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Non-timber forest products: an economic opportunity for First Nations' people

Highlights

- Non-timber forest products (NTFPs) are potential sources of economic development for Aboriginal peoples in rural or remote communities in Canada.
- Country foods such as wildberries have nutritional, social, economic and cultural values for Gwich'in people.
- The economic opportunities that wildberries represent to the Gwich'in people can be measured by the potential supply and demand of berry preserves.
- Urban consumers of specialty goods are willing to pay a price premium for NTFPs produced by First Nation communities.
- Choice Experiment methods are a powerful way to predict consumer and producer behavior across different disciplines.

Non-timber forest products (NTFPs) and their markets represent alternative economic opportunities than those tied to commercial forestry. Enterprises involving NTFPs can be a significant source of income to forest-based communities, especially for households with lower incomes. However, a successful business enterprise involving NTFPs depends on the natural availability of the good (supply) and the economic possibilities the product might have in a specific market (demand).

To explore the market potential of NTFPs, a case study concerning wildberry jam production by First Nations' communities was conducted to evaluate market possibilities. Potential supply was evaluated using estimations of productivity and availability of fruit-bearing plants in the area where the Gwich'in First Nations' people reside. Potential demand was estimated by determining if urban consumers would be willing to pay a price premium for wildberry jams that possess specific attributes.

The Gwich'in First Nations' people reside in Alaska and part of the Northwest Territories of Canada (Figure 1).

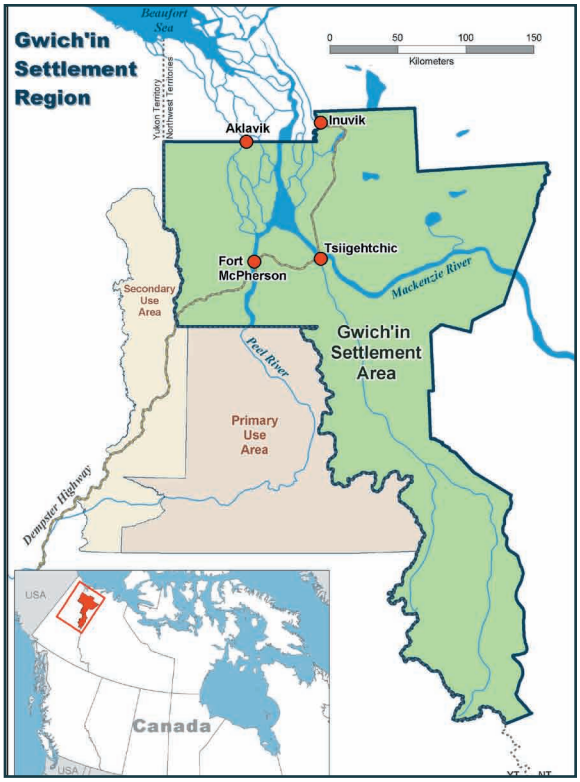

Figure 1: Map of Gwich'in Settlement Area (GSA). Map courtesy of Gwich'in Land-use Planning Board.

Their local economy is a mix of hunting, fishing, plant/fruit collecting and seasonal wage employment. Country foods such as berries have nutritional, social, economic and cultural values and are valuable to Gwich'in people because they are obtained though traditional subsistence community work and effort.

Gwich'in use of plant-based non-timber forest products

To understand the Gwich'in people's use of NTFPs, interviews and surveys were conducted in four communities in the Gwich'in Settlement Area (GSA): Aklavik, Inuvik, Tsiigethchic and McPherson. Wildberries were found to be the most important plant products collected by Gwich'in people. The most commonly collected species were cloudberry, blueberry and cranberry (Table 1). The collected amounts of each type of berry varied between communities; it is believed that this is mainly related to both the availability of each berry species in different areas and to people's preferences.

	Total Volume (litres)			Average (litres/person)		
Community	Cranberry	Blueberry	Cloudberry	Cranberry	Blueberry	Cloudberry
Aklavik	580	240	780	3.5	1.4	4.7
Inuvik	3000	1580	1420	6.5	3.4	3.1
Tsiigehtchic	230	270	230	1.8	2.2	1.8
McPherson	1280	1280	5110	1.8	1.8	7.2
Total	5090	3370	7540	13.7	8.8	16.8

Table 1. Quantities of the berry species most commonly collected by Gwich'in communities in 2000.

Values of wildberries for Gwich'in communities

Wildberries are strongly linked to Gwich'in culture and traditions. These fruits are usually stored to be consumed, fresh or processed, on special occasions and holidays. Berries are the most important food to be served in feasts and holiday celebrations, and the most cherished gift given between community members. Also, berries and other plant products are used as ingredients for traditional remedies and medicines. These uses reflect the important value Gwich'in people give to this NTFP.

Economic, social and environmental values are linked to the way berries are collected and distributed among these First Nation communities. First, an informal property right system regarding berry patches seems to exist. Many of the areas where berries are collected are located around individual or family fish camps; thus, certain patches are always picked by specific families every year. If someone who is not a member of the fish camp wishes to collect berries from that area, permission needs to be asked and given. Second, Gwich'in do not collect all the berries from their patches. They consider it "polite" to ensure that enough berries are left in the patches for other pickers and for animals that feed on these fruits. They collect enough for their families; and if there are some leftovers, these are shared with members of the community who have not met their consumption needs.

Potential supply of wildberries

Wildberry production in the GSA area was estimated using information about productivity and spatial cover of different vegetation types across the landscape. Estimates of actual wildberry production in the GSA accessible area, including the low production years, ranged from 44 to 55 million kg per year. Gwich'in communities consume approximately 12 thousand kilograms of berries in one year, less than 1% of the total production in the GSA.

Given the estimated current production of cranberries, blueberries, and cloudberries of the Gwich'in settlement area, the wildberry supply appears to be sufficient to meet the traditional consumption and the potential demand of an enterprise of wildberry preserves.

Potential demand for wildberry preserves

The potential demand for cloudberry and bog cranberry (lingonberry) jams produced by First Nations' communities was estimated using Choice Experiment (CE) methods. The applied CE method required people participating in a survey to make hypothetical choices among products or alternatives defined by their attributes. The attributes chosen for this case study were: price; type of fruit; origin of the fruit used to prepare the jam; and type of organization producing the jam. Using the information obtained from the surveys, researchers estimated the relative importance of each attribute in determining the respondent's choices. An example of the CE survey is shown in Table 2.

	Product 1	Product 2	The jam you usually buy, at the price you usually pay
Type of berry	Cloudberry	Lingonberry	
Where berries were grown	Northern Canada	Sweden	
Who makes the jam	Unknown	First Nation Community	
Price	$4.50	$3.00	↓
Number of jars you would purchase of each product (total of 5)	____ jars	____ jars	____ jars

Table 2. A sample choice set from the choice experiment used to examine jam preferences among a sample of Edmonton food shoppers.

The survey targeted consumers from Edmonton who usually shop at specialty grocery stores. The design of the choice experiment required respondents to consider their next five purchases of jam. The researchers provided respondents three alternatives for their purchases: the jam they currently buy and two hypothetical products described by levels of four specific attributes (Table 3).

	Attributes			
	Price	Type of fruit	Geographical origin of the fruit	Type of organization preparing the jam
Levels	$3.00	Blueberry	Northern Canada	Commercial organization
	$3.50			
	$4.50	Cloudberry	Scandinavia	First Nation community
	$5.50			
	$6.50	Lingonberry	Unknown	Unknown
	$7.00			

Table 3. Attributes used in the Choice Experiments of jam preferences.

The choice experiment was designed to detect jam attributes that were important to consumers and could affect their purchasing decision, and to identify the group of consumers who seek wildberry jams produced by First Nations' communities.

About 78% were currently consumers of berry jams, suggesting that berry jams are a popular product in this specific market segment. Cloudberries and lingonberries were not very well known by the people surveyed. Researchers provided respondents with samples of commercially-available cloudberry and lingonberry jams, imported from Scandinavia, to allow people participating in the choice experiment to

appreciate the taste of a jam product made with the wildberries. Over 75% of the people surveyed reported they liked the cloudberry jam, and 65% said they liked the lingonberry jam.

Preferences towards cloudberry jam were found to be particularly strong among high-income respondents. Respondents with children in their household showed high interest in trying new jam products; they too preferred cloudberry jam over lingonberry jam. It was also found that high-income households preferred jams with labels that specified the producer organization and the geographical origin of the fruit; preferences were stronger towards products originating from Northern Canada or First Nation areas.

Market shares

To evaluate market potential, researchers specified a hypothetical scenario where respondents had four choices of jam products. The choices were: traditionally purchased jam; generic blueberry brand; Swedish cloudberry brand; and Swedish lingonberry brand. Currently-consumed jam had the highest probability of being purchased (82%). The generic blueberry brand had a 5% probability of being purchased, while foreign cloudberry and lingonberry products had probabilities of 7% and 6% respectively. High-income consumers were relatively more likely to purchase the same jam they usually purchase, while respondents with children were more likely to try the cloudberry and lingonberry flavors.

When First Nation's wildberry jams were included as a choice in the hypothetical market, the probabilities of purchasing all other types of jam decreased—especially for the traditionally consumed brand (which dropped to approximately 65%). Purchase probabilities of First Nation's wildberry jam were found to be between 17% and 27%, depending on the consumer characteristics (Figure 2). Cloudberry jam was preferred over lingonberry jam for all types of consumers.

Choice experiment method

People consume products because doing so increases their *happiness*. In economic theory this concept of happiness is called *utility*. Each product has different components—called attributes—that affect utility in different ways. For example, if a person decides to buy an automobile, a number of attributes will affect the buyer's choice including price, size, color or safety. Some attributes are more important than others for different consumers, and therefore play a crucial role in the purchasing decision. If the constraint is budget, the main attributes influencing the purchase decision might be price and gas consumption of the vehicle. If the buyer has children, size and safety attributes might be more important.

Choice experiments (CE) are designed to measure the importance of the attributes characterizing a specific product, service or activity. This information is then used to predict people's economic behavior. CE methods have been used to assess different topics and their respective policy implications such as: people's willingness to pay to access environmental services such as fishing or camping sites; how different policies influence farmers' decisions to switch to organic farming to reduce water pollution; and how people value the ecological, social and economic benefits that wetlands provide to the public.

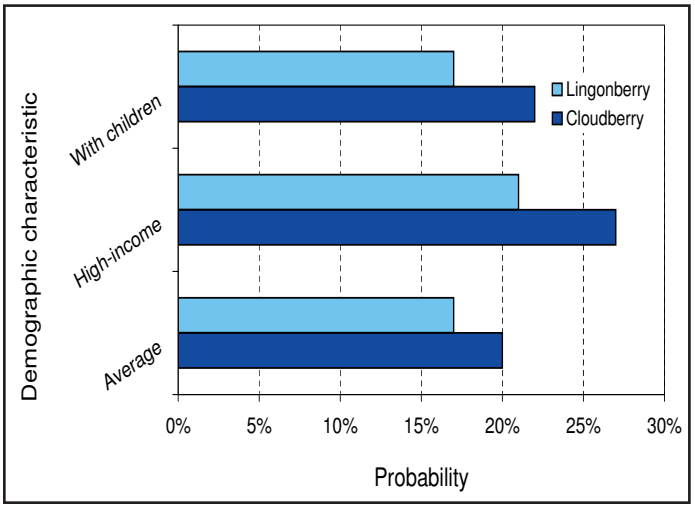

Figure 2. Probability of purchase of First Nation wildberry jam based on demographic characteristics.

Price premiums

The level of success of a new product depends on the consumer acceptance of its attributes and on the market price. Price needs to be competitive to stimulate the product's consumption, but it also needs to be high enough to give the producer reasonable revenue. Since the associated probabilities of purchasing First Nations' wildberry jam were found to be higher than their Swedish counterpart, evidence exists for a market price premium.

Price premiums for First Nation wildberry jams were calculated by equating their market shares to the Swedish cloudberry and lingonberry jams. For example, if a producer aimed to have 7% market share of average consumers for Gwich'in made cloudberry jam, 250 ml of the product should be priced at $7.90/jar, which represents a $4.20 premium compared with the price of Swedish cloudberry jam ($3.70/jar). Price premiums for average consumers and consumers with children were around $4.15, and for high-income consumers were approximately $5.50 for both types of berries. These price premiums might seem too high for realistic market potential, but the target market was a specialty market where quantities are limited and hence the products may command higher prices.

A small but significant percentage of consumers at urban specialty stores are willing to purchase wildberry jam, and pay a price premium if it is produced by First Nations' communities. Because consumers usually prefer familiar products, there is a high probability that Gwich'in origin wildberry jam could become a regularly-purchased item by consumers who have tried it before.

Management Implications

- Viable economic opportunities may exist in the business of producing and supplying cloudberry and lingonberry jams of First Nations' origin to specialty stores.
- The potential supply of wildberries in the area must be assessed to determine if it is sufficient to meet market demand without affecting the stock used for Gwich'in local consumption.
- The property rights system associated with the collection of wildberries is a key component of the supply structure of wildberry jams, because increasing the demand for berries implies need for larger areas for berry picking.
- Evidence exists for a significant price premium for non-timber forest products collected and produced by Gwich'in people. Consumers are willing to pay more for a product manufactured by First Nations' communities.
- Choice Experiments can be used to quantify the value of attributes of a given product and derive valuable information about price premiums. This approach is a powerful tool that can be used in policy making.

Summary

Wildberries are a special type of non-timber forest products that have social, cultural and economic importance for the Gwich'in communities. Wildberry production in the GSA area seems to be higher than the amount needed to meet local consumption. In addition, there seems to be a specific market for wildberry jam produced by First Nations' communities, where specialty grocery consumers are willing to pay a price premium to consume the product.

Even though these basic measures of supply and demand suggest an economic opportunity for Gwich'in communities, other aspects of the jam enterprise would require investigation, such as: the business structure of the fruit collection; the sustainable harvest levels of wildberries; estimates of fruit supply (after local communities and wildlife consumption); and the impacts on the traditional use and importance of berries to the Gwich'in people.

Further reading

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