

MODULE 1: Basic Economic Concepts as Applied to the Circumpolar North

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Overview

This module describes the development of circumpolar regions in terms of gross domestic product (GDP). Module one also examines the structure of the economy in northern regions, the peculiarities of national management and the need for sustainable development of the circumpolar North.

Learning Objectives

Upon completion of module one you should be able to:

1. Examine the role of northern renewable and non-renewable resource exploitation in the global economy.
2. Compare key economic characteristics among northern nations and regions in terms of economic size, total GDP, GDP per capita, population dynamics and industry output.
3. Explain how and why economics is fundamental to human development in the North.

Required Readings

Glomsrød S., Mäenpää I., Lindholt L., McDonald H. and S. Goldsmith. (2008). *Arctic economy within the Arctic nations*. In Solveig Glomsrød and Iulie Aslaksen (Eds.), *The Economy of the North*. Statistics Norway. http://www.ssb.no/a/english/publikasjoner/pdf/sa112_en/kap4.pdf

Huskey, L., Maenpaa, I., and Pelyasov, A. (2014). *Economic Systems* Larsen, Joan Nymand; and Fondahl, Gail (eds.) in the Arctic Human Development Report Regional Processes and Global Linkages, Akureyri: Stefansson Institute. <http://norden.diva-portal.org/smash/record.jsf?pid=diva2%3A788965&dswid=-4712>

Key Terms and Concepts

- GDP/GDP per capita
- Human development
- Market economy
- National budget
- Non-market economy
- Primary, secondary and tertiary sectors of economy
- Social capital
- Sustainable development
- The economy of the circumpolar North
- Traditional economy
- Value added
- Diversification process

Learning Material

1.1 Introduction

There are different reasons as to why people choose to live in the North. Many people consider the North their homeland, community and location of traditional roots. For some, the North offers a sense of excitement for discovery of the unknown and potential to overcome adversity, while others perceive the North as a place needing protection and thorough study. However, one of the main reasons the North is being studied and developed so intensively is because of its rich natural resources. CS 331 examines what natural resources are in the North, how these resources are used, and what limitations to economic activity are present in the North.

Most of the modules in CS 331 are based on the following materials that can be found on the internet: *The Economy of the North* (2006) and the updated 2008 edition; *The Arctic Human Development Report II* (2014); and *The Council of Nordic Ministers' Report Megatrends* (2011). Difficult economic texts have been adapted so the CS student, without a special economics background, can understand how the economy of the North is managed; the difficulties faced during this process; and the most rational management methods that consider the interests of northern society, northern countries and future generations.

Although active industrial development of the circumpolar North began relatively recently (at the end of the 19th century), today the circumpolar North is an industrially developed part of the world. The **market economy** of the circumpolar North is mainly based on oil and gas and mineral resource extraction, and commercial fishing. These activities provide jobs and create the tax base needed for local self-governance and the development of infrastructure for building schools, roads and housing. Regional and federal budgets, partially formed by taxes, help finance research studies and human development in the North and provide funding for major projects for the recovery of fragile ecosystems.

Learning Highlight 1: Market and Non-Market Economies

Important elements of this course are the coexistence of market and non-market economies, economic regulation of land use, and preservation of traditional economic base activities.

The efficiency of economic activity depends on prices set by the global market. Decreasing prices for mineral resources leads to a decline in extraction and processing activity. In contrast with regions that have a comfortable climate, development of the North requires extra costs because of the need for special technology and machinery to overcome cold temperatures, permafrost and strong winds. Also, higher costs in the North are a result of higher prices for the transportation of goods, raw materials and products over long distances to get to the North. In order to stay healthy northerners must eat high-calorie foods, buy warmer clothes, build heat-insulated houses and spend more money on heating than in the South. So life and economic activities in the North are associated with higher consumption, which means the economy of the North must be more profitable than in the South in order to be economically sound.

This first module examines *market* and *state mechanisms* that permit development of the circumpolar economy in spite of these extra costs. In addition, Module One examines the industrial development of the North from the point of view of *sustainable development* and conservation of its fragile nature. Important points of Module One are the coexistence of **market** and **non-market economies**, economic regulation of land use, and the preservation of traditional economic base activities, such as reindeer breeding, fishing and hunting.

1.2 The Circumpolar North and the Global Economy in the Context of Reserves of Renewable and Non-renewable Resources

The circumpolar region contains large quantities of various raw material reserves. Currently circumpolar countries play a leading role in the production of raw materials. The ADHR (2014) reports the population of the circumpolar North 4,053,05, which is down from approximately 10 million as reported in the ADHR (2004). Estimates from 2004 as indicated in the ADHR indicate the **GDP** produced in the circumpolar region makes up 0.44 percent of global GDP. This means GDP per capita in the circumpolar region is greater than GDP in the rest of the world. However, GDP among the various circumpolar regions is not evenly spread. Generally, the Arctic region contributes significantly (more than 5%) to the national GDP in five of the Arctic nations, but as a region, the Arctic accounts for a slightly greater share of national GDP than population. As this course progresses, we will see that the Russian Arctic contributes significantly more to the national economy than its population share (approximately 20% of Russia's GDP).

Industrial development in the North began with the discovery of abundant quantities of precious and non-ferrous metals, hydrocarbons and the availability of natural renewable resources, such as fish, wood and water. The largest resources of nickel and zinc are in the North. Industrial fishing in the Bering and Barents Seas significantly contribute to global supply. Diamonds extracted in Siberia and the Canadian Northwest Territories make up a considerable part of the global diamond market. Table 1 shows the share of the circumpolar region in the global production of these materials.

Learning Activity 1: Circumpolar North Global Reserves of Natural Resources

Briefly review the tables in *The Economy of the North* (2008)

http://www.ssb.no/a/publikasjoner/pdf/sa112_en/sa112_en.pdf. Which resources extracted in the North do you think are most important to the global economy? How does the importance vary with region versus resource?

1.3 Comparison of Economies across Circumpolar Regions

The circumpolar economy has three specific features. First, the large-scale industrial production of oil and gas and minerals mainly determines the structure and place of the circumpolar economy in the global market. Second, social services, schools and hospitals are mostly public in the North so public sector services play an important role in the circumpolar economy's employment structure. Generally, the percent of people employed in the public and social sectors of the northern regions is greater than in other regions. Therefore, the northern economy greatly depends on transfers from **national budgets** to the budgets of northern regions and municipalities to help create infrastructure. Third, the circumpolar economy is a coexistence of industrial and traditional economies. For over a thousand years the Arctic has been home to

Indigenous peoples who followed sustainable traditions of economic activity, which were transferred from generation to generation. The basis of these traditions is the use of renewable resources such as fish, sea mammals, and land-based wildlife. A **traditional economy** does not allow for saving or production of more than current consumption but provides for survival level living standards and maintains natural resources for future generations. Also, preservation of traditional economies saves the unique traditional knowledge and customs of northern peoples and their languages. This is why northern states often follow policies aimed at keeping traditional economies alive.

This module compares how differing shares of **primary, secondary and tertiary sectors of economies** affect GDP and as such allow us to evaluate the sustainability of economies. As a rule, the less reliant an economy is on *primary sector* (associated with resource extraction) like non-renewable resources and the greater its reliance is on *secondary* (e.g. transformation of raw materials into goods) and *tertiary sectors* (e.g. services), the better are its production technologies. Under these conditions the state is less at risk from depletion and scarcity of natural resources and, therefore, its economy is more stable. A comparison of economies in the circumpolar region must consider market laws as well as the national economic policies of each country. There are different methods to measure impacts and the statistical assessment of the economy so it is often difficult to compare Arctic regions. In most countries statistical data allows a comparison of the role of natural resource production and the processing industry. However, Russian statistical data cannot be used for this purpose because data on the Russian fishing industry includes both fishing and fish processing, and the oil and gas industry indicates both the extraction of hydrocarbons, its further refining, and production of end products, such as petrol and oil.

The Gross Domestic Production (GDP) reflects the size of a national economy and is calculated using a region's volume of production (see page 34 of *The Economy of the North*). However, GDP size differs between currencies and in the implementation of rules used to compare them. It is difficult to evaluate GDP at the regional level as the value is misrepresented by the redistribution of revenues between regions. Regional comparisons often use other indicators such as **Value Added** (VA) to evaluate regional revenue as an economic contribution in goods and services at each level in the production process.

The *tertiary sector* contributes the most to GDP in northern economies. It includes private and public services such as transportation, communications, health services, education and social security. These systems make up the production and social infrastructure of an economy. According to data supplied by *The Economy of the North* (2008), the tertiary sector makes up 50 percent of all economic activity in the circumpolar North. In some regions, Yukon (Canada) and Tromsø and Finnmark (Norway), the tertiary sector exceeds 80 percent. There are two explanations for this situation. First, the dominant share in the tertiary sector is comprised of state services. The social infrastructure and education share of the sector make up 20 to 30 percent of economic activity. In regions with weak primary and secondary sectors this share exceeds 30 percent. For example, in Nunavut (Canada) the social infrastructure share is 45 percent. Second, availability of production infrastructure, particularly transportation, plays a major role in the tertiary sector because vast distances and social necessities, such as warmer housing, require its role to be greater. Low northern population density makes the employment share in the tertiary sector higher. Despite small numbers of students or patients, states build schools and medical facilities to ensure students can study and people receive medical services.

The *primary sector* share of GDP is second largest after the tertiary sector. The primary sector reflects extraction of renewable and exhaustible natural resources. The primary sector's volume of production includes industrial exploitation of natural resources and the production of traditional economy destined for sale. The primary sector provides about 70 billion USD-PPP (Purchasing Power Parity) or 31 percent of the North's GDP (Duhaime and Caron., 2006) due to the large-scale extraction of exhaustible resources. The main contribution comes from the extraction of oil and gas, also known as hydrocarbons, in Alaska's North Slope and in Khanty-Mansi and Yamalo-Nenets Autonomous Okrugs (Russia), nickel production in Norilsk and Kola Peninsula (Russia), diamond mining in the Canadian Northwest Territories and the Republic of Sakha (Russia) and gold mining in Chukotka (Russia) and the Canadian Northwest Territories. Oil and gas production alone comprise approximately 53 billion USD annually (Duhaime and Caron., 2006). The circumpolar North is rich in natural resources and plays an important role in the global market. Extraction and primary processing are carried out in most regions, while further processing takes place in southern regions outside of the Arctic.

The second type of primary sector economy is the exploitation of renewable natural resources such as fishing, reindeer breeding, hunting, forestry, agriculture and tourism. For example, the economy of Karelia (Russia) is based primarily on forestry while the economy of the Faroe Islands is based primarily on commercial fishing. In the Arctic, salmon and trout fishing make up 7.7 percent of global production (Lindholt, 2006, p.33). Although mineral extraction only recently reached large scale levels (in the second half of the 20th century), many major mineral deposits are nearly depleted. Unlike the extraction of minerals, renewable natural resource economic activities are labor intensive but do not require a large investment. These activities have been the basis of traditional economies for generations of Indigenous populations.

The *traditional economy* plays a key role in a number of northern regions. Northern people depend on nature's life cycles such as the annual migration of reindeer or fish. Some governments try to support traditional activities with the gradual introduction of policies that support the life values of Indigenous populations. Because the traditional economy suffered from over-industrialization, post-Soviet Russia introduced a policy to encourage an increase in the traditional economy's share of regional domestic products. In some regions, such as the Yamalo-Nenets Autonomous Okrug, after an initial drastic decline in numbers after the fall of the Soviet Union, a dramatic increase in the number of reindeer was achieved. Reindeer herding is the basis of the economic activity of Indigenous peoples in Russia. Increasingly people are recognizing that by providing the opportunity to obtain an education and health services without negatively impacting traditional lifestyles allows for an increase in the standard of living of local traditional communities.

The *secondary sector* (manufacturing and processing production) has the lowest economic impact in the circumpolar North. In the global market the Arctic is an exporter of raw materials and energy and an importer of goods and services for consumption. The low share of value added in the secondary sector can be explained by the labor-intensiveness of these products and transportation and labor costs. Transportation costs are high in the north as are labor costs. Therefore, it is more effective to locate manufacturing and processing industries in the southern more densely populated regions.

The exception is Northern Russia which was developed during the central economic planning period of the USSR. Here state planning replaced markets and governments decided to build industries in the north that produced consumer goods and services. Specifically, the secondary sector in the Russian north provided employment for women as planners preferred to have men

working in what they believed to be the more physically demanding jobs of the primary sector. As workers moved to the North with their families it became necessary to create jobs for women and so secondary manufacturing was promoted. The opening of global markets caused Russian northern enterprises to be uncompetitive and many went bankrupt after the collapse of the Soviet Union, although a few continue to function despite privatization.



Norilsk Nickel's nickel plant in Norilsk, Russia.

Photo Credit: Ilya Naymushin/Reuters

Some northern regions continue to show growth in their share of the secondary sector. For example, modern commercial fishing requires processing close to harvesting areas. Where the rise of the secondary sector is greater, the risk of job loss and bankruptcy is less. The **diversification process** is more successful in Iceland, northern Scandinavia, Alaska and Greenland. Currently the share of the secondary sector exceeds the share of the primary sector in value added in Iceland and northern Finland where the secondary sectors include well-developed fish processing industries, metal working, and machinery production including transport and precision tools. In addition, in Oulu, in northern Finland, Nokia Enterprises, the world's leading cell phone manufacturer, has an important wireless device production facility. Secondary sector enterprises located in the North can compete successfully with other regions, although a well-developed infrastructure and qualified labor force are needed.

Learning Highlight 2:

The circumpolar economy is based on the large-scale industrial production of minerals.

Four regions (Khanty-Mansi, Yamalo-Nenets Autonomous Okrugs, Alaska and the Republic of Sakha) produce more than 60 percent of all output in the circumpolar North (Table 1). Alaska produces one seventh of all circumpolar output yet only 6 percent of all northerners live in Alaska. This fact is explained by the uneven distribution of natural resources in the North. For example, the largest zinc deposits, rich oil deposits and important fish resources are located in Alaska. Apart from uneven resource distribution, production technologies, the level of infrastructure development, and supportive country and state business policy also play key roles.

Non-renewable natural resource reserves are important to northern development, but other methods for economic growth exist. For example, GDP per capita and the standard of living is

extremely high in Norway, Finland and Sweden (Table 2) yet these economies do not depend on exhaustible natural resources, although large-scale oil production does occur in Norway. All these northern countries have well-developed secondary sectors, highly educated populations and no transportation problems.

Northern regions differ greatly in GDP per capita for a variety of reasons but they also differ because the rules used to measure GDP differ. According to Table 2 (data from 2003), Alaska, Khanty-Mansi and Yamalo-Nenets Autonomous Okrugs have a GDP two times higher than the mean value for the circumpolar North. The Canadian Northwest Territories, Alaska, Yamalo-Nenets and Khanty-Mansi Autonomous Okrugs and Yukon have higher internal GDP per capita in USD-PPP than the mean GDP per capita in the country in which they are located (Table 2). In Evenki Autonomous Okrug the GDP per capita is the lowest and equals 5000 USD-PPP per capita. In 2003 the Canadian Northwest Territories had the highest GDP per capita which equaled 80 000 USD-PPP. Russia's northern regions account for 11 percent of its GDP while only 5 percent of its' population reside in the North. The GDP per capita of Russian circumpolar regions is two times higher than Russia's average, however, it is only slightly higher than the GDP per capita of Greenland. On the contrary, the GDP per capita of Norway's circumpolar regions is two times lower than Norway's average. The income in the northern regions of these countries is relatively equal.



Reindeer herders use traditional instruments and modern techniques, such as snowmobile in Jokkmokk Sweden.

Photo Credit: Peter Adams <http://cache2.allpostersimages.com/p/LRG/36/3628/J1KEF00Z/posters/adams-peter-winter-landscape-reindeer-and-snowmobile-jokkmokk-sweden.jpg>

Table 1: Circumpolar Countries GDP and Circumpolar Regions GDP. 2003. Millions USD-PPP and USD-PPP per capita.

Country	Countries		Circumpolar regions		Countries		Circumpolar regions	
	Population		% of circumpolar population in the country	Millions USD-PPP	USD-PPP per capita	Millions USD-PPP	USD-PPP per capita	Per capita GDP as per cent of country average
Canada	31 600 000	111 546	0.4%	950 000	30 040	5 194	46 567	155
Faroe Islands	47 000	47 000	100.0%	1 069	22 738	1 069	22 738	100
Finland	5 200 000	645 272	12.4%	143 000	27 460	13 742	21 296	78
Greenland	56 000	56 000	100.0%	1 108	19 552	1 108	19 552	100
Iceland	289 000	289 000	100.0%	8 835	30 570	8 835	30 570	100
Norway	4 600 000	465 200	10.1%	173 000	37 910	9 882	21 243	56
Russian Federation	143 400 000	7 144 000	5.0%	1 284 000	8 950	139 815	19 571	219
Sweden	9 000 000	508 973	5.7%	239 000	26 710	13 417	26 361	99
United States	290 800 000	648 280	0.2%	10 978 000	37 750	31 704	48 905	130
Total	484 992 000	9 915 271	2.0%	13 778 012	28 409	224 766	22 669	80

Source: The Economy in the North, 2006

Except in European countries, it can be concluded that economic activity in circumpolar regions is more intense on average than the respective circumpolar regions country's average. More intense economic activity correlates with the geographical distribution of natural resources. Regions rich in natural resources, particularly exhaustible, have higher GDP per capita. The Canadian Northwest Territories has the highest GDP per capita because of its low population density and rich resources – diamonds, gold and nonferrous metals. Canada ranks second in the world in diamond production. In circumpolar regions where the economy is based on renewable resources (e.g., the economy of circumpolar regions of Sweden based on forestry) the value of GDP per capita is close to average country value and in some case is even lower.

Learning Activity 2:

Describe human development in one of the circumpolar communities or regions. What are the main economic factors that determine human development? What can you say about national policy affecting human development?

1.4 Why Economics is Fundamental to Human Development in the North?

It should be noted that high GDP per capita does not suggest a high level of consumption per capita. GDP per capita cannot be used alone to evaluate the well-being of a population and human development in a region. It is also important to consider both the market and non-market types of economies in the circumpolar North.

Investment in industrial development benefits workers and their families because it increases the opportunity to provide other types of services such as better education for their children and more spending on health services. At the same time industrial development has the potential to negatively impact traditional activities, reducing access to land and other resources. This negatively affects traditional economies and causes a decline in the standard of living of Indigenous peoples. Accordingly, economic growth influences **human development**.

Disposable income is usually a main factor of human development because it determines consumption levels and, consequently, social indicators such as birth and mortality rates, life

expectancy, and levels of education. A job is a basic value of human development. In the circumpolar North income and the preservation of traditional activities affect human development. Therefore, maintaining traditional activities, reducing income inequality and ensuring sustainable development for future generations are on the national policy agendas of circumpolar countries. Some governments collect taxes and royalties on resource usage and transfer the revenue to special funds that accumulate interest for future generations. A considerable portion of the income received is redistributed in order to balance economic opportunities in different regions. Much depends on the principles of income redistribution used by each national government. Russia does not have a clear income redistribution formula. The national parliament determines how to distribute income each budget year. In Alaska and northern Canada federal grants are distributed according to a procedure that states the larger the population, the larger the grant.

Let's consider how economic growth and national policy influence human development in circumpolar countries and northern regions.

Learning Highlight 3:
Human development in the circumpolar North depends on national policy.

1.5 The Regional Economies of the Circumpolar North

At 28 000 USD PPP/capita, all the circumpolar regions of European countries (Norway, Finland, Sweden, Iceland, and Danish Greenland and Faroe Islands) have a GDP per capita equaling the average of the circumpolar North (Table 1). A relatively diversified economy exists in these regions, which have a well-developed mining industry, secondary sector and tertiary sectors. The primary sector has the greatest significance in Iceland where the fishery plays an important role. These countries each rate among the ten best countries in the world to live when comparing GDP per capita, education and health systems, quality of life, economic growth and political environment. Life expectancy in the European circumpolar region and Iceland as a whole is high and varies from 68.3 years in Greenland to 81.2 years in Iceland. Approximately every fifth resident has an education higher than secondary school

Two northern regions of circumpolar Sweden, Västerbotten and Norrbotten, provide approximately five percent of Sweden's GDP. The regions are rich in wood, iron ore and water resources. The iron ore deposits in Kiruna are very important as they provide much of its production in the circumpolar North.

Circumpolar Finland's regions of Lapland and Oulu cover almost half of Finland's territory. The GDP per capita of northern Finland is fourteen percent lower than the country as a whole. It is particularly low, almost thirty-two percent lower, in Kainuu, the eastern part of the province of Oulu). The secondary sector is not particularly well developed in northern Finland. However, there is a large secondary sector in Oulu where Nokia Corporation Enterprises is located and provides more than ten thousand jobs.

In circumpolar Norway, which includes Finnmark, Tromsø and Nordland counties, the tertiary sector, particularly education, health service, other social services, law and order protection, and the government sector make up the largest part of the GDP. Of the primary sector tourism, hydro power production and the fishing industry provide the largest contribution to GDP. Fishing plays the most important role in the economies of Finnmark and Nordland. In 2006 more than 3 000 people worked as fishermen in Nordland (Norway Statistics. Nordland's economic structure may change considerably due to oil and gas extraction. Deposits have been found in several regions of

the province but have yet to be exploited. The secondary sector of the northern counties of Norway includes metal processing, cement production, fish and wood processing, ship repair and agricultural products processing.

Greenland (Denmark) is the main prawn exporter in the world. In addition, the tertiary sector makes up a relatively large part of the GDP. Fishing provides approximately ninety percent of the country's exports. Fishing also plays a lead role in the economy of Faroe Islands (Denmark) making up more than twenty percent of its GDP and is second in the tertiary sector. Likewise, fishing is a base industry in Iceland and makes up ten percent of its GDP. Iceland also has well-developed tourism and energy production industries that use renewable resources such as water, wind and hot springs.

Undoubtedly, circumpolar Russia is the largest region in terms of area and population as it covers thirteen sub-national districts: Republic Karelia, Republic of Komi, Republic of Sakha, Arkhangelsk and Murmansk oblasts, Autonomous Okrugs such as Khanty-Mansi, Yamalo-Nenets, Taymir, Evenki, Chukotka and Koryakia. However, since 2005 a reform to reduce the number of regions is underway and currently only seven regions remain as national subdivisions. Autonomous Okrugs excluding Chukotka have become part of other northern and southern regions. As a result, it is now even more difficult to compare circumpolar regions since there is no data for half the northern Russian regions.

Khanty-Mansi (Yugra) and Yamalo-Nenets Autonomous Okrugs generate most of the revenue. The value of the other Russian circumpolar regions is less than 1 percent of the circumpolar North's GDP. The **Gross Regional Product** per capita of the richest region, Khanty-Mansi, is 320 times greater than that of Evenki Autonomous Okrug (Rosstat, 2002). The main structure of the economy in the Russian north was created during the Soviet era of central planning. Production chains formed as vertical management systems require corporations and holding companies involved in the extraction of resources in the Arctic to process those resources outside of the Arctic. Under the Soviet planning systems, these tight bonds replaced supply and demand regulation in resource and production markets. Governance of development in the Arctic led to the prevalence of large companies in the North although the development of small and medium-sized business is still complicated. The redistribution of revenues between these regions is very uneven.

Geographic distribution of production in the north of Russia is very unbalanced. The Northern European part of Russia is more industrially developed since industrial development began there as early as the 17th century. The Asian north (Siberia) is considerably less developed and has a much smaller population, which tends to be located around places where mineral extraction occurs. The economy of the Asian part of northern Russia depends heavily on the tertiary sector, which employs every fourth worker. In Koryak, Evenki Autonomous Okrugs and the Republic of Yakutia (Sakha) the percentage of workers employed in the state financed sector exceeds twenty-eight percent. With the exception of Khanty-Mansi and Yamalo-Nenets Autonomous Okrugs, the standard of living in Asian north of Russia is lower, which has resulted in substantial population loss from these regions. Therefore, regional variations in redistribution of economic activity determine social contrasts between the regions.

Privatization caused by the collapse of the Soviet Union and institutional changes from Soviet style planning to a market system utilizing market pricing, followed by destruction of established economic ties between enterprises, caused considerable contrasts in standards of living in different regions. There are low wages, high unemployment, increased death rates and shortened

life expectancies in regions where the economy was not based on large-scale mining. The population is declining in many northern settlements. Since the collapse of the USSR the population of northern Russia has decreased by two million or twenty percent. Currently many northern Russian regions depend on federal transfers that are too low to overcome high poverty and unemployment levels. Decreasing living standards leads to an increase in the number of diseases, suicide rates, alcoholism and drug addiction (Kotyrla, 2008). A relatively high life expectancy of 68.8 and 68.9 years characterizes the regions of Yamal-Nenets and Khanty-Mansi while life expectancy is only fifty-six years in Koryak (2006) where the share of tertiary education graduates in the total population is no more than sixteen percent. Infant mortality is also extremely high in Koryak and other regions with a large share of Indigenous peoples.

In North America, the economy of Alaska is based on oil production, extraction of mineral resources, seafood production, logging and tourism. The Prudhoe Bay oilfield on the north slope of Alaska is the largest reservoir of oil ever discovered in North America. At the end of the 1980s oil extraction reached its maximum with output since consistently decreasing in spite of new oil deposit developments. The Prudhoe Bay oilfield still provides six percent of oil production in the USA. License fees and taxes from oil production provide revenue for the State of Alaska, which invests in the public sector and in the development of production infrastructure. Economic growth remains high but there has been no significant diversification despite special state policy. The economy of Alaska remains based on oil production. The US federal government makes significant contributions to Alaska's economy through the federal management of public lands, service provision to the Indigenous population and the presence of a large military sector. At times the number of people employed in the public sector has been twenty percent of total employment.

Development of zinc deposits, gold mining and lead production play an important role in the Alaskan economy. Zinc production supplies more than fifty percent of total non-ferrous metals produced in Alaska, while gold mining provides fifteen percent and lead production provides ten percent. The tourism industry is developing fast and the number of tourists each year exceeds Alaska's population. The indicators of human development in Alaska in 2006 include a life expectancy rate of 76.7 years, every fourth resident has tertiary education, and Alaska has the highest personal disposable income among the circumpolar regions.



More than one million tourists come to Alaska each year making tourism an important economic branch.

Photo Credit Source: <http://www.alaska-in-pictures.com/heli-skiing-vacation-alaska-2754-pictures.htm>

Learning Highlight 4:

Sustainable development in the circumpolar North suggests preservation of natural resources for future generations and maintaining traditional activities as a fundamental of Indigenous culture.

Oil and gas production is an important economic factor in the Northwest Territories of the Canadian North and has the potential to be important in both the Yukon and Nunavut. Currently extraction amounts are decreasing, however, a boom in diamond production is offsetting the resulting economic loss. Diamonds in the Northwest Territories made Canada a major player in the global diamond market. Gold, the industrial production of which started at the end of the 19th century, continues to play an important role although the volume has decreased considerably. Both the Yukon and Nunavut are facing an important increase in mining over the next few years. The Raglan mine in Nunavik and Voisey's Bay and iron ore mines in Labrador continue to be important to the economy of these regions.

Despite the potential for new mineral and oil and gas development in northern Canada, national transfers make up a considerable portion of the GDP in the Canadian northern territories. Of the three territories, only the Yukon has any direct control over its resource revenues. The Canadian government collects all resource-based taxes in the Northwest Territories and in Nunavut although the Northwest Territories will soon have greater control of its natural resource revenues. It is no surprise then that the Canadian Northern Territories (Yukon, Northwestern Territories) are sixty to seventy percent financed by the federal government. National transfers from the federal government to the northern territories provide assurance for social and economic development. In Nunavut, the least developed territory, there is 21 320 dollars in federal transfers per head, and in Yukon it is 11 067 dollars. In the Northwest Territories, a region with considerable economic growth, federal transfers equal 7 600 dollars per head. Canada is one of the best circumpolar countries in which to live in the world. Life expectancy varies from 70.4 years in Nunavut to 79.1 years in the Northwest Territories. Even though the Canadian Northern Territories have a high proportion of Indigenous people, and people involved in traditional activities, the level of education in the Northwest Territories and the Yukon is comparable to circumpolar regions in Europe.

1.6 Sustainability and Future Generations

It is important to consider the level of sustainability of an economy. Sustainability involves the potential to maintain chosen forms of economic activity, the potential for future generations to live in circumpolar regions, and the ability to develop well-being in northern communities. This relates not only to exhaustible natural resources such as oil, diamond and non-ferrous metals production, but also renewable resources, such as fishing and the forest industry.

Current production and recovery measures affect reserve levels. Preservation of the natural environment is also very important for tourism. Therefore, degradation of nature can considerably effect future human development. The market economy causes damage to topsoil in places of natural resource extraction, road construction and human settlement of territories. Soil degradation is worsened by vegetation in the tundra, which is slow to recover. Topsoil damage threatens traditional economic activities and activities based on the use of renewable resources.

Global warming also seriously effects the circumpolar North by forcing a change in normal economic activities. For example, at the beginning of the 21st century, global warming shortened

the season for annual exploitation of oil deposits in Alaska. Some deposits could only be developed in the winter when the tundra was frozen and staff and equipment could be delivered. As the climate warms, production is reduced. At the same time, global warming could also benefit the economy of the North. With the retreat of ice cover northerners will have new possibilities to develop deposits of natural resources. The growth of open water surface also allows for new opportunities in sea navigation and trade.

A potential economic benefit to the north is connected with rich northern forest reserves. Northern forests occupy seventeen percent of the earth's surface. Forests are rightly called "the lungs of the earth". The ability to absorb carbon dioxide and to produce oxygen make northern forests a strategic good in the world "green" market according to the Kyoto Protocol, which deals with trade quotas to emit carbon dioxide. The Protocol's economic approach to the management of carbon dioxide emissions will give northern countries the opportunity to acquire revenue from countries where carbon dioxide emissions quota is exceeded. A recent reduction in support for the Kyoto Protocol reduces the likelihood of this happening however.

The dependence of the north on non-renewable resource development presents a problem for the sustainability of the northern economy. In order to provide revenue for future generations a responsible approach must solve the distribution problem of natural resource revenue. An example of a successful distribution model is the accumulation of nature taxes in the Permanent Fund of Alaska. This annual dividend payment program clearly shows each citizen how they are taking part in the distribution of income for future generations.

1.5 Conclusion

The circumpolar North is a valuable and vast reservoir of natural resources for the global market, most of which are consumed outside of the North. The circumpolar North is one of the main producers of hydrocarbons, precious and non-ferrous metals, minerals and marine resources. Although the northern economy is based on exploitation of natural resources, the tertiary sector is dominant in its structure due to significant involvement of the state in the economy and the necessity to provide companies and the populace with a standard of living comparable to southern regions. There are fewer manufacturing and processing industries in the North because of high costs caused by high transportation costs and harsh climate conditions. Partially refined raw materials are transported to southern regions where end products are manufactured. Portions of these products then return to the North as goods and services.

Learning Activity 3:

Try to predict future development of one of the circumpolar communities or regions in terms of sustainability of current national policy and local management. Compare well-being of current and future generations.

The Arctic Human Development Report (ADHR) identified two main types of economic activities that are important to an understanding of the well-being of people living in the North. The first are market based types of activities that can be measured using indicators such as the amount of GDP produced per capita. The second type of activities is related to traditional economic activities and mixed economies. Well-being is assessed by the potential to keep a traditional way of life. Many people in the circumpolar North do not want to change their way of

life (Young et al., 2004) even though the level of well-being of communities varies considerably from region to region. In order to balance the well-being of the different communities at a national level, governments set minimum standards of living, which determine necessary family income, social insurance accessibility and quality of life.

A comparison of circumpolar countries shows that despite some common features many differences exist in the standard and style of living among northerners. This is explained by historically formed economic ties, production technologies used and national policies. The future of the northern economy is dependent upon finding ways to ensure a balance between market activities and non-market traditional activities and on finding way to ensure that the exploitation of exhaustible natural resources can help lead to a more sustainable future.

Discussion Questions:

1. Describe how human development depends on economic growth. Give an example.
2. Discuss what the problems of sustainability in the context of globalization are in the North.
3. Can the exploitation of non-renewable resources lead to a more sustainable future for northern communities?

Study Questions:

1. Explain how the primary, secondary and tertiary sectors contribute to economic development in the circumpolar North.
2. Compare two Arctic regions by land area, population, regional GDP and regional GDP per capita. Explain the differences using economic growth, human development, and state policies.
3. Describe the role of primary, secondary and tertiary world sectors of one Arctic country.
4. What are the main economic activities that have contributed to the well-being of your community?
5. Give an explanation of the principles of sustainable development as they apply to the circumpolar North.

Glossary of Terms

Diversification process refers to the creation of jobs in new industries in a region. It is important that the circumpolar regions create jobs in the secondary and tertiary sectors because these jobs provide sustainable development in the territories where the economy is based on non-renewable resources.

Gross domestic product (GDP) and GDP per capita are basic indicators for cross-country analyses of economic development. GDP can be calculated as the sum of household income, firm profit or state revenue in a given year. GDP cannot be used as a measure of income in a small, remote regional economy. Analysts using GDP as a measure of economic performance for a country need to keep in mind a number of well-known shortcomings, such as generally excluded non-market transactions, including economic “bads” (tobacco, for example), and the excluded value of leisure as an aspect of quality of life.

Also GDP does not show that the distribution of income across the population is not measured and the sustainability of production is ignored.

Gross Regional Product (GRP) reflects the full output of a given region.

Human development is the main goal of economic growth according to United Nations declarations. It reflects well-being in a society and the quality of national policy. Indicators of human development include life expectancy, birth and mortality rates, infant mortality rates, GDP per capita, literacy levels, proportion of people in school between the ages 17 to 24, and other social parameters.

Labor-intensiveness refers to a process or industry that requires a large amount of labor to produce its goods or services. The degree of labor intensity is typically measured in proportion to the amount of capital required to produce the goods/services; the higher the proportion of labor costs required, the more labor intensive the business.

National budget is an annual national statement of a nation's finances and its plan for allocating resources consisting of tax and non-tax state revenues and expenditures on public services.

Purchasing power parity (PPP). To add up or compare income accounted for in different countries it is necessary to transform the numbers to a common currency. The USD is frequently used for this purpose as most people have an understanding of how much a dollar can buy in the world market. To adjust for price differences in domestic markets PPP indicators have been established in an attempt to harmonize income measures across regions. The method for calculating the PPP consists of collecting data on the price of a representative basket of goods and services for a specific country and comparing it with a reference basket (Holtsmark, 2006).

The **primary sector** of the economy generally involves changing natural resources into primary products. Most products from this sector are considered raw materials for other industries. Major businesses in this sector include agriculture, agribusiness, fishing, forestry and all mining and quarrying industries.

The **secondary sector** of the economy includes economic sectors that create a finished, usable product, such as manufacturing and construction. Manufacturing is an important activity for economic growth and development. Nations that export manufactured products tend to generate higher marginal GDP growth, which supports higher income and marginal tax revenue is required to fund quality of life initiatives like health care and infrastructure in the economy.

The **tertiary sector** of the economy (also known as the **service sector** or the **service industry**) is defined by the exclusion of the primary and secondary sectors. The main focus of an economy's activity shifts from the primary to the secondary and finally to the tertiary sector when an increase in the quality of life, social security, education and culture, higher level employment qualifications, and prevention of unemployment are evident.

Market economy is based on supply and demand of goods that balance price and quantity of goods. A market economy relies mainly on market forces to allocate goods and resources and to determine prices.

Non-market economy implies non-market relationships such as a traditional economy.

In a **traditional economy** communities produce commodities mostly for their own consumption and do not use money for the redistribution of output between community members. Primitive instruments are usually used for production. It is a term generally used to describe the subsistence activities of Indigenous peoples in the circumpolar North.

Value added in the circumpolar region is the part of gross regional product that reflects total enhancements to products or services by circumpolar economies before the products or service are offered to consumers.

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Supplementary Resources

Survey of Living Conditions in the Arctic: Inuit, Saami, and the Indigenous Peoples of Chukotka Source: <http://www.arcticlivingconditions.org/>

Nordic Arctic Research Program
Source: <http://www.nordregio.se/arcticprogramme>

Facts about Norrbotten
Source: <http://www.lansstyrelsen.se/norrbotten/SiteCollectionDocuments/Sv/publikationer/om%20lansstyrelsen/Engelska%20-%20Fakta%20om%20Norrbotten.pdf>