally not offered funds to offset administrative costs, to develop their capacity to undertake research in partnership with universities, or to work with researchers on their lands. Providing funding to Indigenous Governments in proportion to the research demands on their organizations is essential to ensuring KE sustainability through Indigenous capacity development over the long term.
- Allocating a portion of all Northern- and Indigenous-focused **Canada Research Chairs** to Northern post-secondary institutions.

- **Allocating some research funds and competitions accessible only to Indigenous Governments and organizations**, whether or not in partnership with academic institutions. For example, creating an Indigenous Knowledge research theme that is only available to Indigenous organizations and Indigenous Knowledge holders as primary awardees, adjudicated only by recognized Indigenous community members, whether Indigenous Knowledge holders or academics. This would enable Indigenous governments and organizations to significantly further their own research priorities and needs to help solve pressing problems and develop policies and programming.
- **Building sustainability into research funding**: instead of providing for occasional, one-off funding, create opportunities for sustained ongoing funding for Indigenous communities to address their research priorities rather than those of Tri-council funders or universities.
- **Tracking indicators and data for research focus and spending at the Indigenous Government and community level** to enable Indigenous governments to access evidence that will assist them with developing long-term research agendas, capacity building and program development to leverage research funding benefits to their full potential.
- **Making research and training infrastructure investments** in the North to enable Indigenous Governments to partner with and host academic researchers, Indigenous Knowledge holders, and community members involved in research. The federal government has various infrastructure support programs that have supported infrastructure investments at southern universities that have increased their capacity to do Northern research. Infrastructure investments must be made to ensure that KE initiatives have access to space required to undertake long-term cooperative research and innovation activities with a view to long term sustainability.
- Tri-Council agencies could **create incentives for Canadian and international universities to affiliate NWT-based researchers and Indigenous Knowledge holders**, or create a category of NWT-based researcher, which would no longer exclude NWT-based researchers from funding access due solely to the lack of a university currently in the NWT.
- **Facilitating Indigenous Government eligibility for Tri-Council research grants**. Tri-Council agencies must actively encourage and facilitate processes for Indigenous Governments and organizations to be recognized as eligible institutions for Tri-Council research grants and RSF funding.
- **Ensuring that NWT based Indigenous Knowledge holders and NWT based academics are appointed to national funding council boards and committees**; and, appointed to adjudication committees for competitions that include proposals to conduct research in the NWT and with Inuvialuit/Inuit, Metis, and First Nations peoples.
- **Acknowledge that the ability of organizations in the NWT to provide matching resources for research is far more limited** than those of organizations in the south, and therefore develop

methods that account for that reality rather than effectively penalizing a small jurisdiction like the NWT with fewer resources for not being consistent with southern norms and capabilities.

Indigenous Governments: Current Approaches and Potential Leadership

Building on Indigenous expertise to address needs and ensure control

Indigenous Governments should establish research protocols and agendas to identify research needs, priorities and process control; identify and support Indigenous Knowledge expertise for research and ethics reviews; partner with academic experts on research priorities and with external organizations on partnerships leveraging funds for employment, training and education; seek resources for developing Indigenous-specific cultural competency training for delivery to KE partners.

The lack of policy oversight and tracking of KE sector data and indicators in the NWT can result in both a net drag on the resources of Indigenous Governments and a missed opportunity to access federal funding for research. Indigenous Governments are not provided with resources to respond to research requests and shape research proposals to address their interests. Their resources are therefore taken away from a multitude of other pressing issues to work with researchers, because Indigenous Governments appreciate that research is important for solving challenges and also represents a potential source of income and skill transfer between community members and researchers.

In a recent article in Northern Public Affairs describing the March 2018 National Inuit Strategy on Research³⁵, Natan Obed articulates a rationale for Inuit governance of research about Inuit:

Inuit in Canada are among the most studied Indigenous people on earth, with the total number of peer-reviewed publications and dissertations that focus on Inuit and Inuit Nunangat increasing year after year. For example, in 1996, for every seven Inuit, there was one Inuit Nunangat-related publication; in 2011 for every three Inuit there was one publication. Yet, more research has not necessarily led to improved conditions for Inuit with severe social, health, and economic inequities continuing to impact too many of our people. The primary beneficiaries of research carried out in Inuit Nunangat tend to be researchers that are disproportionately based in southern academic institutions.³⁶

This situation gives a sense of the demands on Inuit organizations that such a level of research activity requires; however, the national funding councils handing out money to researchers do not provide funds to Inuit to engage with or manage research requests. This situation resonates with experiences of NWT Indigenous Governments and organizations which must respond to research license, partnership, community consultation and information requests without dedicated staff resources provided for these activities. Specific actions recommended in this discussion paper are intended to mitigate the negative organizational and resource demands of this situation while building a thriving KE sector whose sustainability in part will rely on the resourcing provided to Indigenous Governments to engage with and manage research on their lands and with their people.

Indigenous Governments have been forced to contend with researchers, the potential benefits and harms that research can bring and the legacy of colonial-era research within communities. Some have issued written research and Indigenous Knowledge policies. Others have established norms and

conventions in communities with respect to researchers. The licensing and ethics processes governed by GNWT legislation to some extent removes the burden of coordinating reviews from communities and in that sense is helpful. However, control and involvement of research is increasing within Indigenous communities, and continued empowerment requires additional resourcing. Many Indigenous Governments regularly provide expertise, office and meeting space, and other supports as in-kind contributions to research. Articulating Indigenous Government needs for continuing to develop approaches and practices of research governance and fostering capacity necessary to conduct research and work with researchers would assist with understanding how funding councils, universities and governments can assist with this ongoing development.

Canadian Universities

University partnerships to build and leverage NWT strengths

Universities should enter into partnerships with NWT institutions to promote scholarship in the NWT and training of researchers; prioritize training and educational opportunities for NWT residents; draw on NWT-based expertise to provide training to southern-based students through NWT-based field schools and involvement of NWT experts in teaching; provide affiliations to NWT-based PhDs and knowledge holders to increase their involvement in southern universities and NWT researchers' and institutions' access to tri-council funding.

Universities across Canada have developed productive and long-standing relationships with NWT communities to their mutual benefit. In the past few decades, researchers have come to embrace OCAP® principles, the inclusion of Indigenous knowledge in research, respecting community protocols and involvement of communities in research. Licensing requirements ensure that researchers work with communities to the extent possible to ensure that research is undertaken with community involvement. Canadian universities can support the development of the NWT KE through the following actions:

- **Creating success pathways** for Northern and Indigenous community members. Universities should expect individual researchers working in the NWT to identify Northern and Indigenous community members to study with them, and make efforts to create pathways for Northern youth and knowledge holders to enter into post-secondary education.
- **Affiliate adjunct researchers**, such as Indigenous Knowledge holders and NWT-based PhD holders. These affiliations can be exceptionally helpful to enable NWT-based researchers to access research funding and develop relationships with colleagues at southern institutions and contribute to university programs and student training. The University of Alberta School of Public Health has appointed several NWT-based Indigenous knowledge holders as Adjunct Professors; University of Toronto, Carleton University, and the University of Alberta have also provided Adjunct status to NWT-based PhD holders which has resulted in millions of dollars in research funding for NWT-based researchers over the last decade.³⁷ Affiliating institutions in turn receive Research Support Funding for grants received by NWT-based Adjuncts.

- **Affiliating existing KE institutions**, which could benefit from the funding eligibility, human and administrative supports, and broad network of colleagues offered by southern university institutions, and assistance to organizations in the NWT to understand and become competitive for research grants and opportunities they currently cannot access. Universities would have NWT locations for southern-based faculty to come to the NWT to offer courses and, in so doing, create success pathways for NWT students.
- Targeting adequate university funding to provide research that facilitates **legacy skill development and capacity building opportunities**, as well as economic benefits, to NWT communities and residents.
- **Hiring Northern researchers.** Universities working in the North should be required to ensure that they can demonstrate Northern-based Adjunct Faculty recruitment and retention efforts, which would provide a basis for NWT-based Indigenous Knowledge holders and academic researchers to access national funding grants and develop relationships with academics interested in doing research in the NWT.

Municipalities, the Private Sector and Philanthropy

Identification of local needs for research and solutions

Municipalities and community governments can identify immediate and strategic municipal issues in need of research and analysis for generating solutions (housing, homelessness, tourism, infrastructure, accessibility, tourism amenities, climate change mitigation and adaptation, etc.) Local greenhouses, green energy projects and housing initiatives would make excellent sites for built-in research and KE activities to amplify the potential economic impact of these initiatives.

Municipalities can enact local measures to foster the KE: through zoning rules, tax breaks and land donations, they are in a position to tailor incentives for research and KE elements that can foster local employment and develop catalysts for attracting additional KE elements. In the NWT, municipal efforts will likely include harmonization and partnerships with local Indigenous Governments and organizations. As governments, municipalities stand to benefit from the evidence and insights that research may bring to matters over which municipalities have authority.

Private sector identification of product and service value-added needs and scoping

Private sector companies can identify ways in which university-based expertise can assist to improve client experiences. Take one of the NWT's fastest-growing economic sectors: tourism. This sector could be grown by creating supports to improve the consumer experience (*e.g.* language and culture classes for staff and tourists); harnessing local expertise to add depth to client tourism experiences such as Indigenous knowledge holders, astronomers, geologists or wildlife experts; market analysis; strategic partnerships for education and training to promote sector sustainability and growth.

Collaborations between the private sector and researchers at universities, polytechnics, and colleges are common place, in all aspects of business practice and products. In the NWT, establishing a polytechnic that takes full advantage of the KE elements that exist in all NWT communities—including the capital and smaller Indigenous communities, whose strengths are currently untapped—would provide a significant resource for doing business better in the NWT. Indigenous knowledge holders and western scientists all have potential contributions to make to solving problems and knowledge creation that could lead to business innovations, creating employment, profitability and the basis for long term investments in the NWT. From Aurora tourism-related potential relating to training in languages, hospitality, and eco-tourism, to cold climate energy innovations that could reduce business costs and have consequent consumer savings and reductions in the cost of living, a KE anchor institution such as a polytechnic that is positioned to work with businesses and industry representatives to solve challenges could have significant positive effects across the NWT economy.

One only need look to southern universities and polytechnics to understand the potential of well-governed post-secondary institutions' partnerships with a variety of industries. An NWT polytechnic would not be well positioned to compete with southern industry-academic partnerships that are already well established. However, there will likely be opportunities for an NWT polytechnic to understand needs of NWT-based industries and work productively with them for knowledge creation that will spark industry innovation and job creation. Industries and companies are also well positioned to create legacy investments in communities and in the NWT KE through providing donations and endowments to further the priorities of their industries, or as a “no-strings attached” contribution to growing local infrastructure and economies.

Increasingly, philanthropy is playing a role in the KE. Organizations such as Tides Canada, the McConnell Foundation, the Walter and Duncan Gordon Foundation, scholarships targeting Northern studies through organizations such as the Association of Canadian Universities for Northern Studies (ACUNS) and the Arctic Inspiration Prize are in positions to promote their priorities within the NWT KE. Philanthropic organizations also have a role to play in understanding the research and economic priorities of the NWT and its communities. Given their current activities, ranging from one-time and multi-year funding for KE organizations, to fellowship and scholarship programs, these organizations are well positioned to respond to a strategic vision of the KE in the NWT.

The Role of Hotì ts'eeda in the NWT Knowledge Economy

Hotì ts'eeda (HT) is a health research connector that:

- connects researchers and research organizations, communities, Indigenous Governments and government departments and agencies who wish to conduct health research;
- identifies and encourages researchers to undertake NWT priority-based health research;
- works with NWT organizations to understand their priorities for research and internal research approval processes;
- works with researchers to develop research ideas and proposals in line with NWT organization requirements, before they connect with NWT-based partners;
- provides a health data access service; and,
- invests in NWT health research training and capacity building through funding programs and other initiatives.

HT contributes to building capacity through its self-sustaining Research and Consultation service, offering highly qualified personnel to work with organizations on a fee-for-service basis to provide expertise in health program development, and program evaluation. HT plays an advocacy and problem-solving role to assist health researchers, support communities and Indigenous governing organizations in accessing resources to address research needs, and contribute resources to develop research capacity among NWT residents.

As a connector, HT has identified critical actions that NWT organizations can take to leverage their internal assets to ensure a flourishing and productive KE. Hotì ts'eeda has staff and resources it can commit to assist NWT organizations to undertake the following actions:

- **Valuing research as a basis for economic development and policy innovation.** NWT organizations' staff involved in research proposal development and approvals processes can facilitate important economic, capacity building, and knowledge creation activity in the NWT, which is of particular economic benefit for smaller NWT communities.
- **Increasing research approvals process efficiency.** Organizations involved in approvals processes for research projects should have streamlined, transparent, accountable internal processes for ensuring researchers who are undertaking research, which involves hiring and providing skill development to NWT residents, have one point of contact who is responsible for requiring action, accountability and timely responses within their organizations, to ensure projects can get off the ground and that research provides benefits for NWT residents.
- **Tracking research economic and policy impact.** Organizations can put in place measures to collect information about funding being spent in the NWT on health-related research, research employment and training benefits and impacts of knowledge creation for NWT-based research partners and non-NWT researchers, and publicly report the information to provide a better understanding of the social and economic implications of research.

- **Ensuring ethical and respectful research practice** that respects Indigenous peoples' unique circumstances, priorities and protocols. Researchers have a responsibility to educate themselves about current and past health research that has been done in the NWT, understand NWT and community research priorities, and seek advice on Indigenous research policies, priorities and protocols. Cultural competency is a basic competency for researchers hoping to work effectively with Indigenous communities.
- **Ensuring ethical accountability.** Researchers are accountable for complying with NWT licensing through the Aurora Research Institute (ARI), and ethics requirements under legislation such as the Health Information Act and as required by tri-council research funding. Many Indigenous Governments have their own research protocols that must be respected. Ethics and accountability requirements should be well defined, and processes for ethics approvals and following community requirements and protocols should be well documented and communicated to researchers before projects begin.

Conclusion: Principles, Challenges, and Opportunities for a Sustainable Knowledge Economy

This discussion paper surveys the current state of the NWT KE, describes its potential and provides specific suggestions about actions and possible directions for various KE participants to foster the NWT KE, within the research and education and training elements of the KE. A central finding of the literature and information reviewed in this paper's development is that the KE itself is not new, but that it has reached a point where its contribution to the health of the NWT economy can be much greater. The KE is an economic support for virtually all economic sectors in the NWT. Therefore, it is critical that an anchor institution, such as a polytechnic, be established to build on the economic benefit to all communities that the KE can bring. In establishing that institution, it is important that the strengths of all NWT communities, whether regional centres, small communities or the capital, are leveraged to the fullest extent. Doing that will likely grow the potential economic benefits more evenly across the NWT—rather than restricting growth to some communities at the expense of others. What this paper has attempted to do in part is to understand research, education and training as economic drivers in all NWT communities, which is intended to shift thinking about the KE toward seeing it as an economic sector that should be fostered not only as a source of knowledge creation and innovation, but as a source of jobs and income in communities that routinely suffer economic hardship.

Below are some key principles that should inform actions for developing the NWT KE:

- **Make the NWT Accessible:** Legislation, regulations, and policy should create an environment where researchers feel welcomed, valued and empowered to work with NWT governments, organizations and communities to undertake research on NWT priorities that will result in improving the lives of residents.
- **Decolonize the KE:** Legislation, regulations and policy should be informed by Ownership, Control, Access and Possession (OCAP®) principles, and create an environment where Indigenous peoples have control of research being done on their lands and with their people, and must provide assurances that any research is without prejudice to Indigenous rights and negotiated agreements including Treaties, Land Claim, Self-Government, Impact Benefits, and Indigenous research strategies, priorities, and needs.
- **Build NWT People:** Research with Indigenous peoples should provide economic benefits primarily to NWT residents and communities, such as employment and skill development opportunities and position communities to participate in knowledge dissemination and knowledge translation about the research results.
- **Connect the KE to Indigenous Culture and Authorities:** Indigenous Governments and Indigenous research institutes have a primary role in creating an environment conducive to a sustainable KE based on their land relationship, governance authorities, program delivery and planning responsibilities and responsibilities to future generations.

- **Measure It:** The GNWT has a role in mandating the submission of information from researchers that will enable it to understand the social and economic impact and reach of research activity in the NWT.
- **Position the Polytechnic as NWT Economic Catalyst:** The recommended polytechnic should be positioned and built as a catalyst for increased research funding and associated opportunities for community residents, researchers, the private sector and program and service improvements and innovations in the NWT.
- **Enable Economic Benefits Through Government Processes:** Within government, mechanisms need to be put in place to facilitate research through establishing and implementing research proposal review and approval processes and process maps for each government department, understanding and respecting Indigenous research priorities, and establishing programs to incentivize leveraging of external research funds.
- **Ensure Research Findings Make a Difference:** Science communications and knowledge translation capacity can ensure research results are communicated to the public and to policy makers. Knowledge translation activities require funding and support.

Appendix 1: NWT Gross Domestic Product Estimates

Gross Domestic Product or GDP measures the value of all goods and services produced in an economy. Statistics Canada releases annual estimates of GDP for the Northwest Territories and other provinces and territories.

NWT Gross Domestic Product at Market Prices
Millions of Chained (2007) Dollars

	2017	2016	% Change
All industries	3,941.4	3,744.8	5.2
Agriculture, forestry, fishing and hunting	21.2	21.0	1.0
Mining, and oil and gas extraction	1,210.4	938.6	29.0
Utilities	48.4	48.5	-0.2
Construction	328.4	367.6	-10.7
Manufacturing	11.9	11.0	8.2
Wholesale trade	114.8	115.2	-0.3
Retail trade	208.4	199.9	4.3
Transportation and warehousing	335.4	339.6	-1.2
Information and cultural industries	82.2	83.9	-2.0
Finance and insurance	116.8	115.6	1.0
Real estate and rental and leasing	326.6	319.6	2.1
Professional, scientific and technical services	83.2	83.6	-0.5
Management of companies and enterprises	29.6	28.8	2.8
Administrative and support, waste management, etc.	66.9	66.9	0.0
Educational services	171.7	170.0	1.0
Health care and social assistance	251.3	247.7	1.5
Arts, entertainment and recreation	7.0	7.0	0.0
Accommodation and food services	74.4	71.3	4.3
Other services (except public administration)	45.4	46.4	-2.2
Public administration	596.4	593.4	0.5

Source: <https://www.statsnwt.ca/economy/gdp/>

Select Bibliography

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Endnotes

¹ In this paper, the term polytechnic is used simply because the recent foundational review of Aurora College recommends a polytechnic.

² The term Knowledge-Based Economy has a primary focus on the labor force, while the term Knowledge Economy takes a systems perspective that concerns itself with knowledge as a form of capital: for example, intellectual property (Cook, P. and Loet Leyersdorff, "Regional Development in the Knowledge-Based Economy: The Construction of Advantage" *Journal of Technology Transfer*, pp. 1-11, 2002).

³ Powell and Snellman (2004: 200).

⁴ Joseph Schumpeter (1911: 57).

⁵ See Florida and Spencer (2015: 37).

⁶ *Ibid.*, The same researchers have found that Canada's burgeoning knowledge economy is catalyzed by cities, ones with growing populations of educated knowledge holders. Their research finds that well-educated populations of city residents tend to foster the development of a "creative class" (i.e. demand and support for artists, filmmakers, cuisine). Such cities are also characterized as having high social tolerance, and are best poised to grow and sustain knowledge economies. These characteristics are ones that are often absent in smaller places.

⁷ See Stiglitz-Sen-Fitoussi Report (2008), and for detailed discussion of the limits of GDP as a measure.

⁸ In particular: funding for the Mine Training Society; Diamond Cutting and Polishing programming at Aurora College; mobile trades training, and similar initiatives.

⁹ For a detailed discussion of college challenges and the potential of its renewal as a polytechnic, see the recent Aurora College Foundational Review document at

https://www.ece.gov.nt.ca/sites/ece/files/resources/aurora_college_foundational_review_report_0.pdf

¹⁰ It is important to explicitly state that none of the organizations or initiatives listed here were consulted with respect to their inclusion in this paper. The contents of this paper reflect the views and analysis of the author.

¹¹ The NWT Health Research Database is available at: <https://nwtspor.ca/projects>

¹² See Appendix 1 for an overview of NWT GDP for 2017.

¹³ While this paper does not permit a discussion of whether GDP tells a full or convincing story of the state of the NWT economy, critiques of GDP that have been offered in recent years, such as those offered in the Stiglitz-Sen-Fitoussi report, have seen many countries adopt measures other than GDP to measure economic activity and success. For example, from the Executive Summary of the Report: "When there are large changes in inequality (more generally a change in income distribution), gross domestic product (GDP) or any other aggregate computed per capita may not provide an accurate assessment of the situation in which most people find themselves. If inequality increases enough relative to the increase in average per capital GDP, most people can be worse off even though average income is increasing."

¹⁴ See for Example strategies such as tourism, education, health, economic opportunities, fishing, film, etc. Consult <https://www.iti.gov.nt.ca/en/economic-opportunities-strategy> for additional examples. It is uncertain how the Knowledge Economy of the NWT or the North generally fits into the federal government Northern/Arctic policy frameworks. The GNWT does have a *Science Agenda* (2009) which puts Aurora Research Institute in the lead of coordinating GNWT efforts to foster research; however, it does not mandate accountabilities and research processes within individual GNWT departments. The *Knowledge Agenda* (2017) issued by the GNWT Geosciences Laboratory provides an excellent synthesis of research priorities and the policies and legislation in place that governs research in the NWT. However, it is not intended to, and therefore does not, describe how the internal mechanisms work in practice: individual departments and a central GNWT function would have to develop implementation plans to understand the daily tasks required to make the Agenda's goals happen, what is working, and what is not working. The Northern Premiers issued *A Northern vision: A Pan-Northern Approach to Science*. None of these documents talk about the knowledge economy. There are no explicit linkages in the documents made to the potential economic benefits that might accrue to the NWT and Indigenous communities, which is reasonable given their focus and intent. However, this points to a gap in understanding the benefits of research from an economic perspective, which would be transformative for the ways that government internal processes facilitate research projects and foster research within the NWT. These documents focus on the GNWT and its role in research and science, and therefore do not provide overviews in these documents of Indigenous Government's Indigenous/Traditional Knowledge or research policies.

¹⁵ See the GNWT 2016-2019 Mandate and also in:

https://www.ece.gov.nt.ca/sites/ece/files/resources/governance_of_postsecondary_education_in_the_northwest_territories_-_discussion_paper.pdf.

¹⁶ See for example <https://www.cbc.ca/news/canada/north/aurora-college-teacher-social-work-programs-cut-1.3967093>; See previous discussion of the NWT 2016-2019 Mandate on the KE.

¹⁷ The review can also be found at: <https://www.assembly.gov.nt.ca/tailed-documents/aurora-college-foundational-review>.

¹⁸ Research and Traditional/Indigenous Knowledge policies have been developed by Indigenous Governments including the Inuvialuit Regional Corporation, Gwich'in Tribal Council, the Dehcho First Nations and others. Indigenous Governments have also articulated research priorities and research agendas; the Inuit Tapariit Kanatami has issued an Inuit Research Strategy which clearly articulates specific actions necessary to ensure its effective and meaningful involvement in research activities in Inuit (including Inuvialuit) territories and communities.

¹⁹ Dehcho First Nations Traditional Knowledge Research Protocol. 2004. Dehcho First Nations, Fort Simpson, NT. The policy can be accessed at: http://reviewboard.ca/upload/ref_library/DCFN%20TK%20research%20protocol.pdf.

²⁰ Gwich'in Social & Cultural Institute. 2004. Gwich'in Tribal Council Traditional Knowledge Policy. Fort McPherson, NT. The policy can be accessed at: http://reviewboard.ca/upload/ref_library/GTC%20FINAL%20TK%20POLICY%202004.pdf

²¹ *Ibid.*

²² Hotii ts'eeda has developed Research Process Maps to assist researchers to work more effectively with NWT organizations: <https://nwtspor.ca/research/how-set-health-research-project-nwt>.

²³ The conference Board of Canada indicates that the NWT does not collect the right data to be able to assess K-12 skills attainment as per <https://www.conferenceboard.ca/hcp/provincial/education/edu-territories.aspx?AspxAutoDetectCookieSupport=1>, which offers this summary of 2011-12 K-12 test scores: "There is however, a sharp contrast in performance between students in the capital, Yellowknife, and in regional centres (Hay River, Fort Smith, and Inuvik) as opposed to outlying communities. Almost 80 per cent of Yellowknife students operate at or above their level in grade 9 English and math, while less than 40 per cent of students in outlying communities do. It should be noted that the capital has a greater concentration of non-Aboriginal children and youth than the rest of Northwest Territories."

²⁴ For a detailed and specific discussion on this for Yellowknife, see the yet unreleased University Feasibility Study produced by the City of Yellowknife.

²⁵ See <https://inspire.ca/successfulpractices/beaufort-delta-elearning-2-2/>.

²⁶ The response can be found at https://www.ece.gov.nt.ca/sites/ece/files/resources/government_response_to_the_acfr_-_for_web.pdf.

²⁷ The City of Yellowknife conducted a feasibility study for a university in the city, which provides analysis of possible economic and social benefits of a Yellowknife campus. The study has been presented to the Legislative Assembly Standing Committee on Social Programs; the Terms of Reference for the oversight committee can be found here: <https://www.yellowknife.ca/en/city-government/university-post-secondary-advisory-committee.asp>.

²⁸ The Research Support Funds provides accredited post-secondary institutions and their affiliates eligible for Tri-Council Academic Research Grants with additional funds to defray administrative costs. These are calculated according to formulas, and usually can support staff positions that relate to finance and administration, and research officers, who assist researchers with writing research proposals and ensure that they use their research funds correctly. For more information see the Research Support Fund webpage at: <http://www.rsf-fsr.gc.ca/home-accueil-eng.aspx>.

²⁹ See reference to City of Yellowknife NWT University Feasibility Study, above.

³⁰ See discussion of NWT GDP statistics previously and as per the Stiglitz-Sen-Fitoussi report.

³¹ The GNWT has established a GNWT Knowledge Economy Working Group; however, it is unclear how this will connect with non-GNWT KE actors.

³² GNWT 2016-2019 mandate, p. 6, as found at: <https://www.eia.gov.nt.ca/sites/eia/files/mandate-of-the-gnwt-2016-2019-en.pdf>.

³³ *Ibid.*, p. 11.

³⁴ See Stiglitz-Sen-Fitoussi report.

³⁵ Note that the Inuit Research Strategy also applies to the Inuvialuit Regional Corporation lands, traditional territories and membership.

³⁶ Source: Obed, Natan, "Unlocking the Potential of Inuit Nunangat Research", in Northern Public Affairs, Vol. 6, Issue 1, July 2018.

³⁷ Using the Social Science and Humanities Research Council Awards Search Engine (and similar engines for other Tri-Council funders), entering in the names of NWT-based researchers with date ranges will yield information about research awarded to them as individuals; for larger awards, often an institutional application is made on behalf of Adjunct Researchers by their university of Affiliation, to comply with SSHRC funding rules.