Transition to a Forest Bio-economy: A Community Development Strategy Discussion

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Abstract

Many jurisdictions question existing practices in making effective use of forest resources. Even in Europe, considered one of the more advanced in value-added production, Engelbrecht (2006) identified that European companies by and large produce low-cost value-added products and that innovation could help them to make more of their environmental advantages. Schaan and Anderson (2002) categorized the forest sector system opportunities into innovations around forest management, harvesting, primary manufacturing, services, and manufacturing suppliers. They found, as did Wagner and Hansen (2005), that firms in forest harvesting and primary manufacturing tend to concentrate on process innovation rather than the development of new products. As a result, forestry industry cutbacks in employment are hardly surprising. Clearly, future job growth will need to come from elsewhere in the forest, including opportunities in value-added wood products, non-timber forest products, and biomass and biofuel products. The forest is still considered as holding a wealth of resources and opportunities, some of them untapped. Ontario, Canada, and perhaps other similar jurisdictions have a number of communities reliant on the forest economy, most of which suffered severe cutbacks in jobs, sometimes in allocation of Crown timber as a result of government's role in preserving land and encouraging alternative use, and in mill rationalisation or centralisation of operations. These communities are beginning to feel the need to diversify and encourage innovation. Although not a panacea to their problems, the bio-economy provides some opportunities worth investigating, including a more thorough use of forest products. This article adopts an economic development approach and explores the challenges in getting involved in the bio-economy. It offers a list of opportunities, and a framework to analyze challenges.

1.0 Introduction

Technologies and global outsourcing reduce the demand for labour in Western economies. Communities have been suffering this trend for years, bleeding a little at a time. They are not diversified, so each cutback is a serious blow. The future prospects are poor, given that developing and underdeveloped economies are entering the global market and are able to offer fibre products that can be grown more quickly and cheaply. Rural and forest economies in Canada experience, as a result, a number of difficulties stemming from changes in the global economy.

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Several rural communities, Northern Ontario being an example, can no longer rely on their single commodity-style industries in paper, pulp, and, to some extent, lumber.

The problem is emphasized when the companies are large because, according to Wagner and Hansen (2005), they tend to utilise their capital for process innovation rather than product or business innovations. Unless commodity-type producers are able to offer a clear comparative advantage in producing or are willing to shift toward a differentiation strategy based on product innovation and away from commodity markets, it will continue to be an industry in slow decline as it must continually find cheaper production mechanisms. Regions such as Northern Ontario or developed countries such as Canada are ill equipped, with their high labour and transportation costs and slow forest growth, to compete against developing countries.

The demand for the types of wood products needed is also changing. Ontario is still focused on products whose price and demand are bound to fluctuate. Fifty percent of its forestry production is based on commodity products and the remaining 50% is considered value-added products (Woodbridge Associates, 2003). Half of the 50% that is value-added is operating in a commodity-type environment. This means that 75% of Ontario's forest products is competing based on price. This is a difficult position for communities as they become reliant on their plants outperforming others from around the world. While other products could be produced in fields where there could be a comparative advantage, current manufacturing operations would have to be retrofitted, views on how to use fibre resources revamped, market strategies refocused, and labour retrained in order to develop a new foothold.

This article will focus on the transition required in economic development thinking and proposes a unique opportunity to increase the use of the forest to encourage a bio-economy. Bio products were described by Sparling and Laughland (2006) as those stemming from biomass. Biomass is biological renewable material that can come from agriculture, food, forestry, marine, and industrial or municipal sources. In this article, the discussion on bio-economy will include bio-products and nontimber forest products (NTFP), such as forest-produced fuels (including ethanol), hemp, plant fibres for construction products, forest foods (blueberries, mushrooms, tea leaves, and the like), nutraceuticals, pharmaceuticals, cosmetics, and more. The bio-economy will not destroy traditional forestry but rather will help it out of its current conundrum (Belcher, Ruiz-Pérez, and Achdiawan, 2005; Duchesne and Wetzel, 2003). However, the transition will necessitate some changes in policies, governance, and planning for communities and regions in a local model of strategy development (Barnes and Hayter, 2005). The efforts of some Northern Ontario communities will be utilised as examples of this change process.

2.0 Strategy Framework

Community strategic planning is adopted by those who wish to develop a common vision toward future economic and social development. It is an effort to remove weaknesses and leverage strengths (Spence, 1994). Change has become the essence of management, and to survive and prosper in the future, organizations and communities need to perfect their 'outside-in' thinking skills, relating information

about development in the external world to what is going on internally (Ashley and Morrison, 1997; Roth and Washburn, 1999). Every wave of discontinuous technological change in history has had a disruptive effect and old industries have died while new ones were formed (Senge and Carstedt, 2001). Regardless of what is happening around the world, there is always a local flavour to consider (Innis, 1956). Barnes and Hayter's (2005) local models approach is described as one that 'allow[s] for the possibility of a greater sensitivity to local peculiarities' (p. 455).

Change can happen in a planned way or it can be a crisis management effort. Strategy is a plan for winning in the long run, not simply a plan to win a short-term challenge in the form of job replacement for a recent downsizing. Encouraging a new industry will take substantial time and effort and those recently laid-off employees are most likely going to move elsewhere for jobs while the new industry is being prepared. This is not a positive outlook for communities but it should be viewed as a short-term challenge. Many communities in the developed world have struggled with high unemployment, declining housing prices, and a depressed economy (e.g., Spokane, WA, USA and Sunderland, England). These communities turned conditions around by looking at new ways of doing business. In these two examples, the turnaround came by encouraging a knowledge-based economy, but their situations were similar to those experienced by forest-based economies. Years later, people had returned, new skills and knowledge had populated these communities, and a return to prosperity had ensued.

McGuire, Rubin, Agranoff, and Richards (1994) researched 24 small, nonmetropolitan communities and concluded that communities that implemented a strategic planning process possessed higher levels of development capacity than those that did not. Within a bio-economy plan, communities need better inventories and a plan to cluster with like-minded communities to develop some economies of scale. Therefore, conventional strategic planning processes at the community level need to change and become collaborative with their region and/or complementary networks in other regions.

An external environmental analysis includes a review of past and current events that could potentially affect the community. It is important to scan the macro-environment for social, technological, economic, environmental, and political development but this may only be feasible once the community understands its capabilities and is focused on a vision. Among the issues that are usually reviewed are government policies, the current economic structure, technology, social and cultural dimensions, and comparative analyses (Ashley and Morrison, 1997). However, critical internal assessment should also include a skills inventory (skills and knowledge), resources inventories (NTFP and biomass), and community capabilities (equipment, buildings, land, and marketing and transportation networks). Outside expertise may be required to think outside the box, including using government staff from other regions, researchers, and specialized consultants to help the community or region hone in on valuable inventories.

The internal environment is often thought to be best described by the citizens living in the community. This may not be true, as 'existing knowledge can prevent a person from creatively defining where the solution to a problem might lie' (Knoblick and Oellinger, 2006, p. 41). Residents' existing knowledge may be so focused and specialized that they neglect important infrastructures or inventories that could spur the development of a new industry. More innovative thinking is often shelved or identified as 'we tried it in the past and failed.' Sometimes, good

ideas are stifled because they came too early: An investor could not be found when the project was undertaken, for example, or the cost of entry into the industry was high because the industry was still in its infancy. As a result, of any number of project setbacks, the idea was classified as infeasible and continues to be defeated even if the internal and external environment has changed and could make the project a viable one. Communities need to recognize that timing is important but also that old ideas may be worth revisiting. The town of Hearst in Ontario realized this fact when it started to pay attention to the several piles of waste wood left behind by mills over the previous 100 years. Innovative community leaders thought this waste wood could give them an edge in attracting a bio-fuel project. An ethanol producer subsequently was found to help the community develop a project.

Within this strategy development framework, the forest bio-economy analysis must consider the elements in Figure 1. Each project, resulting from an assessment of opportunities, will require its own network, probably external and internal to the community, and a number of projects may be linked to one another, or utilise a similar network.

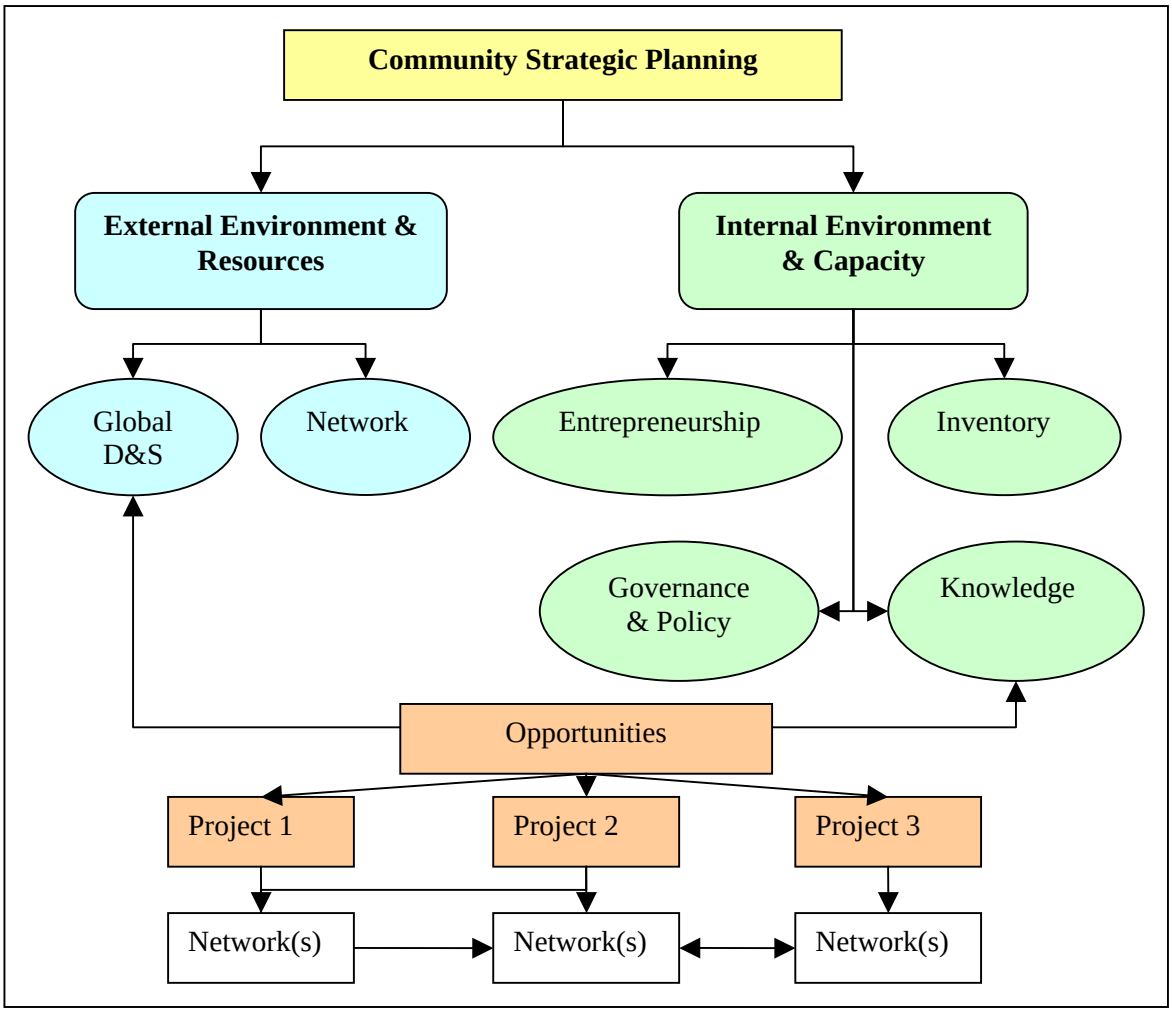

Figure 1. Proposed bio-economy strategy evaluation framework.

3.0 The Global Demand and Competition Challenge

A number of communities, especially rural or single-industry towns, need to look toward new fields for their own sustainability but face numerous challenges; among those are global trends influencing production costs and revenue potential for any value-added forest-based products, NTFP, or other bio-product opportunity. Opponents of bio-economy industries cite the often lower wages in a number of value-added productions, NTFP, and generally the bio-economy environment when compared to typical lumber or pulp rates in Western economies. A number of quality-of-life indicators are sometimes cited by bio-economy defenders that are thought to compensate for this shortfall in wages, and it should be noted that measurement of success will be different based on each community, households and individuals within them (Marshall, Rushton, & Schreckenberg, 2006). A compelling argument in favour of diversifying one's economy to include the forest bio-economy is that when fewer high-paying jobs are available in wood-producing industries, communities need to find other methods to retain

employment. Although wages may start at lower levels, good planning and knowledge development can increase efficiency, competitiveness, and growth in wages over the long run.

In their analysis of success factors of NTFP commercialisation, Marshall, Newton, and Schreckenberg (2003) demonstrate that it is difficult to generalise about the benefits of NTFP. However, some areas have experienced strong job creation and earnings. These places include (1) Quebec, Nova Scotia, and New Brunswick, where value-added producers and farmers in the blueberry industry can earn substantial profits; (2) Bolivia and Mexico, where producers of other types of NTFP products, such as incense, rubber, and palm, enjoy substantial international demand and where producers own, manage, and plant the land (Marshall, 2006), thereby yielding substantial economic benefits; and (3) where producers in pharmaceutical and nutraceutical industries reap the gains of high prices and/or demand on international markets as identified by Wetzel, Duchesne, and Laporte (2006). Examples of successes in these industries include Russia whose nutritional supplement industry is valued well above $1 Billion and has now outstripped pharmaceuticals (Temkin, 2006). More specific examples in pharmaceuticals include those using Canada Yew for curing cancer, or in nutraceuticals using natural herbal remedies to prevent diseases such as those offered by an Edmonton company, CV Technologies, 'who has found commercial success with Cold FX, a product that's been proven through clinical trials to prevent and lessen the severity of cold symptoms' (McConnell, 2005).

There are three clear streams for using the forest, identified by DeYoe (2006) in Figure 2, and at least two other authors have described similar models (Beckley, 2004; Schaan and Anderson, 2002). Streams 1a and 1b are where most communities in Northern Ontario operate. Value-added production (stream 1c), has limited capacity in Ontario and is located in the south of the province primarily to be closer to markets and to take advantage of lower labour costs (often due to the employment of migrant workers). Streams 2 and 3 have barely hit the radar screen as potential opportunities for communities, but they offer some hope. Although some sceptics believe that stream 3 activities, focused on NTFP and nutraceuticals, are low revenue-generation activities (usually referred to as subsistence-level activities), a Canadian study from Tebbens (2005) reported that 64% of all firms in these industries employ more than 10 people, half of the firms export their products, and one third had more than $1 million in export revenues in 2002. It is an industry still in its infancy and Canada has done very little to date compared to the potential available (Mohammed, 1999).

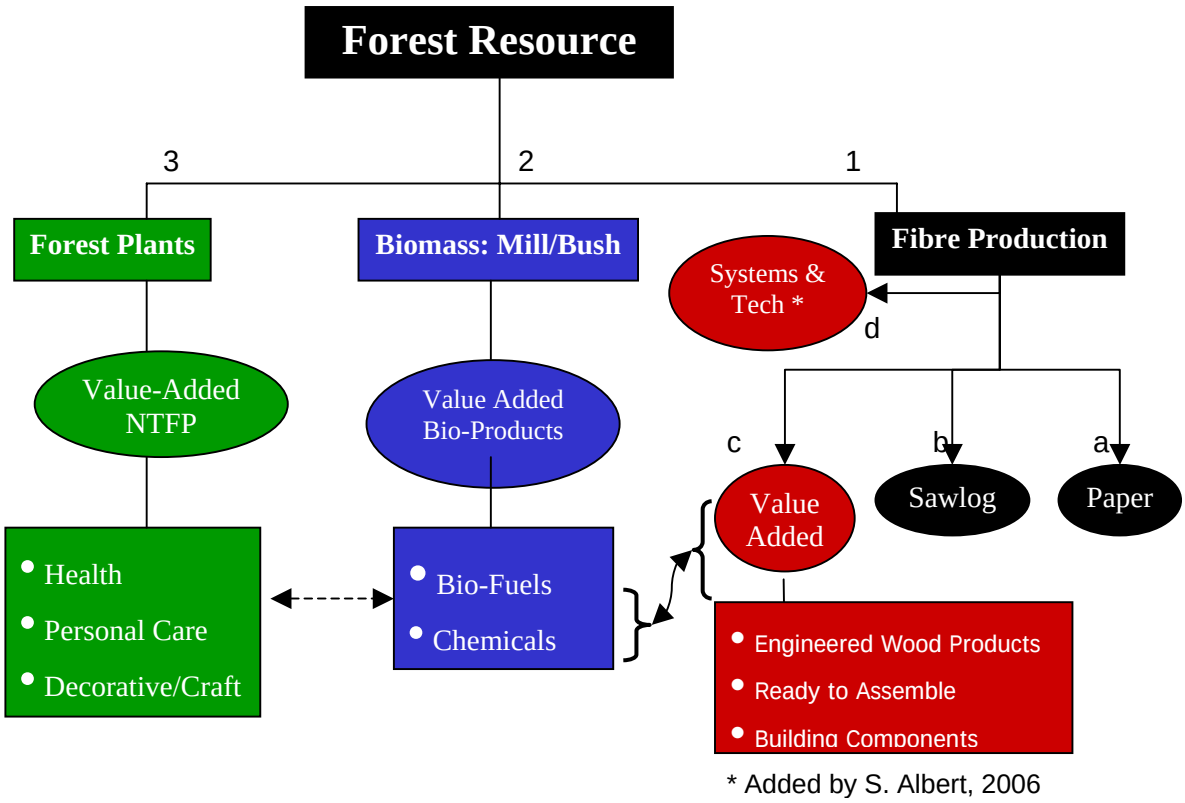

Figure 2. Forest production capabilities (DeYoe, 2006, amended by S. Albert).

The knowledge economy in Canada promises new opportunities created either by selling local knowledge through telecommunication infrastructures or by providing support systems and technologies (see Figure 2, item d) as a niche market to forestry companies and other countries. Canada enters these knowledge industries late, however. Other countries broke into these markets long ago. Europe, for example, has worked the innovation challenge for decades and has already developed a comparative advantage in producing high-tech goods and a host of value-added products in manufacturing supplies (e.g., equipment, robotics, and software). This means that Canadian firms need to out-innovate or out-produce to be competitive in these areas.

Forests can be quite diverse and offer a wide variety of opportunities previously never considered. NTFP, as an example, could provide an environmentally sustainable basis for livelihoods when developed as a traded or commercialised good (Belcher et al., 2005). Forty-four percent of studied cases in NTFP production had higher-than-average income when compared to national income. As local economies become more entrenched in the bio-economy, the life standards can become quite high, as demonstrated by a number of communities in Sweden, Quebec, and Nova Scotia that have encouraged the development of NTFP or value-added products. It should be noted that Belcher et al. (2005) also found that NTFP-specialized strategies need to consider integrated systems including wild harvesting and cultivation. The mix encourages stability in productive systems and minimizes the impact on the resource base.

Under stream 2, communities could explore alternate uses for biomass including using treetops and other waste for bio-energy. The Ontario Ministry of Natural Resources (MNR) has investigated technologies and the feasibility of several bio-fuel initiatives. A recent report on the future of alternative fuels by Allen (2006) demonstrated an industry entering a growth phase. There are now enough cars retrofitted to use alternative fuels and distribution sources to encourage more extensive supply sources. Communities such as Hearst and Atikokan are taking action in bio-energy research and investment. Hearst is looking toward using existing wood waste for the production of ethanol and looking at plantations for a sustainable supply of biomass in the future. The energy crisis has stepped up interest for bio-fuels but the relative economic value of biomass is still a point of contention among some economists, environmentalists, and value-added and other bio-product producers. They question, among other things, whether biomass resources are used most efficiently when burned, whether a new, successful financial structure can be developed to encourage bio-medical products, and whether feasible methods to create a sustainable source of biomass can be established. A number of bio-products face a number of economic constraints that may be difficult to solve and long-term in nature.

Bio-products are not necessarily all fuel sources. They can be products used by pharmaceutical companies or by-products of production processes that can be sold as a niche good. An example is Tembec Inc., a company that has led the way in Northern Ontario and Quebec in R and D on bio-products. The bio-technology industry has a unique structure, and commercial success is difficult, since the timeline for R and D can be lengthy, particularly for pharmaceutical applications (Pisano, 2006). There are some demonstrations of early success with Canada Yew, a plant used to fight cancer; the creation of plantations of it is being considered. There are also thousands of other plants in Ontario's forests with potential pharmaceutical or nutraceutical applications. The Northern Ontario Medical School Bio-prospecting initiative, a part of a wider strategy to create a sustainable health research industry in Northern Ontario, is looking for pharmaceutical compounds—economically valuable biological molecules, organisms, or genetic material from nature (NORMED, 2005). The challenge is to match a use with domestic or world demand and find entrepreneurs to develop appropriate products. Mohammed (1999) was an early pioneer and identified hundreds of plants, bio-products, and food products stemming from Ontario forests as potential prospects. Among others, Beckley (2004) and Duchesne and Wetzel (2003) utilised NTFP and bio-products opportunities to launch a discussion around a more holistic approach to utilising the forest and a new vision for communities. The level of thinking to date has been around resource extraction, production, and to some extent, forestry services. The new vision includes values in research, NTFPs, tourism, nutraceuticals, education, and other bio-products.

4.0 The Network/Supply-Chain Challenge

In this day and age of global competition, it is difficult to sustain small or scattered operators. Networks have come to play an important role in encouraging economies of scale and sustainability (Albert, Flournoy, and Lebrasseur, 2007; Albert, Robinson, Duchesne, and DeYoe, 2006). The Quebec blueberry producers have created such a network, developing a more competitive value-chain for producers and presenting a stronger front in international dealings (SPBQ, 2007).

A supply chain is a network of interrelated organizations, resources, and processes that create and deliver products and services to end customers (Russell and Taylor, 2000). It includes all the facilities, functions, and activities involved in producing and delivering a product or service. Communities must be concerned with managing the supply chain because it will affect the survival of several firms and jobs within their region. Communities can help to solidify a supply chain by identifying the number and suitability of trucks and trains entering and leaving the community to help negotiate a comparative advantage for bio-products produced locally or regionally. It can collaborate to derive enough products regionally to attract a retail or wholesale chain to purchase its products. It can encourage value-added industries to pick up surplus products to minimize waste, as in the case of Dubreuilville (Ontario, Canada), which is planning to use wood waste to create new wood-plastic composites (Ross, 2002). Supply chain management attempts to control the cost of production up the chain and the generation of revenues down the chain to arrive at long-term sustainability and improve profits. Unless we can re-create the town and region-wide economic models of Italy (where each town produces one product in global market quantities), this synergy can only be achieved by collaboration among communities.

Most of the opportunities in NTFP and bio-products require scale or an evolved supply chain (Hobbs, 2002) to minimize cost and maximize image on a global level. One blueberry producer will have difficulty making ends meet, but several producers collaborating can create a regional industry and value-added opportunities. Communities who want to develop opportunities in the bio-economy need different partners and knowledge sources, and they need to create clusters with other communities to decrease the cost of this new knowledge. Bio-industries will not be successful as single project sites; they need critical mass. European communities have understood critical mass for some time as villages organized themselves around producing very specific products for world consumption.

As shown by Davidson-Hunt, Duchesne, and Zasada (2006), not all industries yield high value and therefore long-term economic sustainability becomes an issue. Sustainability can happen through a wider collection of products, or through portfolio diversification. Belcher et al. (2005) showed that diversity in the collection of species spreads risks and allows for economies of scale. The town of Chapleau, whose experience is described later in this article, is evaluating this potential by spreading human resource requirements over several wild crops to create a longer working season as well as improve the financial payback for entrepreneurs.

5.0 The Knowledge Challenge

The accumulated knowledge in communities in Northern Ontario tends to be specialized in mining and forestry, and there is very little know-how in other industries. The degree of specialization in Northern Ontario, and arguably in other jurisdictions, has eroded knowledge on diversification opportunities, even concentric or portfolio-related diversification. Communities in general and their forestry investors are focussed on the current models of business - they tend to explore opportunities related to what they know best, rather than think outside the box. Freudenburg (1992) discussed this problem and referred to it as ‘the addictive nature of extractive industries.’ He pointed out that:

> Raw material extraction once offered an effective route to economic development, but societal relationships with environment and technology have changed so fundamentally that extractive industries today appear more likely to lead rural regions to economic addiction. Key characteristics of addictive activities include rising costs of operation at most extractive facilities, combined with downward trends in world commodity prices. Key characteristics of vulnerable communities and regions include increasing geographic isolation, imbalances of scale and power with respect to extractive industries, and the absence of realistic alternatives for diversified development. Key pressures toward addiction are created by ambiguities that mask the addictive tendencies, including ambiguities of price signals, of employment and development possibilities for remote regions, and of resource exhaustion. The net result is that, while the encouragement to develop extractive industries is often coupled with advice to avoid developing an excessive dependency on a single economic sector, the very regions and nations having the greatest need to hear such advice may also have the lowest realistic ability to respond to it. (p. 305)

This problem is often exacerbated by the canned approach one finds in many community strategic plans. When communities engage outside help, the consultants they employ in strategic planning exercises are often generalists so they adopt similar strategies from community to community. They rely on the expertise within communities rather than engaging external thinking sources. It is easier and more acceptable to local stakeholders to dream about attracting a new plant that uses the same resources and pays similar wages than to think about new industries and learn how to develop them for a true diversification effort.

Innovation will often stem from more critical thinking processes (DeBono, 1988). Surveys and wide community participation are often recommended to ensure that the strategic planning process yields the appropriate information and also the highest community commitment. SWOT exercises (strengths, weaknesses, opportunities, and threat), focus groups (usually around investment attraction, tourism, community development, and the like), and meetings with key community stakeholders for opinions on areas of future opportunity, tend to yield limited new insights. They may encourage positive turbulence depending on the experience of the stakeholder, but these exercises need to be expanded to include specialists in many other areas of economic development to yield ‘outside-in’ thinking. Communities can trigger innovative thinking through ‘strategic innovation’ (Turock, 2001), or through ‘positive turbulence (Gryskiewicz, 1999). According to Turock, market research methods say nothing about what customers may want if dramatic new value becomes available. It cannot provide a good understanding of emerging markets. Biologists and other scientists researching bio-energy, bio-products, or bio-chemical industries should be sought to expand the knowledge of communities and help identify potential new opportunities.

Perhaps adding to the knowledge problem is that regional universities can be specialized or focused in research closest to the current local economy, and linkages between university research and communities tend to be scarce. Most universities are involved with private-sector companies (often larger ones) but these are seldom the vehicle for propagating substantial change at a regional level. The challenge is to find the researchers involved in ground-breaking work or that have detailed knowledge of new opportunities such as those in bio-products, value-

added, and NTFP and match them with communities that are trying to advance these concepts with entrepreneurs. Once projects are found, the next level is to develop a sound network or regional approach to create economies of scale, share knowledge, and ensure long-term sustainability in the face of international competition.

6.0 Inventory Challenge

Communities must think in terms of their capacity (Russell and Taylor, 2000) to attract industries and resources, or sustain a new product or service. Companies look for political and economic stability in choosing a location but also need infrastructure and human resources. Although a community may have the physical resources to attract a company, it may have other problems that hamper its attraction efforts. An inventory of product resources, of capacity, such as in the availability of knowledge workers, as well as physical resources, such as space (buildings), transportation, telecommunication, health and education services, and the cost of all resources, may be required to ensure that a community has an adequate capacity to attract development or projects. The resource-based view in strategy development advocates that a company or a community examine its hard assets (infrastructure, buildings, products), its soft assets (image, patents, quality of life), and its organizational capabilities (human resources, strategic advantages in specific activities on the value chain) to develop a strategic vision. Companies often have difficulty performing these kinds of exercises, and they have a limited number of products, employees, and resources to take into account. By comparison, a community or region is much more complex and probably ill equipped to answer these kinds of questions. There are just too many resources to inventory, too many variables, and too many options so it becomes very onerous and expensive to draw adequate inventories while deriving the potential opportunity that may stem from each. If communities are not equipped to perform these kinds of assessments, it becomes difficult to draft the appropriate strategy that will allow them to transition toward a different kind of economy.

Poyry (2001) offered a list of quantitative and qualitative factors to assess or benchmark capacity against competitors. Demonstrated in Figure 3, these qualifiers for industries are also useful in an assessment of a larger NTFP or bio-industry. Capacity is more than physical and human resources. It also deals with processes and organizational structures. In a bio-products environment, other qualifiers are needed and were added to the equation, including the quality of transportation, local distributor support, intercommunity collaboration, and the strength of supporting institutions. Transportation has already been discussed and is deemed a critical success factor in transporting food-related products. Its importance may be lightened in other bio-industry products, depending on size, weight, and the location of processing. Local distributor support may be important to some food products, and less important if the product is sold internationally. Intercommunity collaboration was discussed in the value-chain challenge, with an argument that scale activities will not happen for some bio-products unless several producers form networks or alliances (this was true of the blueberry industry in Quebec). The strength of supporting institutions includes trainers, bankers, consultants, and the like. A new industry requires help and understanding, and research resources.

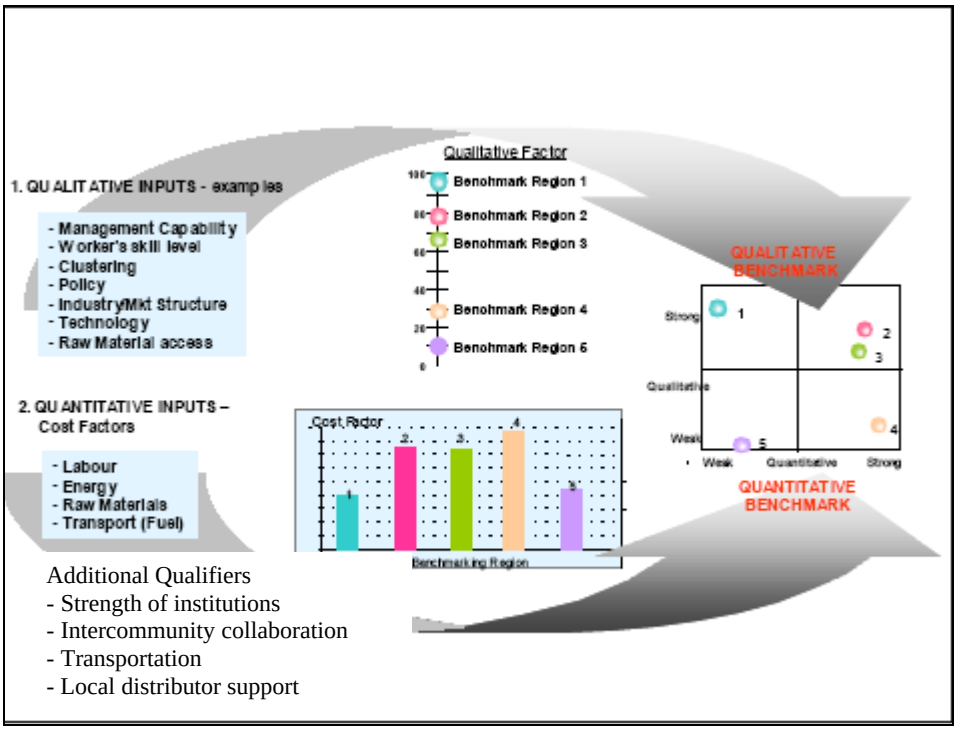

Figure 3. Attractiveness assessment (Poyry, 2001, amended by S. Albert).

Managing the inventory is important, a role not yet undertaken by most communities and needed to attract the right kind of development. Identifying the inventory in bio-products is a long and extensive process. Mohammed's (1999) product list in NTFP opportunities is a useful start for communities and includes these categories: (1) food products, (2) materials and manufacturing products, (3) health and personal care products, (4) decorative and aesthetic products, (5) environmental products, and (6) landscape and garden products. The costs and benefits associated with most of these opportunities have yet to be developed for Ontario. There can be poor understanding of inventories or capabilities and no real commitment to identify what we have, and what it can be used for. This does not mean that there is no will, but the costs are high and there are other pressing concerns. There lies an opportunity for sharing information and resources from a regional perspective and allow more players to collaborate in building a stronger network in each field of activity.

Large unused inventories may lead a community to develop a 'capacity-lead strategy.' For example, some communities that suffered severe unemployment and an oversupply of homes utilized this resource to attract seniors, such as in the case of Elliot Lake, Ontario, described by Robinson and Bishop (1999). New Brunswick, Canada, utilized its large supply of labour to attract call centres. Chapleau identified large segments of land, much of which was sandy soil ideal for blueberries, and an old freezing facility as a natural fit for the development of a value-added blueberry industry. The opportunity germinated from outsiders who had seen the benefits in Quebec and wanted to see an industry develop in Ontario. Their 'outside-in' thinking encouraged Chapleau to seek buildings and land appropriate for blueberries and a freezing facility and, among other projects, allowed them to win a national bid to demonstrate NTFP value development from the Canadian Federal Community Forest Program competition in 2007.

Regions can benefit from or create an innovation leader to spearhead a cause. One example is the Northern Ontario Medical School whose plans to develop a compendium of forest plants and their composites for biomedical and nutraceutical applications could launch communities into new fields of economic development. Although not an inventory, it will help to point the way in plants exhibiting higher health benefits and allow communities to narrow their search for opportunities. The towns of Hearst and Kapuskasing in Ontario spearheaded a Centre of Excellence on forestry. These kinds of innovation leaders can spend the time necessary to study opportunity and enlighten other communities. As a network, each member can advance its cause, but it requires the will to work together.

Inventories and feasibilities performed in one community may not yield an investment. But the data accumulated could be useful to a neighbouring community. There is no mechanism or will to share information in a competitive environment. Walls have been built between communities and need to come down to eventually decrease the cost for each community and create a supporting value chain for industry.

7.0 Governance and Policy Challenge

Policies in Ontario tend not to be conducive to diversification since power is concentrated in the existing wood producers (Beckley, 2004), and there is little direction from the province on how resources can be shared and accessed by new bio-producers. Much of the land, particularly in Northern Ontario, is owned by the Crown and has been allocated for harvesting fibre. There are plenty of excellent examples of partnership with the private sector that can be utilized to implement new initiatives, including Chapleau, which has partnered with the private sector to pilot a forest-based blueberry project. However, business-to-business is not always successful or possible. Not all companies feel comfortable in sharing the resources. The *Syndicat des producteurs de bleuets du Québec* producers lobbied and received a large tract of land from the government to be used by its members for the production of blueberries. This is a potential model for Ontario but we need to understand that this feat was achieved after decades of successful practice on private land. Environmental questions and financial feasibility had already been proved and each government tends to make its own assessment, rather than follow practices in other jurisdictions.

There are also many examples of community forests, where the community makes management decisions to maximize community benefits, and the forest is managed for multiple values (M'Gonigle, 1998). In a community forest, all or a portion of forest values is given consideration in the management mix and the community has a democratic role to play to listen to preferences, deliver environmental stewardship, and encourage local benefits (Beckley, 2004). According to Teitelbaum, Beckley, and Nadeau (2006), there are over 100 community forest initiatives currently taking place on public land in Canada, mainly in Ontario, Quebec, and British Columbia. Most of them are run through local government organizations and approximately 60% operate on Crown land, while the remaining 40% operate on land owned fee simple by local governments. Figure 4 outlines a possible continuum for various types of governance structures and the argument is that communities need to be at the table in order to access needed land and resources, otherwise no involvement or control means leakage of benefits.

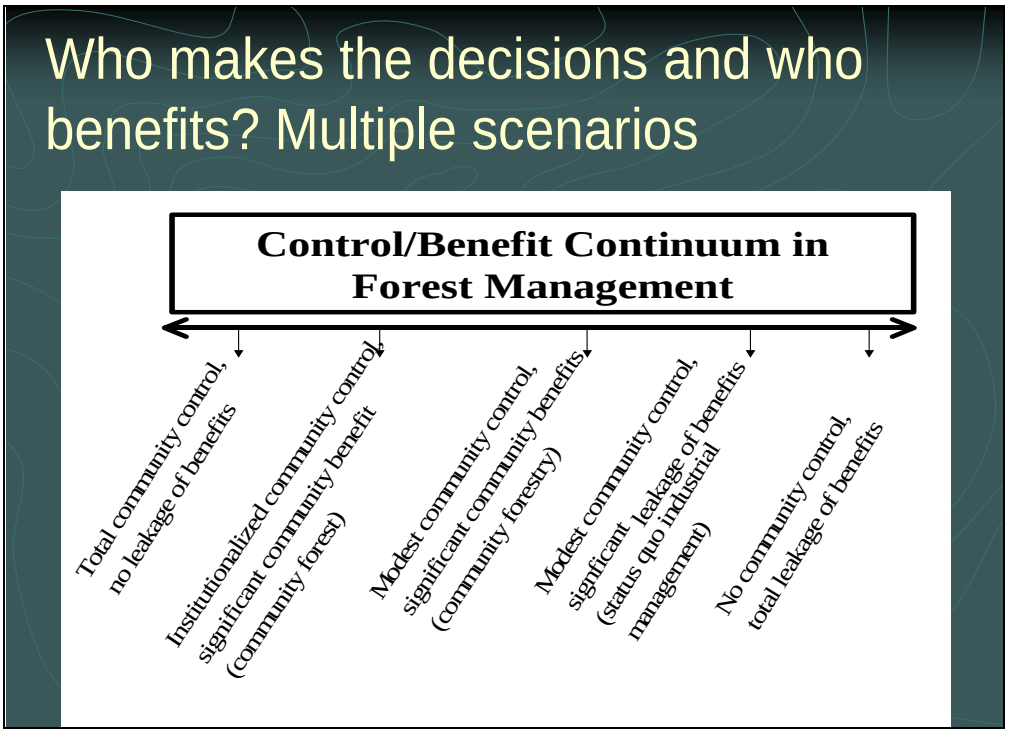

Figure 4. Governance models (Beckley, 2004).

Sometimes policy should follow demonstration, with some more innovative projects showing the way in a pilot project format, and allowing others to flourish in its wake. This may be the only viable option when time is of the essence and a community needs to make things happen quickly to retain an investor. Left to a natural progression, the waiting game for new policy development could chase away investor interest or draw down community resources (financial and volunteer).

8.0 The Entrepreneurial Challenge

Many communities lament the lack of entrepreneurs. Many may be out there, but they need some hand-holding, new directions, the right environment, financial resources, and access to specialized knowledge. They are not likely to fight for new regulations or aggregate inventories to develop a business case because these activities are high risk, especially in the current governing structures. However, if they are told that there is an opportunity, that there is a body willing to help them deal with government systems, and if possible, are shown a business case for the enterprise, then communities will likely attract entrepreneurs willing to take over projects. The cost of knowledge and marketing the assets and capabilities of communities is expensive, but can be shared among like-minded communities. Communities need to lay the foundation for new industries by promoting their assets, which means that they need to identify these assets and perform the groundwork to create the right environment. Communities too often hope that innovation will come from existing, larger forestry players. Wagner and Hansen (2005) reported that larger companies are more likely to come up with process

innovation, but smaller companies develop product and business systems innovations.

The worst thing that can happen is when communities build silos and protect their ideas for fear that someone else will run with it. Often, they do nothing or little with the information they have. The truth is that if the community does not have sufficient assets to attract an entrepreneur, it will not be able to retain him or her in the long run by protecting ideas. Even if the business gets started, sooner or later, the entrepreneur will look at another region and find it more attractive, or worse, a competitor will mimic the operation in a more suitable region and drive the first one into bankruptcy. This is not the way to establish an environment of trust, or a healthy sustainable environment for entrepreneurship. The lack of sharing among communities means that similar studies are replicated, wasting valuable funds. There are thousands of opportunities in NTFP and no need to repeat a study several times over when there are many other opportunities that have been left underdeveloped for far too long. Once the basic economics and structure of a project is defined, it may only require inventories and a comparison of value chains to be replicated elsewhere. The sharing of business planning information, with necessary precautions to safeguard the competitive rights of private sector, can allow an increase in efficiency in the way government funds are allocated for this purpose, reduce time in studies, and increase regional collaboration.

9.0 The Cases of Hearst and Chapleau

Hearst and Chapleau in Northern Ontario (Canada) are examples of communities striving to develop a bio-economy industry. Both communities experienced a number of downsizing or retrenchments from one or more forestry manufacturers. Hearst (population 6,000) chose to proceed with their existing core competencies and find other uses for the wood. They inventoried waste material and identified uses for the various types of wood. They are planning to proceed with a project proposal to inventory the forest using LIDAR or other technologies and will use the results to improve forest management practices and the identification of biomass. Their future projects include those that continue to harvest wood but produce bio-oils and gasification, that utilise nontraditional woods, and that develop value-added products. They are evaluating the feasibility of plantations for long-term sustainability, and based on this new direction, they are also evaluating other energy-producing methods to develop new core competencies in substitute or complementary product lines. The Hearst strategy requires large investments at the onset in research and will require slightly larger firms to develop the project, but the processes will be similar to those already in place in the community and thus, fewer changes or adjustments will be needed once projects are under way. The demand for the end-products will be high, but sustainability costs will also be high and the industries created will be controlled by a few larger players (power is more centralised, less diversified), similar to the systems in place for harvesting and producing wood products today. Although complementary to the local economy, the project could compete for resources with existing players as existing inventories are depleted and the governance/policy issues become more difficult to handle. There are also many unknowns in terms of environmental impact and land-use issues that make these kinds of projects extremely difficult and slow to develop. If successful, this project could open new doors and encourage innovation in the region and as a result, it requires committed leaders who are willing to meet

the many challenges. In small communities, paid staff are few and often loaded with a wide variety of projects. Volunteers become an important resource on projects. Any outside assistance must be supported by a funding application for start-up funds which is not easy. This complicates the process and the community is always at risk of losing key stakeholders in each project. Hearst is also interested in the development of NTFP industries.

Chapleau (population 2,800) opted to use its forest resources but in a new stream by using other base materials stemming from the forest for the development of products in food, nutraceuticals, personal care, decorative crafts and household aesthetic, and pharmaceuticals. The project collaborates with existing forest producers and the resources are considered renewable based on specific practices being suggested to share the land, sometimes in a multi-use format. Many of the opportunities require a shift or an adjustment to the current economy, with different skills and knowledge, more entrepreneurial skills, and possibly lower wages at the onset. The large variety of products means higher research and development costs and greater training requirements for entrepreneurs. Access to financial resources is also difficult. Each opportunity can start as a cottage industry or part-time businesses and possibly evolve over time, but this is difficult to accomplish in an economy where many have lost their jobs and are looking for full replacement of their income. A level of scepticism arises and threatens the good work of volunteers and innovative leaders. There is a need for clustering and networking among firms to gain entry into some markets through scaled activities – including those that can develop more bargaining power as groups of producers. This is difficult to accomplish when the community feels at risk as a result of job loss and does not want to share information and lose out on new opportunities. The benefits include a future economy that is more decentralised in its power structure and more diversified. The community needs a substantial amount of knowledge of these new industries, sometimes to convince entrepreneurs that it is a viable industry, and governments to allow new activities on Crown land. Again, these types of changes require fierce and determined leaders willing to work through much resistance over long periods of time to bring each project to a successful conclusion.

The community's role is said to be to only encourage the private sector to offer or improve products or services. However, there are areas where the community can play a much larger role in introducing products and services for further development by the private sector. This would include the development of new infrastructure, such as roads, land, buildings, inventories, identification of suppliers and buyers, development of friendly policies, and of course, project financing. Chapleau worked with the MNR to identify a list of a few plants or underutilized forest products that should be studied. Canada Yew was one of the potential projects and a preliminary assessment of inventory and some marketing of the project brought a customer from China and this in turn brought an entrepreneur to the table. The point is that development does not follow a straight line. Communities sometimes have to do a lot before the investor gets involved. Government funding bodies will tell you to bring the entrepreneur first, and then they will study opportunities. Often it is the other way around. Investors are not always easy to find or identify, for example, and bio-product projects are not always developed by farmers; all kinds of entrepreneurs will have an interest depending on the product, collection method, processing method, distribution method, and so on. The community needs to better describe the opportunity and

what is involved to attract new breeds of entrepreneurs. Some people may be already involved in hobbies that interconnect with an opportunity being sought by a community.

The commitment and vision of Chapleau and its regional partner communities in the East Superior Region of Ontario did not fall on deaf ears. They were able to secure a coveted federal government 5-year demonstration project in July 2007 and are working with Hearst and other communities to develop a larger regional approach to create a new forest bio-economy. The network concept is alive in these two communities, as they have come to realize that they can produce more together than they can alone.

10.0 Conclusion

A number of community challenges were discussed in the development of a new bio-economy, including:

1. Global demand and competition affects local competitive capabilities;
2. The lack of knowledge of new industries stifles innovation and has created a dependency on extractive industries;
3. The lack of knowledge of available inventories and their feasibility masks potential new opportunities;
4. Current government policies and governance mechanisms for access to land and forest resources often discourage new investment, including a lack of participation in decisions surrounding Crown land;
5. There is a general lack of entrepreneurs, specifically in single industry towns where young people have started with excellent wages early in their career from forestry manufacturers. This means that communities either need to import entrepreneurs, or import knowledge and train interested local residents. In the long run, communities need to create a new environment that encourages entrepreneurship and capacity building;
6. The need to build clusters and networks to create economies of scale requires a change in classical thinking around development.

Some possible solutions were offered, including starting with a comprehensive strategic planning process to slowly shift thinking in communities and to better take advantage of products available in the forest bio-economy. This includes a more thorough analysis of current resources, the engagement of specialists with ‘outside-in’ thinking to promote positive turbulence, and the development of regional networks to encourage economies of scale and long-term project sustainability. Despite the challenges enumerated, communities need to collaborate to find solutions in order to develop these opportunities, since there are few other prospects offered to them. Even if the odd plant is constructed to bring a number of jobs in one community, it is not likely to replace the lost jobs to date, or to be able to be replicated in all of the communities affected. Several initiatives are needed to provide some solutions to current problems and contribute to the diversification of communities. Each possible course of action, including the ones offered in the bio-products and NTFP industry cases, are pieces in a puzzle that can assist communities to move toward improved long-term community sustainability.

11.0 References

Albert, S., Flournoy, D., & Lebrasseur, R. (2008). *Networked communities: Strategies for digital collaboration.* Hershey, Pennsylvania: IGI International.

Albert, S., Robinson, D., Duchesne, L., & DeYoe, D. (2006). *Transition strategy for the northeast superior forest community.* Paper presented to Canada's Model Forest Program, Natural Resources Canada.

Allen, M. (2006, May). How far can you drive on a bushel of corn? *Popular Mechanics,* 75–81.

Ashley, W., & Morrison, J. (1997). Anticipatory management: Tools for better decision making. *The Futurist, 31*(5), 47–51.

Barnes, T., & Hayter, R. (2005). No 'Greek-letter writing': Local models of resource economies. *Growth and Change, 36*(4), 453–470.

Beckley, T. (2004). *Community forests: Backgrounder for the Select Committee on Wood Supply*. University of New Brunswick. Retrieved February 19, 2004 from http://nrc.concordia.ca/_ftp2004/prince_george_2004/CommunityForests2004.ppt#256

Belcher, B., Ruiz-Pérez, M., & Achdiawan, R. (2005). Global patterns and trends in the use and management of commercial NTFPs: Implications for livelihoods and conservation. *World Development, 33*(9), 1435–1452.

Clayoquot Green Economic Opportunities Project. *Sector analysis non-timber forest products (NTFPs).* Retrieved July 17, 2007, from http://www.focs.ca/reports/cgeo2_6.html

Davidson-Hunt, I., Duchesne, L., & Zasada, J. (1999, October 1–4). *Non-timber forest products: Local livelihoods and integrated forest management.* Paper presented at NTFP Conference Proceedings. Retrieved October 11, 2006, from http://ncrs.fs.fed.us/pubs/gtr/other/gtr-nc217/

DeBono, E. (1988). *Letters to thinkers: Further thoughts on lateral thinking.* London: Penguin Books.

DeYoe, D. (2006). Building Resilient Communities. Retrieved September 2007 from http://www.hearst.ca/pdf/BES/speakers/David_DeYoe.pdf

Duchesne, L., & Wetzel, S. (2003). Managing timber and non-timber forest product resources in Canada's forests: Needs for integration and research. *The Forestry Chronicle, 78,* 837–842.

Duchesne, L., & Wetzel, S. (2003). The bioeconomy and the forestry sector: changing markets and new opportunities. *The Forestry Chronicle, 79,* 860–864.

Freudenburg, W. (1992). Addictive economies: Extractive industries and vulnerable localities in a changing world economy. *Rural Sociology, 57,* 305–28.

Gryskiewicz, S. (1999). Positive turbulence: A climate for creativity. *Health Forum Journal, 42*(2), 16–19.

Hobbs, J. (2002). Evolving supply chains in the nutraceuticals and functional foods industry. *Canadian Journal of Agricultural Economics, 50*, 559–568.

Innis, H. A. (1956). The teaching of economic history in Canada. In *Essays in Canadian economic history* (pp. 3–16). Innis, M. Q., Ed., Toronto, ON, Canada: University of Toronto Press.

Knoblich, G., & Oellinger, M. (2006). The eureka moment. *Scientific American Mind*. October/November, 38–43.

Marshall, E., Newton, A., & Schreckenberg, K. (2003). Commercialisation of non-timber forest products: FirstSteps in analysing the factors influencing success. *International Forestry Review, 5*(2).

Marshall, E. (2006**).** Commercialisation of non-timber forest products: Factors influencing success. In K. Schreckenberg & A. C. Newton (Eds.), *Lessons learned from Mexico and Bolivia and policy implications for decision-makers.* Downloaded September 2007 from http://quin.unep-wcmc.org/forest/ntfp/outputs.cfm

Marshall E., Rushton, M., Schreckenberg K. (2006). NTFP Commercialisation Research Methods. Downloaded September 2007 from http://quin.unep-wcmc.org/forest/ntfp/outputs.cfm

McConnell, T. (2005). Health and wellness in the West. Western Economic Diversification Canada. Retrieved September 2007 from http://www.wd.gc.ca/rpts/publications/accesswest/2005_04/4a_e.asp

M'Gonigle (1998). International Network of Forest and Communities. Retrieved September 2007 from http://www.forestsandcommunities.org/main.html

McGuire, M., Rubin, B., Agranoff, R., Richards, C. (1994). Building Development Capacity in Nonmetropolitan Communities. *Public Administration Review, 54*(5), 426–433.

Mohammed, G. (1999). *Non-timber forest products in Ontario: An overview.* (Forest Research Information Paper No. 145). Sault Ste. Marie, Ontario, Canada: Ontario Forest Research Institute.

NORMED (2005). Creating a Sustainable Health Research Industry in Northern Ontario. Retrieved September, 2007, from http://www.normed.ca/events_publications/media_room/Nov15_2005/backgrounder_en.htm

Pisano, G. (2006, October). Can science be a business? Lessons from BioTech. *Harvard Business Review*, 114–125.

Poyry, J. (2001, June). *Assessment of the status and future opportunities of Ontario's solid wood value-added sector*. (Research Report). Retrieved September 2007 from http://www.livinglegacytrust.org/PDF/Final_Summary_Report.pdf

Robinson, D., & Bishop, M. (1999, April). Layoffs and municipal finance: The case of Elliot Lake. In A.-M. Mawhiney & J. Pitblado (Eds.), *Boom Town*

Blues: Elliot Lake—Collapse and Revival in a Single-Industry Community. Toronto and Oxford: Dundurn Press.

Ross, I. One mill's waste another man's treasure (2002, July). *Northern Ontario Business.* Retrieved August 2007 from http://www.northernontariobusiness.com/regionalReports/SaultStMarie/195347/02-Wawa-waste.asp

Roth, B., & Washburn, S. (1999). Developing strategy. *Journal of Management Consulting, 10*(3), 50–54.

Russell, R., & Taylor, B. (2001). *Operations management* (3rd ed.). Upper Saddle River, New Jersey: Prentice Hall.

Schaan, S., & Anderson, F. (2002). Innovation in the forest sector. *The Forestry Chronicle, 78*(1), 18.

Senge, P., Carstedt, G., & Porter, P. (2001). Innovating our way to the next industrial revolution. *MIT Sloan Management Review, 42*(2), 24–38.

SPBQ, Mémoire du Syndicat des producteurs de bleuets du Québec. Retrieved July 18, 2007, from http://www.caaaq.gouv.qc.ca/userfiles/File/Memoire2/02-35-A-Syndicat_prod_bleuets.pdf

Sparling, D., & Laughland, P. (2006). Agriculture's role in the bioproducts industry. *Statistics Canada Vista on the Agri-Food Industry and the Farm Community* (catalogue no. 21-004XIE), 11.

Spence, F. (1994). Embrace the future with an effective strategic plan. *Bank Management, 70*(2), 64–68.

Tebbens, J. (2005). *Functional foods and nutraceuticals: The development of value-added food by Canadian firms.* (Science, Innovation, and Electronic Information Division Working Papers). Ottawa: Statistics Canada, *16*, 36.

Teitelbaum, S., Beckley, T., & Nadeau, S. (2006). A national portrait of community forestry on public land in Canada. *The Forestry Chronicle, 82*, 416–428.

Temkin, G. (2006). Registration of Nutraeuticals in Russia : Challenges and Solutions. BISNIS Bulletin. Retrieved September 2007 from http://bisnis.doc.gov/BISNIS/BULLETIN/aug06.htm#Nutra

Turock, A. (2001). Strategic innovation. *Executive Excellence, 18*(9), 9–10.

Wagner, E., & Hansen, E. (2005). Innovation in large versus small companies: Insights from the U.S. wood products industry. *Management Decision, 43*(5/6), 837–850.

Wetzel, S., Duchesne, L., & Laporte, M. (2006). *Bioproducts from Canada's forests:New partnerships in the bioeconomy*. Dordecht, The Netherlands: Springer.

Woodbridge Associates. (2003). The Ontario wood products industry. Living Legacy Trust. Volume 1, Main Report. Retrieved September 2007 from www.livinglegacytrust.org