

Take a hike in a park, and I'll tell you how much it's worth!

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The value our national parks and protected areas

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¹ The views expressed are those of the authors and do not necessarily reflect the position of Parks Canada

Abstract

There is an increased need to value protected areas in Canada, which host some of the most important ecosystem goods and services. This is part of a global movement to place a value on the world's ecosystem services or parts of it that has emerged over the last decade. How can a monetary value be applied to the wide variety of ecosystem services? How much do we think these protected areas, which harbour valuable ecosystem goods and services, are contributing to our national economies? And how much are we willing to pay in order to have our parks and rivers protected? Some of these questions that were raised by Robert Costanza and other ecological economists still remain unanswered, despite numerous attempts to find the "right" methodology to estimate the economic value of ecosystem goods and services.

Canada, and Parks Canada in particular, have a long history of using sound economics to demonstrate the impacts of parks' operations and visitors' impacts and the contribution of national, provincial and territorial parks to the national economy. In the 70's and 80's Parks Canada emerged as leaders in this field, by developing and applying various economic models. In the late 1990's, the Canadian Parks Council (CPC) updated the former Parks Canada economic models into the Provincial Economic Impact Model (PEIM). In 2003, the Department of Canadian Heritage and the Canadian Tourism Commission, with the support of the CPC, re-vamped the latest version of PEIM, renaming it the Economic Impact Model for Parks and Protected Areas (EIMPA v.7). Despite the data adjustments to estimate the direct and indirect impacts derived from the Statistics Canada Inter-provincial Input-Output model, the EIMPA is not comprehensive enough to capture the total economic impacts: direct, indirect and induced. In addition, a way needs to be found to integrate conventional economic valuation methods and measures with the new concepts and measurements of ecosystem economic valuation. Furthermore, these tools still do not yet address other non-economic values, such as personal or societal values of protected areas. These must be topics of other future research.

In order to keep up with the world, we need to add these topics to our renewed socio-economic research agenda.

Valuing the Ecosystem Goods and Services

We are challenged more and more by the need to diagnose the conditions of the world's ecosystems and assess their economic value as a basis for actions needed to enhance their conservation and sustainable use (Millennium Ecosystem Assessment, 2005). A specific example is the World Conservation Union's (IUCN) forward-looking agenda that emerged from the 2003 World Parks Congress and the decision of the Conference of the Parties to the Convention on Biological Diversity², which called on governments for international awareness and understanding of the economic values generated by protected areas.

² See for example CBD Decision VII/28, 3.1.2 which urges Parties to: " Conduct national-level assessments of the contributions of protected areas, considering as appropriate environmental services, to the country's economy and culture, and to the achievement of the Millennium Development Goals at the national level; and integrate the use of economic valuation and natural resource accounting tools into national planning processes in order to identify the hidden and non-hidden economic benefits provided by protected areas and who appropriates these benefits.

Parks and protected areas contain a range of ecosystem goods (i.e., timber, oil, gas, freshwater and hydropower potential) and services provided by wetlands and forests (i.e., purifying water, regulating climate, and producing oxygen). While the market benefits of the ecosystem goods is measured in terms of the contribution to Canada's GDP, the full economic value of a protected areas' natural capital and ecosystem services, when conserved, is practically unknown. Natural Capital includes the resources, living systems and ecosystem services provided by Earth's biosphere, including the ecological systems that support life. If full ecosystem services of protected areas could be accurately measured, the economic impact would be exponentially higher than the value of such resources if harvested or consumed.

The need to estimate the economic value of protected areas or particular ecosystems has been acknowledged by economists from around the world, and brought forward by the Task Force on Economic Benefits of Protected Areas of the World Commission on Protected Areas (WCPA) in collaboration with the Economics Service Unit of IUCN³ (WCPA, 1998). Protected areas provide many benefits through the conservation of natural ecosystems. Ecosystem services perform various physical, biological or chemical functions associated with their natural system. However, measuring the value of a particular area/system using a monetary symbol, does not mean that the "assessed good", in this case, the park or the ecosystem, is bought and sold in markets. For example, in the case of a national park, assessing its economic value requires estimating the economic impact of the particular area; in this case, the definition of the economic impact is the regional economic activity, employment, and payroll that can be attributed to the operation of that particular park.

Economic impact assessments do not measure financial feasibility or the cost/benefit of a park; they merely show the economic significance of a park. As the CPC report (the Outspan Group, 2005) warns, it is important to differentiate the economic impacts from the economic benefits. And why would it be so important to differentiate the two? Because the economic impacts are "measurable and real" within the selected defined economic area (country, province, national or provincial park) regardless of where the money originated first. In terms of measures of economic impact, the most used indicators are value added, measured in the Canadian economy as gross domestic product (GDP) at factor cost, labour income, employment, and tax revenue. However, not all impacts can be considered economic benefits. According to the CPC report (2005), benefits occur when the impacts reflect an injection into the defined area, from outside sources, such as extra regional or foreign visitors to our national parks.

As pointed out in the 2004 IUCN report, *How Much Is an Ecosystem Worth* (The World Bank, 2004), ecosystems goods and services are undervalued, either due to the lack of comprehensive data or to the fact that they are not captured at all in conventional measures of the economy. The same line of argument is brought forward by the Pembina Institute's study on *Counting Canada's Natural Capital* (2005). Despite significant data limitations due to the absence of concrete quantitative data for the boreal region of Canada, the Pembina report provides estimates on the net market value⁴ of boreal natural capital extraction associated with the use of some of the boreal region's

³ The report is part of WCPA Best Practice Protected Area Guidelines Series

⁴ The net market value calculated in this report is based on the contribution to Canada's GDP from boreal timber harvesting; mineral, oil and gas extraction; and hydroelectric generation (\$48.9 billion) minus the estimated \$11.1 billion in environmental costs (e.g., air pollution costs) and societal costs (e.g., government subsidies) associated with these industrial activities.

natural capital resources (e.g., timber, minerals, water); the net value of these assets was estimated at \$37.8 billion for the year 2002. At the same time, the report provides estimates of the non-market value of a small subset of boreal ecosystem services, including the economic value of carbon sequestration by forests and peat lands, nature-related recreation, biodiversity, water supply and regulation, pest control, non-timber forest products, and Aboriginal subsistence values. The non-market value of boreal ecosystem services for the year 2002 was estimated at \$93.2 billion, 2.5 times greater than the net market value of boreal natural capital extraction. The combined value was \$131 billion.

Another study by the Canadian Boreal Initiative, published in January 2007, reports the natural wealth of the Mackenzie Region is close to \$500 billion, and estimates the ecological goods and services provided by nature in the Mackenzie watershed region to be 10 times the total economic value generated by natural capital extraction industries and other activities within the watershed (Wilson and Anielski, 2007).

To assess or not to assess the world?

There have been many studies in the past decade, trying to estimate the value of ecosystem services or parts of them. There is one study, however, that gave us the most debated and controversial value of the planet's ecosystem services, the famous \$33 trillion per year. In 1997, Costanza and his ecological economics fellow colleagues from the United States, the Netherlands and Argentina published in the British journal *Nature* (Costanza et al, 1997) an estimate of the total annual economic value of the services that natural systems provided free. As if this number itself was not surprising enough, it seemed even more astonishing at the time when compared to the total value of the gross world product (the combined production of all nations), which was estimated at \$18 trillion for the same reference year, 1997.

The results of Costanza's study and his \$33 trillion have been both extensively quoted by scientists, environmentalists and ecological economists, and largely disputed by classical, traditional economists, who consider the results "profoundly flawed", from a conceptual and methodological point of view (The World Bank, 2004). The main complaint of the traditional economists is that the value of all ecosystems on earth is seriously underestimated. They argue that the freshwater ecosystems, as well as the boreal forests and the tundra (as part of the Canadian ecosystem heritage) are all left out. In the 1997 *Science* edition, Pimm noted that absent from Costanza's calculations were also the mountains, the Arctic and deserts, as were the urban areas with city parks.

Other like-minded traditional scholars have reacted simply to Costanza's idea of pricing ecosystems, and accused him of "confusing sacred space with the market place by commoditizing biodiversity in the global sanctuary simply to maximize immediate human gain" (Weiskel, 2003:4).

On the other side of the fence, there are the supporters of Costanza's results. As ecological economists, this group of scholars integrates the fields of economics, ecology and sociology, attempting to develop a new form of environmental planning and policy that brings together the human, ecological and economic aspects of world policies and management issues. According to Costanza (Harris, 2003:4), his team's study provided the numbers "just to make those value judgments explicit" in order to focus people's attention on the value of our ecosystem.

However, before accepting or rejecting Costanza's results, we need to take into account that, at the time of their report, there were fewer studies on ecosystem valuation than in the past five years. His team gathered bits and pieces of scattered information, and estimated the value of ecosystem services per unit per biome, and then extrapolated it to all services and biomes in order to establish a first approximation of the relative magnitude of global ecosystem services. Their exercise was meant to set up a framework for further analysis, and stimulate additional research and debate (Costanza, 1997).

And what stimulation it created! This debate has been going on for almost ten years now, and it may go on for other ten. New studies are starting to fill-in the gaps and complete the puzzle Costanza and his team tried to layout for us, a decade ago. Such an example is the above-mentioned new Canadian study on assessing the real value of Canada's boreal ecosystems. As new bits and pieces of valuation of various ecosystem services around the world are being added to the puzzle, it would be interesting to update Costanza's numbers and recalculate the total value of the ecosystem services.

The value of ecosystem goods and services around the world

For the past ten years we've seen a shift in the debates, research and decision-making, which made us expand our boundaries from the more limited concept of protected areas to the wider ranging one, of ecosystem services. Maybe this shift we've seen over the past decade arose from an increased awareness of the need to think more broadly than the pure conservation and protection "box". In this new light, the Millennium Ecosystem Assessment (MA) was carried out between 2001 and 2005, to assess the consequences of ecosystem change for human well-being and set the basis for action in order to enhance the conservation and sustainable use and their contributions to human well-being (Millennium Ecosystem Assessment, 2005). Four international conventions -the Convention on Biological Diversity, the UN Convention to combat Desertification, the Ramsar Convention on Wetlands, and Convention on Migratory Species- feed the MA with information needed to respond to various requests from governments, business community, the health sector, NGO's, and indigenous people.

As the IUCN points out, there has been "an explosion" of studies that have tried to value sub-sets of the benefits of particular ecosystems in specific locations (The World Bank, 2004). Some studies are more conservative than others. Some challenge us to think past our formal training, while some studies such as Costanza's (1997) or Kool's (2001) advocate that, "the services of ecological systems and the natural capital stocks that produce them are critical to the functioning of the Earth's life-support system" (Costanza in Nature, 1997).

Now, before looking in our own backyard, let's look at some examples of how other countries have been dealing with the concept of putting an economic value to selected ecosystem services. Enthusiasts of these types of studies can find a diverse classification of the ecosystem valuation on the Web, by checking the Environmental Valuation & Cost Benefit News (<http://www.envirovaluation.org/index.php>), or checking various studies published every month in the specialty magazines and journals, such as Ecological Economics, Nature, Scientific American, and other journals.

US state park agencies have been active in estimating the economic contribution of both, national and state parks. For Americans, as for Canadians, parks are unique areas, cherished by many people. IUCN (2005) reported that, in 2002, the United States maintained about 210,000 square miles (54,000,000 hectares) as total land described by IUCN under category I (wilderness areas), and category II (national parks). With a complex system of national parks, which sometimes created confusion in terms of land management and operation systems, the US focused on valuation studies on the economic value of their national park system. Worth mentioning are two reports, which have a more conservative approach.

In 2006, a study conducted by the National Parks Conservation Association revealed that “conservatively estimated”, visitors to national parks spent over \$11 billion annually in the local regions of the parks, supporting \$13.3 billion in sales, 267,000 jobs, and \$7.5 billion in value added, for the 2004 reference year (Hardner & Gullison, 2006). The study also reported that, if all visitor spending were taken into account (e.g., spending outside the local area), estimates could be two to four times greater.

In 2004, Reyes and Mates prepared for the New Jersey Department of Environmental Protection Division of Science, Research & Technology the study on the *Economic Value of New Jersey State Parks and Forests*. The report identified three general types of values derivable from New Jersey State Parks and Forests (P&F), direct, indirect and non-use values, and estimated that the total value of the benefits of maintaining NJ State Parks and Forests was worth \$1.2 billion annually, for the reference year 2002.

Europe has been also challenged by the same global trends and the need to value ecosystem services. Europe has many natural areas of great beauty, and wildlife habitat, however, not too many of those areas have been protected by national parks designations. Among the northern European countries, Sweden has been the most active in undertaking some economic assessment of their national parks (Tilton, 1998), while Finland and the Netherlands have been expanding their idea of biodiversity and protected areas, while not yet completing any significant valuation studies in this area (Earth Trends, 2003).

However, remarkable work was conducted in the United Kingdom. By trying to define and calculate the ecological footprint (the measure of the mark we leave on the natural world that sustains us), the Scottish Parliament launched in June 2005 a Global Footprint Network at the same time as the launch of an analysis of Europe’s ecological footprint (Global Footprint Network and WWF, 2005). Even though this method received some criticism (Cook, 2005), it has the potential of providing some useful information regarding the link between humans and environment as well as potential future studies on valuation of ecosystem services.

A step forward was taken by the study on the Economic Value of Protected Landscapes in the North East of England (SQW Limited, 2004), with the double purpose of demonstrating the value of public and private sector investment in the management of protected landscapes, and of providing information regarding the value of protected areas to the regional economy.

Not surprisingly, given their increased attention on nature-based tourism, recreation, and wildlife protection and conservation, the most studies on the economic value of various segments of ecosystem services come from Oceania. In the past two years, both Australia and New Zealand generated study after study of economic valuation regarding biodiversity conservation, national and marine parks, and recreation and tourism. These reports range in Australia from techniques and methods for integrating biodiversity valuation into economics (Australian Department of Environment and Heritage, 2005), to measuring the economic & financial value of the Great Barrier Reef Marine Park (Great Barrier Reef Marine Park Authority, 2005), to managing objectives of economic value for Australian national parks, and assessing the economic value of recreation and tourism in Western Australia's national parks and forests. At the same time, New Zealand released in March 2004 the study "Regional Economic Impact of West Coast Conservation Land" (New Zealand Department of Conservation, 2004), followed in 2005 by the "Regional Economic Impacts of Abel Tasman National Park and Queen Charlotte Track" (New Zealand Department of Conservation, 2005).

In South America, Brazil paid some attention to natural resources valuation, mainly due to the environmental issues, such as Amazon deforestation. In his book, Peter May (1999) presents the challenges of applying some of the environmental valuation methods and various conflicts related to implementing resource management policies.

The Caribbean and Central American nations have also conducted their own economic studies regarding the value of various ecosystems, characteristic to each region. Belize, Costa Rica and Jamaica have been mainly conducting the valuation research on the economic value of their barrier reefs and tropical forests, and to some extent, on the impact of tourist activities in their protected areas (e.g. recreational fishing and scuba diving). Trinidad and Tobago conducted studies on conservation and economic value of its wetlands. These studies were released during the World Wetlands Day in 2001 (www.ramsar.org). One of the most recent is the study by Latoya Johnson on the Economic Value of Reefs in the Caribbean region. On October 4, 2004 Johnson stated in a press release that the natural shoreline protection by the Coral Reefs within the Caribbean (stretching over an area of 26 thousand square kilometres) saves countries between US\$700 million and US\$2.2 billion annually in built shoreline protection.

On the African continent, a few countries such as Zimbabwe, South Africa, Botswana and Gabon have tried timidly to approach the conservation valuation issues since the mid 90's. However, Ghana and Lesotho have conducted more comprehensive reports on the environmental economics in the Sub-Saharan Africa, the importance of conservation of protected areas, and the challenges of sustainable development (www.worldbank.org, 1995).

At last but not least, Japan and China have been conducting dozens of ecosystem valuation studies in the past six years. Some of these studies were published in the Ecological Economics Journal, some of them with a high academic value. Such examples include the Valuation Studies for Agricultural and Forest Land in Japan (Kuriyama, 2000), and the Contingent Valuation in China to Measure the Total Economic Value of Restoring Ecosystem Services in Ejina Region (Xu et al., 2003).

At home

Since late 1960s, Canada has been a world leader in terms of its national statistical system, environmental accounts, and the Tourism Satellite Account (TSA).

To refer back to the title, why is it important to value our national parks and protected areas? The answer is simple: together with the United States, Canada is considered to have the oldest and most comprehensive national parks system in the world. For Canadians, like for Americans, it is very important to estimate the economic impacts from tourism and outdoor recreation activities and the value placed on parkland use by society. From a social science perspective, it is also important to take steps to improve research methods and data collection so that results are credible and defensible. Better data collection and evaluation methodologies will be useful in evaluating future investments and programs, developing adequate performance indicators related to the state of protected areas, and investing in environmental and socio-economic accounting as a tool for decision making in conserving the protected areas while delivering high visitor satisfaction.

At the national level, in 2000, Environment Canada released a national study based on the findings of the 1996 Survey on the Importance of Nature to Canadians (Environment Canada, 2000). According to this study, Canadian residents and US visitors' spending on nature-related activities in 1996 contributed to an overall economic impact of \$12.1 billion to Canada's Gross Domestic Product (GDP), to \$5.9 billion in personal income, generated 215,000 jobs, and contributed \$5.4 billion in government revenue from taxes.

In the protected area context, a number of economic impact studies were conducted at the national level by The Outspan Group, an environmental economics consultancy, including:

- *Benefits of Protected Areas* (1996);
- *Benefits and Economic Impacts Associated with the Canadian Heritage Rivers System* (1997);
- *Lake Superior National Marine Conservation Area: Tourism Potential Assessment Study* (1999) and *Potential Economic Impacts* (2000);
- *Benefits of Parks and Protected Areas* (2000), commissioned by the Canadian Parks Council;
- *Provincial Economic Impact Model - PEIM* (2003), commissioned by the Department of Canadian Heritage and by the Canadian Tourism Commission;
- *Economic Impact Model for Parks and Protected Areas – EIMPA* (2004), commissioned by the Canadian Parks Council; and the most recent study,
- *The Economic Impact of Canada's National, Provincial & Territorial Parks in 2000* (Nov. 2005), commissioned by the Canadian Parks Council.

As a further contribution to the literature on natural capital, Ducks Unlimited Canada (DUC) and the Nature Conservancy of Canada published in 2004 Dr. Nancy Olewiler's study, *The Value of Natural Capital in Settled Areas of Canada*. A press release issued at the release of the report makes reference to the report's conclusions that governments should "develop a system that puts a price tag on the services nature provides in our settled areas, before it is too late". In her study, Olewiler used Canadian

case studies to show the value of nature and the importance of preservation of our natural areas within settled parts of Canada. Some estimates in the study reveal that conservation on a hectare of an estuary may annually be worth \$22,832/ha, the lakes and rivers, \$8,498/ha, the temperate/boreal forests, \$2,007/ha, and the grass/rangelands could be worth \$232/ha (Ducks Unlimited Canada, 2004).

At a regional level, in a summary prepared for Parks Canada, Delbeare and Gosselin (2004) present a detailed list of economic impact studies at the provincial/territorial level. Worth mentioning are the following: Saskatchewan Provincial Parks – A Legacy for the Future (2005); Parks Canada's Impact in the Gaspé Peninsula (2002); 2001 Gros Morne National Park Economic Impact Analysis (2002); The Economic Impact of Visitors to Alberta's Rocky Mountain National Parks in 1988 (2000); and The Economic Significance of Parks Canada in Prince Edward Island (1998).

Still at a regional level, Richard Kool's article (2001), *What Are Protected Areas Worth*, is a good example of making use of the ecosystem service model used by Costanza and his team. Kool adapted Costanza's model to biomes that are found in the protected area system of the province of British Columbia, Canada. Kool calculated an estimate based on the average value of a hectare of nature, and determined that British Columbia's protected spaces contributed a value of approximate \$12 billion per year to the province. At the same time, Kool estimated that the value of the protected areas in 2001 was around 10% of the total BC economy.

Show me the numbers!

We've been the envy of the world, not only when we produced and released the first Tourism Satellite Account (TSA)⁵ in the world in 1994, and put tourism on the map of our national economy (OECD et al, 2001), but also when Parks Canada recognized in the mid 1960's the need to use economic models to help in planning and managing its budgets, assets, and services. Eventually, these economic models evolved, and in the late 1970's, Parks Canada's first team of socio-economists including Jay Beaman, Alain Charlebois, Solange Dion, Gilles Gauthier, Scott Meis, Dick Stanley and Erik Val, developed the first National Economic Impact Model for Parks.

Throughout the 1980's a second socio-economic team led by Greg Danchuk, Dave de Lange, Dave McVetty and Luc Peron adapted the previous version of the economic model, due to an increased need to provide evidence of the economic activity of parks agencies and visitor-related spending (Beaman, Peron and Stanley, 1993), and used the Tourism Impact Model template, which incorporated Statistics Canada's Input/Output (I/O) model of the Canadian economy to produce its final estimates. In the years that followed, various refinements have been developed to compute economic impacts associated with national, provincial and territorial expenditures.

For more than a decade, in the process of developing more up-to-date economic impact models to serve parks agencies, the Canadian Parks Council (CPC), a national organization with members from all 15 protected area organizations in Canada⁶, has

⁵ A Tourism Satellite Account is a statistical instrument, based on the accounting principles of the System National Accounts. This internationally recognised system is an integrated framework of statistics that allows for the measurement of a country's economic production. It outlines the structure of the economy and the contribution of each industry.

⁶ The CPC was formerly known as the Federal Provincial Parks Council

taken a significant role in supporting and funding a series of economic impact studies for the national and provincial/territorial use. Much of this work has been based on early groundbreaking work done by Parks Canada socio-economic researchers.

The Economic Impact of Canada's National, Provincial & Territorial Parks

The need to improve the availability of economic impact estimates for Park managers and the need for an integrated use of information, led to the development in 1998 by the CPC of the Economic Benefits Framework. The framework proposed to include not only traditional economic impact measurements (e.g., tourism spending and spending by parks agencies on operations and capital development) but also direct user benefits (e.g., consumer surplus, existence benefits), and societal benefits (e.g., benefits from biodiversity, water production, scientific and educational benefits) (The Outspan Group, 2000).

Appendix A shows the generalized framework of the total benefits of protected areas. Each category of benefits is defined in the glossary of terms (Appendix B). The Outspan framework provides a comprehensive assessment of the socio-economic benefits derived from parks and protected areas, and is a first step in answering the questions floating around the total value of our national parks.

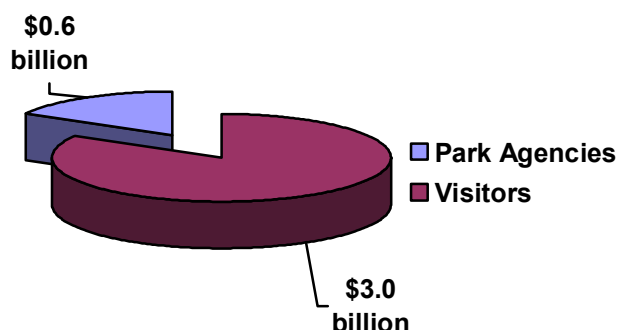
Also, the need for adequate information on how economic impacts are to be calculated led to the development of a new user-friendly computerized model, which has its roots in the previous versions of the Economic Impact Model (EIM) and the Provincial Economic Impact Model (PEIM). The 2003 version called the Economic Impact Model for Parks and Protected Areas (EIMPA, v 7.0) was re-developed in partnership by the Department of Canadian Heritage and the Canadian Tourism Commission, with the support of the CPC. This model allows refined and more detailed economic impact estimates to be calculated in a timely and accurate manner by using the most up-to-date Statistics Canada Input-Output tables, including inflation factors, and estimating revenues at both the federal level and to individual provincial governments (CPC Report, 2004).

Using the same EIMPA template, the Outspan Group completed in 2005 a report for the Canadian Parks Council, *The Economic Impact of Canada's National, Provincial & Territorial Parks in 2000*. The report provides a first estimate of the more conservative collective economic impacts of the spending by park agencies and park visitors, related to Canada's national, provincial and territorial parks, illustrating their importance in the national and provincial/territorial economy (CPC Report, 2005).

The report gives us a clear picture of combined park agencies and visitors spending in the national and provincial/territorial parks. The various agencies responsible for managing Canada's national, provincial and territorial parks spend substantial amounts of money on wages and salaries as well as on goods and services. In addition, more than 70 million (Parks Canada survey results, 2005) people visit these parks on an annual basis and in 2000 they spent \$3.0 billion, which is five times more than was spent by parks organizations. What did the visitors spend their money on, in 2000? According to the Outspan report, recreation, entertainment and other expenditures was the category on the top of the list, followed by food and beverage expenditures, and transportation-related expenditures, in third place.

Figure 1 shows the \$3.6 billion combined gross spending by parks agencies and by visitors for the year 2000.

Figure 1: Gross Direct Spending



Numbers are based on The Outspan Group (2005)

The CPC report also gives us an important economic representation of the economic impacts (direct and indirect) by province and territory and at a national level, derived from EIMPA. Table 1 provides a summary on how the \$3.6 billion combined spending by park agencies and visitors translated into a series of economic impacts, such as gross domestic product (GDP), labour income, full-time employment, and tax revenues, at provincial/territorial and federal levels. Chart 2 and Chart 3 also show the proportion of each of the four aspects of the economic impact at provincial/territorial and federal levels.

Table 1: Economic Impacts of the National, Provincial and Territorial Parks (2000 reference year)

	GDP* (Millions \$)	Labour Income (Millions \$)	Tax Revenues (Millions \$)	Employment (FTE)
Provincial/Territorial	1,160.10	747.00	62.25	27,678.60
Federal	1,296.20	887.20	74.65	31,342.60
TOTAL	2,456.30	1,634.20	136.90	59,021.2

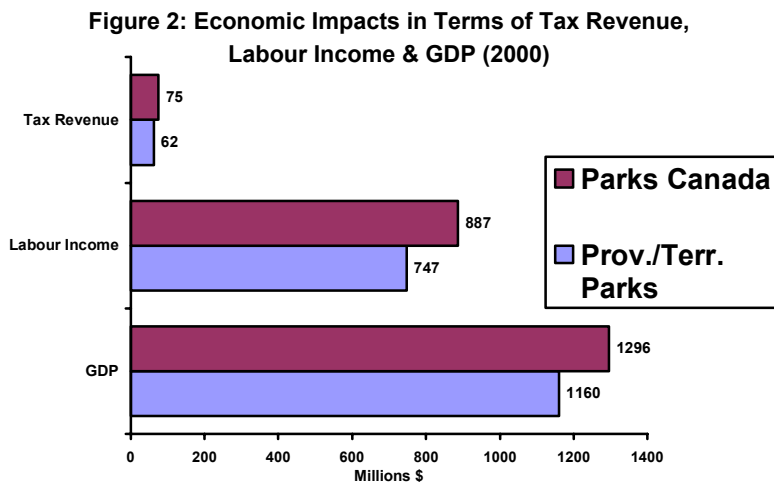
* Includes both direct and indirect impacts

Adapted from The Outspan Group (2005)

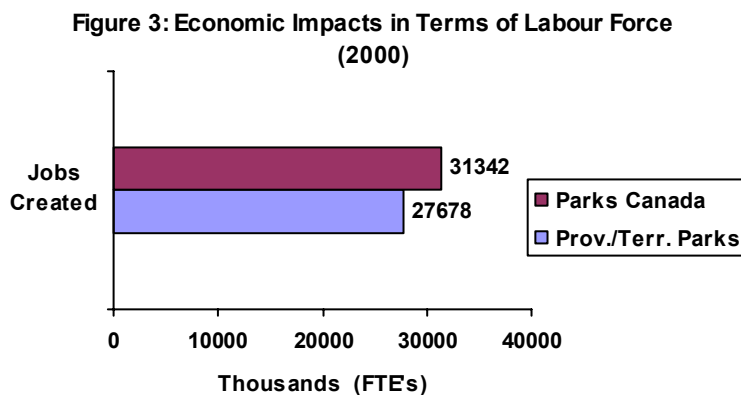
Overall, we could say that, for the year 2000, the economic impact from combined visitor and park agency's expenditures was:

- \$2.5 billion to Canada's Gross Domestic Product
- \$1.6 billion in labour income

- \$137 million in tax revenue to governments, and
- 60,000 full-time jobs



Numbers are based on The Outspan Group (2005)



Numbers are based on The Outspan Group (2005)

Other dimensions of economic impacts of the national, provincial and territorial parks

A separate study by the Outspan Group (CPC, 2005)⁷ of the contribution of induced impacts⁸ to total economic impacts found that the induced impacts can be substantial and represent a significant portion, perhaps as much as an additional 20 - 30% of total

⁷ Based on 2005 data as reported by 3 of the 13 protected area organizations in Canada

⁸ See Glossary for definition

impacts when they are included in the analysis. This is mainly due to the high labour content in tourism-related businesses and the significant amounts spent on wages and salaries for park staff. This study also suggested that, in general, the induced impacts had roughly the same value as the indirect impacts. However, in comparison to some other economic impact models, the results using the Economic Impact Model (EIMPA v.7) should be considered as minimum values.

Now, let's do a simple math calculation: let's take the 2000 GDP dollar figures from the CPC report (\$2.5 billion) and expand our calculations, to include the induced effects, for a new adjusted total. Keeping in mind that the induced effects have equal value to the indirect ones, we'll develop three scenarios for induced and indirect impacts to the total economic impacts: (a) 20%; (b) 25%; and 30% each of total impact. Table 2 shows that total economic impacts could vary from \$3.1 billion to \$3.5 billion, when taking in consideration the additional induced effects.

Table 2: Total Economic Impacts in Terms of GDP for National, Provincial and Territorial Parks (2000 reference year)

	Direct	Indirect	Induced	Total
Scenario A*	\$1.86B	\$0.62B	\$0.62B	\$3.1B
Scenario B**	\$1.65B	\$0.82B	\$0.82B	\$3.3B
Scenario C***	\$1.40B	\$1.05B	\$1.05B	\$3.5B

* Induced and Indirect Impacts represent 20% each of the total impacts

** Induced and Indirect Impacts represent 25% each of the total impacts

*** Induced and Indirect Impacts represent 30% each of the total impacts

Let's assume that relationships of a similar order of magnitude occur at a larger scale and for a broader range of ecological services. If we adopt Kool's (2001) base number for the ecosystem value in BC of \$350 per hectare, and make a heroic assumption and apply it to the total protected areas in Canada, of 104 million hectares⁹, we could say that, the total production value of protected areas in Canada could be \$36.4 billion in 2004. Given that the total value of Canada's economy, the value of all goods and services produced in 2004 was one trillion, we can assume that the GDP contribution of parks and protected areas in Canada in 2004 was 3.6% to the national economy.

Acknowledging that Statistics Canada uses a different methodology to calculate each industry's contribution to the national economy than the methods used by Costanza or Kool to calculate the annual output of ecosystem services, just for the sake of argument, let's look at the comparison with other conventional industries with similar GDP shares:

- The combination of tourism industries as measured by the tourism GDP accounted for \$22.4 billion in 2000, a contribution of 2.2% to the national GDP;
- Agriculture, forestry, fishing and hunting accounted for \$22.0 billion in 2000, a contribution of 2.2% to the national GDP; and
- Motor vehicle manufacturing GDP accounted for almost \$15.0 billion in 2000, 1.5% to the GDP.

⁹ 2005, Environment Canada

If we look at these industries' contribution to the national economy, compared with the contribution of our protected areas to the national economy, we can see that Canada's national, provincial and territorial parks, along with other protected areas make an equivalent contribution to the national economy, to that of a number of strategically significant industries.

This comparison between the value of our protected areas and conventionally recognised industries is not to show an equal (par per par) evaluation. This comparison is done in this context, for illustrative purposes only, given that the methodological bases of the two types of measurements are different and therefore, not directly comparable.

Another dimension of the total economic impacts of Canadian national, provincial and territorial parks to the economy is given by the value of the volunteer work performed by Canadians in these parks. According to the November 15, 2005 National Post newspaper, the charitable sector (including areas such as sports, recreation, religion, arts and culture, education, and health) in Canada is vital to the economy. The sector employs over two million Canadians - 2.5 times more than in the construction industry – translating into two billion volunteer hours, the equivalent of one million full-time jobs.

Now, if we want to see how important volunteer work is in the context of parks, we only have to go to Statistics Canada's latest Satellite Account of Nonprofit Institutions and Volunteering (Statistics Canada, 2005), and take the estimated \$13.35 per hour as an average wage rate for the reference year 2000¹⁰. This amount, multiplied by the number of volunteer hours worked by Canadians in the national parks (197,554 hours) for the 1999/2000-reference year, gives us an additional total of \$2.6 million to the national economy¹¹.

Other economic impacts include private sector investments encouraged by parks, however, not calculated by the economic impact models. These are usually treated as tourism businesses, not attributed to parks

Limitations to existing parks-related economic impact models in Canada

A first limitation in attempting to provide a reliable number for the value of the total ecosystems services provided in our protected areas is the absence of adequate baseline information on the current state and rates of change in our ecosystem services. As the Pembina report reveals (November 2005), data on current stock and changes in the boreal natural capital assets such as forest inventory, minerals, petroleum resources, water resources, fish and wildlife, and arable agricultural land are not currently available. Therefore, in the absence of quantitative inventory data, it is very difficult for any research study to come-up with a "real", defensible number. The vast majority of economic analyses, including Costanza and Pembina studies, use estimates of stock flows of some natural capital accounts, which are proxies for actual inventories.

A second limitation deals with outdated data, which eventually loses its credibility and comparability with new reference years or reference figures. This is the example of the

¹⁰ The wage rate of community and social services occupations, derived from the 1996 Canadian Census of Population, was used to value volunteer services.

¹¹ The total number of volunteer-hours are at the national level only.

study released in 2000 by Environment Canada (Minister of Public Works and Government Services Canada, 2000), which reported that Canadian residents and US visitors spent \$11.7 billion on nature-related activities in Canada during 1996. One may ask what would be the results if the same survey would be updated to 2005 data.

A third type of limitation is directly related to the ability of current economic models to calculate the three types of benefits (personal, commercial and societal), as described in the CPC's framework. *The Economic Impact of Canada's National, Provincial & Territorial Parks in 2000* (The Outspan Group, 2005), underestimates the full effects of economic impacts mostly because it measures only the value-added to the economy from attributable park-related spending and it does not include induced impacts (the successive re-spending impacts associated with household spending from wages and salaries). In addition, the EIMPA is unable to estimate directly the benefits of parks to individual people or the full benefits to society either. Societal benefits (or public good values) range within the environmental services performed by national parks from clean air and water for our communities, to soil erosion prevention, and protection of endangered species. These benefits are very important, however, they require other methodologies and measurements than the current economic models provide.

Another limitation is caused by the lack of up-to-date available data. EIMPA is based on Statistics Canada's Input-Output (I-O) accounts, which update the information on a regular defined schedule, every three to five years. Even though EIMPA uses the most recently updated I-O available data, it is usually dated by several years, due to the time needed to obtain and reconcile the most recent information from all required sources.

What's next?

Some questions emerge for future work on the economic value of our national, provincial and territorial parks:

- (a) Do we want to limit ourselves to the GDP¹² impact of \$2.5 billion as a measure of value-added retained within the country from the expenditures made by park organizations and park visitors?
- (b) Do we want to expand our calculations, to include the induced effects, for a new adjusted total, in the range of \$3.1 to \$3.5 billion?
- (c) Do we want to expand our calculations even further, to include a more comprehensive, annual productive value of our natural capital, and follow Costanza's model?

If the answer is yes to all these questions, then what can we do? There is a need for additional future basic and applied economic research work to fully cover all types of economic impacts and benefits of Canada's national parks and protected areas as first proposed by the CPC framework; there is also a need to expand on the third type of benefits -societal- as they are yet virtually unexplored.

Keeping in mind that it is not sufficient or useful to just produce a bigger number, the main objective is to produce a more credible number, which aids in justifying investments in parks and protected areas in comparison with other societal ends.

¹² The Outspan Group used current 2000-dollar figures.

As the United Nations Committee of Experts on Environmental-economic Accounting (1995) acknowledges in its Operational Guidelines there is a need to promote the use of environmental-economic accounting and related statistics among international organizations and countries. Future research is needed in order to:

- Expand the work that has already been done, updating the results more frequently and producing the results for all regions of the country, and disseminating the results more widely;
- Undertake specific case studies or revive/update previous ones (e.g., *The Importance of Nature to Canadians*);
- Develop objectives to outline and assess if the economic models can play an important role in the valuation of protected areas;
- Make recommendations on the basis of the current figures derived from the latest impact analysis for future action, funding and support for similar studies/research;
- Partner with the Canadian Tourism Commission and Statistics Canada in developing a link between the tourism satellite account, the environmental accounts, and associated sets of park-related environmental performance indicators;
- Integrate conventional economic valuation methods and measures with the new concepts and measurements of ecosystem economic valuation.
- Conduct further research to address other non-economic values, such as personal or societal values of protected areas.
- Organizations such as the Parks Canada Agency and the Canadian Parks Council should consider allocating funds to update the economic model, to include total economic impacts (direct, indirect and induced), and to issue a new report on a five-year cycle. This would build upon the investment already made in the CPC 2005 Report, and would permit the development of a trend analysis in terms of economic benefits.

In the end, we may ask each other who benefits from parks, and the only answer is that we all do. That's why we need to renew our previous and successful leading edge work on economic impact models, to include the full array of benefits, in order to make the right decisions and to continue acting as world leaders.

Let's keep this global image not because it is fun to be the best, but because we owe the world to share our knowledge and expertise, and because we have the skills, the instruments, and the drive to do so!

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APPENDIX A

Table 1: CPC Framework of the Total Benefits of Protected Areas

BENEFIT CATEGORY:		
PERSONAL	COMMERCIAL	SOCIETAL
DEFINITION:		
PERSONAL	COMMERCIAL	SOCIETAL
Benefits accruing to stakeholders (users and non-users).	Economic impacts derived from the redistribution of commerce from one area to another.	Benefits with “public good” characteristics and tending to be societal in scope.
BENEFIT COMPONENTS:		
PERSONAL	COMMERCIAL	SOCIETAL
Use Values: - Direct Use - Indirect Use	Impacts from spending by stakeholders and by location management for development and operations, from sources outside the area of assessment (as measured by increases in GDP, labour income, employment and tax revenue)	Ecological Functions: - Primary production; - Sequestering carbon dioxide; - Soil formation; - Oxygen production; - Population moderation; - Nutrient transport; - Moderation of macro & micro-climate; - Decomposition; - Maintenance of genetic diversity; - Other.
Non-use Values: - Option Value - Existence Value - Bequest Value		Resource Integrity: - Maintenance of existing benefits; - Ameliorate effects of human changes.
		Health Effects – physical, mental, spiritual
		Worker Productivity
		Educational Benefits
		Scientific Benefits
		International responsibilities and agreements (NAWMP, CBD, RAMSAR, CITES, MAB, etc.)
		Business Location Decisions (quality of life/business), Community Cohesion

Adapted after The Outspan Group (Economic Framework Project, May 2000)

APPENDIX B

Glossary of Concepts, Definitions and Terms

Benefits (Use Benefits)

- **Commercial Benefits:** are those benefits to businesses which result from the additional commercial activity associated with spending within the area under study brought about by a park or protected area. This increased commercial activity, measured as the gross domestic product (GDP) at factor cost (or value added) retained within the economy being considered, comes about from spending, which occurs because of the park or protected area. To be considered an economic benefit, most often this value added is derived from spending, which comes from sources outside the study area. This spending from outside represents an injection of funds into the economy, which will have an economic impact which is therefore considered a commercial benefit attributable to the park. GDP value added is the measure of economic impact used within the framework to be added with other economic benefits (Canadian Parks Council).
- **Personal Benefits:** are comprised of use and non-use benefits received by individuals; that is, they are the benefits received by both those who use the park and by those who do not (necessarily) use the park but place value on its preservation (Canadian Parks Council).
- **Societal Benefits:** refer to those benefits a society gains collectively, and can be attributed to a park or a protected area. Generally, these benefits exhibit 'public good' characteristics, which mean that consumption or use of the benefit by one person does not materially affect consumption or use by others. Examples of these benefits produced by parks include ecosystem services such as carbon sequestration, oxygen production, soil formation, water filtration and other similar services (Canadian Parks Council).

Benefits (Non-use Benefits)

- **Bequest Benefits:** are those benefits that individuals receive from the satisfaction and knowledge that future generations will have a protected area for future use, enjoyment and benefit (Canadian Parks Council).
- **Existence Benefits:** are the benefits that individuals receive from the knowledge that a protected area remains in existence, even though they will likely never use it (Canadian Parks Council).
- **Indirect Use Benefits:** are those benefits that individuals receive from the off-site use and enjoyment of a protected area by some indirect means, such as watching television programs on a protected area (Canadian Parks Council).
- **Option Benefits:** are those benefits that individuals receive from the knowledge that they have the option to use a protected area in the future – somewhat similar to an insurance premium (Canadian Parks Council).

Climate Change: term frequently used in reference to global warming due to greenhouse gas emissions from human activities.

Conservation: is the protection, preservation, management, or restoration of wildlife and natural resources such as forests and water. Through the conservation of biodiversity the survival of many species and habitats, which are threatened due to human activities can be ensured (The Business and Biodiversity Resource Centre).

Ecological Footprint: An ecological footprint is the land (and water) area of the planet or particular area required for the support either of humankind's current lifestyle or the consumption pattern of a particular population. It is the inverse of the carrying capacity of a territory.

Ecological Economics: Ecological economics, as the authors interpret it, encompasses a concern for: (1) sustainability, or the maintenance of human well-being and the services rendered by natural systems over intergenerational time scales; (2) economic efficiency, or the satisfaction of human preferences as operationalized through cost-benefit analysis; and (3) distributional equity, or the just sharing of burdens and benefits between social groups. This approach exceeds the traditional scope of environmental economics, which focuses rigorously (and at times rigidly) on questions of efficient resource allocation (Costanza et al.).

Economic Impact Analysis: Economic impact analysis is an analytical tool used by economists to estimate the total and cumulative effects of an injection of funds into an area's economy. Inter-industry relationships and employment characteristics within the area will have a bearing on the impacts felt within the area (Canadian Parks Council).

Direct impacts are the changes in the economic activity during the first round of spending (e.g., what visitors spend and what parks spend, including wages).

Indirect impacts are the changes in sales, income or employment on the chain of supply upstream (e.g., food, various boutique items bought by visitors in the park).

Induced effects are a function of spending of household income (wages) generated by direct and indirect impacts (e.g., wages are spent by park employees on various goods in the national economy, generating other round of impacts in all sectors).

Ecosystem: A dynamic complex of plant, animal, and microorganism communities and their non-living environment interacting as a functional unit (World Foundation for Environment and Development)

- **Ecosystem Goods** include assets such as timber, oil, gas, and hydropower potential (Pembina Institute).
- **Ecosystem Services** are produced by interactions within the dynamic complex of plants, animals, microbes, and physical environmental features that make up an ecosystem. Examples include atmospheric, climate, and water regulation, water purification and waste treatment, genetic resources, disease and pest regulation, spiritual, aesthetic, and recreation and ecotourism values (Millennium Ecosystem Assessment).

Gross: The term gross is a common means of referring to values before deducting consumption of fixed capital (generally used as in "gross capital stock" or "gross domestic product"); all the major balancing items in the accounts from value added through to saving may be recorded gross or net (OECD)

- **Gross value added** is the value of output less the value of intermediate consumption; it is a measure of the contribution to GDP made by an individual producer, industry or sector; gross value added is the source from which the primary incomes of the SNA are generated and is therefore carried forward into the primary distribution of income account (OECD).

Gross Domestic Product (GDP): Gross domestic product is an aggregate measure of production equal to the sum of the gross values added of all resident institutional units engaged in production (plus any taxes, and minus any subsidies, on products not included in the value of their outputs). The sum of the final uses of goods and services (all uses except intermediate consumption) measured in purchasers' prices, less the value of imports of goods and services, or the sum of primary incomes distributed by resident producer units (OECD).

Gross National Income (GNI), previously known as Gross National Product (GNP): Gross national income is GDP less net taxes on production and imports, less compensation of employees and property income payable to the rest of the world plus the corresponding items receivable from the rest of the world, in other words, GDP less primary incomes payable to non-resident units plus primary incomes receivable from non-resident units (OECD).

Gross World Product (GWP): is the total gross national product of all the countries in the world (Wikipedia.org).

Input-Output Accounts provide detailed and balanced Industry and commodity accounts (Statistics Canada).

- **Input-Output (I/O) Tables** represent the most detailed accounting of the Canadian economy available and thus serve as benchmarks to the Canadian System of National Accounts. The Input-Output tables are the most comprehensive and detailed statistics on transactions involving production activity and intermediate as well as final consumption of goods and services in the economy (Statistics Canada).

IUCN – The World Conservation Union: Founded in 1948, The World Conservation Union brings together States, government agencies and a diverse range of non-governmental organizations in a unique world partnership: nearly 1000 members in all, spread across some 140 countries. As a Union, IUCN seeks to influence, encourage and assist societies throughout the world to conserve the integrity and diversity of nature and to ensure that any use of natural resources is equitable and ecologically sustainable.

National Parks: National Parks are a countrywide system of representative natural areas of Canadian significance. By law, national parks are protected for public understanding, appreciation and enjoyment, while being maintained in an unimpaired state for future generations. National Parks have existed in Canada for well over a century (Parks Canada).

Natural Capital: refers to natural resources, such as water and oil, the land which provides space on which to live and work, and the ecosystems that maintain clean water, air and a stable climate. Unlike produced capital such as buildings and machinery, a significant portion of natural capital such as oil and species is

irreplaceable. Natural capital is essential to sustaining all forms of life including human life (OECD).

Protected Area: As defined by the World Conservation Union (IUCN) is an area of land and/or sea especially dedicated to the protection and maintenance of biological diversity, and of natural and associated cultural resources, and managed through legal or other effective means.

The IUCN specifies six categories of protected areas, however, this paper includes just Category I and II.

I. Strict nature reserve/wilderness area: protected area managed mainly for science of wilderness protection

II. National park: protected area managed mainly for ecosystem protection and recreation

III. Natural monument: protected area managed mainly for conservation of specific natural features

IV. Habitat/Species Management Area: protected area managed mainly for conservation through management intervention

V. Protected Landscape/Seascape: protected area managed mainly for landscape/seascape protection and recreation.

VI. Managed Resource Protected Area: protected area managed mainly for the sustainable use of natural ecosystems.

System of National Accounts (SNA): consists of a coherent, consistent and integrated set of macroeconomic accounts, balance sheets and tables based on a set of internationally agreed concepts, definitions, classifications and accounting rules (OECD).

Tourism: Represents the activities of persons travelling to and staying in places outside their usual environment for not more than one consecutive year for leisure, business and other purposes (World Tourism Organization/United Nations Statistical Commission/Statistics Canada).

Tourism industries: Represent those industries, which would cease to exist or would continue to exist only at significantly reduced levels of activity in the absence of tourism. Examples of tourism industries include air transportation and accommodation (Statistics Canada).

Tourism commodities: Are those commodities for which a significant part of their total demand comes from visitors. Examples include travel agency services and rail transportation services (Statistics Canada).

Tourism demand: is defined as the spending of Canadian and non-resident visitors on domestically produced commodities. It is the sum of tourism domestic demand and tourism exports (Statistics Canada).

Tourism employment: is a measure of employment in tourism and non-tourism industries. Tourism employment measures the number of jobs in an industry generated by, or attributable to, tourism spending on the goods and/or services produced by that industry. It is based on an estimate of jobs rather than “hours of work”. Thus, someone

who works 10 hours a week counts for as much, by this measure, as someone who works 50 hours a week (Statistics Canada).

-Tourism employment measured as **Full-Time Equivalent (FTE)**: FTE is the equivalent of one year of work for one person (for example, three individuals working for a four-month period would equal one FTE, or five FTEs could represent five individuals holding full-time positions for one year).

Tourism Gross Domestic Product (TGDP) is the unduplicated value of production, within the boundaries of a region, of goods and services purchased by tourists. In the Canadian Tourism Satellite Account (CTSA), GDP is calculated at basic prices in both current and constant dollars. Only direct GDP is calculated in the CTSA. GDP is also generated indirectly in the upstream production chain of a good or service. Although these indirect effects can be linked to tourism, they are not included in the TGDP (Statistics Canada).

Tourism Satellite Account (TSA) is a statistical instrument, based on the accounting principles of the System National Accounts. This internationally recognized system is an integrated framework of statistics that allows for the measurement of a country's economic production. It outlines the structure of the economy and the contribution of each industry. The TSA allows researchers to directly compare the impacts of tourism with those of other industries and from country to country. Canada was the first country in the world to publish a TSA and a provincial/territorial TSA (Statistics Canada).

- **Canadian Tourism Satellite Account (CTSA)** is based on the accounting principles of the System of National Accounts. This internationally recognized system is an integrated framework of statistics that allows for the measurement of a country's economic production. It outlines the structure of the economy and the contribution of each industry (Statistics Canada).

Visitors: are persons who undertake the activity. They are referred to as either tourists (those who stay overnight or longer in the place visited), or same day visitors (Statistics Canada).

Wages and Salaries: equal the total remuneration, in cash or in kind, paid to employees in return for the work done. It is recorded on a gross basis, before any deduction for income taxes, pensions, unemployment insurance and other social insurance schemes. It also includes other forms of compensation, namely commissions, tips, bonuses, directors' fees and allowances such as those for holidays and sick leave, as well as military pay and allowances. It excludes employers' social contributions, which are treated as supplementary labour income (Statistics Canada).

