

6. Interdependency of subsistence and market economies in the Arctic

Iulie Aslaksen, Winfried Dallmann, Davin L. Holen, Even Høydahl, Jack Kruse, Birger Poppel, Mary Stapleton and Ellen Inga Turi

In the mixed cash-subsistence economies of the Arctic, consumption possibilities are usually created by a combination of market participation and subsistence activities. The purpose of this chapter is to give a brief overview of the importance of subsistence activities in different Arctic regions. With some notable exceptions, as in Alaska, subsistence activities are mostly invisible in official statistics, due to lack of data and lack of recognition of how they contribute to livelihood and well-being.

Hunting, herding, fishing and gathering continue to be of major significance to the indigenous peoples of the Arctic in providing food, social relationships and cultural identity.¹ The Arctic Human Development Report² stated that: “Customary harvesting practices are not only culturally but also economically important locally, although their role varies by region, ethnic group, urban or rural setting, and generation.”

Subsistence activities and the cash economy are mutually dependent on each other for providing consumption possibilities in the Arctic today, and are at the same time part of a lifestyle that represents continuity, sharing and connection to nature.³ A study by Rasmussen⁴ showed that for hunters in Greenland, the estimated value of their production for own consumption was almost as large as the sales value of their production for sale, which is a considerable share of their income. Estimates of subsistence production of indigenous families in Northern Russia indicate that the market value of consumed goods from own production can be as high as several times the annual monetary income.⁵

On the other hand, when traditional hunting and fishing activities take place far away from modern infrastructure and market opportunities, an economic viewpoint will emphasize that high transportation costs can represent a barrier for broader participation in the market and thus limit the benefits provided by the market economy, such as access to wage income, credit, subsidies and market-related transfer payments.⁶

Indigenous people and other Arctic residents tend to base their livelihood both on subsistence and market activities. Economic activities, like petroleum exploration, mining, transportation, tourism and other services have the potential to alter the Arctic environment and social systems considerably.⁷ Sustainable development

requires that new economic activity represents additional benefits to indigenous and other local people.⁸

The concept of subsistence has had a prominent position in discussions of indigenous peoples' rights in international legislation, conventions and declarations, as in The United Nations Covenant on Civil and Political Rights, from 1966, and The International Labour Organization (ILO) Convention No 169: The Indigenous and Tribal Populations Convention, from 1989. A crucial issue for indigenous peoples is the recognition of their right to natural resources and land as material basis for their culture. A milestone in the rights of indigenous peoples worldwide was reached on 13 September 2007 when the United Nations Declaration on the Rights of Indigenous Peoples was adopted by the General Assembly.

Box 6.1: Traditional ecological knowledge

Traditional ecological knowledge is defined as the knowledge, practice, and beliefs about dynamic relationships of living beings and the environment, a knowledge based on experience, which has evolved in adaptive processes between humans and nature and has been handed down from generation to generation. In the Arctic, traditional ecological knowledge about animal migrations, ice patterns, vegetation and weather is used for improved hunting and harvesting, and may now supplement and enrich scientific data on climate change impacts. Combining traditional and scientific knowledge about nature is an important part of understanding the resilience capacity of ecological and social systems in the Arctic, enhancing the potential for sustainable development and self-sufficiency.

Reindeer herding provides examples of how traditional ecological knowledge is relevant for adaptation to climate change. The texture of snow and ice is an important determinant of the access of reindeer to food. “Reading” snow and ice is only one element of the ongoing process of observing and evaluating grazing pastures and weather conditions, wind directions, the sequence of changes in nature, all factors which determine access to pastures and the behaviour of the reindeer herd.¹

¹ Heikkilä, L. (2006): ‘The Comparison of Indigenous and Scientific Perceptions of Reindeer Management’, in Forbes, B.C. et al. (ed.) Reindeer Management in Northernmost Europe, Springer-Verlag, 73-93. Tyler, N.J.C. et al. (2007): Saami reindeer pastoralism under climate change: Applying a generalized framework for vulnerability studies to a sub-arctic social-ecological system, Global Environmental Change, 17, 191-206.

Understanding the dependence of indigenous peoples on combined subsistence activities is important for legal regulations like, for instance, compensation payments for lost lands. In Russia, when land is allotted to oil companies, reindeer herders only receive compensations for the assumed loss of pastures and reindeer, while the loss of hunting, fishing and gathering grounds, which represent very important subsidiary sources of subsistence, is not compensated.

Documentation is needed on the participation levels and costs of subsistence harvesting activities. Circumpolar and reliable data on subsistence production and consumption are required and should be compiled in a similar way that the United Nations have recommended for "satellite accounts", i.e., supplementary accounts to the national accounts, to make the value of subsistence activities in the Arctic visible in statistics.

Subsistence in Alaska

*Davin L. Holen, Division of Subsistence,
Alaska Department of Fish and Game*

Subsistence in Alaska is a broad-ranging category that refers to both a management regime and a way of life that is meaningful to residents of rural communities. The Alaska Department of Fish and Game defines subsistence as the customary and traditional uses of wild resource for food, clothing, fuel, transportation, construction, art, crafts, sharing, and customary trade. In sum, any resource that can be gathered from the environment for human use or consumption is considered subsistence. But for many people it goes beyond this simple definition of meeting the material needs. The subsistence way of life in Alaska is a complex package that involves harvesting wild resources to meet the needs for personal, family, and community nutrition and wellbeing, as well as spiritual and ritual ties to the land and to the animals, fish, and birds that are harvested. Alaska's Native people have deep ties to the resources and land. In many rural communities both Alaska Native and Non-Native peoples engage in subsistence and share the harvests with their neighbors and family. The only case where ethnicity in Alaska is an issue is in the hunting of marine mammals. Under federal law only Alaska Natives may hunt marine mammals.

Subsistence differs from, but is closely tied to commercial harvesting of wild resources, in particular commercial fishing. Alaska has a robust commercial fishing economy, and participation in commercial harvesting of salmon, herring, pollack, and other fish are important for rural communities. For example, in Bristol Bay in Southwest Alaska, commercial fishing in 2004 comprised 51 per cent of the total available jobs.⁹ Commercial fishing accounted for 97 per cent of all wild resource harvests in Alaska combined.¹⁰ In addition, residents of both urban and rural communities in Alaska engage in sports hunting and fishing. Subsistence users consume two per cent of the harvest of wild resources while sport activities account for the other one per cent. Although a resident of a rural community may do a

combination of subsistence and sport activities, they both contribute to the overall household harvests. The definition of subsistence and sport activities are defined by laws established under a dual management system in Alaska.

Dual management in Alaska

Subsistence regulations in Alaska are defined by both State and Federal Agencies and referred to as "dual management." Federal lands in Alaska comprise some 60 per cent of Alaska territory (1 030 713 km²) of which 80 per cent is set aside for public use.¹¹ Twenty-eight per cent of Alaska (480 999 km²) is designated State lands. In addition, under the Alaska Native Claims Settlement Act (ANCSA) Alaskan Natives controls 68 750 km² considered as private land. Other private lands comprise less than one per cent of the total land area of Alaska. Federal and State regulations differ as to harvest limits and seasons.

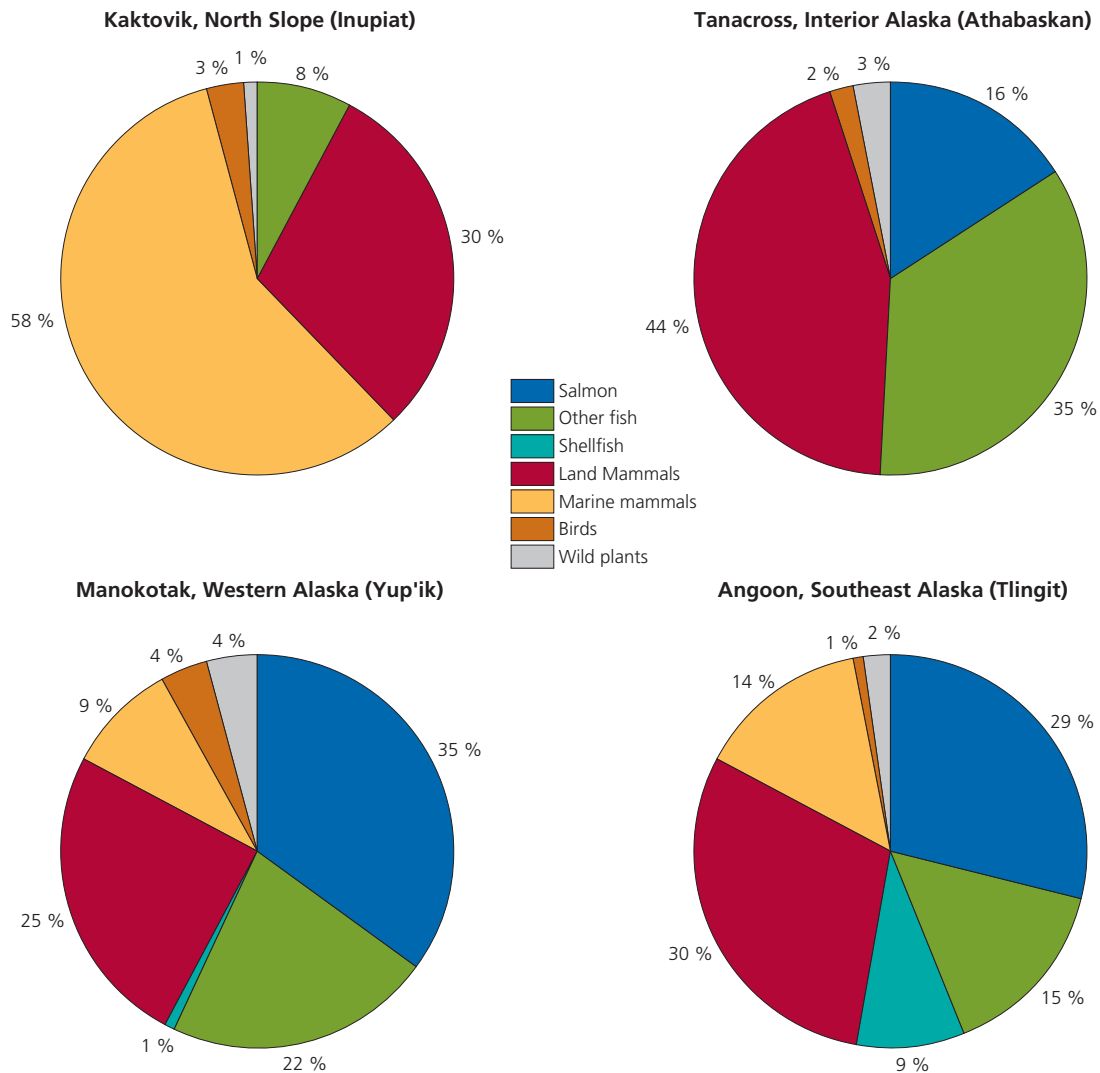
Under Alaska state law all residents of Alaska qualify for participation in subsistence activities and the right to hunt and fish is given regardless of ethnicity or place of residence. In some cases where hunting opportunity is limited by resource availability, a rural priority called Tier II is enacted under state law. This applies to specific populations of animals and a set of criteria based on dependence and history of harvesting the resource. Tier II creates a preferential treatment for access to the limited resource, for example a specific caribou herd, or a moose population within a game management unit. This designation is based on residence, not ethnicity.

The Federal law takes the preferential treatment for access one step further. The Alaska National Interest Lands Conservation Act (ANILCA) enacted in 1980, created 10 new National Parks and Preserves on existing federal lands in Alaska, and a priority was given to residents of rural communities that border these lands. These two competing laws are commonly referred to by Alaskans as the "subsistence dilemma." Whereas all Alaska residents under state law have the right to harvest resources anywhere on public lands, federal law in some cases allows only residents of communities that border federal lands to harvest wild resources on those lands. Federal lands often have hunts that follow state seasons and harvest limits in an attempt to streamline regulations to make them less confusing. However, they also may have subsistence hunts or fisheries that are only open to local residents in an attempt to provide a greater opportunity to local users. This often leads to confusion, as crossing from federal land to state land could mean moving from an area where hunting is open to where it is closed. Varying court cases and efforts by the state of Alaska have tried to amend this impasse.

Subsistence economies throughout Alaska

Although the state of Alaska constitution does not recognize a rural preferential treatment for subsistence, it does recognize that residents of rural com-

Figure 6.1. Diversity of wild resource harvests in four communities in Alaska. 1990s. Per cent of total quantity



Source: Division of Subsistence, Alaska Department of Fish and Game.

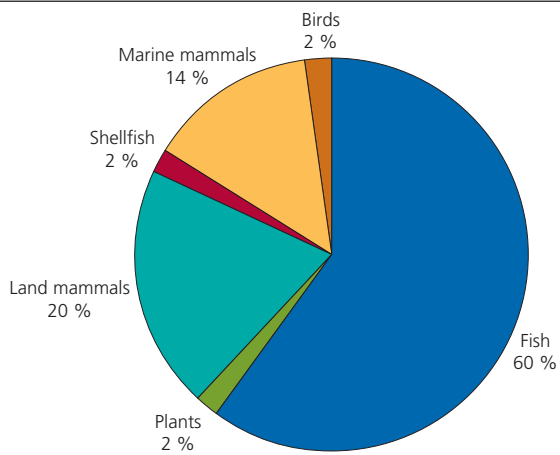
munities have a customary and traditional use of wild resources through the Alaska Subsistence Law. Besides research on traditional ecological knowledge, one of the main tasks of the Division of Subsistence within the Alaska Department of Fish and Game is to scientifically quantify harvests of wild resources by rural residents, as required by Alaska law. Community-wide estimates of wild resource harvests are established, and harvest estimates for communities that rely on a particular stock or population, for example caribou, referred to as the amount necessary for subsistence (ANS). If the population of a caribou herd diminishes, managers must determine the ANS for the population and allow for local residents to have a priority once the available surplus of the caribou reaches this number.

Over the past 30 years the Division’s small staff of social scientists has worked in every rural community in Alaska. Surveys are carried out face-to-face in each household to record demographics, harvests, sharing and distribution of wild resources, and the cash economy including jobs and income. The surveys record use, harvest, and sharing for each possible wild resource

that could be harvested in an area. The surveys are in English with Alaska Native translations such as Central Yup’ik and Inupiat in communities where Alaska Native languages are still spoken.

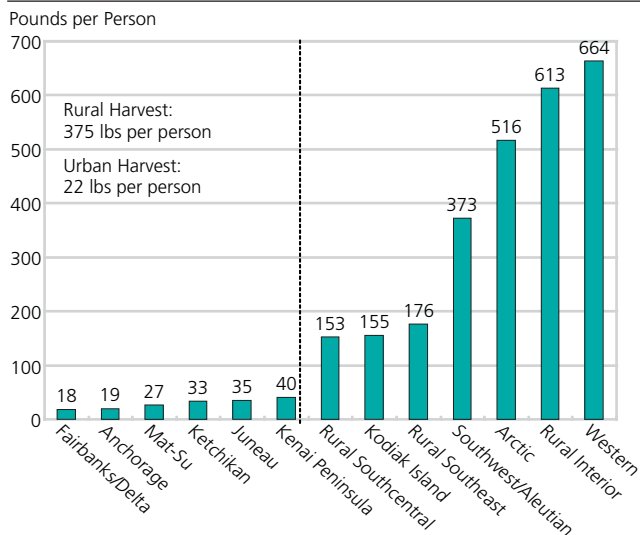
Surveys completed over the past 30 years have found that there is not one subsistence economy in Alaska; there are many subsistence economies. Alaska’s ecosystems and available resources are diverse, with environments including the high Arctic, interior Alaska with its boreal forest environment, southwest Alaska with its expansive tundra and multitude of river systems, the rainy windswept islands of the Aleutians, and the temperate rain forests of southeast Alaska.¹² Figure 6.1 shows the diversity of harvests from four communities. Whereas salmon is a major resource for many communities, its importance in the high Arctic along Alaska’s northern coast is surpassed by the importance of marine mammals. Shellfish may be important in southeast Alaska but are almost nonexistent in the harvests in the high Arctic. Land mammals, especially moose, caribou, and bears are important sources of food in the interior of Alaska but are less important on the coast. Overall,

Figure 6.2. **Composition of wild food harvests in Alaska, 1990s.**
Per cent of total quantity



Source: Wolfe (2000), see endnote 10.

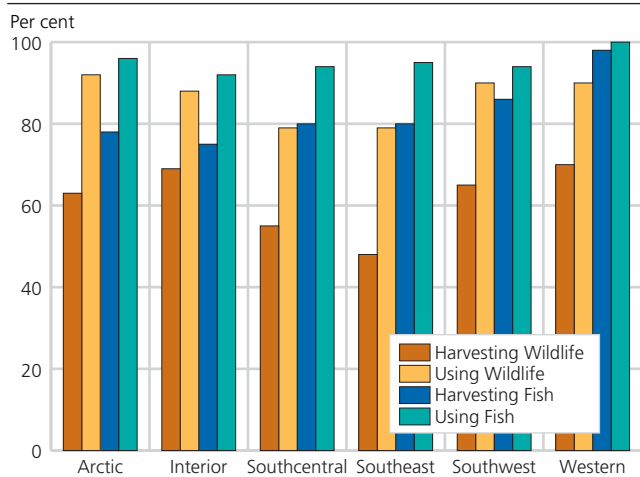
Figure 6.3. **Wild food harvest¹ in Alaska, by area, 1990s**



¹ Average harvest data collected throughout the 1990s. The left side of the figure represents urban areas of Alaska, and the right side represents rural Alaska.

Source: Wolfe (2000), see endnote 10.

Figure 6.4. **Per cent of households participating in subsistence activities in rural areas in Alaska**



Source: Wolfe (2000), see endnote 10.

adding all harvests by rural residents together would demonstrate that fish compose 60 per cent of wild harvests, land mammals 20 per cent, marine mammals 14 per cent, and shellfish, birds, and plants 2 per cent respectively (Figure 6.2).

Harvests are high both within communities and at the household level. In 2005, for example, the per capita harvest of usable wild resources was 899 pounds per person in the southwest interior community of Koli-ganek on the Nushagak River.¹³ Shungnak in the North-west Arctic Interior had a more comparable harvest to other communities throughout Alaska with an average of 610 pounds per person.¹⁴ Harvests in these isolated interior communities is still high when compared with the average harvest by rural residents in Alaska of 375 pounds per person.

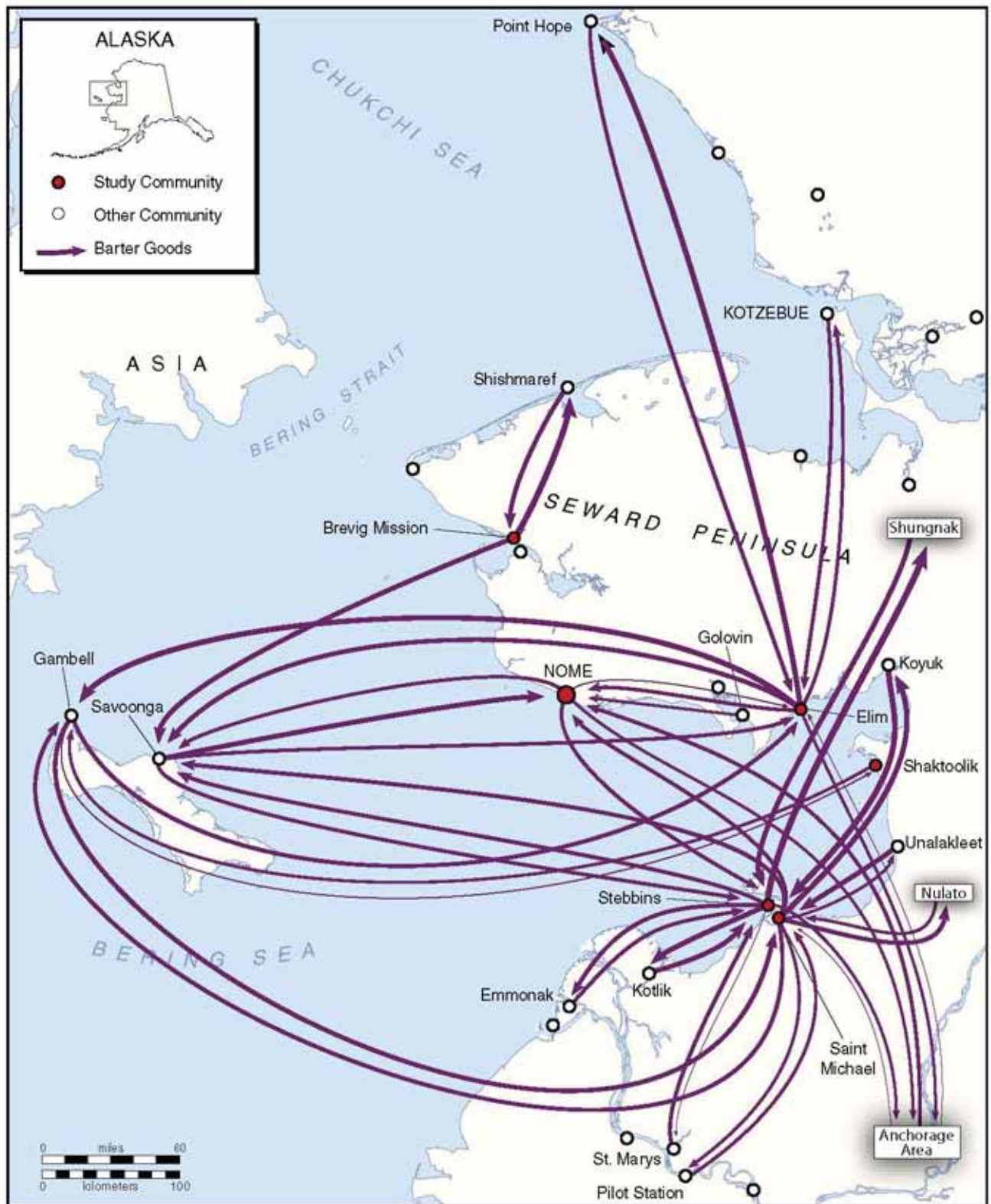
There is a great difference between the harvests of rural residents and those of urban harvesters. In the 1990s urban users harvested 22 pounds per person. However, wild resource harvests averaged at pounds per person is only one measure of the importance of subsistence (Figure 6.3). Participation in subsistence activities is also an important measure. Figure 6.4 gives a state-wide overview of participation in harvesting and using wildlife, which includes large and small land mammals as well as birds, eggs, and fish, both salmon and non-salmon species. Fisheries tend to have the highest participation rates, and in Western Alaska 100 per cent of households used fish while 98 per cent participated in harvesting fish. In each case the number of households using wildlife resources is higher than those harvesting. Over the decades a general pattern has emerged in that 30 per cent of households harvest 70 per cent of the resources in a community average. These households tend to have higher incomes and spend more money on subsistence related gear such as boats, snow machines, nets, rifles, and fuel. This high harvest is then shared with family and neighbors in these small rural commu-nities.

Besides simply sharing, resource customary trade and barter is also important in the subsistence economy. There is a significant amount of trade and barter occurring at the village level as well as with neighboring rural communities, regional hubs, and even urban communities.¹⁵ This is indicated in the community of Saint Michael on Alaska’s Seward Peninsula in Figure 6.5. These types of trade and barter of wildlife resources enable residents to share subsistence resources across large distances as well as to obtain market goods that assist in continuing the subsistence economy.

Cash and subsistence economy

The cost of living in rural Alaska has risen significantly in recent years, especially due to high prices for trans- portation. With few year-round ice free ports, most goods must arrive in rural communities by air in winter. In the summer coastal communities receive barges loaded with fuel and supplies from ports on the West

Figure 6.5. Patterns of trade and barter between neighbouring communities, regional hubs, and urban communities. Data collected between 2004-2006 in six western Alaska communities



Source: Magdanz et al. (2007), see endnote 15.

Table 6.1. **Wild food harvest in Alaska, 2000. Pounds. Replacement values. USD**

Rural Areas	Annual Wild Food Harvest	Annual Wild Food	Wild Food Replacement	Wild Food Replacement
	(per person)	Total Harvest	Value @\$5/lb	Value \$7/lb
	Pounds	1000 Pounds	Mill. USD	Mill. USD
Southcentral	153	1688,5	8,4	11,8
Kodiak Island	155	2061,6	10,3	14,4
Southeast	178	5064,5	25,3	35,5
Southwest-Aleutian	373	5114,5	25,6	35,8
Interior	613	6359,6	31,8	44,5
Arctic	516	10507,3	52,5	73,6
Western	664	12918,6	64,6	90,4
Total Rural Alaska	375	43714,6	218,6	306,0

Source: Wolfe (2000), see endnote 10.

Table 6.2. **Wild food harvest in some Alaska communities: Replacement values. 2005**

	Annual harvest	Replacement value	Mean household	Annual	Percentage of
	per household	per household	cost of annual	household	annual cash income
	Pounds	USD7/lb	food purchases	income ¹	spent on food
		USD	USD	USD	Per cent
Igiugig	1 584	11 088	8 110	32 755	24.8
Kokhanok	2 136	14 952	7 452	30 007	24.8
Koliganek	2 139	14 973	7 279	34 800	20.9
Levelock	693	4 851	4 213	28 459	14.8
New Stuyahok	871	6 097	7 104	27 572	25.8

¹ Unpublished data

Source: Holen et al. (2008), see endnote 13.

Coast of the United States. Smaller barges transport supplies up major rivers such as the Yukon and Kuskokwim as well, cutting the cost of transportation. Residents must order a year's worth of groceries and other supplies. In addition, during trips to Anchorage or other urban centers rural residents stock up on supplies to be mailed back to their communities as well or pay freight fees on air transportation. Especially in winter, air transportation is the only reliable means to receive goods from urban centers. The cost of aviation fuel has significantly added to the cost increase seen for basic goods. In 2005, prior to the significant rise in gas prices seen in 2007 and 2008, the cost of groceries and basic necessities in Arctic communities in Alaska was 2.47 times higher than in urban Anchorage, and in Subarctic communities in Alaska it was 2.23 times higher as compared to urban Anchorage.¹⁶

Dividends received from Alaska Native regional and local village corporations established under ANCSA allow Alaska Native residents to invest money back into the subsistence economy. In Tyonek, one of the communities that received payments from Cook Inlet Regional Corporation (CIRI) in 2000, the payout led to new boats, motors, all-terrain vehicles, and investments in fish camps.

Energy costs are a main concern in rural Alaska. At the 2008 Alaska Federation of Natives meeting, the cost of energy in rural Alaska dominated the discussion. High prices for fuel for boats and all-terrain vehicles are limiting the ability of residents of rural Alaska to get out on the land to engage in subsistence. In addition, in many

rural homes across Alaska heating oil has replaced wood burning stoves. During the cold winters residents will use several barrels of heating oil throughout the winter. Many homes receive electricity from diesel powered generators and it is not uncommon that residents' spend over half of their cash income during the year on utility costs. Cash incomes in rural communities are significantly lower than in urban areas of Alaska. The 2000 US Census found that median household incomes in Shungnak or Noatak in the Arctic were USD 30 833 compared to Anchorage at USD 55 546 with a lower cost of living.¹⁷ Many residents have only short term summer employment such as working on fire crews, participating in commercial fishing, repairing roads or airports, and doing short term work through grant funded projects in communities. Local governments such as tribal and village organizations provide many of the short term jobs. In Kokhanok in southwest Alaska, 55 per cent of the available jobs in 2005 were with the local government. Commercial fishing supplied an additional 16 per cent, and construction jobs 10 per cent.¹⁸

Subsistence is therefore a vital part of the economy in rural Alaska communities in maintaining the ability of residents to continue living in areas where jobs are harder to come by and costs of living are higher. Subsistence holds a special place in the maintenance of cultural, as well as the nutritional needs of rural Alaskan residents. A 2000 summary of wild food production in Alaska estimated the cost of replacing the wild food harvest of rural communities at USD 218.6 million dollars at a replacement value of USD 5 per pound.

Prices of transportation and food have risen significantly between 2000 and 2008 so using a more realistic replacement value of USD 7 a pound gives us a total USD 306 million (Table 6.1).

In some communities this replacement value exceeds the amount spent on food by most households (Table 6.2). This wild food harvest is important for sustaining residents in areas where the cost of shipping in store-bought food is expensive.

Most residents spent less than 25 per cent of their income on food, yet their expenses for food were greater than they had realized (Table 6.2). A recent project by the Division of Subsistence in Southwest Alaska have found a small migration of residents leaving communities over recent years to resettle in urban areas where the cost of living is lower. Similar preliminary findings are also being analyzed by a project underway at the Institute of Social and Economic Research (ISER) at the University of Alaska Anchorage¹⁹.

Modern context of subsistence

Subsistence in Alaska today enables residents to continue a livelihood with significant cultural meaning. Culture in Alaska is not static, and residents have had to adapt in order to survive, and thrive in a modern world. Although incomes in rural communities are low, residents of rural Alaska stay in their communities to continue a way of life that is meaningful. Subsistence is a large part of life, contributing to offset the high cost of importing groceries and other goods, but more importantly to continue traditions that are culturally meaningful. Alaska is also undergoing a period of change where commercial resource development is becoming more common, which allows for residents to obtain jobs nearby their natal communities. Long work weeks lead to less time for subsistence, although higher incomes provide the necessary means to pay for the equipment which allows for the traditional subsistence economy to continue into the future.²¹

Interdependency of subsistence and market economies in Northern Canada

Mary Stapleton, *Arctic Circumpolar Gateway*

The purpose of this section is to give a “snapshot” of Northern Canada in late 2008, reflecting the role of the market and subsistence economies.²⁰ The Canadian North as referred to in this section includes the three northern territories – Yukon, Northwest Territories (NWT), and Nunavut, plus Nunavik in Québec and Nunatsiavut in Labrador, and comprises about 40 per cent of the land area of Canada. There are significant numbers of indigenous peoples who live across the North, including Inuit, Inuvialuit, Indian and Métis.

Northern Canada’s vast spaces have always been widely used by indigenous peoples to hunt and gather seasonal food. The land is better understood by studying indigenous use of its rivers, coast, forests and tundra than by

Table 6.3. **Indigenous peoples in the Canadian North, 2006**

Territory	Indigenous population	Total population
NWT		
Dene/Métis and Inuit	20 000	41 000
Yukon		
First Nations/Métis	7 500	30 000
Nunavut		
Mainly Inuit	25 000	29 000

Source: <http://www.statcan.gc.ca>

locating towns on conventional maps. Traditional place names reveal the use of land by indigenous peoples for millennia.²¹ The cold climate has always allowed travel and trade among northern residents, along a circumpolar infrastructure of ice, and today’s languages and cultures reflect this interaction. Life based on the cycle of the seasons implied detailed understanding of the environment in order for peoples to survive and to thrive.

Map of Northern Canada²²

Vast areas of the Arctic continental shelf lie beneath the shallow seas within the Arctic archipelago. With extensive mineral, oil and gas deposits, the North is a place of incredible economic opportunity for Northerners and all Canadians. The North is also on the front line of climate change impacts. The importance of the North continues to increase as sea ice melts and the opening of the Northwest Passage becomes a reality.

Indian and Northern Affairs Canada (INAC) is the primary department of the federal government in the Canadian North, responsible for meeting obligations and commitments to Indians, Inuit and Métis. INAC balances the need to support the North’s use of its economic potential with sustainable development and environmental protection.²³

Who are Canada’s indigenous peoples?

The Canadian constitution recognizes three groups of aboriginal people: Indians (commonly referred to as First Nations), Métis and Inuit. Nearly one million people in Canada identify themselves as aboriginal persons, accounting for 3.8 per cent of the total population of Canada (2006 Census). Indigenous people make up a large proportion of total population in each northern territory (Table 6.3).

Most of today’s Inuit communities are located on the tundra north of the treeline, and along the Arctic coast. The Inuvialuit of the NWT live along the western coast near the Alaska border. The First Nations people in the Yukon and Northwest Territories are most often Dene or Gwich’in Nations. Métis indicates persons of mixed ancestry. In this section, indigenous, First Nation and aboriginal are used interchangeably. Inuit may be included in aboriginal, as the Government of Canada uses this form. Native is also used to describe indigenous people.

Table 6.4. **Education, employment and income. Indigenous and non-indigenous population of the Canadian North. 2001. Per cent and Canadian dollars**

Selected socio-economic indicators	Métis	Non-Status Indian ¹	Non-aboriginal
	Per cent	Per cent	Per cent
Age 15-19 not in high school	23	24	15
Age 25-44 with university degree	7	6	22
Employment rate (age 15+)	60	56	62
Unemployment rate (age 15+)	14	15	7
Per cent receiving government transfer payments	15	16	12
	Canadian dollar	Canadian dollar	Canadian dollar
Average total income (all sources)	22 395	21 460	30 060
Average employment (full time) income	33 822	33 978	42 619

¹ Non-Status Indian are Indian persons who are not registered as Indians with the Government of Canada.

Source: Statistics Canada and <http://www.ainc-inac.gc.ca/ai/ofi/uas/fs/mnsifs-eng.asp>.

Table 6.5. **Senior high school graduates by ethnicity. Northwest territories**

Year	Dene	Métis	Inuit	Non-aboriginal	Total
2000	45	20	12	177	254
2001	68	22	26	169	285
2002	67	13	16	148	244
2003	65	22	32	164	283
2004	64	19	34	175	292
2005	104	27	37	175	343
2006	124	28	36	178	366
2007	87	29	48	203	367

Source: www.stats.gov.nt.ca/StaInfo/Labour/Labour%20Trends/2007/Ethnicity.pdf

Socio-economic indicators such as school attendance, post-secondary school completion, employment, and income levels are higher for non-indigenous than for indigenous Northerners. Table 6.4 gives an example.

Table 6.5 shows trends in completing secondary school in the NWT, according to ethnicity. There are many cultural issues with regard to attending and finishing schools, especially in small communities. Although most communities have excellent physical facilities, retaining teachers and maintaining sufficient enrollment is often a problem. Many schools begin to lose students after the fourth or fifth year, when children would traditionally begin to participate in adult subsistence activities. Conventional Canadian curricula may seem irrelevant to Elders who value above all knowledge of the land and tradition.

The obstacles to taking education and training can be easily underestimated by outsiders. Some indigenous students are uncomfortable leaving their home communities, but must do so to attend secondary school. Training is offered for jobs in the oil and gas and other industrial sectors at Aurora Research Institute and Aurora College in Inuvik, NWT; Nunavut Research Institute in Igloolik and Iqaluit, NU; and Yukon College in Whitehorse, Yukon. These are the only post-secondary institutions in the Canadian North. These institutions have the ability to be directly adaptable to current labour market needs.

Land claims, self government, and co-management of resources

The indigenous concept of the land is dramatically different from the Euro-Canadian view. Land is part of the spiritual heritage, and its resources belong to all its users, animal and human. Today the Government of Canada and the territories are trying to create a system of land holding that will respond to market development, as well as protect the environment and acknowledge First Nations' interests and beliefs.

Land in the North is increasingly being regulated according to indigenous land claims and self-government principles. Since 1973, Canada has been negotiating settlements with the First Nations and territorial governments. The objectives of the indigenous peoples in land claim negotiations have been related to self-determination and the preservation of their way of life.²⁴

Values and interests of First Nations are often not synonymous with those of other stakeholders, such as government resource managers, recreational hunters, conservationists and private resource developers. Under the titles of co-management and joint stewardship, a variety of new institutional approaches to resource management have been gaining momentum in Canada, involving a restructuring of power and responsibilities among stakeholders. This involves moving away from a situation of top-down decisions and lack of coordination among indigenous and governmental resource management to decentralization and collaborative decision-making.

Traditional Ecological Knowledge (TEK) is the term used in Canada for "particular forms of place based knowledge of the diversity and interactions among plant and animal species, landforms, watercourses, and other qualities of the biophysical environment in a given place".²⁵ Its purpose is to gain a useful understanding of how ecological systems generally work and how key components of the total ecosystem interrelate. TEK has been recognized to some degree by Canadian environmental assessment specialists, especially in regard to achieving sustainable use of renewable resources.²⁶

The market economy in Northern Canada

Table 6.6 shows total GDP, population, and per capita GDP in the northern territories of Canada.

GDP per capita in NWT and Yukon is higher than average for Canada due to natural resource extraction. Moreover, government has always been an important employer in the North.

Mining

Diamond mining has large economic significance in the Canadian North, mostly in NWT. Three diamond mines have created more than 10 000 jobs. About 60 per cent of these jobs went to Northerners. In 2008, NWT government and the three large diamond mines signed an agreement, promising to work together to ensure more participation by Northerners.

Under the Indian Act and the Indian Mining Regulations, INAC issues permits and leases for the removal of minerals from First Nation reserve lands. INAC seeks to secure benefits for First Nations in the form of mineral royalties and other economic benefits, environmental protection, and rehabilitation of mines sites.²⁷

Oil and gas

It is estimated that Northern Canada is the site of one quarter of Canada's remaining reserves of conventional petroleum and one third to one half of the country's estimated potential. Heightened interest in Arctic oil and gas exploration and development creates economic opportunities for Northern communities and helps to secure Canada's energy supply.

In the NWT, the responsibility for petroleum resource management rests with the INAC. In 1998, the Yukon Territorial Government assumed power to manage and regulate Yukon onshore oil and gas resources. INAC works in partnership with Northern and aboriginal government, to help First Nations gain autonomy over the management of their oil and gas resources.

Transportation

Private vehicle travel is very limited in the North, except in Yukon where the Alaska Highway was built in the 1940's to link Edmonton and Alaskan military sites. Presently winter roads are the only surface transportation available to roadless communities in the NWT and Nunavut. There are ferry service/ice crossings on the Mackenzie, Yellowknife and Dempster Highways between the NWT and Yukon, but these are closed seasonally at freeze and break up. Use of standard automobiles and trucks is limited. Most individuals get around by all-terrain vehicle, snowmobile, and boat. Industries use cat trains and heavy duty trucking on ice roads.

Many "highways" are winter ice roads, engineered from snow and ice. Ice roads play a major economic role for northern industry and have a crucial role in enabling goods to be brought into communities without permanent road access. Air or sea transportation is used at

Box 6.2: The proposed Mackenzie Valley pipeline

When natural gas deposits were found in the Mackenzie Delta and in other locations along the Mackenzie Valley in the 1960s, the Berger Enquiry was set up to determine whether the people of the Northwest Territories would benefit from the exploitation of this natural resource. The commissioner of the enquiry was Justice Thomas Berger. The enquiry was notable for the voice it gave to aboriginal people whose traditional territories the pipeline would cross. The Berger Report concluded that the northern Yukon was too susceptible to environmental harm and cautioned that a gas pipeline would be a precursor to an oil pipeline. The commission recommended that no energy corridor be built in the Mackenzie Delta region. A ten-year moratorium was put on petroleum development in the region. Berger suggested that a number of sanctuaries and protected areas be created for threatened and endangered species. At the same time, the commission saw no significant environmental risk further south through the Mackenzie Valley.

The Berger commission found no significant economic benefit for the region from the project. The report concluded that large-scale projects based on non-renewable energy sources rarely provide long-term employment, and that those locals that did find work during construction could only fill low-skill, low-wage positions. In addition, Berger feared that pipeline development would undermine local economies which relied on hunting, fishing, and trapping, possibly even increasing economic hardship in the area. Berger predicted that the "social consequences of the pipeline will not only be serious—they will be devastating." At the time the report was released, there were several ongoing negotiations over native land claims in the area, and Berger suggested that pipeline construction be delayed until those claims were settled. In addition, land claims were part of a broader native rights issue that needed to be settled between the government and the First Nations. In Berger's view, rapid development in the north would preclude settlement of these important issues due to the influx of non-native populations and growing business interests.

The second Mackenzie Gas Project, is a proposed 1220-kilometre pipeline system along the Mackenzie Valley, linking northern natural gas producing wells to southern markets by connecting to an existing pipeline system in northwestern Alberta. The Aboriginal Pipeline Group (APG) is a corporation of the First Nations in regions affected by the proposed pipeline. Under this plan, large corporations which are producers of natural gas would sign long-term shipping contracts, and pay fixed fees to transport the gas extracted from the Mackenzie Delta and valley. All pipeline owners, including APG members, would receive their share of transportation fees after operating costs of the pipeline have been paid. APG revenue would be paid as dividends to the respective First Nations.

The Mackenzie Valley Environmental Impact Joint Review Board's mission is to conduct environmental impact assessments, in order to protect the environment and the social, economic and cultural well being of the residents of the Mackenzie Valley and all Canadians. Bill C6, not yet in force, would regulate the operation of the pipeline. The Joint Review Panel overseeing this project is expected to submit its final report in the near future. The final outcome of the project has not yet been determined.

Table 6.6. **Gross Domestic Product (GDP) for northern territories in Canada and total Canada. Million Canadian dollar. 2006**

Territory	GDP	Population	GDP per capita
Northwest territories	4 103	41 900	97 923
Nunavut	1 213	30 800	39 383
Yukon	1 596	31 200	51 154
Total Canada	1 439 291	32 623 500	44 118

Source: Statistics Canada.

Table 6.7. **Government employment in Canadian North. 2008**

	NWT	Yukon	Nunavut
Federal government employees	10 000	6 500	5 000
Territorial government employees	4 500	4 000	3 000
Total employees (Territorial)	22 500	17 500	8 400
Total population (Approximate)	41 000	20 000	29 000

Source: Statistics Canada.

other times of the year to bring in food and supplies, but this can be prohibitively costly for bulky goods such as building supplies and heavy equipment. Recent warming has affected the longevity of ice roads' season.

Commercial fishing

Until recently, commercial fishing in the Arctic Ocean has been restricted by sea ice cover and lack of infrastructure. As global warming increases ocean temperatures, Arctic fish stocks may become more accessible. Discussions are under way to negotiate an international agreement for managing migratory and trans-boundary fish stocks in the Arctic Ocean and Northern Atlantic. Commercial whaling ended in this area in the early 1900s; however, the hunting of bowhead whales has recently been resumed in both the eastern and western Canadian Arctic.

The NWT has established a Fresh Water Fish Marketing Corporation (FFMC) to promote international markets for Northwest Territories fish products. Fresh water fish are abundant all over the North, but are sought after as trophies by tourists, rather than serving a commercial fishery. Fish are dried, smoked, or eaten fresh in all indigenous cultures.

Tourism

Tourism in the North contributes to all the territories' revenues, but is relatively underdeveloped. The potential for growth is great, and progress has been made in the last few years. Much of the North's tourism in the past was based on sports hunting and fishing in fly-in lodges, and did not influence the economy in a significant way. Aboriginal tourism is one of Canada's unique strengths, in both the domestic and international markets. According to the 2003 National Study on Aboriginal Tourism in Canada, demand for aboriginal tourism is outpacing capacity. There is great potential to increase aboriginal tourism activities and at the same time contribute to the wealth creation, economic development and self-reliance of Aboriginal people and communities in all the territories.

Nunavut aspires to be branded as a place of adventure, nature and Arctic beauty. In 2003, tourism brought CAD 30 million a year into Nunavut, making it one of the territory's largest economic sectors. Hunting polar bear, caribou or other wildlife brings in the highest revenues, but affect only a few people in a small area. Guide-outfitters say they are feeling the impact of a U.S. ban on polar bear trophies, hides and parts, imposed in 2008, after naming the polar bear a threatened species under its Endangered Species Act. The move was decried by Inuit outfitters in Nunavut, where bears have a healthy population level.

For Yukon in 2000, it was estimated that CAD 164 million in revenue was directly attributable to non-resident tourism. It is estimated that 1 900 jobs are directly dependent on tourism. This represents approximately 11 per cent of all jobs in the Yukon in 2000, where tourism is the largest private sector employer. Although summer brings the highest number of tourists, there is an increasing demand for dog sledding and aurora viewing by winter visitors. Sports fishing and big-game hunting are also popular.

Seal hunting

Most of the world's seal hunting takes place in Canada. Seal hunting is an important source of income and food in small coastal communities. Natsiq (ringed) seals are the most common type hunted for their meat, blubber, and pelts. The Inuit seal hunting accounts for three per cent of the total hunt. The traditional Inuit seal hunting is exempted from The European Commission's call in 2006 for a ban on the import, export and sale of seal products. The natsiq have been the main staple for food, and have been used for clothing, boots, fuel for lamps, containers, igloo windows, and furnished harnesses for dogs. Uses of the natsiq have diminished, but ringed seal is still an essential food source for the people of Nunavut. Sealing is now controlled by quotas based on recommendations from the International Council for the Exploration of the Sea (ICES), and in 2007, the Canadian Department of Fisheries and Oceans (DFO) set a "total allowable catch" (TAC) of harp seals, which are not considered threatened. Ten thousand animals were allocated for hunting by aboriginal peoples. According to Canadian authorities, the value of the 2004 seal harvest was CAD 16.5 million.

Trapping

Aboriginal peoples in Canada have been harvesting animals for thousands of years as a necessary part of their survival. Their understanding of animal behavior, combined with hunting knowledge and skills accumulated over many generations, has enabled indigenous people to capture a variety of animals for food, shelter, clothing, tools and trade. Today many indigenous people with a tradition of trapping have "trapslines", a legal arrangement whereby an individual or group has the sole right to trap within a defined area, which they do not own.

Table 6.8. Annual fur harvested and sold. Number of animals and value. Northwest Territories. 2007-2008

Species	Annual harvest	Annual sold	Annual sold	Personal consumption
	Number of animals	Number of animals	CAD	CAD
Bear, Black	7	12	945	200
Bear, Grizzly	3	2	1 750	100
Bear, Polar	1	1	2 300	50
Beaver	1 399	1 277	24 914	7 580
Coyote	3	2	60	20
Fisher	27	32	2 004	330
Fox ¹	452	618	15 240	4 500
Lynx	723	725	171 500	17 300
Marten	11 282	11 093	1 019 224	211 522
Mink	704	675	10 817	1 030
Moose Hide	4	4	3 350	0
Muskrat	10 736	4 768	13 886	623
Otter	22	40	1 475	50
Seal, Ringed	309	42	2 489	725
Squirrel and weasel	1 459	946	3 024	469
Wolf ²	57	54	8 564	450
Wolverine	78	76	19 747	2 750
Total	27 266	20 367	1 301 289	247 699

¹ Fox comprises Cross Fox, Red Fox, Silver Fos and White (Arctic) Fox.

² Wolf comprises Boreal Wolf, Arctic Wolf and Tundra Wolf.

The success of Canada's fur trade reflects a centuries-old tradition of responsible and sustainable development. The Fur Institute of Canada, a national non-profit organization, has acted as a round table for fur trade, animal welfare and furbearer conservation issues since 1983, and is the coordinator for overall implementation of the Agreement on International Humane Trapping Standards in Canada.²⁸ Trapping is highly regulated by the provinces and territories and no endangered species are trapped or used in the fur industry. Trappers play an active role in protecting wildlife habitat from the onslaught of urban development and from excessive and non-sustainable use of renewable resources, while ensuring an economic value for the wildlife resource. Over 70 000 Canadians rely on trapping as a livelihood. For the Northwest Territories, detailed data are available as illustrated in Table 6.8.

Arts and crafts

The arts and crafts of First Nations and Inuit are known around the world for fine workmanship and unique design. Each region has its own style of clothing and boots, jewellery, and traditional household and hunting utensils. Traditional crafts are not done on a large scale, although there are initiatives which produce modern versions and ideas.

Inuit carving has attracted worldwide attention. The first Co-ops in the north were formed in the 1960s to produce and market traditional industries. Today, Arctic co-operatives purchases art from community co-operatives for the wholesale and retail marketing, to secure a fair price and to guarantee authenticity.

The subsistence economies of Northern Canada

The most defining feature of the northern indigenous economy is the harvest and use of wild foods and resources. Despite profound social and economic change, indigenous peoples throughout Canada have maintained an enduring connection with the environment through hunting, fishing and gathering of resources from the land and sea. Subsistence economies continue to demonstrate considerable resilience and remain integral to the health and well-being of northern communities.²⁹

Hunting, fishing, and gathering are important activities in the economy of indigenous societies, but people also participate in the wage economy as opportunity arises. Cash exchange has become inextricably enmeshed in the subsistence economy as it is necessary to hunt and fish with modern guns and equipment. Basic hunting and fishing now require boats, snowmobiles, and all-terrain vehicles. Both the equipment and the gasoline require that at some point cash be available within the smallest units of the economy.

Exchange or bartering, or the distribution of extra meat or other resources, are widely used alongside monetary exchange. The mixed subsistence and market economies are now so intertwined that it is difficult to discuss them individually. Subsistence economies are characterized by members' recognition that the community has shared economic needs.

The extent of the market economy cannot fully be described by the specific number or type of jobs held by indigenous peoples. It is essential today for individuals to have money to buy, at the most basic level, food, clothing, housing, fuel and transportation. Jobs in a

village are scarce, usually depending on administrative needs. Working for wages means leaving the community for long or short periods. This is hard for small communities, because they lose the very people who assist with education, hunting and trapping, communication, and other essential services. The tradition of sharing also means that amassing wealth is contrary to community traditions. Some families with members working in mining, for example, consider that the worker's generous pay is the property of all.

Observation would indicate that villagers often do not join the work force permanently, but take on wage employment at different times of their lives. They work for necessities such as boat or snowmobile gas, or to help the family; and then may return to activities which support their families and home communities. Many educated people with valuable market skills feel the obligation to return to support their communities. This pattern can be seen at the current time; the next generation may join the southern Canadian trend towards moving to urban areas. At present, the overall aboriginal employment "snapshot" likely reflects a pattern of carrying on much of private life in a traditional way, with work being a secondary consideration.³⁰

The Hunters and Trappers Organizations (HTO) in tiny communities attest to the ubiquity of traditional harvesting and sharing activities. In Nunavut, there is a government program that offers full-time hunters boats, motors, all-terrain vehicles and snowmobiles up to a maximum of CAD 12 000 per hunter, and also subsidizes heavy-duty industrial sewing machines, to encourage traditional lifestyles.

A survey of food use, focused on measuring the amount of traditional foods used by different Northern groups, indicated that subsistence hunting and fishing continue to form a significant part of the diets of all indigenous groups. For Canadian Inuit, intake of country food did not seem to change between 1987-88 and 2003. Traditional country food use by men and women between 20 and 40 years of age was found to be highest in Inuit communities, followed by Dene and Métis of the NWT and First Nations people of the Yukon. It was found that country food consumption increased with age, and average intakes were higher among men than women.³¹ The amount of country food consumed in the north is estimated to be 90 to 300 kg per person every year. Most of this is meat and fish.

The cost of market food influences frequency of traditional food use. In more remote areas, retail prices are high. In addition, the small populations of communities only support stores which carry minimum inventories. Arctic Coop Stores and a few independent initiatives provide fresh and frozen vegetables winter and summer, but they have been transported long distances. The calculated cost of feeding a family of four solely from marketed foods was 2.5 times higher in Old Crow than in Whitehorse, Yukon.³²

The nutritional benefits of country food are substantial, even though country food may comprise only six to 40 per cent of total diet. Research findings have confirmed across the Canadian Arctic that decreasing country food is likely to have negative health consequences. Traditional diets contribute significantly more protein, iron and zinc.³³ Nutritional analysis has been carried out at the Centre for Indigenous Peoples' Nutrition and Environment (CINE), and findings show that an average serving of meat or fish from the land can supply all the recommended daily requirements of a number of essential nutrients.

Four Yukon First Nation communities have been studied extensively to look at what people eat: Virtually all households in the survey used moose and salmon, as well as berries and other plant foods. In total, mammals accounted for about half of the traditional food, fish for one fifth, berries for one-fifth, other plants for one-tenth and birds for one-twentieth. People got most of their food from hunting and fishing. One study shows the typical wide variety (80 species, in this case) of foods used by First Nations. They include moose, salmon, other fish, caribou, hare, ground squirrel, beaver, ducks, grouse, cranberries, crowberries, blueberries and Labrador tea. Virtually all households consumed some or all of these during the year; and country food was eaten approximately once daily in the communities studied.³⁴

Heavy reliance on country food seems to reduce the risk for certain health problems. Indigenous groups in the Canadian Arctic have among the lowest age-standardized prevalence of diabetes in the country. Diabetes is one of the most prominent health risks associated with changes to a more "western" diet.

The Canadian Arctic Contaminants Assessment Reports studied impacts and risks to human health from current levels of contamination in key Arctic food species, as well as determining trends of contaminants in key species and air.³⁵ Persistent environmental contaminants such as PCBs, toxaphene, DDT and mercury are present in considerably higher quantities in human tissue in the Arctic than in the south, reflecting greater consumption of species at the top of the food chains.

The mixed economies

The history, constant change, and present dynamism of Canada's northern economies have resulted in a unique blend of traditional and market activities. All northern communities face ecological pressures such as climate change, industrial pollution, loss of diversity and productivity on the land, and the resulting compromise of traditional livelihood strategies. The life within Arctic communities serves as an illustration of how the connections among ecosystem health and individual livelihoods function today.

While the importance of wages in the northern economy has influenced the social structure of some

indigenous communities, there is ongoing debate on whether it is meaningful to divide subsistence and wage economies into distinct “sectors”. Aboriginal involvement in the two economies is most clearly seen as occurring along a continuum with participation at varying points on the scale. The economic makeup of most households is heterogeneous, including a blend of economic activities. Some household members may participate in subsistence harvesting, while others may produce and sell commercial products such as fur, carving and other crafts. Some may receive government transfer payments (employment insurance, social assistance, pensions) and others may be involved in full or seasonal wage-earning labour. Rather than choosing to participate in any one activity, most households attempt to find a balance with household incomes being derived from multiple sources.³⁶ The complementary nature of subsistence and wage-earning in the northern mixed economy is perhaps the optimal resolution.³⁷

Indigenous peoples in the Russian Arctic: Some aspects of subsistence economy

Winfried Dallmann, Norwegian Polar Institute

Who are the indigenous peoples of the Russian North?

The population of Russia as a whole is approximately 142 million inhabitants, of which about 20 per cent belong to more than 100 ethnic groups other than Russians. In the Russian North, Siberia and the Russian Far East, approximately 2 million people have a non-Russian, native ethnic status. These include large peoples with more than 50 000 individuals, as well as members of peoples that form majorities in adjacent states (Koreans, Chinese, etc.).

Since 2002, a number of 40 ethnic groups have the official status as “Indigenous Numerically Small Peoples of the North, Siberia and Far East of the Russian Federation” – increased from 26 peoples during the Soviet Era. About 250 000 individuals belong to these 40 approved indigenous peoples with a population of less than 50 000 each. The largest of these, the Nenets, counts about 41 000. Ten out of these 40 peoples count about 1,000 or less each, and their existence as cultural groups is severely threatened.

According to Russian political tradition and the indigenous peoples’ own feeling of community the term “Indigenous Numerically Small Peoples of the North, Siberia and Far East of the Russian Federation” is used in Russia and has legal applications. This term includes population in the Russian Federation to the east of the Urals, as well as in the European part to the north of the ethnic Russian core areas. It excludes peoples in southern, mainly European, parts of Russia, which belong to quite different cultural regimes and do not have a clarified status with respect to the definition of indigenous peoples.

Box 6.3: Organisation of traditional occupations

SPK - Agricultural production cooperative

СПК - Сельскохозяйственный производственный кооператив

An SPK is an organization established by agricultural commodity producers and/or private farmers for joint activity on agricultural commodities production, processing and marketing, as well as for other activities not prohibited by legislation. An SPK is based on voluntary membership and on joining member’s property shares. Activities of SPKs are based on personal labour of the members.

Tribal community (“Obshchina”)

Родовая община

A form of self-organization of indigenous people joint by blood relations, leading a traditional way of life, and occupied with traditional economy. Tribal communities are non-profit organizations.

TТNU - Territories of Traditional Nature Use

Территории традиционного природопользования

Territories of Traditional Nature Use (Land Use) of Indigenous Peoples of the North, Siberia and Far East of the Russian Federation are especially protected natural territories, founded for pursuing traditional nature use and traditional way of life by indigenous peoples of the North, Siberia and far East of the Russian Federation.

compiled by

*E. Khmeleva, Rodnik Legal Center
for the MODIL-NAO project*

This term excludes also, according to Russian law, large peoples with a population higher than 50 000 individual. This limit has historical significance and is debated, but there is a general accept that large groups (with several hundred thousand individuals like the Yakut, Komi, Karelians, Buryats) do not need a similar strong legal protection to preserve their culture.

The migration of Russians away from the North, Siberia and Far East in the 1990s has led to an increase of the indigenous peoples in many areas. Outside urban areas, especially in sparsely populated rural areas, indigenous peoples often form the majority of the population. Emigration of qualified personnel amplified the economic crisis in the Russian North. For example, the population of the Magadan Region dropped from 391,000 in 1989 to 182,000 in 2002 and further to 165,000 in 2008.

Socio-economic development

The majority of the indigenous peoples of the Russian North live in villages in or close to their traditional land use areas, where they pursue mainly traditional activities like reindeer herding, hunting, fishing and gathering, or, at a smaller scale, vegetable gardening, livestock and fur farming. To a lesser, though increasing degree, they work in the service and trade sectors. They are practically not represented in manufacturing industry.

Figure 6.6. Indigenous peoples of the Russian North, Siberia and Far East. Compiled and drawn by W. Dallmann



Large expanses of their homelands have gradually been converted into areas for alien settlement, transportation routes, manufacturing, forestry, mining and oil production. Indigenous peoples have very strong ties to their natural environment. Their cultural identity is dependent on intact ecosystems. This explains the enormous difficulties indigenous peoples have in adopting “modern ways of life”, and the social disaster that resulted from the state’s attempt to settle nomads, erode traditional social structures and reorganise subsistence into commercial economies.

Russia’s socio-economic crisis in the 1990s led to a break-down of most of the public services and transportation system in the remote areas. Having been made dependent on modern infrastructure and product distribution, the people found themselves left alone, lacking supplies and medical care, rising mortality, and without the economic means and legal expertise to deal with the situation. Some of these trends have been reverted since the early 2000s, while others are still continuing. This differs significantly from place to place.

Subsistence economy was the original economy of these peoples in pre-Tsarist times. In Tsarist Russia taxation (*yasak* – mainly a fur tax) was introduced, having a strong impact. For the first time, people had to spend a large part of their life with hunting and trapping for other purposes than subsistence. Still, subsistence

economy has retained importance under the socialist conditions of the Soviet Era, in spite of the all-over collectivisation of all traditional economic branches.

Subsistence economy gained renewed importance during the socio-economic crisis of the 1990s, when people had to replace the sudden loss of traded goods and food in the shops. It remains to be an important factor even under the present market-economic conditions, which is not seen in the official statistics.

Subsistence – tradition and necessity

While many Russians – like other Northern nationals – supplement their householding by gathering berries and mushrooms, gardening potatoes and vegetables (partly in greenhouses), or spare-time hunting or fishing, harvesting from nature has a much larger significance for those indigenous peoples living in rural or remote areas. It also has a similar significance for so-called Old Russian settlers (*starozhily*) in Arctic Russia that have led a similar way of life for generations.

Existing studies of subsistence economy are occasional and sporadic, results may be difficult to access and cannot necessarily be compared. A lot of the knowledge is qualitative and based on subjective judgements by individuals. Surveys may be biased due to strategic answering. Authorities may impose quota on fishing and hunting even for personal consumption and regulate such activities in various ways. To avoid penalties, people



Magadan: Each person has permission to catch 50 kg of fish per year without a quota, for their own consumption. This is not much fish to eat for people, whose traditional way of life is fishing for subsistence. Photo: M. Yashchenko.

may be tempted not to indicate their real subsistence consumption in questionnaire campaigns. Indigenous people normally perceive harvesting from nature as their traditional right, and see authority regulations as an imposition, because they regard themselves as the original owners of the land and its natural resources. Unemployment, low income or difficult access to high-quality fresh food in shops often make the people exceed the quotas.

Subsistence in the Magadan region

The situation in the village Ola of the Magadan Region can serve as an illustration of the subsistence quota dilemma. In Ola the indigenous people and descendants of early Russian settlers, the 'old residents', subsist and earn a livelihood by fishing. In 2004, 715 persons (11 per cent) belonged to indigenous peoples, mainly the Evens. The official share of unemployed indigenous persons in the Ola District was 16.9 per cent; the exact number of unemployed aboriginals is unknown, as many of them are not registered with the labour administration, but estimates among local residents reached as high as 50 per cent.

There were seven enterprises having official status as 'indigenous enterprises', and six indigenous clan communities. The greatest obstacles to economic development were lack of capital, with no access to low-interest loans, and problems in obtaining catch quotas. To receive a quota, an enterprise must prove adequate resources for catching, storing and transport, and there were few who qualified. Most quotas went to larger Russian companies, which were financially better off. Several catch landing establishments and fish-processing factories along the coast lie today in ruin and spoil the otherwise beautiful coastal landscape.

Each person has permission to catch 50 kg of fish per year without a quota, for their own consumption. This is very little for people who traditionally make their living mainly from fish products, who do not qualify for

profit-oriented business quotas, and face a very high rate of unemployment.

Survey in the Koryak Autonomous Okrug, Kamchatka

A survey on indigenous livelihoods in Kamchatka was carried out in 2002 by Olga Murashko, anthropologist, as part of a project with the Ethno-ecological Information Centre 'Lach'. The survey was conducted in coastal villages among the sedentary Koryak population (semi-nomadic Koryaks in the interior of Kamchatka pursuing reindeer-breeding). The survey had 350 respondents and is a reliable statistical basis.

Without distinguishing between subsistence and trade economy, people answered in which traditional activities they were engaged, see Table 6.9:

Table 6.9. Participation in traditional activities and share of output for own consumption. Per cent. Koryak, Kamchatka. 2002

	Participation in activity	Share of output for own consumption
Fishing	91	100
Gathering	93	100
Hunting	11	20
Sea mammal hunting	9	25
Reindeer herding	1	20

Source: Olga Murashko and Ethno-ecological Information Centre 'Lach'.

The largest harvest and consumption of fish was noticed for members of fishing communities, and unemployed people. The smallest numbers of caught and consumed fish were noticed among civil servants and municipal workers. This group has the highest incomes within their settlements.

A livelihood survey among 100 respondents of the Itelmen fishing village Kovran revealed that 93 per cent of the local population is engaged in fishing and related activities, like conservation of fish, repairing and manufacturing of fishing tackles.

Sea mammal hunting is carried out in August-September. Quite often the seals are hunted while accompanying the fish swarms. Water fowls are hunted in the autumn and bears in the winter.

Men hardly find time beyond fishing to help the family to plant and harvest potatoes, and harvests are small. Women, old men and children are engaged in gathering of wild plants. Reindeer meat is exchanged from reindeer breeders for dried or salted fish, or for the money obtained from the sale of caviar. Licenses of winter hunting on some fur animals are restricted to professional hunters.

The consumption pattern in Koryak is similar to that in the other coastal areas, where own consumption of hunting and reindeer herding is slightly lower, 10 and 15 per cent, respectively.



Nenets family in a nomadic reindeer herders' camp, Cooperative 'Voskhod', village Oma, Nenets Autonomous Okrug. Photo: Yasavey

Survey in the Nenets Autonomous Okrug

An ongoing survey among Nenets reindeer herders in the Nenets Autonomous Okrug is mainly aimed at monitoring the influence of oil development on indigenous peoples' livelihoods.³⁸ Although results are very preliminary at present time, they indicate a clear picture: The respondents are all fully engaged in traditional activities. Reindeer herding is pursued all-year-round, fishing over a 5-6 months period and hunting 2-3 months a year.

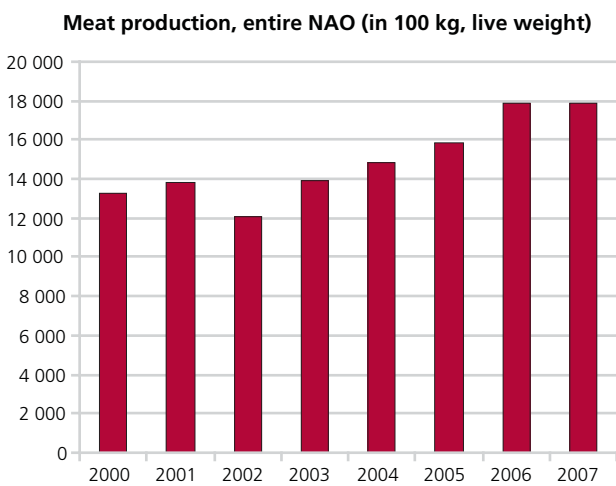
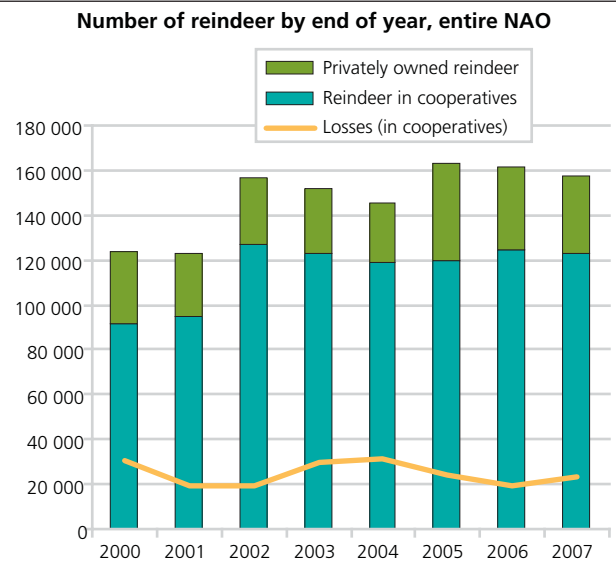
Reindeer meat is consumed daily by more than half of the families, especially in winter, and 3-4 days a week by the others. Almost the same can be said about fish. Half of the families make their own traditional winter clothing themselves, others buy or barter with producers. Still, about 50 per cent of their income is used for food products and 20 per cent for clothes.

Generally for Russia, the contribution of subsistence to the family budget is characteristically underestimated (Murashko). According to the respondents of the questionnaire campaign, production within traditional kinds of activity makes up half of the family income. Although, for a year, salaries, subsidies and other money income of a family may total 200 000 rubles, while the market cost of reindeer meat and fish eaten by this family can make up more than 1 000 000 rubles.

Traditional economies and subsistence facing industrial development and climate change

Reindeer herding by both Nenets and Izhma-Komi people, in the Nenets Autonomous Okrug (NAO), is a good illustration of multiple external factors currently influencing traditional livelihoods. Reindeer herding is the most prominent traditional occupation in the area. The breeders move northward from their settlements close to the winter pastures in the forest tundra belt to the summer pastures in the barren tundra. Even if many are settled or semi-nomads partly working in brigades of collectives, or, subordinate, as private reindeer herders, the vast tundra areas still are roamed by individual groups of fully nomadic reindeer breeders.

Figure 6.7. Number of reindeer and meat production in the Nenets Autonomous Okrug 2000-2007



Source: Prepared by W. Dallmann (IPY project MODIL-NAO) from data of the former Agricultural Department, Nenets AO.

Nenets and Izhma-Komi participate in commercial fishing. Fishing also provides a subsidiary subsistence-based occupation for reindeer breeders, as well as other traditional occupations like hunting and gathering.

A severe threat towards traditional occupations and the associated cultural values of the indigenous society comes from oil and gas development, mainly because of three reasons:

1. The loss of pasture lands, where intense drilling activities take place.
2. Pollution of rivers, lakes and ground water through released fuels and chemicals.
3. Pipelines cutting off migration routes, although with present, but insufficient over- and underpassages.

The loss of pasture lands is associated with extensive deterioration of tundra ground through driving with

Table 6.10. Population and livestock size in the Nenets Autonomous Okrug (NAO)

	Population total	Population urban (Naryan-Mar/Iskateley)	Nenets population	Komi population	Number of reindeer, total, each 1 January
1989	54 000	26 000 (48 %)	6 500 (12 %)	5 100 (9.5 %)	190 000
1996					180 000
2002	45 000	27 000 (60 %)	8 500 (19 %)	4 600 (11 %)	123 000
2008	41 500	26 600 (64 %)	7 200 (17 %)		157 000
			In urban areas 1 582 (in 2004)		

Source: Numbers are from various sources and may be based on different preconditions; thus they are not assumed to be statistically consistent, but they indicate trends.

heavy vehicles. Russia is the only Arctic country where driving with heavy vehicles on unfrozen tundra ground in connection with oil exploration is still not prohibited.

Since the Russian socio-economic crisis of the 1990s, reindeer herds have been rebuilt and stock numbers are now at a level around 160 000 reindeer (Table 6.10). Although fluctuations occur, partly or mainly due to “bad winters” and problems in the management of collective farms, the overall productivity is still rising.

State subsidies and support programmes have certainly been a major reason for the overall restoration of the reindeer husbandry after 2000. Oil companies also pay compensation for ceded pasture lands. However, these are based on a variety of individual, often confidential agreements, and not captured by the statistics.

Economic losses from oil development seems to be compensated for the time being. Local knowledge of the tundra enable reindeer herders to use the remaining pastures in the best possible way. Of course, there are limits to how far things can be pushed. Just the fact of working and living in – and being dependent on – an area with increasing pollution and environmental degradation triggers a feeling of insecurity and hopelessness among portions of the indigenous population.

The threat of global climate change has not really occurred to the reindeer herders as something that will severely affect them. Of course, breeders realise that we are in a period of warmer weather. Winters start and rivers freeze later. Reindeer herders know how to deal with normal variations in weather, even with periods of abnormal weather through several years. They adjust the usage pattern of the pastures to the conditions. Bad economic outcomes during a period of hard conditions are also considered to be normal, and until now nothing has happened weather-wise that has not happened earlier, too. A winter with wet precipitation resulting in ice formation over large tundra areas only has occurred once, in 1997 or 1998.³⁹

Like always, problems will occur when unfavourable factors add up. More unfavourable winter weather and/or an increasing nuisance by insects in summer will make it necessary to change the usage pattern of the pastures. If the availability of pastures is confined through oil development, then problems can arise.

Box 6.4: Okrug target programme to stabilise reindeer industry since 2002:

from A. Degteva, 2005: Oil industry and reindeer herding. MS Thesis, University of Tromsø

- Technical support
- Purchase of slaughtering houses and refrigerators
- Veterinary actions
- Actions against predators
- Reindeer insurance
- Financial support (130 rubles for each reindeer per year)
- Subsidies of 53.5 rubles/ kg sold meat inside the NAO
- Coverage of 80 per cent of transportation cost for meat to customers

Industrial land use may to a large extent still leave room for reindeer husbandry, but this is conditional on a persisting climate and environmental quality.

Availability of spare pastures seems to be one of the most crucial factors for climate change adaptation. Once pastures are destroyed or polluted, they cannot be used as spare pastures for periods of unfavourable weather conditions. There will be limits to how much subsidies the state will provide. Then we could face a sudden decline of reindeer husbandry – at least in the areas of heavy oil development. Along with people leaving the tundra for other jobs, subsistence-related activities will decline.

Reindeer pastoralism

Ellen Inga Turi, Sámi University College

Reindeer pastoralism is an indigenous livelihood of key importance for more than 20 indigenous groups in the entire Arctic and Sub-arctic area, in the countries of Sweden, Finland, Norway, Russia, Canada, Alaska, Greenland, Mongolia and China. In total the livelihood involves around 100 000 people and around 2.5 million⁴⁰ reindeer (*Rangifer tarrandus*) grazing on natural pastures stretching from the North Sea to the Pacific Ocean, covering an area amounting to 10-15 per cent of the entire land area of the world. Reindeer herding is a nomadic livelihood, a consequence of the strategy of securing forage for animals entirely through natural pastures and an adaptation to the natural migration patterns of reindeer, often from coastal grass areas in

the summer to lichen covered inland areas during the winter. The nomadic life has enabled use of barren arctic mountain and tundra areas for food production since time immemorial. The following section provides a brief presentation of reindeer herding in Norway and the circumstances important for the economy of reindeer pastoralism.

Reindeer pastoralism in Norway

Reindeer pastoralism in Norway is predominantly a Sámi livelihood practiced in the Sámi reindeer herding areas stretching from Hedmark in the south to Finnmark in the north. This area makes up 45 per cent of the total land area of mainland Norway and equals around 146 000 km². Within these areas around 2900 people, including women, children and elders, are involved in the herding of around 240 000 reindeer⁴¹.

The traditional social organisation of reindeer pastoralism is based on herding partnerships or work communities. In the Sámi reindeer pastoralism this unit is referred to as the *siida*, often defined as an organisation of households cooperating on herding and supervision of reindeer⁴², where members work and migrate together, sharing the duties associated with nomadic reindeer herding. The households in a *siida* are usually made up of the core family and perhaps some hired help, but may also include close relatives. The households are independent units responsible for their own economy and work equipment. Further, members of households individually own reindeer and have private earmarks, and thus also have the sole responsibility to make decision concerning their own individual reindeer. The *siida* constellation is thus made up of individuals as owners of reindeer, and households as independent economic units. Although *siidas* are often made up of siblings or relatives, family ties are not necessarily prerequisites for *siida* constellations. Further, *siida* constellations are not necessarily stable or durable, meaning that *siidas* may break up to several units seasonally or change altogether in adaptation to local pasture circumstances or even social or economic conditions.

The traditional organisation of reindeer pastoralism show strong structural similarities across all reindeer herding regions, and is an important feature of the adaptability and vitality of reindeer pastoralism. The organisation gives herders the freedom to determine the structure and size of the herd according to available natural resources, to determine the best strategy for migration. The flexibility of this system is therefore an important factor in ensuring resilience for the livelihood⁴³.

One of the greatest challenges for reindeer husbandry in Norway is fragmentation of pastures. Over the past decades reindeer pastures have been exposed to bit-by-bit encroachment following from, among other things, development of cabin resorts, infrastructure, hydropower, forestry and mineral exploration, causing

increasing problems for reindeer husbandry depended on pasture resources with minimal human activity. The United Nations Environment Programme (UNEP) estimates that if the current rate of encroachment continues, there will be no room for traditional reindeer herding in Norway within less than 50 years as central pasture resources will be fragmented and incompatible with traditional reindeer herding⁴⁴. Fragmentation of pastures represents an economic cost to herders due to loss of reindeer and increased cost for managing herds.

Governance of reindeer pastoralism

Reindeer pastoralism in Norway is formally administered by the Ministry of Agriculture through its administrative bodies. Reindeer pastures in Norway are formally divided into 6 reindeer herding regions, which are in turn divided into almost 80 reindeer herding districts, some of which are year-round districts while others are only seasonal districts. Within the districts are one or more *siida*. Finally, *siida* are formally composed of so-called 'siida shares' which consist of an individual or a family group. Subsidies are granted to *siida* shares, and it is the owners of *siida* shares that have the formal right to vote in *siida* issues. There is no formal allocation of pastures on the *siida* level, but pastures are often allocated through an informal traditional system.

The main policy instruments for administering reindeer pastoralism in Norway are legal, through the Reindeer Husbandry Act, and economically through the Reindeer Husbandry Agreement. It is through these means that the political goals of an economically, culturally and ecologically sustainable reindeer husbandry are strived for.

The Reindeer Husbandry Act regulates among other things, the formal administration of reindeer pastoralism, the rights to practice reindeer herding, property rights and other general rules. In July 2007 a new and revised Reindeer Husbandry Act came into force in Norway, and reflected the result of a prolonged process of revising and updating the previous act from 1978 which was increasingly criticized as being misfit to the realities of reindeer herding. The new act involved several important changes, the most significant one being that the *siida* was, for the first time in Norwegian legislation, granted formal juridical status.

The Reindeer Husbandry Agreement is negotiated annually between the Association of Sami Reindeer Herders in Norway and the Ministry of Agriculture and Food. The Reindeer Husbandry Agreement for 1 July 2008 - 30 June 2009 has an overall framework of 97 million NOK. The majority of funds are allocated to development and investment, and as direct subsidies to reindeer herders. The subsidies granted through the reindeer husbandry agreement provide significant economic incentives for regulating the size and structure of herds according to politically determined goals.



Photos: Jens-Ivar Nergård

The economy of reindeer husbandry in Norway

Reindeer husbandry in Norway has a strong focus on meat production, and income from selling meat contributes to a considerable portion of the income of reindeer herding families. The Norwegian reindeer husbandry administration produces annual reports of the economy in reindeer husbandry, where production based incomes, governmental subsidies and compensations are estimated. An overview over the composition of income in reindeer pastoralism in Norway in 2005 and 2007 is presented in Table 6.11.

Data from 2005 for value of meat production show that sales of meat to official slaughterhouses make up around 39 per cent of the total income of reindeer pastoralism⁴⁵. As reindeer herding is sensitive to climatic variations and weather patterns, the number of reindeer sold per year may fluctuate considerably. Own consumption and private sales amount to around 6 per cent of total income. The distribution of total meat value between meat production for official sales and for own consumption and private sales is based on the percentage share of animals slaughtered for these purposes, see the previous note for details. The Norwegian reindeer husbandry administration estimates an average of 20 reindeer per year per *siida* share for own consumption and private sales⁴⁶. This number is

the basis for the total number of privately slaughtered reindeer used in the distribution of total meat value.

Government subsidies provide the second most significant contribution to the income of reindeer pastoralism. Figures from 2005 show that government subsidies make up around 34 per cent of the total income. In addition, compensation for loss of reindeer as well as compensation for loss of area constituted around 14 per cent of the total income of reindeer pastoralism in 2005. Further income from subsidiary activities such as producing *duodji* (handicraft), hunting, fishing, picking berries and even tourism are recognized as an integrated part of the Sámi reindeer herding economy. A common practice is for family members to make handicrafts of reindeer products such as antlers, bones and fur, and sell these to tourists during the summer season. Figures for income from subsidiary activities are at best estimates, and for 2005 the share of income from such activities was estimated at about 2 per cent.

The figures show that even though meat production is the most important activity of reindeer pastoralism in terms of monetary income, other sources of income provide a significant contribution to reindeer herders economy. Further, incomes give only an indication of

Table 6.11. **Composition of income in reindeer pastoralism of Norway. 2005 and 2007**

Type of income	2005		2007	
	Value (1 000 NOK)	Per cent	Value (1 000 NOK)	Per cent
Meat production for official sales	95 594	38.7	117 551	39.8
Own consumption and private sales	15 247	6.2	17 565	5.9
Changes in the value of the herd	-1 668	-0.7	10 155	3.4
Subsidiary incomes	5 758	2.3	5 160	1.8
Other production-based incomes	12 725	5.1	14 703	5.0
Subsidies	84 894	34.3	69 202	23.4
Compensation	34 617	14.0	61 279	20.7
Total incomes	247 167	99.9	295 615	100.0

Source: Reindriftsforvaltningen (2006): Totalregnskap for reindriftsnæringen, Summary table, and Table 2 on p. 128, and Reindriftsforvaltningen (2008): Totalregnskap for reindriftsnæringen, Summary table, and Table 2 on p. 122, see endnote 45.

actual monetary value of different sources of income, and do not give a complete picture of the economic reality of reindeer herding families. Own consumption and private sales, estimated above at 6 per cent of total income, is an important aspect of reindeer pastoralism and an incentive for participation in the livelihood for most families. Further, income from subsidiary activities is extremely difficult to estimate and the figure of about 2 per cent can best be considered as a very rough estimate.

Finally, a significant proportion of available income is not included in such estimates, namely wage income from work in other sectors. The Norwegian reindeer husbandry administration estimates that salary from other sectors in 2005 contributed an annual average of 180 000 NOK to the reindeer herding family's economy, in comparison to 182 000 NOK from meat production⁴⁷. Reindeer herding is not seen as purely an occupation for a member of the family but a lifestyle of the entire family. Apart from providing a significant contribution to the family economy, earnings from other sectors also provide reindeer pastoralism with investment capital for buying transportation equipment. It is, however, extremely difficult to estimate the actual contribution from wage income from other sectors to reindeer pastoralism, a challenge which reflects the dynamic nature of natural subsistence economies.

Number of reindeer

One of the framework conditions from reindeer husbandry regulated by the Reindeer Husbandry Act is the maximum number of reindeer in districts. The most recent recording of the total number of reindeer in Norway is 241 432 in 2007. This number is slightly higher than the allowed maximum number. For reindeer herding regions in Western Finnmark the number of reindeer is particularly higher than the allowed maximum number.

There has been a prolonged discussion on the sustainable size of the reindeer population in Norway, and efforts have been made in order to decrease the population of reindeer by political or economic means⁴⁸. In order to qualify for governmental subsidies a *siida* share



Photo: Birger Poppel

is allowed a maximum of 600 reindeer, and a minimum level of meat production must have been achieved.

Norwegian reindeer pastoralism from an international perspective

Compared to other reindeer husbandries, the Sámi reindeer husbandry in Norway, Sweden and Finland is characterised by high density of reindeer, strong focus on meat production, and being highly mechanised. In terms of number of reindeer, the Sámi reindeer husbandry is only outnumbered by the Nentsy reindeer husbandry in North West Siberia.

Although reindeer pastoralism in Norway generates a relatively high income, in comparison to other reindeer husbandries outside the Nordic countries, it is also characterised as perhaps the reindeer pastoralism with the highest level of costs, due to high degree of mechanical equipment.

Finally, reindeer pastoralism in Norway is characterised by intensive regulation in comparison to other reindeer husbandries. A recent comparative study between reindeer pastoralism in Western Finnmark and in Yamal Peninsula of Western Siberia suggests that herders in Norway are constrained by detailed regulation of pasture use and distribution and enjoy relatively lesser autonomy to move within own pasture resources⁴⁹.

Sámi statistics in Norway

Even Høydahl, Statistics Norway

The Sámi traditional settlement area is in the North of Norway, Sweden and Finland, and at the Kola Peninsula in Russia. The national statistical offices of the Nordic countries publish population statistics based on census and population registers in each country. With regard to scope and accuracy, Nordic population statistics is considered among the best in the world. However, ethnicity is not included as a dimension in the census, neither for Sámi nor for any other ethnic groups. It is therefore not possible to produce population statistics for the Sámi population from the population registers.

From 1845 to 1930 the census in Norway included estimates of the number of Sámi and *kvens* (people of Finnish descent in Northern Norway). The 1950 census provided estimates of the use of Sámi and Kven language in some villages. The 1970 census was the last time when questions about Sámi language and ethnical background were included, via a supplementary questionnaire distributed to selected municipalities and local communities in the three northern counties in Norway.

The last decades have seen a distinct change in policies and attitudes towards the Sámi people in Norway. Assimilation into the Norwegian society was a clearly stated policy for a long period, lasting long into the post war period. Sámi were expected to give up their language and adopt the way of life of the majority population. Starting around 1980, considerable efforts have been made to reverse the consequences of assimilation and to secure the rights of the Sámi people. A Sámi Parliament has been established, with its first election in 1989. The business of the Sámi Parliament is any matter that, in the view of the Parliament, particularly concerns the Sámi people. One aim of the Sámi Parliament is to support the development and strengthening of Sámi identity and local communities.

While the Sámi Parliament has policy goals and means, there has however been a lack of statistical information basis to describe Sámi society and to evaluate to what extent the political objectives have been achieved. In 2003 the Sámi Parliament commissioned a project with cooperation between Statistics Norway and *Sámi Instituhtta* (Nordic Sámi Institute) to develop a permanent framework for development, production and dissemination of Sámi statistics in Norway.

Since the central population register does not include information on individual ethnicity, as explained, other approaches must be taken to produce Sámi statistics. The solution that has been chosen so far is to produce statistics for selected areas defined as Sámi settlement areas. In practice, this was operationalized by selecting those areas that qualify for financial support from the Sámi development fund (*Samisk utviklingsfond SUF*),

called the SUF area.⁵⁰ The fund is managed by the Sámi Parliament, and the Sámi Parliament decides which geographical areas that qualifies for support from the fund, irrespective of whether the individual applicant is Sámi or not. The scope and extent of the fund has been extended several times, most recently in 2008.

The geographical approach to Sámi statistics, based on the SUF area, has obvious shortcomings. First, many of the inhabitants in these areas are not Sámi. And equally important, many Sámi live outside these areas. Although old census data give reason to claim that Sámi people are strongly over-represented within the SUF area and under-represented outside the SUF area, the accuracy of the Sámi statistics is far from the level it should have, from the perspective of describing characteristics and development for the Sámi population. The entire SUF area lies north of the Arctic Circle, and none of the large towns and villages of Northern Norway are within the SUF area. To a large extent, the difference between Sámi and non-Sámi areas in the statistics therefore reflects the difference between urban and rural areas, and to some extent the difference between north and south. A statistical approach that would have allowed comparison of Sámi and non-Sámi, independently of place of residence, would have been far better.

Statistics Norway is currently exploring the possibilities to produce Sámi statistics based on individuals. This could be done by using some existing registers where individuals directly or indirectly have declared themselves as Sámi. One such register is the 1970 census. In addition, Statistics Norway has access to the register over persons affiliated with reindeer herding activities, a register owned by the Reindeer Herding Administration. If the Sámi Parliament would allow Statistics Norway to combine data from the 1970 census and the reindeer herding register with the electoral register for the Sámi Parliament, it would perhaps be possible to establish a representative sample of the Sámi population for statistical purposes.

Statistics Norway will nonetheless continue to produce geographically based Sámi statistics. As long as the Sámi Parliament continues to provide funds to particular geographical areas, it will be important to closely follow the development in these areas. So far, two editions of (mainly) geographically based Sámi Statistics have been published, *Samisk statistikk/Sámi statistikk 2006* and *Samisk statistikk/Sámi statistikk 2008*, both in Norwegian and Northern Sámi (not in English). The next edition is planned for 2010. The topics of the statistical publication cover elections to the Sámi Parliament, population, education – including the use of Sámi language in schools and kindergartens, income and personal economy, labor market, reindeer herding and agriculture, and fishing and hunting.

Some results from the Survey of Living Conditions in the Arctic (SLiCA)

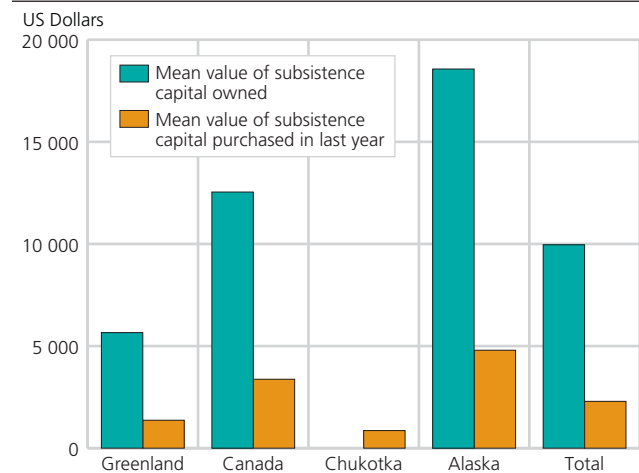
Birger Poppel, Ilisimatusarfik, University of Greenland, and Jack Kruse, University of Alaska Anchorage

The Survey of Living Conditions in the Arctic, SLiCA, has been carried out by an international group of researchers and research institutes in partnership with indigenous peoples of the Arctic. The core questionnaire (www.arcticlivingconditions.org) applied by SLiCA offers opportunities to examine and grasp some of the economic, social, cultural and nutritional significance of subsistence activities. A broad variety of questions have been asked about individual and household activities and behaviour. The importance of a mixed cash and subsistence economy for living conditions in the Arctic is one of the research topics suggested by the indigenous people’s representatives participating in SLiCA. The SLiCA study is based on more than 7 000 personal interviews with Inuit adults in Greenland, Canada, Chukotka in Russia, and Alaska⁵¹.

The following section is reprinted from an article by Birger Poppel and Jack Kruse: ‘The Importance of a Mixed Cash- and Harvest Herding based Economy to Living in the Arctic – An Analysis on the Survey of Living Conditions in the Arctic (SLiCA)’⁵²

Whereas the meat and fish consumed is the result of the harvesting process, hunting and fishing equipment (e.g. boats, dog sleds, skidoos, rifles) is the necessary means to harvesting and thus are production costs. Figure 6.8

Figure 6.8 Mean value of subsistence capital stock and invested previous year. USD



Source: Reprinted from Fig. 3.1 in Poppel and Kruse (2009), see endnote 52.

illustrates that subsistence activities depend on significant capital investments. Alaskan households rank highest when it comes to owning and purchasing subsistence capital (USD 18 000 and 5 000 respectively). Chukotkan households represent the lowest amount purchased in the last year (USD 2 000).

The SLiCA survey illustrates that harvesting meat and fish is of importance to the household economies as it substitutes for store bought food. At the same time harvesting requires investments in hunting and fishing equipment and thus, cash income.

The integration aspect – the mix of subsistence and cash activities

As referred to above, one of the themes of analysis highlighted by the indigenous partners of SLiCA was ‘The importance of a mixed cash- and harvest herding based economy to living in the Arctic’. An approach to

an understanding of the integration aspect is to examine the extent to which households tend to mix cash and subsistence activities.

Table 6.12 groups households on two dimensions: household income and the proportion of meat and fish consumed by the household that was harvested by household mem-



Street business – Siberian women trying to supplement the household budget through street selling. Photo by Gérard Duhaime



People in rural areas, and even in small towns, are often self-sufficient in potatoes. Photo: Winfried Dallmann

Table 6.12. Percentages of Inuit Households by Combination of Proportion of Meat & Fish Harvested by Household and Total Household Income Adjusted for Purchasing Power

	\$16,000 or less	\$16,001- \$50,000	More than \$50,000	Total
None	29	18	15	20
Less than half	28	36	40	35
About half	21	22	21	21
More than half	23	25	23	24
Total	100	100	100	100

Source: <http://www.arcticlivingconditions.org/SLiCA/Results/Report/Tables>

bers (excluding Canadian Inuit). The left column income category includes households below the poverty line, while the right column income category reflects households above median total household incomes, adjusted for purchasing power.

Households with incomes above the median are just as likely to derive more than half of their meat and fish from household harvest activities as households with poverty level incomes. They are less likely to harvest none of their meat and fish than households with poverty level incomes. The most obvious conclusion is that households do not seem to specialise in one kind of activity, it rather seems that there is a tendency to mix activities.

That it takes money to participate in subsistence activities might also – at least partly – explain the finding from the SLiCA data that the lower income groups do not seem to compensate their low incomes by hunting and fishing.⁵³ The fact that households with higher cash incomes and high level of subsistence activities also invest more in hunting and fishing gear might indicate that low income households are worse off when hunting and fishing, and that they risk harvesting less due to less optimal equipment.

Notes

¹ Poppel, B. (2006): Interdependency of subsistence and market economics in the Arctic. In S. Glomsrød and I. Aslaksen (eds.): *The Economy of the North*. Statistics Norway.

² AHDR (2004): *Arctic Human Development Report*. Akureyri, Stefansson Arctic Institute.

³ Poppel, B. and J. Kruse (2009): 'The importance of a mixed cash-and harvest herding based economy to living in the Arctic – an analysis based on Survey of Living Conditions in the Arctic (SLiCA)'. In: V. Møller and D. Huschka (eds.): *Quality of Life and the Millennium Challenge: Advances in Quality-of-Life Studies, Theory and Research*. Social Indicators Research Series. © Springer Science+Business Media B.V.

⁴ Rasmussen, R.O. (2005): Socioøkonomisk analyse af fangerhvervet i Grønland [Socio-economic analysis of the Greenland hunters]. Prepared under contract to the Greenland Home Rule Government, Department of Fisheries and Hunting.

⁵ Unpublished estimates by Olga Murashko.

⁶ Kleinfeld, J., J. Kruse, and R. Travis (1983): Inupiat Participation in the Wage Economy: Effects of Culturally Adapted Local Jobs. *Arctic Anthropology*, 20(1):1-21. Kruse, J. (1991): Alaska Inupiat Subsistence and Wage Employment Patterns: Understanding individual Choice. *Human Organization*, 50(4):317-326. Stabler, J.C., G. Tolley, and E.C. Howe (1990): Fur Trappers in the Northwest Territories: An Econometric Analysis of the Factors Influencing Participa-

tion. In: *Arctic* 43(1):1-8. Myers, H. and S. Forrest, (2000): Making Change: Economic Development In Pond Inlet, 1987 to 1997, *Arctic*, 53(2):134-145. Usher, J.P., G. Duhaime, and E. Searles (2003): The Household as an Economic Unit in Arctic Aboriginal Communities, and its Measurement by Means of a Comprehensive Survey, *Social Indicators Research*, 61: 175-203.

⁷ Ford, J.D., Smit, B. & Wandel, J. (2006): 'Vulnerability to climate change in the Arctic: A case study from Arctic Bay, Canada', *Global Environmental Change*, 145-160.

⁸ Duhaime, G., Rasmussen, R.O. & Comtois, R. (1998): *Sustainable Development in the North*. Québec, Gétic, Laval University.

⁹ Patton, Michael and Dan Robinson (2006): Employment in the Alaska Fisheries. *Alaska Economic Trends*. February 2006. Vol. 26, No. 2. Pp. 4-13. Alaska Department of Labor & Workforce Development. Juneau.

¹⁰ Wolfe, Robert (2000): Subsistence in Alaska: A Year 2000 Update. Juneau, Alaska. Available online www.subsistence.adfg.state.ak.us/geninfo/publctns/articles.cfm

¹¹ ADNR (2000): Alaska Department of Natural Resources: Fact Sheet, Title: Land Ownership in Alaska. Juneau.

¹² Arctic, in the context of Alaska, is considered to be that region of Alaska north of the Brooks Range. Most of Alaska is within the sub-Arctic region. Southeast Alaska, often referred to as the "panhandle" with its more moderate rainforest environment, is geographically aligned with the Northwest along with British Columbia, Washington, Oregon, and Northern California. Alaska is a single state, however, and management of resources and collection of harvest data is consistent as much as possible throughout the state.

¹³ Holen, D. L., T. Krieg, and D. Koster (2008): Subsistence harvests and uses of wild resources in Igiugig, Kokhanok, Koliganek, Lev-elock, and New Stuyahok, Alaska, 2005. Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 322. Juneau.

¹⁴ Magdanz, J.S., R.J. Walker, and R.R. Paciorek (2004): The Subsistence Harvests of Wild Foods by Residents of Shungnak, Alaska, 2002. Technical Paper No. 279. Division of Subsistence, Alaska Department of Fish and Game. Juneau.

¹⁵ Magdanz, J.S., S. Tahbone, A. Ahmasuk, D.S. Koster, and B.L. Davis (2007): Customary trade and barter in fish in the Seward Peninsula area, Alaska. Alaska Department of Fish and Game Division of Subsistence Technical Paper No. 328, Juneau.

¹⁶ USDA/UAF 2007.

¹⁷ ADCED (2008): Alaska Department of Community and Economic Development Community Database Online. www.commerce.state.ak.us/dca

¹⁸ Holen, D. L., T. Krieg, and D. Koster (2008): Subsistence harvests and uses of wild resources in Igiugig, Kokhanok, Koliganek, Lev-elock, and New Stuyahok, Alaska, 2005. Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 322. Juneau.

¹⁹ <http://migration.iser.uaa.alaska.edu/>

²⁰ Some useful web sites:

Aboriginal Canada Portal, <http://www.aboriginalcanada.gc.ca/acp/site.nsf/en/ao28007.html>
 Aboriginal Fishing Strategy, http://www.dfo-mpo.gc.ca/communic/fish_man/afs_e.htm
 Arctic Oil and Gas 2007, Arctic Monitoring and Assessment Programme, Arctic Council, www.amap.no
 Aboriginal Population of Canada, <http://www.statcan.gc.ca/daily-quotidien/080115/dq080115a-eng.htm>. Country Food <http://www.angelfire.com/realm/shades/nativeamericans/inuitcountry-food.htm>
 Canadian Arctic Contaminants Assessment Report II, Northern Contaminants Program, Human Health, Indian and Northern Affairs Canada, Ottawa, 2003; www.ainc-inac.gc.ca
 Indian and Northern Affairs Canada, See <http://www.ainc-inac.gc.ca/nth/index-eng.asp>
 Interactive Map of the NWT, Prince of Wales Northern Heritage Centre, <http://www.lessonsfromtheland.ca/LandTrail.asp?SiteID=S08&lng=English>.
 Inuit Circumpolar Conference of Canada, (www.inuitcircumpolar.com)

- Non-indigenous Northerners <http://www.ainc-inac.gc.ca/ai/of/uas/fs/mnsifs-eng.asp>
 Statistics NWT, <http://www.stats.gov.nt.ca/>
 Statistics Nunavut, www.gov.nu.ca/eia/stats/
 Statistics Yukon, www.eco.gov.yk.ca/stats/
 Territories of Northern Canada Map http://atlas.nrcan.gc.ca/site/english/maps/reference/provinceterritories/northern_territories/map.jpg
 Impact Benefit Agreement Research Network, www.impactandbenefit.com
 The Coastal Learning Communities Network, Subsistence Economies Learning Circle, <http://clcn.seedwiki.com>
 Indian and Northern Affairs Canada, <http://www.ainc-inac.gc.ca/nth/index-eng.asp>
 Inuit Tapiriit Kanatami (ITK) (<http://www.itk.ca/>)
 Employment and Training of Aboriginal People, http://www.hrsdc.gc.ca/en/employment/aboriginal_training/index.shtml
 Northern Contaminated Sites and Northern Contaminants Program, <http://www.ainc-inac.gc.ca/enr/cts/index-eng.asp>
- ²¹ <http://www.lessonsfromtheland.ca/LamTrail.asp?SiteID=S08&Ing=English>
- ²² http://atlas.nrcan.gc.ca/site/english/maps/reference/provinceterritories/northern_territories/referen
- ²³ <http://www.ainc-inac.gc.ca/nth/index-eng.asp>
- ²⁴ Doubleday, N. (2007): *Culturing Adaptive Co-Management: Finding Keys to Resilience in Asymmetries of Power*. In Armitage, Derek, Fikret Berkes and Nancy Doubleday (eds.), *Adaptive Co-Management: Collaboration, Learning and Multi-Level Governance*. Vancouver: University of British Columbia Press: 228-248. Kulchyski, P. and F.J. Tester (2008). *Kiumajut (Talking Back) Game Management and Inuit Rights, 1900-17*. Vancouver: University of British Columbia.
- ²⁵ Peña (2005)
- ²⁶ Berkes, F. (2008): *Sacred Ecology*. Second edition. Routledge.
- ²⁷ See <http://www.ainc-inac.gc.ca/enr/mm/index-eng.asp>
- ²⁸ www.fur.ca
- ²⁹ The Social Economy Research Network of Northern Canada, located at Yukon College, supports research projects dealing with the Social Economy in the North. The overall goal of this Research Network is to bring together researchers and practitioners working on issues relevant to the social economy in northern Canada.
- ³⁰ <http://www.caledoninst.org/Publications/PDF/471ENG%2Epdf>
- ³¹ CACAR II, p.1. Canadian Arctic Contaminants Assessment Report II, Northern Contaminants Program, Human Health, Indian and Northern Affairs Canada, Ottawa, 2003; www.ainc-inac.gc.ca Indian and Northern Affairs Canada, See <http://www.ainc-inac.gc.ca/nth/index-eng.asp>
- ³² Wein, E. (1994): The traditional food supply of Native Canadians. *Canadian Home Economics Journal* 73: 759-764.
- ³³ CACAR II, p. iv.
- ³⁴ Wein, E. and N.M. Freeman (1995): Frequency of traditional food use by three Yukon First Nations, *Arctic* 48(2): 161-171.
- ³⁵ CACAR I, 1993; and CACAR II, 2003.
- ³⁶ Fienup-Riordan, A. (1986). "When Our Bad Season Comes: A Cultural Account of Subsistence Harvesting & Harvest Disruption on the Yukon Delta". Alaska Anthropological Association. Natcher, D.C. (2008): *The Social Economy of Canada's Aboriginal North*. In Proceedings from the 5th Northern Research Forum Open Assembly, Anchorage, Alaska, September 24-27, 2008. <http://www.nrf.is/index.php/publications/seeking-balance-in-a-changing-north>. Natcher, D.C. (2009): Subsistence and the Social Economy of Canada's Aboriginal North. *The Northern Review* 30 (in press, Spring).
- ³⁷ Nuttall, M., F. Berkes, B. Forbes, G. Kofinas, T. Vlassova and G. Wenzel (2005): Hunting, Herding Fishing and Gathering: Indigenous Peoples and Renewable Resource Use in the Arctic. In *Arctic Climate Impact Assessment*, Cambridge, U.K., University of Cambridge Press, 649-690.
- ³⁸ The survey takes place within the frame of a IPY-supported project conducted by Winfried Dallmann in cooperation with the Nenets People's Association 'Yasavey' and anthropologist Olga Murashko.
- ³⁹ Z.V. Ravna, pers. comm. 2008.
- ⁴⁰ Figures from: Conservation of Arctic Flora and Fauna (CAFF) (2006), 'World Reindeer Husbandry; CBMP EALAT – Monitoring', supporting document to CAFF *Circumpolar Biodiversity Monitoring Program – Framework document*, Akureyri, Iceland: CAFF International Secretariat. CBMP Report no. 10.
- ⁴¹ 2006/2007 figures from: Reindrifftsforvaltningen (2008), *Ressursregnskap for reindrifftsnaeringen*, Alta: Reindrifftsforvaltningen.
- ⁴² Oskal, N. and M. N. Sara (2001), 'Reindriftssamiske sedvaner og rettsoppfatninger om land' in Strøm-Bull, K., N. Oskal and M. N. Sara, *Reindrifften i Finnmark: Rettshistorie 1852-1960*, Oslo: Cappelen Akademiske Forlag, p. 302.
- ⁴³ Turi, E.I. (2008), *Living With Climate Variation and Change: A Comparative Study of Resilience Embedded in the Social Organisation of Reindeer Pastoralism in Western Finnmark and Yamal Peninsula*, University of Oslo: Master thesis in political Science
- ⁴⁴ Nelleman, C., L. Kullerud, I. Vistnes, B. C. Forbes, T. Foresman, E. Huseby, G. P. Kofinas, B. P. Kaltenborn, J. Rouaud, M. Magomedova, R. Bobiwash, C. Lambrechts, P. J. Schei, S. Tveitdal, O. Grøn and T. S. Larsen (2001), *GLOBIO: Global Methodology for Mapping Human Impacts on the Biosphere*, UNEP Environmental Information and Assessment Technical Report.
- ⁴⁵ Calculation based on 2005 figures from: Reindrifftsforvaltningen (2006), *Totalregnskap for reindrifftsnaeringen*, Alta: Reindrifftsforvaltningen. The number of reindeer sold to official slaughterhouses is 71 663 and the number of reindeer for own consumption and private sales is 11 430, giving a total of 83 093 slaughtered reindeer, see Table 2 on p. 128. Hence, the percentage distribution between official sales and own consumption/private sales is 86 per cent and 14 per cent. Distributing the total meat income of 110 841 000 NOK by these percentages gives the values reported in Table 6.11. For 2007, the distribution of the total meat income of 135 116 000 NOK between official sales and own consumption and private sales is estimated by the number of slaughtered animals, 73 890 and 11 170, respectively, from Table 2, p. 122, in Reindrifftsforvaltningen (2008), giving a distribution of 87 per cent and 13 per cent.
- ⁴⁶ Reindrifftsforvaltningen (2006), *Totalregnskap for reindrifftsnaeringen*, Alta: Reindrifftsforvaltningen, p 8
- ⁴⁷ Reindrifftsforvaltningen (2006), *Totalregnskap for reindrifftsnaeringen*, Alta: Reindrifftsforvaltningen
- ⁴⁸ Joks, S., O. H. Magga, S. D. Mathiesen and I. M. Henriksen, *Reintallet i Vest-Finnmark; en forskningsbasert vurdering av prosessen rundt fastsettelse av høyeste reintall i Vest-Finnmark*, Sami University College / Nordic Sami Institute: Report.
- ⁴⁹ Turi, E.I. (2008), *Living With Climate Variation and Change: A Comparative Study of Resilience Embedded in the Social Organisation of Reindeer Pastoralism in Western Finnmark and Yamal Peninsula*, University of Oslo: Master thesis in political Science.
- ⁵⁰ In 2008 the SUF area changed its name, in Norwegian: Geografisk område for søkerbasert tilskudd til næringsutvikling.
- ⁵¹ Poppel, B., Kruse, J., Duhaime, G., Abryutina, L. 2007. Survey of Living Conditions in the Arctic: SLiCA Results. Anchorage: Institute of Social and Economic Research, University of Alaska Anchorage. <http://www.arcticlivingconditions.org/>.
- ⁵² Poppel, B. and J. Kruse (2009): 'The importance of a mixed cash- and harvest herding based economy to living in the Arctic – an analysis based on Survey of Living Conditions in the Arctic (SLiCA)'. In: V. Møller and D. Huschka (eds.): *Quality of Life and the Millennium Challenge: Advances in Quality-of-Life Studies, Theory and Research*. Social Indicators Research Series. © Springer Science+Business Media B.V.
- ⁵³ Kruse, J., Poppel, B., Abryutina, L., Duhaime, G., Martin, S., Poppel, M., Kruse, M., Ward, E., Cochran, P., & Hanna, V. (2007) Survey of Living Conditions in the Arctic, SLiCA. In: Møller, V., Huschka, D., and Michalos, A.C. (eds.). *Barometers of Quality of Life Around the Globe*. Springer Social Indicators Research Series. Springer, Dordrecht, The Netherlands.