



P.O. Box 360  
Kugluktuk, NU X0B 0B0  
Telephone: (867) 982-3310  
Fax: (867) 982-3311  
www.kitia.ca

Kugluktuk

Kelli Gillard, B.Sc., P.Ag  
Technical Advisor/Monitoring Officer for Doris North  
Nunavut Impact Review Board

Bathurst Inlet  
Kingaok

Sent via e-mail: [kgillard@nirb.ca](mailto:kgillard@nirb.ca) cc [CMasson@GOV.NU.CA](mailto:CMasson@GOV.NU.CA)

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Bay Chimo  
Umingmaktok

**Re: NIRB Monitoring Process for Projects.**

Dear Kelli Gillard, I have reviewed the documents and information on the NIRB Monitoring Process for Projects.

Cambridge Bay  
Ikaluktutiak

Concerning soliciting for information and coordinating public input on various reports, the NIRB needs to continue to coordinate with the NWB as it has on the Hope Bay Project. This would require a review of information and reporting requirements for both NIRB and the NWB.

Gjoa Haven  
Okhoktok

In providing input to both NIRB and the NWB, I provided the NWB a copy of what I had provided to NIRB because the information that is wanted by the NWB is a sub-set of information required by NIRB. My view on doing this is that the NWB could extract the information it needs for the water license and be aware of everything NIRB received from KIA to facilitate joint NIRB and NWB coordination.

Taloyoak

Only NIRB and the NWB can tell me how well this worked for them on the Hope Bay Project. Sonia Aredes thought it was ok to do this.

Kugaaruk

Concerning monitoring of activities at a project site such as Hope Bay, one has to look very closely at TMAC's reporting requirements required by KIA under the Framework Agreement and the Commercial Lease. Our reporting requirements are fairly basic and would be a subset of reporting to either NIRB or the NWB.

Both the KIA, NIRB, and the NWB would have to jointly review TMAC's annual report to KIA to see what changes could be made to meet all three parties reporting needs. This would make it easier for TMAC to fulfill its reporting requirements and ensure no gaps in information are occurring. It is my impression that TMAC is trying to do this already in its annual report which I have to finish reading.

The greatest potential for improvement is in the socio-economic monitoring of projects through SEMC and the GN. The Government of Nunavut is planning a Territorial Monitoring Workshop in September. I have stated at public hearings for the Hope Bay Project that a standardized approach to socio-economic monitoring should be adopted. There are several frameworks that can be employed for this.

This would allow for consistent monitoring for all projects and municipalities that can be rolled up into meaningful statistics on socio-economic matter for regulatory



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agencies and the territorial government. The whole point to socio-economic monitoring is not just to see what impacts projects have but to set and adjust government policies and programs in the production of public goods and services to citizens.

The current SEMC approach emphasis proponent mitigation, while a broader approach would emphasis government policy, programs, and initiatives with proponent mitigation only being a sub-component.

I reviewed the following documents to create a basic presentation of a standardized socio-economic monitoring framework for discussion purposes:

- United Nations Economic Commission for Europe, Conference of European Statisticians Recommendations on Measuring Sustainable Development, 2014.
- Environmental and Sustainable Development Indicators for Canada, 2003, NRTEE – TRNEE.
- Edmonton 2008 Genuine Progress Indicator Report, the State of Economic, Social and Environmental Wellbeing for the City of Edmonton, November 11, 2009.
- Alberta GPI Blueprint, the Genuine Progress Indicator (GPI) Sustainable Well-being Accounting System.
- Contribution to Beyond Gross Domestic Product (GDP); Name of the Indicator/method: The Human Development Index (HDI), Summary prepared by Amie Gage, UNDP Human Development Report Office, August 2011.
- Frequently Asked Questions (FAQs) about the Human Development Index (HDI).
- Measuring Human Development, the Use of Principal Component Analysis in creating an Environmental Index.
- The Economist Intelligence Unit's Quality Life Index, The World in 2005.
- Quality of Life: Public Planning and Private Living, 2002.
- Quality of Life, Facts and Views, Eurostat Statistical Books, 2015 Edition.

I selected the Five Capital Model of the GPI and UN Economic Commission Four Capital Model and themes as a basis for the framework. Indicators for the Human Development Index are included in the framework as well. This allows for the generation of several standard indices these being GPI Index, GPI sub-indexes for Economic Capital, Built Capital, Natural Capital, Social Capital, and Human Capital, Human Development Index (HDI) and an Environmental Sustainability Index (ESI). The use of standard indices allows for ease of year-to-year comparison and benchmarking.



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The GPI index and its sub-indexes can be monetarized and graphed with GDP for depiction to policy makers. The HDI index and ESI index are on a scale of 0 to 1 and can be depicted together on a year-to-year basis to illustrate change. A Quality of Life (QOL) Index can also be developed if desired and depicted on a 0 to 1 basis as well. This may be a bit redundant given the HDI is a basic QOL index and the GPI index is a more comprehensive QOL index. The HDI allows for ease of benchmarking with Canada and other countries.

### Socio-Economic Framework for Monitoring Development in Nunavut

Capital	Theme	Indicators	KIA addresses
Economic Capital	Financial Capital	<ul style="list-style-type: none"> <li>Economic growth</li> <li>Economic diversity and development</li> <li>Trade</li> <li>Public/government expenditures</li> </ul>	Framework Agreement and IIBA
	Consumption and Income	<ul style="list-style-type: none"> <li>GNI per capita PPP\$US</li> <li>Disposable Income</li> <li>Personal Expenditures</li> <li>Savings/Debt</li> <li>Taxes</li> <li>Net worth</li> </ul>	IIBA
Built Capital	Housing	<ul style="list-style-type: none"> <li>Private Household infrastructure</li> <li>Public Housing</li> </ul>	
	Public Infrastructure	<ul style="list-style-type: none"> <li>Roads, bridges, airports</li> <li>Hospitals</li> <li>Schools, colleges, universities</li> <li>Recreation facilities</li> <li>Water treatment plants</li> <li>Waste disposal facilities</li> </ul>	
	Private Infrastructure	<ul style="list-style-type: none"> <li>Industrial and mine facilities</li> <li>Commercial facilities</li> <li>Non-commercial facilities</li> </ul>	IIBA
Natural Capital	Energy Resources	<ul style="list-style-type: none"> <li>Energy; oil, gas, and coal</li> </ul>	
	Mineral Resources	<ul style="list-style-type: none"> <li>Precious metals; gold, silver, platinum</li> <li>Base metals; zinc, copper, magnesium</li> <li>Rare earth minerals; scandium, yttrium</li> <li>Uranium and thorium</li> <li>Diamonds</li> </ul>	Framework Agreement and IIBA
	Land and	<ul style="list-style-type: none"> <li>Wilderness land; taiga</li> </ul>	Framework



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	Ecosystems	<ul style="list-style-type: none"> <li>shield, southern arctic, northern arctic, arctic cordillera</li> <li>Industrial land</li> <li>Municipal land</li> <li>Habitat land loss</li> <li>Nature preserves and parks</li> <li>Sustainable food harvest</li> </ul>	Agreement
	Water	<ul style="list-style-type: none"> <li>Water Quality index</li> </ul>	Framework Agreement
	Air	<ul style="list-style-type: none"> <li>Air Quality index</li> </ul>	Framework Agreement
	Climate	<ul style="list-style-type: none"> <li>GHG Emissions</li> </ul>	
Social Capital	Subjective Well-being	<ul style="list-style-type: none"> <li>Level of happiness</li> <li>Income/wealth equity</li> <li>Family relations/cohesion</li> <li>Gender equality</li> </ul>	
	Leisure	<ul style="list-style-type: none"> <li>Social and community activities</li> <li>Fitness and physical activities</li> </ul>	
	Physical Safety	<ul style="list-style-type: none"> <li>Safe communities</li> <li>Road safety</li> </ul>	
	Trust	<ul style="list-style-type: none"> <li>Sense of belonging</li> <li>Work-place stress</li> </ul>	
	Institutions	<ul style="list-style-type: none"> <li>Political freedom and security</li> <li>Voter turnout</li> <li>Participatory democracy, community presentations and public hearings</li> </ul>	
Human Capital	Health	<ul style="list-style-type: none"> <li>Life expectancy at birth</li> <li>Long, disability-free life</li> <li>Healthy infants and toddlers</li> <li>Healthy productive seniors</li> <li>Healthy mental well-being</li> </ul>	
	Nutrition	<ul style="list-style-type: none"> <li>Healthy diet</li> <li>Healthy life style</li> <li>Low disease rates</li> <li>Healthy body weight – low obesity rates</li> </ul>	
	Labour	<ul style="list-style-type: none"> <li>Employment rates</li> <li>Fulltime/permanent job rates</li> <li>Job satisfaction</li> <li>Work place, health and wellness</li> </ul>	IIBA



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		<ul style="list-style-type: none"> <li>• <b>Job security</b></li> </ul>	
	Education	<ul style="list-style-type: none"> <li>• Educational attainment – measured by the mean years of schooling for adults 25 years and over and the expected years of schooling for children of school age</li> <li>• Graduation rates</li> </ul>	IIBA
	Knowledge	<ul style="list-style-type: none"> <li>• Knowledge and skills of people – Knowledge capital index of percentage of workforce population with educational qualifications beyond the secondary school level</li> <li>• Ideas, patents, processes, and knowledge of organizations.</li> </ul>	IIBA

As stated previously, and overall GPI index can be developed and monetarized with most of the indicators along with GPI sub-indexes for the five Capitals which can be graphed with GDP. This allows to see if social progress is being made with rising wealth generation.

The standard HDI index can be developed on a 0 to 1 scale from the following indicators:

- GNI per capita PPP\$US (Material Well-being)
- Life expectancy at birth
- Educational attainment – measured by the mean years of schooling for adults 25 years and over and the expected years of schooling for children of school age

The HDI allows for benchmarking with Canada and other countries and provides policy makers with a sense of progress within Canada and the world.

An Environmental Sustainability Index (ESI) can be developed from the following indicators:

- Wilderness land; taiga shield, southern arctic, northern arctic, arctic cordillera
- Industrial land
- Municipal land
- Habitat land loss
- Nature preserves and parks
- Sustainable food harvest
- Water Quality index
- Air Quality index
- GHG Emissions

Component analysis and mathematical transformation would have to be done to create an ESI index similar to the HDI index with a scale of 0 to 1.



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By graphing both the HDI and ESI together over the years, policy makers can see that human development is occurring and gauge its impact on the environment.

A fairly typical Quality of Life (QOL) index can also be developed using the following indicators:

- GNI per capita PPP\$US (Material Well-being)
- Level of happiness
- Income/wealth equity
- Family relations/cohesion
- Gender equality
- Social and community activities
- Political freedom and security
- Life expectancy at birth
- Educational attainment – measured by the mean years of schooling for adults 25 years and over and the expected years of schooling for children of school age

The QOL index is a bit more comprehensive than the HDI, but it can be developed like the ESI through component analysis and mathematical transformation for an index similar to the HDI with a scale of 0 to 1.

Given the use of the GPI and GPI sub-indexes this would be redundant. However it could be substituted for the HDI and plotted with ESI index, but it could not be used in benchmarking with Canada and other countries.

The areas that the KIA seek to address through our Framework Agreement, IIBA, and commercial lease are areas that other mining projects could be measured with using a standard framework for SEMCs. This would allow for systematic monitoring of project impacts and roll-up for government policy making and program development.

These are my suggestions for making improvements in NIRB monitoring Process and the Government of Nunavut to consider in the Monitoring Workshop.

Yours truly

John Roesch, P.Eng.  
Senior Hope Bay Project Officer  
Department of Lands and Environment  
Kitikmeot Inuit Association