



## **Toward a Bio-Processing Eco-Industrial Alliance in Stormont, Dundas and Glengarry**

A Situation Analysis and Preliminary Implementation Plan

### **Final Report**

March 31, 2010

#### **PREPARED FOR:**

**Stormont, Dundas & Glengarry  
Community Futures Development Corporation**  
26 Pitt Street  
Cornwall, Ontario, Canada  
K6J 3P2  
(T) 613.932.4333

#### **PREPARED BY:**

**Doyletech Corporation**  
Suite 201, 28 Thorncliff Place  
Ottawa, Ontario, Canada  
K2H 6L2  
(T) 613.226.8900  
[www.doyletechcorp.com](http://www.doyletechcorp.com)



#### **Core Project Team:**

Dennis Senik, Denzil Doyle  
Glenn McDougall, Paul Milne, Jeffrey Doyle



**STORMONT, DUNDAS & GLENGARRY**  
Community Futures Development Corporation  
Société d'aide au développement des collectivités



With the support of the Federal Economic Development Agency for Southern Ontario



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## Executive Summary

This report examines the feasibility of what will be referred to as a *Bio-Processing Eco-Industrial Alliance* in Stormont, Dundas and Glengarry (SD&G). It would have many of the characteristics of a technology cluster, comprising players associated with agriculture and food processing. The companies would range from small and medium enterprises (SMEs) to branch operations of multinational enterprises (MNEs). Related institutions would be affiliated with education, research, and government services such as labs.

The alliance would generate additional revenues in the region by matching existing material and energy flows, filling upstream value chain gaps, extending downstream processing opportunities and realizing new product potential. Such a regional network would be built around optimizing byproduct, waste and value-added potential outlined in the “Summary of Regional Resources, Processes and Opportunities” included as part II of this report.

The summary outlines four key buds of growth for the creation of this network: product initiatives between Natunola and Tri-County Protein (TCP); co-location around the Laflèche Environment Park, building on energy generation from waste; reintroduction of flax, its downstream processing and recovery of waste flax fibre as a plastics reinforcing agent; and value-added processing of soy oil. In all, there are thirty-some opportunities, the most advanced of which concern Natunola and TCP.

This initiative is being led by a group of local companies and the Stormont, Dundas and Glengarry Community Futures Development Corporation (SD&G CFDC). The SD&G CFDC is a community-based, not-for-profit development agency with the resources to assist in financing and developing SMEs as well as attracting MNEs.

In order to scope out a vision for the alliance, it is estimated that by the year 2020, a total of ten new initiatives would result: three MNEs, four SMEs, and three institutions - R&D/Government/Education offices or labs. The MNEs would employ 150 people (50 each), the SMEs would employ 40 (10 each), and the institutional facilities would employ 10 collectively. Of the 200 employees, half would be scientific and professional personnel earning \$80K per annum and half would be administrative and technical people earning \$50K per annum (in 2010 figures). This would result in incremental *direct* payroll of \$6.5 million per year.

The resulting economic payback would be substantial, justifying the resources required to make it happen. Taking into account the new expenditures on such things as rent and local supplies and the spending by the employees on local goods and services, the multiplier effect from this type of activity is typically 3 to1: yielding 600 jobs, including the 200 direct jobs estimated above. At a February 11<sup>th</sup>, 2010 planning meeting held with key prospective alliance members at Winchester, Ontario 1,000 total jobs was seen as within reach. In short, the consensus was that these figures were conservative.

A more aggressive scenario, based on rapid realization of the possibilities outlined in Part II, would generate significant jobs as early as three years from now. These possibilities are presently largely at the visionary stage.

A key component of the resources dedicated to this project would be a full-time person to ensure that the initiative has an annually updated ten-year plan and that tenant companies are exposed to best cluster practices from around the world. This report outlines a three-year plan to put in place the groundwork to realize the proposed *Bio-Processing Eco-Industrial Alliance*.

## Introduction

The strategies in creating an economic cluster of the type being proposed here fall into two broad categories:

- **Grow-your-own:** The emphasis is on the creation of new companies. The major challenge is access to early stage capital from both the public and private sectors.

NRC-IRAP is an example of public sector financing, while angel investors are an example of private sector financing. The availability of private sector financing has diminished dramatically in recent years with the virtual collapse of Canada's venture capital industry. Although the financing directly available from SD&G CFDC is limited, its importance lies in leveraging: to attract other sources of financing, both public and private.

- **Importation:** The emphasis is on attracting branch plants or product lines of existing companies. The major challenge is competition from the hundreds of communities throughout the world that are making similar overtures. From an economic development perspective, the two strategies are very different, but as will be seen in this report, **SD&G CFDC** has the resources and expertise to pursue both.

There are advantages and disadvantages to both strategies. The grow-your-own strategy will usually take longer to produce jobs, but the resulting companies will typically be more innovative; once established, they will be strongly committed to remaining in the community. The imported companies will typically produce jobs at a faster rate but they may have less control over their own destiny.

This report consists of two parts:

**Part 1 – A Strategic Overview:** a discussion of the strategies that could be pursued in developing a Bio-Processing Eco-Industrial Alliance in Stormont, Dundas and Glengarry;

**Part 2 – An Assessment of Regional Resources, Processes, and Opportunities:** an inventory of the industrial activity that is likely to contribute to the strategy.

## Part 1 – A Strategic Overview

### 1.1 The Trend toward Clusters

Regardless of company origins, they are attracted to clusters primarily because they see easier access to resources. When asked what resources they are seeking, they will typically point to human resources (experienced workers) and financial resources (both public and private money, as mentioned above).

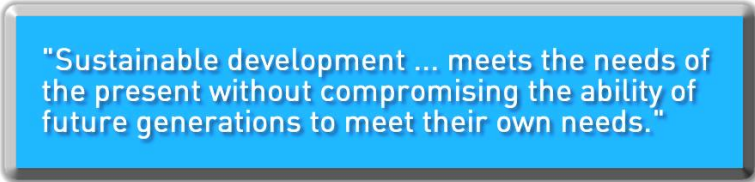
Clusters are no longer confined to companies that supply their own proprietary products and services. Automobile dealers and big box stores are forming retail clusters that resemble specialized shopping centres. While this trend is being primarily driven by marketing considerations, there is a human resource element as well because the products they are selling and servicing are becoming more and more complex. Like the goods producing companies, they seek experienced workers. On the other hand, venture capital is not likely to be a big issue with them. The major clustering influences, particularly those related to technology, will be discussed in a later section.

#### 1.1.1 The Eco-Industrial Concept

Worldwide, eco-industrial development is based on the growing realization that *sustainable economic growth* is a solution to finite resources and environmental limits.

The concept of boundless economic growth was first challenged by the Club of Rome<sup>1</sup> in their ground-breaking 1972 report, “The Limits to Growth.” That same year, sustainable development received international attention at The United Nations Stockholm Conference on the Human Environment. Significant international efforts to resolve the conflicting policy goals of economic growth, environmental quality and social equity soon followed.

By 1987, the UN-sponsored Brundtland Commission<sup>2</sup> proposed both initial strategies and a succinct definition of sustainability:



“Sustainable development ... meets the needs of the present without compromising the ability of future generations to meet their own needs.”

A practical means of realizing this goal is the *Eco-industrial park*, first defined by the US President’s Council on Sustainable Development in 1996:

“a community of businesses that co-operate with each other and with the local community to efficiently share resources [such as] information,

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<sup>1</sup> An international association of scientists, business executives, public officials and scholars.

<sup>2</sup> *Our Common Future*, United Nations World Commission on Environment and Development (WCED).

materials, energy, infrastructure and natural habitat, leading to economic gains, improvements in environmental quality and equitable enhancement of human resources for businesses and the local community”

The bottom line is greater mutual benefit than the gains from acting alone. While the term “park”, suggests this requires a special site, such exchanges can occur anywhere: from within a single plant up to many firms collaborating across entire regions.

The underlying concept is that of an industrial ecosystem where traditionally separate industries collaborate to optimize the consumption of energy and materials while using waste from one process as raw materials for other processes. The know-how to apply this concept is part of a multidisciplinary field called *industrial ecology*.

This emerging field traces its roots to a seminal 1989 article<sup>3</sup> that explored the idea of designing industrial systems to be more like the natural world. Indeed, the biosphere comprises deeply interconnected, *closed loops*: wastes from one species are resources to others. Industrial ecology takes a *systems approach*, examining problems from the perspectives of sociology, the environment, the economy and technology. As of 2002, well over sixty eco-industrial networking projects in Canada and the U.S. had been identified.<sup>4</sup>

### 1.1.2 The Interrelationship between Clusters and Eco-Industrial Initiatives

*Regional business clusters* have much in common with the eco-industrial concept as a source of competitive advantage. The term was first popularized by Michael Porter<sup>5</sup> in the 1990s. In fact, cluster analysis dates from the 1890s when the great British economist, Lord Alfred Marshall, noted how many British industries were regionally concentrated, from cotton textiles in Manchester and iron-works in Birmingham to cutlery in Sheffield.

The competitive advantage of clusters stems from their concentration of *skilled labour*, *specialized support services* and *technical advances* driven by the ready exchange of information. Regional clusters are geographic networks of businesses, suppliers, and associated institutions in a particular field: they are highly interrelated supply chains.

Clusters enjoy *external returns to scale* – i.e. advantages accrue to the cluster as a whole; individual firms benefit from being embedded in the networks. Most importantly, clusters are *path-dependant*. Their deep interconnections are powerfully shaped by historical accident: i.e., where you end up depends on what happens along the way. The bottom line for policy makers is one of encouraging the enabling factors that spur the dense interconnections of regional actors.

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<sup>3</sup> Frosch, R.A.; Gallopoulos, N.E. (1989). *Strategies for Manufacturing*. Scientific American 261 (3): 144 -152.

<sup>4</sup> *The Evolution of Eco-Industrial Development*, The Eco-industrial Advantage, Volume 2, Number 1, 2002

<sup>5</sup> Michael Porter, *The Competitive Advantage of Nations* (1990).

### 1.1.3 A Framework for Eco-Industrial Analysis

The following framework is based on the work of Marian Chertow, a leading researcher in the field of industrial ecology. She developed a billion dollar waste infrastructure system as President of the Connecticut Resources Recovery Authority. She is currently a professor at Yale University and former Director of their Industrial Environmental Management Program.

A few basic concepts and tools are central to the systems perspective that underlies the description and analysis of the physical resource flows which are the foundation of eco-industrial clusters.

Three basic systems concepts are:

- *Embedded Resources:* Products are the end result of *investments* in materials, transportation, energy, manufacturing, distribution and the like. Reusing byproducts like energy and waste retains more of the original resource investment in the system – to the benefit of the region.
- *Life Cycle Perspective:* Optimization can only be realized over the total life history of resource utilization: from virgin to finished material, to spent product, to ultimate disposal.
- *Reuse:* There are *two* ways to recapture embedded resources. First is *cascading*: the reuse of resources in lower value applications, e.g. waste plastic recast as ‘lumber’ for decking; waste process heat as an auxiliary energy source, e.g. for greenhouses. Second is *recycling*: the capture of degraded resources for reuse in their *original* application, e.g. bottles.

Two of the following three basic tools were used to track SD&G resource flows in order to lay out a plan to put the above concepts into practice:

- *Industrial Inventories:* Regional businesses were contacted to sketch a basic input-output-process analysis from which to assess the potential for matches.
- *Stakeholder processes:* For example, an initial meeting of potential community participants was convened on February 11<sup>th</sup> by the SD&G CFDC. It resulted in moving ahead with this eco-industrial development initiative. The results of the subsequent industrial inventory were presented to a second, larger meeting on March 22<sup>nd</sup>. As discussed later in this report, maintaining the momentum generated by this initiative is critical.
- *Materials Budgeting:* Essentially, this is a deeper level of stock and flow analysis than industrial inventories (above), beyond the scope of this initiative.

The final element in an eco-industrial cluster is its geographical extent. The regional industrial inventory was based broadly, but not exclusively on the traditional county borders shown in Figure 1 below.

**Figure 1: The United Counties of Stormont, Dundas and Glengarry**



In general, the greater the distance, the less the opportunity, especially for flows of water and heat energy. However, byproducts can travel much further. The Yale framework rates possibilities on a 1-5 scale: 1 being the most constrained; 5 being the broadest.

**Figure 2: Five Levels of Exchange**

Type	Name	Essential Features
1	<b>Waste Exchange</b>	Typically materials at end-of-life-cycle, e.g. municipal recycling, scrap dealers. Exchanges are on a trade-by-trade basis vs. continuous
2	<b>Intramural</b>	Primarily within large organizations vs. a group of smaller parties. Exchanges can occur along entire supply chains if under single ownership, e.g., P&G consumer paper products
3	<b>Co-Location</b>	Organizations that are contiguously located can exchange energy, water and materials; even information and services such as transportation and marketing.
4	<b>Local</b>	Exchanges occur among partners that are located within roughly a two-mile radius, to match <i>existing</i> material, water and energy flows. The network provides opportunities for new businesses to fill gaps based on common service requirements and input-output-process matches.
5	<b>Virtual</b>	Linkages are anchored on <i>value chain</i> enhancement across entire regions. Potential byproduct exchanges increase enormously with the larger number of firms that can be involved. An additional advantage is the potential to include small, outlying agricultural and other businesses.

The results of the industrial inventory, presented in Part II of this report, showed that the opportunities are concentrated in Type 5: byproduct and waste exchanges that create

value-added opportunities by filling gaps and extending value chains through additional processing.

## **1.2 Delivering the Right Messages**

A key message to be delivered by a community like SD&G in the growth and importation of companies is that it offers advantages over other communities in the availability of resources and marketing infrastructure. The challenge will be to communicate that message in a simple and business-like manner. While it is still acceptable to use terms like “quality of life,” it is over-used and needs specific positioning such as a people, finance, or marketing advantage.

It should also be understood that advantages mean different things to different people. While the *people* advantage will have broad appeal, a public sector *financial* advantage (e.g. NRC-IRAP) will not have the same appeal to an MNE as it will to an SME.

More will be said about messages and how to deliver them in the discussion on branding that is part of the implementation plan. It is crucial that any initiative involving clustering be clearly defined as early as possible. In particular, it is important that a vision for 2020 be formally discussed and adopted by those who participated in the February 11<sup>th</sup> and March 22<sup>nd</sup> sessions along with other relevant stakeholders.

## **1.3 Potential Development Scenarios for a SD&G Bio-Processing Initiative**

Although it is recognized that what is being visualized in this initiative may not be a cluster in the traditional sense (it may turn out to be more of an alliance in which the companies are not necessarily in close proximity to each other) a review of some cluster activity throughout North America may be helpful in the development of a vision statement and possible evolution scenarios.

### **1.3.1 Lessons from Technology Clusters**

In agriculture, the origins of the Saskatchewan Biotechnology Cluster can be traced to the development of canola, a derivative of rapeseed, whose supply was virtually cut off during World War II. A unique variety of rapeseed, developed by Canadian scientists was particularly well suited to western Canada and by the early eighties, canola replaced rapeseed in Canadian oil seed production. The success of canola created a strong entrepreneurial spirit in Saskatchewan and many local champions.

A highly relevant example for SD&G is the case of Prince Edward County. The local economic development commission has realized a strategy built on the interrelated regional strengths in Agriculture and Wine Production, Tourism and Heritage. Results include \$45 million of investment in new wineries and increased tourism spending of 168% over 5 years.

Silicon Valley, the legendary technology cluster that shaped the second half of the 20<sup>th</sup> century, got its start from Bill Hewlett and David Packard, two Stanford University

professors who felt that their graduates should be able to find jobs locally rather than moving to the east coast of the United States. They were “champions” trying to solve what they considered to be a local need.

Closer to home, the Ottawa cluster got its start from the defence business when a local entrepreneur saw the need for a company to commercialize the vast amount of technology that had been developed in the city’s laboratories during World War II. In the early sixties, it morphed into a telecommunications cluster when Northern Electric established its major R&D facility in the region. It became not only a powerful technology engine, but a market for small technology-based companies, many of which had started as defence companies.

A common characteristic of the above examples is that they all involved *local champions addressing local needs*. The SD&G initiative does appear to meet this requirement. Local biotechnology experts have identified the need for strengthening the region’s bio-processing capacity.

### 1.3.2 Lessons from Canada’s Food Processing Industry

The broad objective is to apply the *industrial ecosystem* concept to SD&G’s agricultural and agri-food sector. The outcome would be the development and marketing of value-added products from the region’s platform crops. The means is collaboration and partnering with upstream and downstream members of the supply chain, from producers and processors to ingredient suppliers, packaging companies and retailers. The Canadian food processing industry is a good example:

**Figure 3: Innovating Food Processing Firms and their Collaborators**

Partner Group	Product Innovation	Process Innovation
	% of innovating establishments	
Food ingredient suppliers	40	14
Packaging suppliers	27	23
Raw agricultural product suppliers/organizations	22	9
Food retailers/wholesalers	22	5
Equipment suppliers	20	37
Consultants	17	18
Commercial laboratories or R&D enterprises	15	7
Foodservice operators	14	3
Universities and colleges	12	6
Federal/provincial government research facilities	8	5
Competitors	5	3
Private research institutions	4	2

Source: AAFC, The Nature and Extent of Innovation in the Canadian Food Processing Industry, 2006

Clusters enhance the *skilled labour, specialized support services* and *technical advances* that are all potent resources in addressing the ever-present barriers to innovation that this particular industry faces:

**Figure 4: Impediments to Innovation in the Canadian Food Processing Industry**

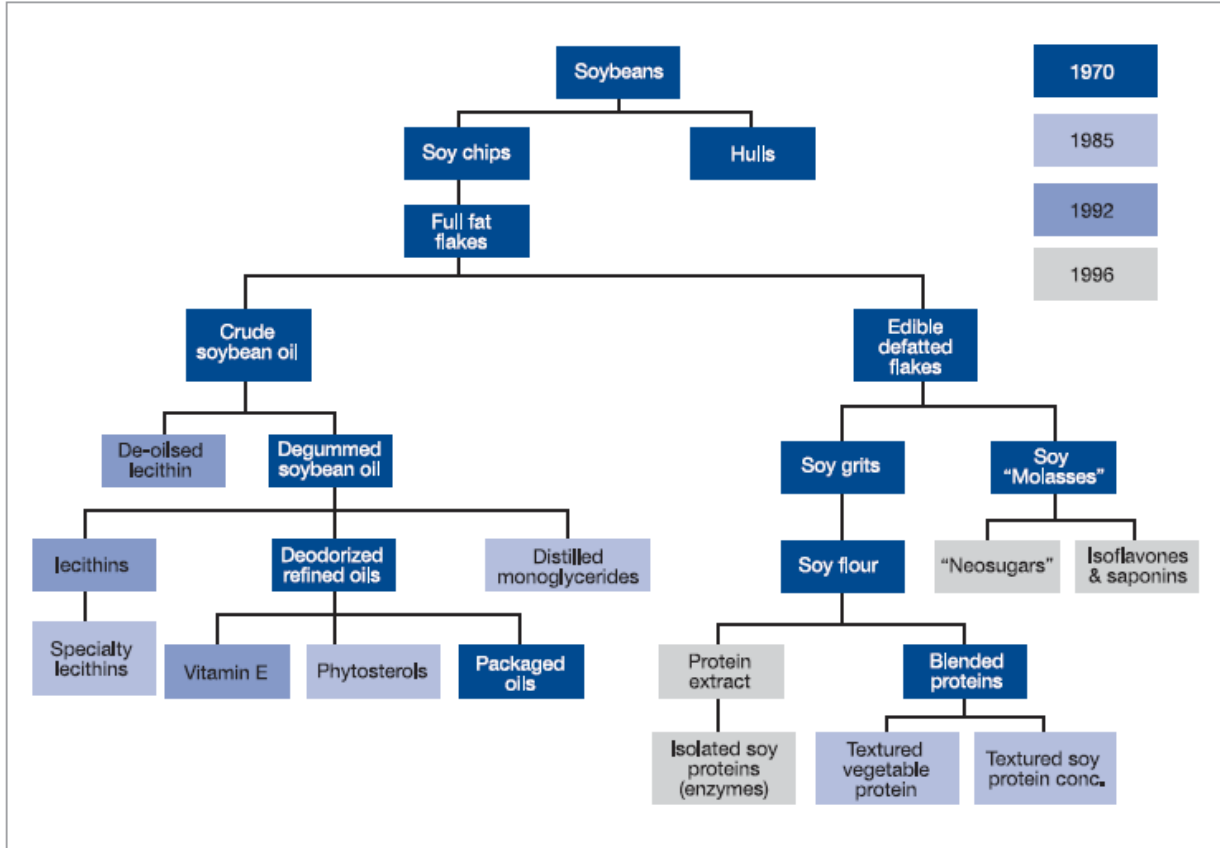
Factor	% of innovating establishments indicating medium or high importance
Lack of internally generated cash flow	42.2
Long gestation period of innovation	37.4
Insufficient flexibility in regulations or standards	37.3
Shortages of skilled workers	37.1
Lack of marketing capability	36.3
Lack of retail acceptance or access to distribution channels	29.1
Lack of external equity funding	26.0
Lack of debt financing	25.2
Lack of idea champions	24.1
Corporate/management resistance to innovation	15.8
Difficulty in negotiating clear intellectual property (IP)	9.3

Source: AAFC, The Nature and Extent of Innovation in the Canadian Food Processing Industry, 2006

Over the past thirty years, platform crops have been used to develop a variety of bio-products, food and feed items. For example, Agriculture and Agri-food Canada (AAFC) has worked with public and private organizations to develop value-added products from soybeans.

**Figure 5**, below, shows how traditional soy outputs such as oil and meal have been used as starting points to produce a whole range of valuable oils, flours, vitamins, proteins and concentrates for use in industrial and food applications.

**Figure 5: Soy Production**



Source: AAFC Research Branch

In short, an eco-industrial cluster organized around the region’s strengths in bio-processing could realize opportunities to augment the value of regional production.

## 1.4 Vision Statement

Based on the workshops and the interviews that were held with relevant companies, we propose the following as a *starting point* for the SD&G CDFC, local champions and regional supporters to define a vision statement for this initiative:

**“By the year 2020, there will be a bio-processing eco-industrial park in SD&G that includes at least ten enterprises employing at least 200 people in the supply of goods and services to markets that are driven by the agriculture and food processing industries.”**

Our previous work with similar initiatives suggests a simple way to estimate the *employment impact* from a regional bio-processing industrial alliance. It is based on the ratio of GDP per employee for the SD&G region (about \$80,000) and the average sales per company employee (about \$250,000), i.e.:

$$\$250,000/\$80,000 \sim 3:1$$

While the bio-processing alliance would result in direct employment of 200, the total regional impact would be 600 jobs (200 x 3). The additional 400 indirect jobs would include what is often referred to as induced employment which is created by unrelated suppliers such as legal, accounting, retail and education. The consensus from a meeting among interested parties on February 11, 2010 was that the 200 figure for direct employment was very conservative.

## 1.5 Attracting Participants to the Initiative

As in any sales situation, it is important to clearly define both the product and the market.

- *To define the product:* Summarize the advantages it brings to its users.
- *To define the users:* Identify their needs.

As stated above, the needs of the SMEs will be very different from those of the MNEs:

**SMEs:** By far the greatest resource requirement for new initiatives is financing. While they do have a need for highly specialized personnel, that need is typically filled by the companies' founders. SD&G can offer assistance in accessing capital, both directly and through its linkages into both public and private sources of capital. As for marketing, the degree to which SD&G can assist will depend on whether the company is addressing a local or a remote market. While local markets will be a known quantity, SD&G may assist with remote markets by organizing seminars and even trade missions.

**MNEs:** Their needs will fall in all three resource categories and SD&G can assist in accessing all of them. Being part of a cluster can be a marketing benefit because it gives the companies (both SMEs and MNEs) an image of maturity. Their needs will be more

heavily concentrated in the “people” category where the quality of life and educational facilities are major advantages.

## 1.6 An Implementation Plan

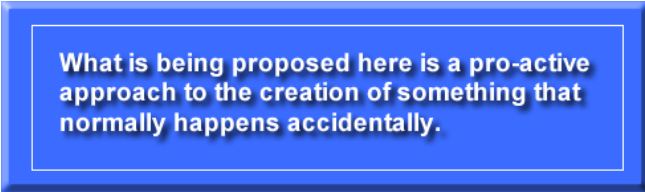
The major challenge will be convincing all of the potential influencers that such an entity can be created in SD&G.

There is a widespread belief that clusters are creatures of urban areas; moreover, that the key players are academics or financiers. However, innovation is not limited to the cities and their institutions. In particular, the OECD has undertaken groundbreaking work on rural innovation.<sup>6</sup> Member countries are aggressively pursuing rural innovation as well:

### 1.6.1 The Reality of Rural Regional Innovation

In the U.K., rural innovation policy has evolved “to focus on local assets rather than outside investments and transfers; to emphasize opportunity rather than disadvantage; toward collective governance involving all levels and stakeholders.”<sup>7</sup> In the U.S., the title and theme of their preeminent agricultural forum captured this new reality as well: “Prospering in Rural America: through and beyond agriculture.”<sup>8</sup>

Traditionally, rural economies have been dominated by industries such as farming, forestry, mining, and tourism. Today, they have similar occupational structures and large concentrations of employment in services and manufacturing. “On the whole, both nearby and remote rural areas’ economies are growing more similar to the rest of the economy.”<sup>9</sup> In summary, policy makers worldwide are addressing the changing face of the rural economy and the importance of rural innovation.



What is being proposed here is a pro-active approach to the creation of something that normally happens accidentally.

The most effective way of getting “buy-in” from the key players is to create a business plan that will be updated annually; it will be the roadmap for key activities. A representative of SD&G CFDC should be given the responsibility for the updating, but a steering group should be responsible for the content. The key organizational details to realize this are part of the detailed plan required by no later than early 2011.

The annually updated plan should be less than twenty pages in length. However, it should address specific actions like joint marketing campaigns, venture capital “show-and-tell”

<sup>6</sup> Innovative Rural Regions: The Role of Human Capital and Technology. OECD Rural Policy Conference, Cáceres, Spain (March 21-23, 2007).

<sup>7</sup> *Rural Innovation*, National Endowment for Science, Technology and the Arts, (UK), December 2007.

<sup>8</sup> Transcript of keynote speech by the USDA Secretary, Mike Johanns, USDA Agricultural Outlook Forum, Feb. 16-17, 2006.

<sup>9</sup> *Rural Innovation*, National Endowment for Science, Technology and the Arts, (UK), December 2007.

presentations and “lunch and learn” sessions – something that was highly successful in building the Saskatchewan cluster. Speakers should be brought in to discuss cluster best practices around the world. As the cluster matures, the opportunities for joint ventures will increase. This is an area that requires a unique combination of skills in law, intellectual property protection and company valuation.

The following is a list of basic needs and actions that should be addressed in the annually updated plan:

- Real estate – office space, land, etc.;
- Transportation – including customs clearance;
- A listing of government incentive programs;
- The regulatory environment; and
- Sources of marketing information.

The plan should be realistic in its growth projections; it should acknowledge that the employment figures will be negligible until near the end of the ten-year period being discussed in this report. However, it is recommended that the business plan be a rolling ten-year plan and that each update of it will cover a new ten-year period.

The next six sections will provide details of an implementation plan.

### **1.6.2 Recruit a Manager**

As stated above, this would be a person who is knowledgeable about entrepreneurship and about the role that venture capital plays in it. In fact, he or she could be the same person who manages the Community Venture Capital Fund. A broad range of business knowledge and skills would be required because that same person would be expected to provide assistance to firms seeking all types of available funding (e.g. IRAP and SRED). It would be a full-time salaried position and the person would have access to a board of advisors (the steering group referred to above).

### **1.6.3 Prepare a Business Plan**

Even though this document would be referred to as a business plan, it would read more like a scenario analysis because a true business plan would make reference to the plans of individual companies. However, they will not be made available to the manager or the board of advisors except as required for investment decisions or for business advice as discussed above. What will be in the plan will be overall employment projections and data that will not compromise the confidentiality of the plans and operations of individual companies. An example of such data will be projections for supporting services (e.g. legal and accounting).

### **1.6.4 Implement a Branding Program**

Even before the business plan begins to take shape, there should be a branding exercise that makes the appropriate linkages between the economy of SD&G and the

cluster/alliance concept that is being promoted here. The ideal result of such an exercise would be to identify the economy of SD&G with agriculture-related bio-processing in the same way that the economy of Haliburton is identified with tourism or the economy of Waterloo is identified with high technology.

The starting point could be a short document (one or two pages) that would act as a supplement to the existing SD&G promotional material. It would emphasize that innovation will play a key role in future economic development plans and that those plans include both an *importation strategy* and a *grow-your-own strategy*.

### **1.6.5 Establish Goals for the Alliance/Cluster**

These would also be key components of the business plan, including targets for both employment and number of companies. Where possible, comparisons should be made between this alliance/cluster and others throughout North America operating in similar markets or exploiting similar technologies. As the entity matures, it should become easier to use industry-wide figures for forecasting growth.

Our experience in the evolution of the Kanata cluster showed that the growth was very erratic in the early years but in later years, it followed the growth rate of the North American telecommunications industry.

### **1.6.6 Establish Linkages with Other Clusters**

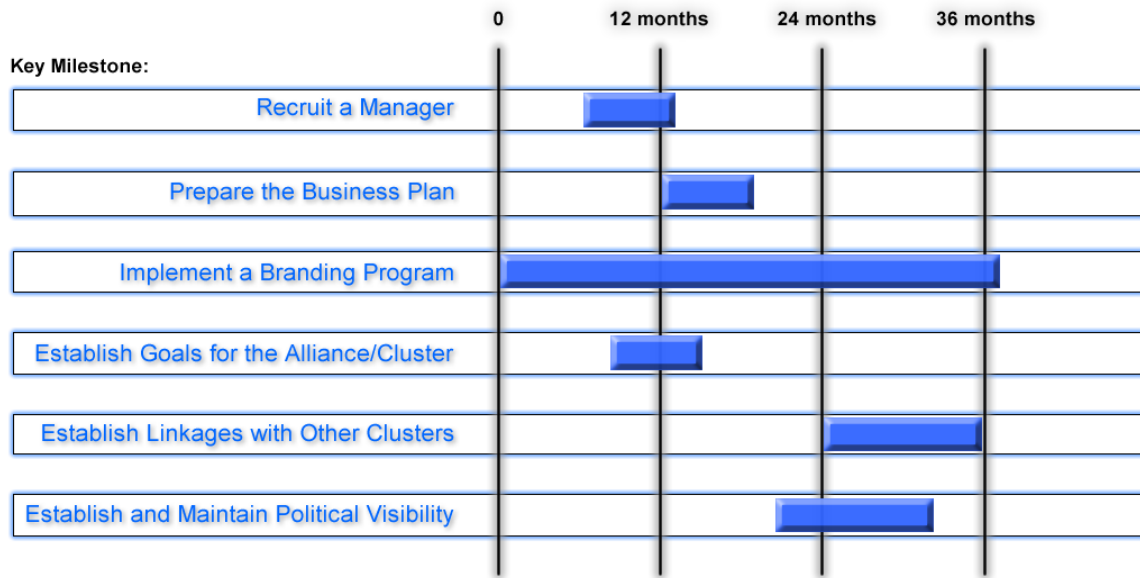
Such linkages should not be limited to the technologies or markets that will be pursued by SD&G. For example, packaging presents problems and opportunities that cut across many industries. Some of the packaging expertise that exists in the Ottawa cluster is likely applicable to the SD&G alliance/cluster.

### **1.6.7 Establish and Maintain Political Visibility**

Employment is one of the economic indicators that attract the most attention of politicians and policy-makers at all three levels of government. While the projections shown in this document are modest (200 direct employees in ten years) it should be pointed out that in 1977, Kanata had 700 high technology employees – and over 20,000 some twenty years later. Also, such jobs have a much greater multiplier impact than conventional jobs. The annually updated plans that are called for in this report should make an attempt to quantify such multipliers and the economic growth that they create.

**Figure 6** is a proposed timeline for the implementation plan.

**Figure 6: Proposed Timeline for Implementation Plan**



The following section of the report presents a summary of the regional resources and opportunities that lie at the heart of the above framework to lay the groundwork to realize their potential.

## Part 2 – An Assessment of Regional Resources, Processes, and Opportunities

### **Disclosure: Forward Looking Statements**

This report contains projections and other forward-looking statements regarding future events, potential relationships among corporations, technology trends, and the performance of corporations. We caution the reader that these statements are expressed as possibilities or predictions only. They are not guarantees of future performance and involve certain risks and uncertainties, which are difficult to predict. Actual future results and relationships may differ materially from what is forecast in these forward-looking statements. As a result, Part 2 of this report is subject to revisions. Notwithstanding the above disclaimer, the assumptions may be useful for strategic decision making about the formation, growth, and promotion of SD&G's Bio-Alliance.



**Paul Milne, PhD, MBA**  
**President**  
**Milne Research and Consulting Services**  
5523 Lion St.  
Osgoode, ON K0A 2W0  
Tel: (613) 826-3413  
Fax: (613) 482-3917  
phmpm@sympatico.ca

## 2.1 Purpose and Goals

This section presents a regional industrial inventory of SD&G's resources, industrial capability and capacities in agricultural production and related processing into food, feed and bioproducts. The objective is to examine the feasibility of establishing a Bio-Processing Eco-Industrial Alliance. The focus is on industrial ecology: the network of local value chains, and the gaps and opportunities to utilize wastes and byproducts to create additional value within SD&G.

The over-arching goal is to provide a factual basis to guide regional economic development in the bio-sectors toward the establishment of a bio-alliance in SD&G.

## 2.2 Methods

We begin with a macro picture of SD&G: human resources, utilities, knowledge, and materials. Then SD&G's agriculture, food and bio-products sector are examined based on the most recent StatsCan data. Selected value chains of interest are also examined. This section concludes with an analysis of strengths, weaknesses opportunities and threats (SWOT).

Next, a micro picture is drawn based on selected companies, beginning with the anchors of the Bio-Alliance: Natunola Health and Tri-County Protein – already collaborating. The focus is then expanded to include many of the companies that participated in the stakeholder meeting held on February 22<sup>nd</sup>, 2010. These companies are examined in light of input-output matching and are assessed for cluster potential and value-added opportunities. Deficiencies and drivers of cluster development are also examined. As the development of the eco-industrial bio-alliance concept unfolds, many more regional companies will be integrated into the process.

## 2.3 The Macro Analysis

SD&G is examined in terms of its resources such as land, people, and materials. The focus is on the agriculture, food and bio-products sector. Primary data sources are the *Statistics Canada Census of Agriculture Community Profile* (2001, 2006<sup>10</sup>), *The Economic Structure of Stormont, Dundas and Glengarry: Analysis and Comparative Advantages*<sup>11</sup> (2005) and the Dunn & Bradstreet database<sup>12</sup>.

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<sup>10</sup> [http://www26.statcan.ca:8080/AgrProfiles/cp06/PlaceSearch.action?request\\_locale=en](http://www26.statcan.ca:8080/AgrProfiles/cp06/PlaceSearch.action?request_locale=en)

<sup>11</sup> Gulriz Barkin MA, James dePater MA, Dr. Gordon Myers PhD. *The Economic Structure of Stormont, Dundas and Glengarry: Analysis and Comparative Advantages*. 2005.

<sup>12</sup> <http://www.dnb.ca/>

### **2.3.1 A Brief Overview of SD&G's Resources**

#### **Land and Location**

There are 817,159 acres or 3,307 km<sup>2</sup> of land in SD&G. Approximately 60 percent of the land is utilized for agriculture. SD&G is located near some of the most lucrative markets in the world. SD&G is one hour from Ottawa, one hour from Montreal, 4 hours from Toronto and 6 hours from Boston and New York (by car). The three counties of SD&G are also serviced by major highways and border the St. Lawrence Seaway which provides access to the world.

#### **Human Resources**

The population of SD&G was 110,399 in 2006 and is growing at about 0.8 percent per year. In 2010, the population is approximately 114,000, roughly 1 percent of Ontario's population.

Total workforce was 54,460 of which 2,700 (5%) are in agriculture and 11,990 (22%) are in manufacturing. Both are higher percentages than for Ontario overall. The unemployment rate in 2006 was 6.1 percent. The number of farm workers has declined almost 17 percent in 5 years. Their average age is 52. Youth are leaving the farms. This presents a special challenge for economic development officers.

There is an abundance of knowledge workers in surrounding regions. There are numerous colleges and universities such as the University of Ottawa, Carleton University, McGill University and its McDonald College, Queens University and Royal Military College, Kemptville and Alfred Colleges (University of Guelph), and many others. There are also numerous government research institutes such as the National Research Council and Agriculture Canada.

The challenge is attracting these knowledge workers to SD&G. Strong growth from the bio-alliance in terms of start-ups, strength of the companies, number of jobs, and job compensation and benefits would present an attraction to professionals and knowledge workers.

#### **Utilities**

SD&G is serviced by Hydro One, Cornwall Electric, Union Gas and Enbridge among others. Rates of electricity in rural areas varies from \$0.086 to \$0.116 per kWh.

#### **Industrial Parks**

SD&G has 4 fully serviced industrial parks with road, rail and/or seaway access. Industrial parks include Alexandria (36 acres), Ingleside (225 acres), Long Sault (210 acres), and Morrisburg (88 acres). There are also a number of private industrial parks including Chesterville (80 acres plus 370,000 ft<sup>2</sup> facility) Shaver Kudell (60 acres) and Lafleche Environmental (90 acres).

### 2.3.2 Overview of SD&G's Agricultural Sector

Statistics for SD&G's Agricultural Sector for 2001 and 2006 are found in Table 1, below. The agricultural sector falls under NAICS 11.

**Figure 7: Selected SD&G Agricultural Statistics for 2001 and 2006**

	SD&G 2001	SD&G 2006	% Growth	% of Ontario '06	Ontario 2006
Total population	109,522	110,399	0.8%	0.9%	12,160,282
Total number of farm operators	3,244	2,700	-16.7%	3.3%	82,410
Total number of farms	1,940	1,811	-6.6%	<b>3.2%</b>	57,211
Dairy	586	448	-23.5%	<b>9.1%</b>	4,937
Cattle ranching	362	292	-19.3%	2.6%	11,052
Hogs and pig farming	15	19	26.7%	0.9%	2,222
Poultry and eggs	18	20	11.1%	1.2%	1,700
Corn and grain		832		4.6%	18,275
Wheat		313		2.1%	14,682
Soybean		154		2.6%	5,812
Hay		238		4.0%	5,917
Flax		1		1.3%	79
Greenhouses		22		1.2%	1,898
Maple tree farms		68		3.0%	2,240
Bee farms		26		2.7%	981
Total land area (acres)	817,159	817,159		0.4%	224,261,535
Total area of farms (acres)	496,498	494,589	-0.3%	3.7%	13,309,925
Wheat (acres)		25,343		2.1%	1,235,390
Corn (acres)		109,929		5.8%	1,898,621
Soybeans (acres)		83,678		3.9%	2,155,884
Land in crops (acres)		351,531		3.9%	9,046,185
Average area of farms (acres)	256	274	7.0%	-	232
Cattle		85,482		4.3%	1,982,651
Dairy cows		28,643		8.7%	329,737
Pigs		45,970		1.2%	3,950,592
Poultry		512,783		1.2%	44,101,552
Bee colonies		1,931		3.0%	64,591
Total farm capital (\$M)		\$1,822		2.8%	\$65,337.0
Gross farm receipts (\$M)	\$265.0	\$294.4	11.1%	2.8%	\$10,342.0
Total farm expenses (\$M)	\$214.0	\$228.5	6.8%	2.6%	\$8,843.9
Feed, supplements, hay (\$M)		\$28.9		2.5%	\$1,170.3
Wages (\$M)		\$23.5		1.9%	\$1,269.8
Energy (fuel, electricity \$M)		\$22.0		2.6%	\$852.4
Total farm income (\$M)	\$51.0	\$65.9	29.2%	4.4%	\$1,498.1
Average farm income (\$)	\$26,405	\$36,388	37.8%	-	\$26,185.5

Despite having roughly 1 percent of Ontario's population, SD&G holds more than 3 percent of Ontario's farms. In 2006 there were 2,700 farm operators in SD&G, about 2.4 percent of SD&G's population. The number of farm operators declined 16.7 percent. Their average age is 52 and retention of youth is a problem.

In 2006, SD&G had 1,811 farms, down 6.6 percent over 5 years and down 33 percent in 25 years. At that rate of decline, there are about 1,700 farms today. Dairy, cattle ranching and corn dominate. More than 9 percent of Ontario's dairy farms (448) are in SD&G, 2.6 percent in cattle ranching (292) and 4.6 percent in corn and grain (832). These are very strong agricultural sub-sectors. However, the number of dairy operations has declined 24 percent in 5 years and the number of cattle ranches has declined 19 percent in the same time period. In terms of acreage, corn and soybeans are dominant at 110,000 and 84,000 acres respectively. Since 2006, soybean acreage has experienced high growth and local farmers report that soy acreage in SD&G may have even doubled in the last 4 years.

SD&G has one flax farm (a hobby farm), 68 maple syrup operations and 26 bee farms.

The average size of a farm in SD&G is 274 acres, up 7 percent from 5 years previously and almost one-fifth larger than the provincial average of 232 acres. Farms in SD&G are undergoing consolidation. The mean distribution is between 10 and 400 acres.

The total market value of farms in 2006 was \$1.8 billion. In 2006, farm revenues were \$294 million up 11 percent from 5 years previously. Farm revenue averaged \$163,000 per farm. Only 132 of 1,811 farms (7.3%) made more than \$0.5M in revenues. Only 9 or 0.5 percent made more than \$2.0 M in revenue.

Farm expenses were \$228 million or 78 percent of sales. Animal feed represented 12.6 percent of expenses or 9.7 percent of sales. Energy was 9.6 percent of expenses or 7.5 percent of sales.

Farm income was \$66 million or 22 percent of sales. Average farm income was \$36,388 per farm, up 38 percent over the previous 5 years and about 38 percent higher than the provincial average.

These numbers date to 2006 when oil was \$50-\$70 per barrel. In July 2008 when oil reached \$147 barrel, energy and fertilizer costs spiked and farm incomes saw deep decline but not as bad as the province in general. In 2008, farm expenses rose over 9 percent, the largest increase since 1981. Two-thirds of this increase came from three inputs: fertilizer, feed and fuel. Recovery occurred in 2009. In 2010, the price of energy is inching up again with oil at \$80 per barrel.

### **Selected Agricultural Value Chains**

Dairy has such a large presence in SD&G. Soy and flax value chains will also be examined as they provide the primary inputs to the bio-alliance anchor companies: Natunola and Tri-County Protein).

#### ***Dairy***

SD&G has 448 dairy farms which supply milk to the Dairy Farmers of Ontario (the marketing organization for the province) on a "supply managed" quota system. The

advantage of the quota system is that it provides a steady supply of milk to processors such as Parmalat and Kraft. The dairy farmers are paid according to raw milk composition (butterfat, protein and other solids). As of Feb 2010, component prices per kilogram were: butterfat, \$10.14; milk protein, \$8.06 and other solids, \$1.67. The sector has a very low profit margin; thus there is an imperative for the production of value-added products. Examples include artisan cheeses produced by Glengarry Cheesmaking and numerous types of milk powders produced by Parmalat.

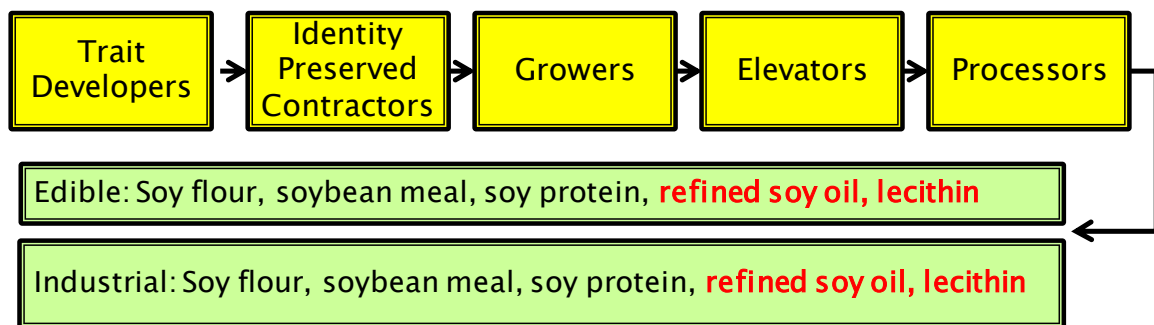
**Soybeans**

The soy bean value chain is outlined in Figure 1, below.

Trait Developers do R&D on soybeans to breed varieties that benefit growers and consumers. For growers, increases in yield, consistency and resistance to disease are desirable. To meet consumer demands and preferences, soy beans are bred for taste and nutrition. Traits include “mouth feel”, lower linolenic acid for shelf life, or increased omega-3. Soybeans are developed by both public and private entities in Canada. The seed breeding industry is dominated by the big three: Pioneer (DuPont), Syngenta and Monsanto) but locally, Hendricks is active in the sector.

Soybeans “identity preserved” (IP): i.e., unique traits or are preserved through production, transportation, handling and processing. Third party IP contractors perform testing on over 200 varieties of soy beans. Sophisticated records and documentation are typically required by certain customers or markets to track GMO (genetically modified organism) or non-GMO varieties.

**Figure 8: The Soy Bean Value Chain**



Canada produces more than 3.25 million metric tonnes of soybeans annually. SD&G produces 91,000 metric tonnes, 2.8% of Canada's production.<sup>13</sup> In SD&G, soybeans are grown on 154 farms covering 84,000 acres. The average farm is 543 acres although this has possibly doubled since 2006. The average yield is 0.9-1.2 metric tons per acre. The price for soybeans is \$350 to \$600 per metric tonne depending on quality, varieties, etc. Price, generally on the lower end of the range, has dropped 10 percent since last year and

<sup>13</sup> <http://www.soyinfocenter.com/pdf/137/Cana.pdf> accessed Mar. 31/10.

is expected to be volatile in 2011<sup>14</sup>. Food grade soybeans for export markets represent the majority of the industry's value-added although niche markets are emerging.

Challenges include the fluctuating Canadian dollar as well as developing a grower base to satisfy increasing global demand. Threats to soybean growers include the rising costs of inputs (fertilizer, crop protection products, seed, fuel) as well as pests. An additional threat is the uncertain export market acceptance of GM soybeans.

Soybeans are sent to local elevators for storage. This is a critical link in the value chain because quality storage is so crucial. Over 60 percent of Ontario's soybeans are handled and stored by 10 companies. In SD&G, local elevators include PH in Winchester with capacity 10-15,000 MT (metric tonnes) and Rutter elevator in Chesterville with a capacity 5,000 MT. Some beans are also sent direct to processors such as Hendrick Seeds and Tri-County Protein. Hendrick Seeds isolates and packages high quality soybeans for sale to Japan. Tri-County Protein employs a non-chemical crush and extraction (capacity 100 MT/day) to obtain crude soy oil and soy meal. Tri-County Protein is competing against very large processors in southern Ontario and Quebec, employing chemical-based (hexane) extraction with capacities over 3,000 MT per day. The processors sell soy oil, soy flour and protein meal (mainly as livestock feed).

Soy flour, soy meal, and soy protein all have both edible and industrial uses. Value-added soy products such as refined soy oil and lecithin also have edible and technical or industrial uses. SD&G has no local ability to refine soy oil to access value-added product possibilities.

Possible value-added edible applications of refined soy oil include antibiotics, cooking oils, mayonnaise, margarine, pharmaceuticals, salad dressings, salad oils, sandwich spreads and vegetable shortening. Value-added technical uses include caulking compounds, disinfectants, electrical insulation, insecticides, printing inks, putty, soap and wallboard.

Edible uses for lecithin include emulsifying agents in bakery products, surface active agents in beverage powders and chocolate coatings, anti-splattering agents in margarine and stabilizing agents in shortening.

Technical uses of lecithin include anti-foaming agents, dispersing agents for paints, inks and rubber, wetting agents in cosmetics, calf milk replacers and textiles, and stabilizing agents in emulsions.

A challenge for SD&G's soybean processors is to access or create soy oil refining capability to access the higher value applications of soy products.

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<sup>14</sup> CANADA: GRAINS AND OILSEEDS OUTLOOK, Ag Canada Report, 1/28/10.

## ***Flax***

According to OMAFRA, in the early 1950s, Ontario grew 74,100 acres of flax but this has now been reduced to less than 2,470 acres. Almost all domestic flax is now grown by 12,000 farmers in Western Canada. In SD&G, there is one small flax hobby farm. Most of Ontario's flax is grown in Grey-Bruce counties in southern Ontario. This dearth of flax is due to lack of local crushing/storage facilities and the attractiveness of other crops. Yet numerous companies in SD&G use flax inputs. Flax is a major input for Natunola Health, one of the anchor companies in the bio-cluster. Natunola has to purchase its flax from Manitoba and pay significant delivery charges. This major gap in the flax value chain represents a significant business opportunity.

### **2.3.3 Overview of SD&G's Food Sector**

According to Statistics Canada, in 2007, 22 companies were active in SD&G in the food industry (NAICS 31); 15 producing food for human consumption and 7 for animal consumption. The total number of employees in the food sector was 1,395. Over 500 were employed at Kraft (cheese) and Parmalat (cheese, butter and milk products).

The food sector in SD&G generated total revenue of \$1,033,246,000 in 2007 which was 47 percent of the revenue from all manufacturing industries (about \$2 billion). Total expenses were \$1,027,715,000 or 99.5 percent of sales. The number one cost was materials (mostly raw ingredients) at \$870,439,000 or 84 percent of sales. Manufacturing value-added was \$137,232,000. Total income was \$5,531,000 or 0.5 percent of sales; thus there is a significant need for value-added production.

### **2.3.4 Overview of SD&G's Bio-Product Sector**

Bio-Products are defined as commercial or industrial products (other than food, feed and medicines) made with biological or renewable agricultural (plant, animal), marine or forestry materials<sup>15</sup>. Bio-products encompass more than 20 NAICS codes, many overlapping with food and agriculture. Examples include bio-fuels, bio-energy, bio-chemicals, bio-plastics, cosmetics, and fibre composites, etc.

Chemicals Manufacturing (NAICS 325) may be the closest proxy for the bio-products category. In SD&G, in 2007, 12 companies and 248 employees were active in the chemicals manufacturing sector. Total revenue was \$140,501,000 or 6.4 percent of revenue from all manufacturing industries. Total expenses for the sector were \$125,896,000 or 89.6 percent of sales. Salaries and wages were \$12,601,000 or 9.0 percent of sales. Cost of materials was \$60,146,000 or 42.8 percent of sales. Manufacturing value-added was \$45,442,000. Total income was \$14,605,000 or 10.4 percent of sales.

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<sup>15</sup> Statistics Canada Bioproducts Development Survey 2004.

## A Summary SWOT Analysis

The macro analysis of SD&G and its three key sectors (agricultural production, food and bio-products) reveals the following:

### Strengths

- very strong revenues in the agriculture and food industries; the bio-product sector is growing; profit margins in agriculture and bio-products are strong
- high quality of life and low cost of living
- high quality of soil (8 percent organic matter in soil)
- proximity to Toronto, Montreal and Ottawa ( 1<sup>st</sup>, 2<sup>nd</sup> and 6<sup>th</sup> largest cities, 27 percent of Canada's population)
- 4 ports located on St. Lawrence Seaway; served by 2 major rail lines
- Located on Highways 401, 416 and 417
- Direct access to major North American markets
- existing infrastructure
- three hospitals plus a new clinic in Moose Creek
- inexpensive land: \$5,000 to \$10,000 per acre

### Weaknesses

- low rate of economic growth
- very low profit margin food industry
- HR problems; difficult to attract professionals; youth leaving
  - partly due to SD&G being mostly rural
  - partly due to agriculture, the dominant sector is losing its people
- key gaps in selected value chains: no soy oil refining; no local flax production.

### Threats

- rising costs of farm inputs such as fertilizer, crop protection products, seeds and fuel.
- Increase in pests: soybean aphids, soybean cyst nematodes and soybean rust
- uncertain market acceptance of genetically modified (GM) crops. EU has zero tolerance for GM foods. Japan allows GM soybeans for animal and industrial uses but not for human consumption.
- opportunity costs of inaction in economic development and cluster development.

### Opportunities

- access to capital through SD&G CFDC, CVCF and various federal programs.
- strong opportunity to develop a bio-cluster in SD&G. With that comes technology development and technology transfer, new businesses through organic growth and attraction, increased human resource needs and utilization, and youth retention and development.

## 2.4 The Micro Analysis

The micro analysis assesses specific companies from the agriculture, food and bio-products sectors from the perspective of bio-cluster potential. Companies selected for

review include the two anchor companies, Natunola and Tri-County Protein, and many of the companies that participated in the February 11<sup>th</sup> meeting to discuss this initiative. A list of companies evaluated is found in Appendix B.

### 2.4.1 Methods

As clusters develop, companies cooperate with each other and the local community to share and exchange resources such as materials, energy, information, infrastructure and finance. The developing industrial ecosystem optimizes the consumption of materials and energy while using waste or outputs from one process to serve as the raw material inputs for another process.

To evaluate the cluster potential of the selected regional companies, a five-step method was employed:

1. Capabilities, inputs, outputs and capacities of local businesses, utilities and institutions. The starting point is purchase of products and services as part of their Cost of Goods Sold (COGS)<sup>16</sup> - usually a company's greatest expense.
2. Input/Output Matching: Outputs from one company are matched with inputs from another company. This applies to products, waste and services.
3. Opportunities and linkages are identified by type. Examples include:
  - Waste exchange, intramural, co-location, local or virtual
  - Supply Chain (products, services, energy, knowledge, waste)
  - Marketing & distribution (i.e. Co-marketing, new distributors etc)
  - R&D Collaboration (product/process development)
  - Technology acquisition and technology matching
4. Soundness of economics and competitive advantage of business opportunities
5. Quantification of incremental gains. Metrics include the number of linkages by type, incremental revenues/savings/job creation/dollars retained in SD&G/export dollars/number of R&D projects and access to capital (via SR&ED, IRAP, other funding programs, VC, other) and number of new companies started or attracted to SD&G.

### 2.4.2 Results

The industrial ecosystem, outlined in Figure 9, was evaluated starting with 22 selected companies. Each company is profiled in Appendix B. At least 29 linkages were identified, not counting links to educational institutions, research institutes and funding providers.

Some linkages are already underway, some have developed since the initial February 11<sup>th</sup> meeting and some are speculative. A detailed description of the potential linkages is given in Appendix A. Numbers assigned to the linkages in Figure 9 correspond to details in Appendix A.

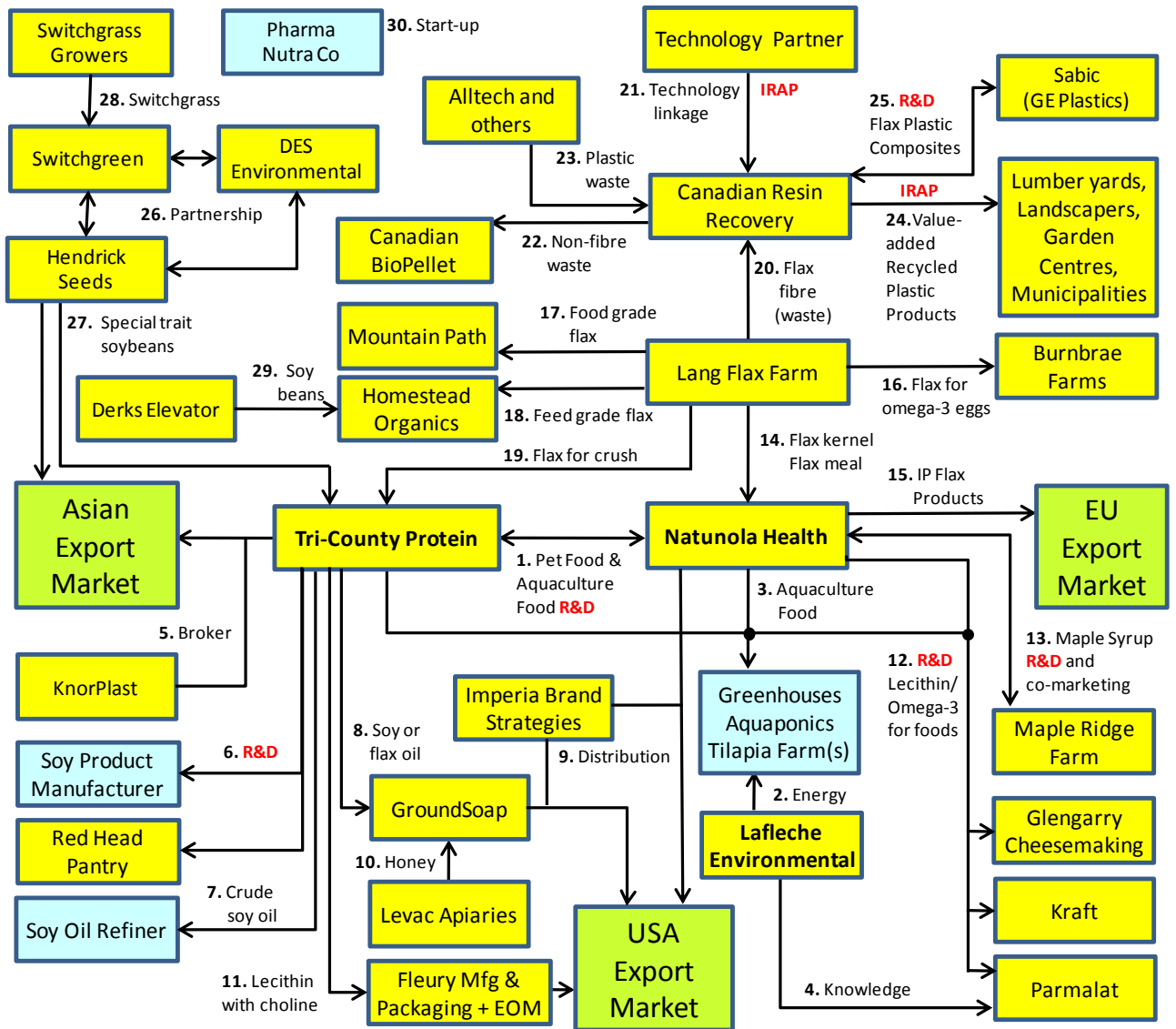
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<sup>16</sup> "The ED Linkages Service – Creating Supply Relationships between Regional Communities and Urban Economic Clusters" Doyletech Corporation. [www.doyletechcorp.com](http://www.doyletechcorp.com)

Figure 10 conceptualizes the linkages by category: biofuels, value-added waste utilization, food and food ingredients, energy from waste, small companies and non-food soy use.

Figure 11 shows numerous potential sources of HR, R&D & funding support for the companies in the bio-alliance.

**Figure 9: Chart of Potential Bio-Cluster Linkages**



Key: Green is export markets, yellow identifies companies in existence and blue identifies companies not in existence but on the short term horizon.

Figure 10: Categories of Potential Bio-Cluster Linkages

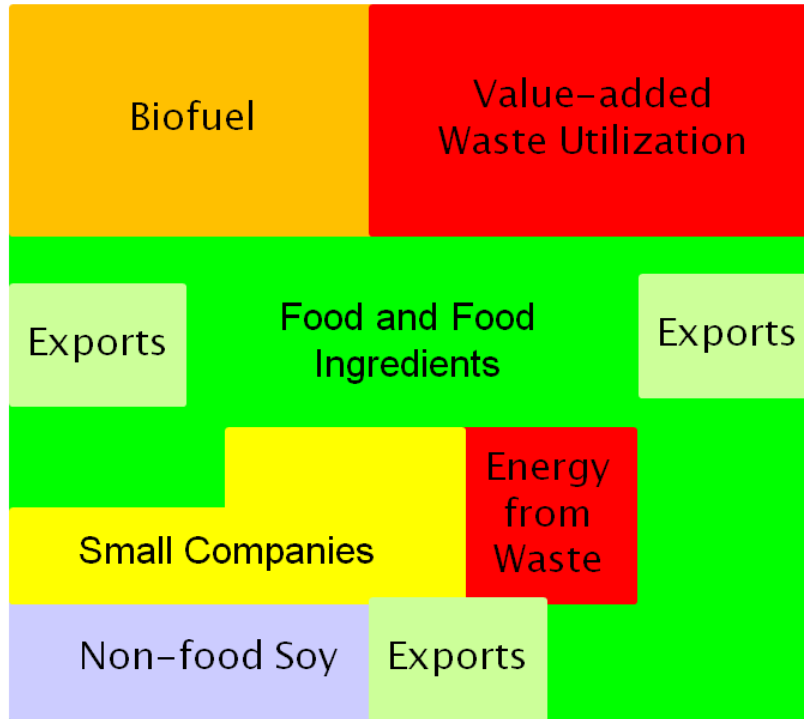
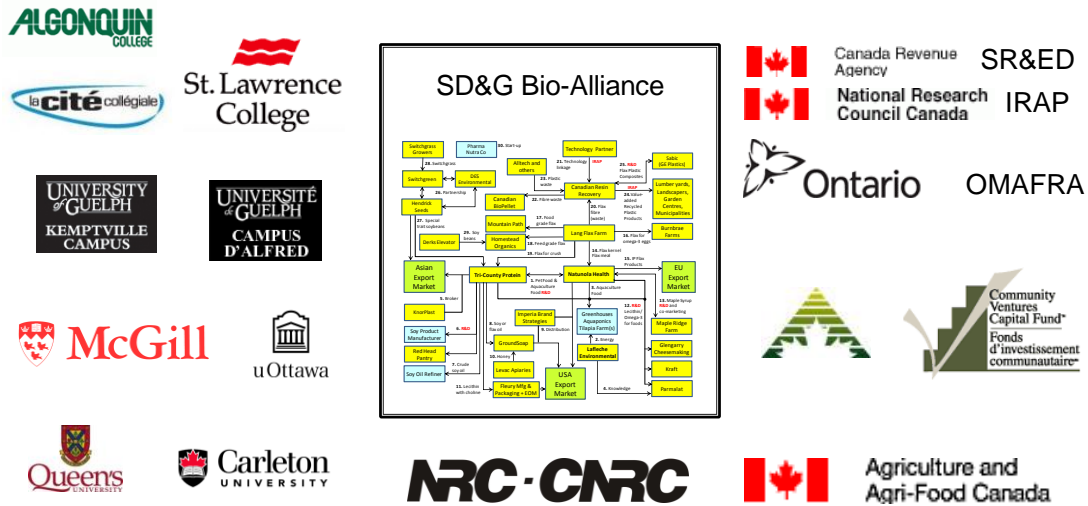


Figure 11: Specific Examples of Potential Bio-Cluster Linkages



### 2.4.3 Conclusions

Twenty-eight of the 29 linkages are virtual-based on value chain enhancement *across the region*: co-location is not a factor in their realization. One linkage is local (Natunola - Tri-County Protein), the other (Lafleche Agri Eco Industrial Park) involves co-location.

In addition to the 29 intercompany linkages, at least 8 others have been identified between bio-alliance companies and educational and research institutes. Natunola, Hendrick Seeds and Lafleche Environmental are linked to regional institutes for purposes of R&D. The large food and nutrition companies Alltech, Kraft and Parmalat also have sizeable R&D divisions though not necessarily located in SD&G.

The anchor companies of the bio-processing eco-industrial alliance are Natunola and Tri-County Protein. A follow-on cluster of companies would co-locate at the Lafleche industrial park. Linkages between the anchors and Lafleche partner companies are likely. Further cluster activity would occur due to the re-introduction of flax into SD&G. The Lang flax farm has the potential to produce flax as an input for numerous companies including the anchors. It would also produce flax fibre, “waste” for the purpose of plastic lumber production by Canadian Resin Recovery. Lafleche captures methane gas from waste decomposition to generate energy.

The value drivers in the emerging bio-alliance are:

1. The re-introduction of flax and the large number of potential food and industrial uses.
2. The utilization of waste as products (i.e., fibre from flax) or as energy (gas generation from organic waste).
3. The production of value-added food products from soy and flax by Tri-County Protein and Natunola.
4. Cost reduction due to location or co-location. For example, delivery costs incurred by companies using flax inputs will decrease by up to 90 percent once flax is re-introduced to SD&G.
5. Entrepreneurialism, R&D, technology development and innovation. Visionary business leaders are the ones who raise risk capital to drive economic growth and cluster growth through innovative business practices.

There are a tremendous number of value-added linkages among the companies of the bio-alliance. When the relationships are examined in detail (Appendix A) and tabulated, the incremental gains may be quantified as follows:

**Figure 12: Summary of Incremental Gains**

Incremental Gain	Number*	Incremental Gain	Number**
Total supply chain linkages	27	Revenue	> \$5M
Product	17	Cost reduction	> \$1M
Services	2	Profit	> \$2M
Energy	1	Jobs	> 150
Knowledge	3	\$ Retained in SD&G	>\$2.5M
Waste	4	Export dollars	>\$2.5M
Mktg & Distribution	3	R&D Projects	11
R&D Collaboration	7	Funding via SR&ED, IRAP, etc.	10
Technology acquisition	1	New companies to SD&G	8-13
JV or partnership	1		

\* there is some overlap in categories.

\*\* over 3 years.

Of the potential value chain linkages, 17 are products, mostly involving agricultural inputs such as flax or soybeans. There are also a number of waste linkages. Lafleche will generate energy from organic waste and sell to partner companies. The Lang Flax farm will yield waste fibre to be used in plastic composites. There are also a large number of potential R&D projects and collaborations.

The bio-alliance would spur significant economic incremental gains as outlined in Section I. An aggressive scenario based on rapidly realizing important opportunities that are now at the vision stage could generate significant jobs within three years. For example, the Lafleche Agri-Eco industrial park could be attracting tenants and Canadian Resin Recovery could be producing plastic lumber composites. Combined with initiatives from the anchor companies, incremental revenue is projected to exceed \$5 million. The re-introduction of flax is projected to result in more than a \$1 million in cost savings for various companies purchasing flax inputs. Furthermore, a healthy profit margin on incremental revenues combined with cost savings should see incremental profits easily soar past \$2 million.

Initially, the bio-alliance could generate, optimistically, over 100 jobs within three years. Numerous companies would be co-locating at Lafleche, possibly leading to more than 50 jobs. Canadian Resin Recovery expects an increase in 20-25 jobs from its plastic lumber initiative.

The re-introduction of flax into SD&G will also open export markets such as the EU due to the flax's non-GMO nature. Asian markets may be accessible by Tri-County Protein's products. Within 3 years, Natunola and GroundSoap may also be generating significant sales of product in the US export market.

While precise incremental economic gains are difficult to estimate, it appears there is tremendous potential for the establishment and growth of a successful bio-processing eco-industrial alliance in SD&G.

## 2.5 Deficiencies and Drivers

Interviews with potential participants in the SD&G bio-cluster revealed numerous problems (i.e. restraining factors or deficiencies) which could impede the formation of the bio-cluster. Solutions to these problems would help promote the formation of the bio-cluster. The identified problems and proposed solutions are listed in the following chart.

Problems (which may impede formation of the bio-cluster)	Proposed Solutions
<p>Access to capital is the single greatest problem or deficiency for most companies. Many small and mid-sized companies have capital needs for equipment, upgrades, R&amp;D, product development, marketing initiatives, land purchase, buildings for expansion or co-location, etc. Lack of sufficient capital prevents these companies from executing their business strategies.</p>	<p>In many cases, companies were unaware of potential funding programs such as SR&amp;ED, IRAP, RED and other programs promoted by SD&amp;G CFDC. Potential solutions involve initiatives to increase awareness of funding programs.</p>
<p>Most companies, other than the largest, do not have a business plan or pro forma financial statements. Only 3 percent of companies have a business plan and those that do are much more successful than those that don't. Business plans are almost always a prerequisite to obtain funding from government or private sources. Furthermore, many companies do not have the requisite skills to perform market research, develop commercialization strategies or perform proper profit analyses of their products and operations, all vital elements of a good business plan.</p>	<p>Possible solutions involve educational seminars to help companies acquire business planning skills, business know-how and knowledge about the process of innovation. Lists of business plan consultants could be made available to companies. Companies should also be made aware of funding programs such as EODP which provide business planning assistance up to \$5,000.</p>
<p>Access to information is also an identified deficiency in many local companies. Good information is vital to make good business decisions.</p>	<p>An information package could be drafted which outlines cost-effective ways to access information, lists accessible databases and gives insights on superior internet search methods.</p>
<p>There is a problem with the retention of youth and professionals and the retention of the latter.</p>	<p>One potential solution to these problems is the development and promotion of a thriving bio-cluster in SD&amp;G. High value jobs will become a draw for professionals from outside SD&amp;G, as well as encouraging local youth to stay.</p>

In summary, there is a strong need in SD&G for capital, business knowledge, information and human resources. Strategies which provide these elements constitute enablers or drivers which will promote the establishment of a bio-alliance.

## 2.6 Conclusions

SD&G has the beginnings of a very strong bio-processing eco-industrial alliance. There are at least 29 linkages. The sectors of waste recovery and utilization and the commercialization of food ingredients based on flax and soy are particularly promising.

## **Appendix A: Micro Analysis of Cluster Relationships**

The following paragraphs are numbered to correspond to the “linkage numbers” listed in Figure 2, “Chart of Potential Bio-Cluster Linkages”.

### **1) R&D Partnership between Tri-County Protein and Natunola Health to Produce Improved Pet Food**

The anchor companies of the bio-Alliance have pooled their resources and expertise to research and develop improved foods for pet food. Natunola brings chemistry and R&D expertise as well as packaging and distribution capability. Tri-County Protein brings soy supply as beans, protein concentrate, isolates and crude soy oil.

Soy provides a high level of protein. Flax provides numerous therapeutic ingredients including omega-3 fatty acids which improve the health and function of skin and coats, joints, kidneys, heart and immune system.

Projected U.S. retail sales of pet foods are projected to exceed \$20 billion by 2012 (Pet Food Market Outlook 2009-2010: The New Value Equation. Petfood Forum, April 2009, produced by Packaged Facts<sup>17</sup>). There is a huge market opportunity for innovative pet food products which combine health and wellness with an all-natural product concept and convenience for the purchaser.

### **2) Establishment of a Tilapia Farm at the Lafleche Enviro-Park**

Lafleche Environmental, recently acquired by Transforce<sup>18</sup>, is an innovative, advanced waste management company located in Moose Creek. Lafleche has set up state of the art bioreactor landfills<sup>19</sup> (“cells”) which decompose 300,000 MT of organic waste annually, primarily from Ottawa and surrounding areas. Recirculation of leachate encourages accelerated anaerobic reaction which decomposes the waste three times faster than traditional landfills. Methane gas is captured and will be used to generate electrical and thermal energy suitable for use by greenhouse, aquaponics and aquaculture operations. Currently Lafleche has 8 bioreactor cells per stage and is approved for 3 additional stages.

In 2011, Lafleche plans to set up an Agri-Eco Industrial Park on 90 acres of its land and attract companies that operate under a shared vision and guiding principles. Lafleche is potentially planning on using “green” energy from a future anaerobic bio-digester or its existing waste operation as an energy input for partner companies at the industrial park.

A natural fit for an initial partnership or tenant would be a tilapia farm in a heated greenhouse. Canadian tilapia operations suffer a natural competitive disadvantage of cold

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<sup>17</sup> [http://www.petfoodindustry.com/uploadedFiles/Petfood\\_Industry/Petfood\\_Industry\\_Articles/0907PETmarketupdate.pdf](http://www.petfoodindustry.com/uploadedFiles/Petfood_Industry/Petfood_Industry_Articles/0907PETmarketupdate.pdf) (see page 62)

<sup>18</sup> <http://www.obj.ca/Local/2010-03-02/article-849164/TransForce-subsidiary-buys-Ontario-landfill-company-Lafleche-Environmental/1>

<sup>19</sup> [http://www.laflecheenvironmental.com/images/lafleche6\\_9\\_05.ppt](http://www.laflecheenvironmental.com/images/lafleche6_9_05.ppt)

winters which elevate energy costs versus operations in the southern U.S. Low-cost energy from Lafleche, lower than the typical energy costs of 10-15 percent sales, could significantly level the playing field.

Lafleche's Agri-Eco Industrial Park is projected to supply energy for numerous companies within the next 10 years. Projected revenues are in the millions and projected job creation is in the hundreds.

### **3) Aquaculture Feed as Input for Tilapia Farm at the Lafleche Enviro-Park**

Aquaculture feed is a major input cost, typically 18-20 percent of sales. This input could be supplied by an aquaculture product produced by Natunola Health and Tri-County Protein with revenues remaining in SD&G. Alltech Biotechnology also sells aquaculture feed<sup>20</sup>.

### **4) Lafleche Environmental Assisting Parmalat to Reduce Waste Water Treatment Cost**

A reduction in waste water treatment costs would provide significant value-added to Parmalat. Lafleche Environmental are experts in waste water treatment. Possibly, Lafleche's advanced waste water treatment techniques and knowledge could be used to significantly reduce Parmalat's waste treatment costs. One could make a case that the new cluster/alliance envisaged in this document could play a role in the development of this opportunity where advanced waste treatment knowledge is transferred to Parmalat.

### **5) Brokerage / Co-Marketing Arrangement between KnorPlast and Tri-County Protein**

KnorPlast, operates as an industrial plastics recycling brokerage<sup>21</sup> with significant ties to the Chinese market. Through extensive dealings with Chinese clients, Eric has encountered many Chinese clients with substantial interest in Canadian natural health products and functional foods. Orders would potentially be quite large. Thus, Eric Lang has expressed an interest to broker large deals involving soy products produced by Tri-County Protein.

### **6) Creation of Value-added Input by Tri-County Protein for Soy Product Manufacture**

Tri-County Protein is working on a soy-based product which reduces manufacturing costs for selected soy product manufacturers. This may result in an IRAP-funded R&D project.

### **7) Crude Soy Bean Oil from Tri-County Protein as Input to a Soy Oil Refiner**

Tri-County Protein extracts crude soy oil from soy beans using non-chemical means. Capacity could easily increase to 16 metric tonnes per day.

TCP is able to extract 70 percent of the available crude soy oil from the beans. The crude oil contains 1-3 percent lecithin gum. Refinement of the oil is required to separate the soy

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<sup>20</sup> [http://www.alltech.com/en\\_US/nutrition/aquaculture/Pages/Introduction.aspx](http://www.alltech.com/en_US/nutrition/aquaculture/Pages/Introduction.aspx)

<sup>21</sup> <http://www.knorplast.com/>

oil from the lecithin. Both products have numerous value-added edible and technical uses.

Currently TCP sells its high quality crude soy oil to feed mills that use the oil as a binder for feed pellets. With refinement, TCP would have two bioproducts, soy oil and lecithin which could command a much higher price. Unfortunately there are no local soy oil refiners. It takes at a volume of least 40 metric tonnes of crude oil per day as an input to make a soy oil refiner viable. The local region doesn't produce this. TCP could attempt to integrate forward and refine a small portion of its crude soy oil to access value-added applications.

Significant capital is required to bring soy oil refinement to SD&G, filling this gap in the soy value chain.

### **8) Soy Oil from Tri-County Protein Sold to GroundSoap as a Raw Material Input**

GroundSoap is a small producer of hand-crafted soap formulated from organic and wild ingredients. GroundSoap uses vegetable fats (oils in form of triglyceride fatty esters) as a major raw material input. GroundSoap currently produces nine soap products using extra virgin organic olive oil and organic coconut oil as the main inputs.

Ground Soap could experiment with new product development using soy oil as the vegetable fat. Both refined and unrefined soy oils could be tested. A review of soap characteristics<sup>22</sup> indicates that soy oil produces a soft soap with a stable lather and conditioning -- all very attractive qualities. Importantly, from a business point of view, soybean oil is much less expensive than olive oil or coconut oil. Price (\$USD) per metric ton for the three oils in February/March 2010 was \$840<sup>23</sup>, \$3,484<sup>24</sup>, and \$950<sup>25</sup>, respectively.

The experimentation using soy oil possibly could be funded through IRAP.

GroundSoap's current capacity is 1,000 bars of soap per week at 6 to 7 oz per bar. Assuming all vegetable fats were replaced with soy oil (in product extensions), this translates to less than 10 metric tons of soy oil (crude, not refined) equivalent to less than 1 day's production by Tri-County Protein<sup>26</sup>. This could become a significant opportunity for Tri-County Protein only if GroundSoap's sales ramped up considerably and soy oil was used as a major input. Ground Soap would have to access specialized distribution channels for this to happen.

This linkage opportunity involves possible new product development, reduced input costs, and money retained in SD&G.

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<sup>22</sup> <http://www.soapnuts.com/indexoils.html>

<sup>23</sup> <http://www.indexmundi.com/commodities/?commodity=soybean-oil&months=60>

<sup>24</sup> <http://www.indexmundi.com/commodities/?commodity=olive-oil&months=60>

<sup>25</sup> <http://www.apccsec.org/document/PRICES.PDF>

<sup>26</sup> <http://www.soy2020.ca/pdfs/Canadas-Soybean-Value-Chain.pdf> (page 7)

## **9) Distribution of GroundSoap Products and Shelled Flax Kernel via Imperia Brand Strategies & Solutions**

Imperia Brand Strategies & Solutions Ltd (IBSS) is a sales & marketing consulting firm with an innovative strategy to link manufacturers (product vendors) of natural health products with huge U.S. distributors in the mass market or multi-level marketing arena<sup>27</sup>. IBSS has initiated discussions with GroundSoap to assist in a sales & marketing strategy to rapidly grow sales. The CEO of Imperia has experience linking an Australian soap manufacturer with U.S. distribution resulting in a jump in sales into the millions. The plan is to recreate this type of success. The niche attributes of the products are a positive factor.

If warranted by demand, Ground Soap has plans and capability to increase capacity. The company could hire two more staff and ramp production to 3,200 bars per week. With 4 additional staff, the company could produce 10,000 bars per week. With 8 additional staff, the company could produce 20,000 bars per week or about one million annually.

A second distribution opportunity involves Natunola Health. CEO Dr. Han reports that an ongoing need is access to distribution channels for his products. Possibly IBSS could assist.

IBSS is impressed with Natunola's Shelled Flax Kernel. One pound of product provides 90 servings of omega-3; each single serving (2 tsp) provides the daily recommended intake of omega-3 (EPA, DHA and ALA)

The product has many attractive features and benefits:

- trans-fat and gluten free
- a product of Canada (Canada has excellent NHP reputation)
- is for the maintenance of cardiovascular health
- is for normal development of the brain, eyes and nerves
- has extended shelf life
- requires no grinding or refrigeration
- is based on patented technology developed at Agriculture Canada

This product would be excellent for inclusion in an early stage multi-level marketing (MLM) with a limited product portfolio. If the MLM had 20,000 independent distributors, a limited product portfolio (i.e. 10 or less) and required monthly minimum purchase requirements. Annual sales of Shelled Flax Kernel could be significant.

## **10) Honey from Levac Apiaries as a Raw Material Input for GroundSoap**

The second ingredient listed on GroundSoap's website is Ontario honey<sup>28</sup>. GroundSoap doesn't currently source locally but has expressed a desire to do so. One litre of honey is

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<sup>27</sup> <http://www.imperia-solutions.com/>

<sup>28</sup> [http://www.groundsoap.com/ground\\_soap/Ingredients.html](http://www.groundsoap.com/ground_soap/Ingredients.html)

sufficient to produce 400 bars. One litre of honey, equal to 1.36 kg, sold for \$6.01 per litre in Ontario as recently as 2008<sup>29</sup>.

If GroundSoap sources locally, this would reduce input costs and would keep money in SD&G.

There is possibly another opportunity here. Colonies of bees could be placed at the Lang Flax Farm for the production of flax honey. It apparently is a very light coloured honey which crystallizes after a few days and then is almost white. The honey tastes fine and sweet.

This may result in a possible product-line extension for Levac Apiaries.

### **11) Tri-County Protein Supplies Lecithin with Choline to Fleury Manufacturing & Packaging for Processing and Possible Sale to Balchem**

Fleury Manufacturing & Packaging (FMP) based in Morrisburg is a toll drier of choline chloride for Balchem. FMP operates at 1/3 capacity of 1,000 MT per month. The company has 10 FTE jobs. FMP has excess capacity to dry organic materials for producers in the region. FMP also offers packaging services. Associated company, EO Millwrighting, handles maintenance for FMP and is available to assist other companies.

There is a potential link with Tri-County Protein (TCP). If TCP isolates lecithin gum from soy oil, this high value material could be potentially processed by Fleury for sale to Balchem. Lecithin contains choline, the key ingredient which Balchem sells. There may be a natural fit.

### **12) Speculative R&D Collaboration between Tri-County Protein and Natunola: Soy Lecithin Encapsulated Omega-3 Ingredient for Foods**

Soy lecithin has been found to be an excellent encapsulating agent for molecules which easily degrade. Omega-3 could be encapsulated and introduced into various food products such as cheese. Possibly the cheese-making food companies in the region could benefit.

### **13) Joint R&D between Natunola, Kemptville College and NRC; Potential Co-marketing with Maple Ridge Farm**

Natunola, NRC and Kemptville College have teamed up to research the first low glycemic index maple syrup. Glycemic index (GI) ranks carbohydrates according to their effect on blood glucose levels. Low GI contributes to a reduction in risk of heart disease and diabetes and is possibly a key to sustainable weight loss.

This new product would have significant sales potential with diabetic consumers. The Canadian Diabetes Association reports that more than 3 million Canadians have diabetes

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<sup>29</sup> <http://www.statcan.gc.ca/pub/23-221-x/23-221-x2008000-eng.pdf>

and this number is expected to reach 3.7 million by 2020<sup>30</sup>. Worldwide, an estimated 285 million people are affected by diabetes. With 7 million people developing diabetes each year, this number is expected to hit 438 million by 2030.

Strong demand would also likely come from non-diabetics who are simply very health conscious.

This R&D project, if successful, will improve markets and business opportunities for the area's maple syrup producers and should give the domestic processed food industry competitive advantages internationally.

As reported in the Ottawa Sun (March 13)<sup>31</sup>:

*Natunola is collaborating with the Natural Research Council of Canada and with the Agro forestry Education and Research Centre — including a pipelined sugar bush — on the Kemptville Campus of the University of Guelph which is supplying syrup and expertise to the project.*

*Campus spokesman Pat Remillard said Natunola has purchased the agro forestry centre's entire production over the past two seasons, up to 2,000 litres. The company is using the centre's state-of-the-art sap processing equipment and staff as part of the partnership, Remillard said.*

*Despite growth opportunities, the Ontario maple sugar industry has been lagging, project partners point out. In most cases, maple syrup production provides supplemental income to a primary agricultural operation; only a handful of farms make the majority of their income from maple sugaring.*

*Statistics make it clear that maple syrup needs new markets, the partners indicate. A decline in the number of Ontario trees tapped annually is directly related to slow sales, with production volume having increased more rapidly than demand.*

*Remillard said Kemptville Campus research indicates the maple industry should be providing products which are unique, lighter, and higher in nutritional value.*

*“The ultimate goal is to grow the maple syrup industry through quality improvement and market expansion. This project will offer producers training and technical assistance that will broaden and strengthen their capabilities and ability to compete in value-added markets.”*

This R&D project has very high potential. Natunola has further linked with Maple Ridge Farm, a maple syrup producer located in Apple Hill<sup>32</sup>. They will assist with co-marketing and promotion of a low glycemic index maple syrup.

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<sup>30</sup> <http://www.diabetes.ca/about-diabetes/what/prevalence/>

<sup>31</sup> Tom Van Dusan. “Sweet treat for diabetics”. Ottawa Sun, March 13, 2010.

<sup>32</sup> <http://www.mapleonline.com/>

#### **14) Re-introduction of Flax Production into SD&G by Lang Flax Farm; Sale of Flax to Natunola**

The Lang family has major agricultural holdings in SD&G. After discussions with Natunola, Eric Lang has decided to re-introduce flax into SD&G for the purpose of supplying the flax needs of local companies and to access flax fibre which will be an extremely useful input for his company Canadian Resin Recovery Inc.

First, Eric Lang is initiating a R&D project to test crop yield and processing of the flax and fibre.

Flax has to be planted by end of April for the 2010 growing season. Thus Eric made his decision to proceed with the feasibility study quickly. Flax has been sourced to plant a 10 acre test plot. If test results are positive, up to 1,000 acres of flax will be planted in 2011.

Flax yields (the seed) are in the range of 1,100-1,800 lbs per acre<sup>33</sup> and an equal amount is left behind in the field as flax straw<sup>34</sup>. A 1,000 acre farm would produce 525 to 850 metric tonnes of flax seed and an equal amount of flax straw. About 40 percent of the flaxseed is flax oil. After oil is extracted, the remaining flaxseed meal is a valuable livestock protein supplement. It averages 20 percent protein and has a gently regulating effect on livestock.

Flax could be sold as food grade or feed grade to local agrifood concerns depending on processing. The Lang Flax Farm is able to produce all of Natunola's annual needs. One particularly strong financial advantage for Natunola would be to source flax locally, decreasing shipping costs by over 90 percent. The money for the purchase of flax also stays in SD&G. The Lang Flax farm and associated operations are expected to create 10-15 jobs and will retain hundreds of thousands of dollars in SD&G.

#### **15) Greatly Increased Access to EU Export Market for Flax Products by Natunola Health**

Traditionally, 70 percent of flax exports from Canada have gone to Europe. However traces of CDC Triffid, a genetically modified (GM) variety, have been detected in some shipments. Consequently, the EU is severely restricting flax shipments<sup>35</sup>. The EU has a zero tolerance policy on GMO products.

While Western flax growers work to solve this issue, there will be a huge vacuum in the European market for non-GMO flax products. This represents a huge market opportunity for Natunola Health and other producers of consumable non-GMO flax products.

Natunola will source its flax inputs from the Lang Flax Farm. Since flax grown on the Lang Flax Farm is identity preserved and non-GMO, Natunola will be able to sell their products into the European Union. Strong sales are expected.

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<sup>33</sup> <http://www.omafra.gov.on.ca/english/crops/pub811/7other.htm>

<sup>34</sup> <http://www4.agr.gc.ca/AAFC-AAC/display-afficher.do?id=1226611043307&lang=eng>

<sup>35</sup> <http://www.flaxcouncil.ca/files/web/MESSAGE%20TO%20PRODUCERS%20Certified%20Seed%202011%20January,%202010.pdf>

Since the Lang Flax Farm is isolated, the probability of contamination with GM varieties is remote.

#### **16) Sale of Flax from Lang Flax Farms to Burnbrae Farms**

Burnbrae Farms of Brockville<sup>36</sup> produces omega-3 eggs. They purchase large quantities of flax and/or flax meal from Manitoba for poultry feed. Flax could now be purchased from Lang Flax Farm and save Burnbrae significant shipping costs, possibly up to 90 percent.

#### **17) Sale of Flax from Lang Flax Farms to Mountain Path as Input for Organic Human Food**

Mountain Path Inc. is a full-scale food distribution business providing bulk and packaged dried goods and groceries throughout Ontario & Quebec<sup>37</sup>. Situated on a 138 acre farm south of Ottawa in SD&G, Mountain Path has been strictly committed to organic production since 1975, and certified organic since 1987. Mountain Path uses a 30 inch stone mill in its operation which produces superior organic flours versus high capacity steel mills (which run hot). Mountain Path has a philosophy to buy local in an effort to support regional organic agriculture and business. Accordingly, Mountain Path will be able to purchase flax from Lang Flax Farm and will be able to make flax flour. Specialized vacuum sealant equipment may be required. Due to location of supply, input costs should be much less and dollars would be retained in SD&G. There may be significant demand for locally produced flax flour. It has been used since 2004 as a functional food in numerous long term care homes in Ottawa and Alexandria<sup>38</sup>.

#### **18) Sale of Flax from Lang Flax Farms to Homestead Organics for as Input for Organic Animal Feed**

Homestead Organics (HO) is an organic farm service business<sup>39</sup> based in Chesterville. Homestead sells organic flax and soy as animal feed in 25 kg bags<sup>40</sup>. HO will be able to purchase flax from Lang Flax Farm for animal feed and, due to location of supply, input costs should be much less and dollars will be retained in SD&G.

#### **19) Cold Press of Flax Seeds by Tri-County Protein to Produce Linseed Oil**

About 40 percent of the flaxseed is oil also known as linseed oil. Its major use is in oil-based paints and other protective coatings to yield a durable finish. Flax oil is also used in linoleum, printer's ink, soaps, putty, as an industrial lubricant and as a salt-resistant coating for concrete highways and sidewalks.

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<sup>36</sup> <http://www.burnbraefarms.com/consumer/index.htm>

<sup>37</sup> <http://mountainpath.com/>

<sup>38</sup> <http://www.oltca.com/axiom/DailyNews/2005/April/April04.htm>

<sup>39</sup> <http://users.xplornet.com/~tmanley/index.htm>

<sup>40</sup> [http://users.xplornet.com/~tmanley/files/feed\\_prices.pdf](http://users.xplornet.com/~tmanley/files/feed_prices.pdf)

TCP may source flax seed from the Lang Flax Farm then use its expertise and equipment in chemical-free crushing to produce linseed oil. Value-added production and the generated revenues would be retained in SD&G.

## **20) Flax Fibre Produced at Lang Flax Farm as Input for Canadian Resin Recovery**

Oilseed flax straw contains up to 40 percent fiber<sup>41</sup>. The fiber is extracted from the skin of the stem of the flax plant. Flax fiber is soft, lustrous and flexible; bundles of fiber have the appearance of blonde hair, hence the description "flaxen". Flax fiber has numerous value-added applications including use as biofuel, pulp sweetener, geo-textiles, insulation, cottonized flax, high quality paper products, linen fabrics, ropes and plastic composites.

With plastic composites, flax may be used to replace fiberglass in combination plastic/fiberglass products (plastic composites) such as auto parts, plastic lumber for decks and fences, etc. Fibreglass is used to impart strength, reduce weight and/or reduce cost. Flax fibres are generally cheaper, lighter and impart more springiness than fibreglass. In addition, flax fibres take less energy to manufacture and are easier to decompose or burn than fibreglass. The demand for flax fibres in plastic composites is growing by more than 50 percent annually in Europe and this trend has begun in North America.

Canadian Resin Recovery (CRR), owned by members of the Lang family, is a toll service recycler of industrial plastics. CRR has a strategy to integrate forward in the value chain to produce value-added recycled plastic products such as plastic lumber. Within 3-5 years, CRR projects incremental jobs to increase to 20 and incremental revenues and profits in the millions. More than 3 million kilograms of plastic lumber is projected to be processed annually. Depending on the percentage of flax fibre in the composites, this may require more than half of the flax fibre output from Lang Flax Farm. CRR receives a very useful low cost input and is able to produce a value-added product from agricultural "waste".

## **21) Technology acquisition by Canadian Resin Recovery**

Canadian Resin Recovery (CRR) is acquiring a technology to assist with its R&D and production of value-added recycled plastic products such as plastic lumber.

## **22) Non-fibre Waste from Canadian Resin Recovery Utilized by Canadian BioPellet**

Any non-fibre flax waste from CRR could be diverted to Canadian BioPellet as a source material for production of solid fuel bio-pellets. Dry flax straw generates up to 20 MJ/kg (8.6 MBTU/lb) of thermal energy<sup>42</sup>, superior to coal, wood and wheat straw.

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<sup>41</sup> <http://www.flaxcouncil.ca/english/index.jsp?p=growing12&mp=growing>

<sup>42</sup> [http://www.pami.ca/pdfs/reports\\_research\\_updates/using\\_straw\\_as\\_a\\_farm\\_heating\\_fuel\\_719.pdf](http://www.pami.ca/pdfs/reports_research_updates/using_straw_as_a_farm_heating_fuel_719.pdf)

### **23) Plastic and Cardboard Waste from Alltech Sent to Canadian Resin Recovery**

Canadian Resin Recovery receives plastic waste from industrial customers. Some is for toll grinding and pelletizing services. Some is diverted from landfill. Plastic waste generated by Alltech in Alexandria, currently shipped long distances, could be diverted to CRR in Cornwall, only 50 km away. This would represent a significant efficiency in the utilization and cost of waste processing. Also, the value of the recycled plastic waste would be retained in SD&G.

### **24) Production of Value-added Recycled Plastic Products by Canadian Resin Recovery**

Canadian Resin Recovery (CRR) has a strategy to produce value-added recycled plastic products such as plastic lumber. More than 3 million kg of plastic lumber is projected to be processed annually, possibly requiring more than half the flax fibre output from the Lang Flax Farm. Incremental jobs are projected to be 20. Incremental revenues are projected in the millions.

An IRAP-funded R&D project will examine optimum composite lumber formulations for key physical parameters such as strength, weight, melt flow, flex, etc.

### **25) Potential R&D Project by Sabic on Flax Filled Plastic Pellets**

Sabic, formerly GE Plastics, is a major client of Canadian Resin Recovery. Sabic produces millions of tons of glass-filled plastic pellets annually as a raw material input for the auto industry, etc<sup>43</sup>. Glass is used to impart strength but it also increases the weight significantly.

In recent years there has been a move to replace glass with natural fibers in plastic composite due to numerous inherent advantages<sup>44</sup>:

- Weight reduction of 10 to 30 percent
- Good mechanical and manufacturing properties
- Possibility to manufacture complex structural elements from one material in a single pass
- Good performance in accidents (high stability, no splintering)
- Superior environmental balance during material and energetic use, confirmed by several studies
- Occupational health advantages compared to glass fibers
- No emissions of toxic substances
- Overall cost advantage compared to conventional construction

Flax fibre is the most widely used natural fibre in the European auto industry. In 2005, 12,200 tons of flax (64 percent of total natural fiber) was used in the German auto

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<sup>43</sup> <http://www.sabic-ip.com/gep/Plastics/en/Home/Home/home.html>

<sup>44</sup> <http://www.druglibrary.net/olsen/HEMP/IHA/jiha6209.html>

industry<sup>45</sup>. Last year Peugeot announced that 20 percent of the polymeric materials in its cars will include flax and hemp fibers<sup>46</sup>.

Sabic is researching the use of natural fibers, including flax, in plastic composites. It could be a major publicity victory for the bio-Alliance consortium if Sabic were willing to perform R&D in SD&G and even set up an automotive test centre.

## 26) Hendrick Seeds, DES Environmental and Charles Forman to Start Switchgreen

SwitchGreen is a new biofuel company initiated as a partnership between Charles Forman, Glen Swerdfeger (DES Environmental) and David Hendrick (Hendrick Seeds). The company seeks to draw switchgrass supply from 500 to 700 acres locally<sup>47</sup>.

SwitchGreen is facilitating opportunities for producers in Eastern Ontario to grow Switchgrass. Switchgrass bales will be purchased and locally pelletized for biomass fuel. These fuel pellets will be used for both commercial and residential applications.

## 27) Hendrick Seeds Supplies Special Trait Soybean to Tri-County Protein

Possibly TCP could source special trait soybeans from Hendrick Seeds and process to produce value-added soy products for animals.

## 28) Supply of Switchgrass to Switchgreen

Switchgreen is encouraging local farmers to plant switchgrass which could be purchased by Switchgreen and pelletized for biofuel. Switchgreen makes the case that a decade of planting switchgrass would generate greater returns to the farmer than 10 years of traditional rotation (corn, soy, spring wheat).

**Figure 13: Switchgrass Total Net Revenue per Acre per Year<sup>48</sup>**

Rotation	\$/acre/year
5 years switchgrass only	\$234.50
5 years traditional rotation (corn, soy, spring wheat)	\$303.20
10 years switchgrass only	\$299.00
10 years traditional rotation (corn, soy, spring wheat)	\$268.85

Moreover, Switchgrass requires less inputs and thus profit per acre should be much higher.

Switchgrass is suitable for planting on marginal lands, representing a significant value-added opportunity for those farmers to use that land.

<sup>45</sup> <http://www.incropsproject.co.uk/documents/Events/FibreCropsOpenDay09/Michael%20Carus%20final.pdf>

<sup>46</sup> [http://www.ecocomposites.net/index.php?option=com\\_content&view=article&id=170:major-boost-for-flax-and-hemp-in-autos&catid=10:automotive](http://www.ecocomposites.net/index.php?option=com_content&view=article&id=170:major-boost-for-flax-and-hemp-in-autos&catid=10:automotive)

<sup>47</sup> <http://www.agrinenews.ca/archives/article-9998.htm>

<sup>48</sup> <http://www.switchgreen.ca/Average%20net%20revenue.html>

### **29) Derks Elevator Supplies Raw Materials to Homestead Organics**

Derks Elevator is a working farm growing 625 acres of soy beans and 825 acres of corn, 1,450 acres total<sup>49</sup>. Derks has storage for up to 7,800 tonnes for soy beans and corn. The farm also has a small crusher for extraction of soy oil and a bean roaster. Derks supplies roasted organic beans to Homestead Organics.

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<sup>49</sup> <http://www.agrinewsinteractive.com/archives/article-6263.htm>

## **Appendix B: Profiles of Selected Companies that could participate in the SD&G Bio-Alliance**

### **1. Natunola Health**

[www.natunola.com](http://www.natunola.com)

Natunola Health Inc. is a leading supplier of botanical ingredients to the cosmetic industry as well as shelled flaxseed to the food industry. Natunola produces products based on flax-seed derived omega-3 fatty acids, flax protein, flax lignans, specialty natural products, bio-nutrients and functional supplements for human and animal care markets. Natunola has developed and sold a range of new flax products such as shelled flax kernel and shelled flax meal. These products are shelf stable and do not require grinding or refrigeration. They are sold under the brand name Natunola® health's delight.

The Company also offers health conscious consumers a unique natural alternative to petroleum based ingredients for the cosmetic and personal care industry. Natunola uses patented vegetable gel technology to produce vegetable gels based on canola, sunflower, castor oil and rice bran oil, as well as customized ingredients.

The company has an office in Ottawa and manufacturing facilities in Winchester. The parent company is Natunola Health Biosciences Inc. (formerly Sentex Systems Ltd.) which trades on the TSX under NHI.

NEED: Natunola seeks additional customers and distributors for its cosmetic, functional food and natural health products.

CONTACT:	Dr. Nam Fong Han President & CEO Natunola Health Biosciences Inc. 661 St. Lawrence Winchester, ON K0C 2K0	Tel: (613) 774-9998 Fax: (613) 774-2226 <a href="mailto:nfhan@natunola.com">nfhan@natunola.com</a>
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### **2. Tri-County Protein**

[www.tripro.ca](http://www.tripro.ca)

Based in Winchester, Tri-County Protein (TCP) is the largest non-chemical, mechanical soybean crushing facility in Eastern Ontario. The plant processes 100 metric tonnes of soybeans per day and produces natural extracted soybean meal, high by-pass soybean meal, extruded/expelled soybean meal, crude oil, virgin oil and cold crushed oil. Brand names include the animal nutrition products Tri-Pro Gold and Tri-Pro Plus.

The plant is well located regionally. There is an abundant supply of soybeans in Eastern Ontario. SD&G also has large dairy herds and large pig operations. Livestock operations are one of the largest consumers of soy meal. TCP's feed output is split between local markets and those in Southwestern Ontario.

TCP sells its high quality crude soy oil to feed mills that use the oil as a binder for feed pellets. TCP uniquely is able to extract up to 70 percent of the available crude soy oil from the beans. Some oil remains in the soy meal (Tri-Pro Gold) which enhances

palatability, enhances animal health (less veterinary care), increases milk yields and product value.

NEED: TCP has carved a niche in the highly competitive animal feed industry but continues to seek additional customers and distributors for its animal nutrition products.

CONTACT: Brian Vandenberg  
Tri-County Protein  
P.O. Box 414  
12206 Gypsy Lane  
Winchester, ON  
K0C 2K0

Tel: (613) 774-0141  
Fax: (613) 774-2013  
[info@tripro.ca](mailto:info@tripro.ca)

### 3. Hendrick Seeds

[www.hendrickseeds.com](http://www.hendrickseeds.com)  
[www.hendrickagrifoods.com](http://www.hendrickagrifoods.com)

Hendrick Seeds specializes in the production, processing, and export of soybeans and other edible beans. The office and processing plant are located in Inkerman, 50 km south of Ottawa. The company's goals are:

- to be the leading producer, processor and exporter in Eastern Ontario of soybeans and other beans, destined for the Japanese and other markets,
- to conduct research in order to continually improve the quality and consistency of Ontario soybeans and other beans produced for Japan, and other Asian and global markets, and
- to follow a food-as-medicine strategy.

The products presented for sale to the export markets are carefully conditioned according to the customer's particular specifications, and are certified by the Canadian Grain Commission or other specified certifying agencies. The products are stored separately, by variety, at Hendrick Seeds' storage facilities in order to preserve the identity of the beans. The total capacity of the storage facility is currently 4,000 tonnes with an annual processing capacity of 15,000 tonnes.

Hendrick Seeds is associated with Hendrick AgriFoods, a leading contractor and supplier of exclusive lines of Canadian, non-GMO food-grade soybeans to the soy-food industry around the world.

NEED: Hendrick Seeds seeks additional customers and distributors for its food products.

CONTACT: James dePater, CEO  
Hendrick Seeds  
11791 Sandy Row  
RR 1 Inkerman, ON  
K0E 1J0

Tel: (613) 774-3469  
Fax: (613) 774-0346  
[jamesd@hendrickseeds.com](mailto:jamesd@hendrickseeds.com)

#### 4. Switchgreen

[www.switchgreen.ca](http://www.switchgreen.ca)

SwitchGreen is a recent start-up facilitating opportunities for producers in Eastern Ontario to grow Switchgrass. Switchgrass bales will be purchased and locally pelletized for biomass fuel. These fuel pellets will be used for both commercial and residential applications.

NEED: Switchgrass is currently seeking growers in Eastern Ontario to produce switchgrass.

CONTACT: Jim Wallbridge  
Switchgreen

Tel: (613) 561-6294  
[jimw@hendrickseeds.com](mailto:jimw@hendrickseeds.com)

#### 5. Mountain Path

<http://mountainpath.com>

Mountain Path Inc is a full-scale food-distribution business providing bulk and packaged dried goods and groceries throughout Ontario & Quebec. Situated on a 138 acre farm south of Ottawa in SD&G, Mountain Path has been strictly committed to organic production since 1975, and certified organic since 1987. Mountain Path uses a 30 inch stone mill in its operation which produces superior organic flours versus high capacity steel mills (which run hot). Mountain Path has a philosophy to buy local in an effort to support regional organic agriculture and business.

NEED: Mountain Path seeks additional customers and distributors for its food products.

CONTACT: Bob Hogg  
Mountain Path  
10755 Pepperville Rd.  
Mountain, ON K0E 1S0

Tel: (613) 989-2973  
Fax: (613) 989-1057  
[info@mountainpath.com](mailto:info@mountainpath.com)

#### 6. Homestead Organics

[www.homesteadorganics.com](http://www.homesteadorganics.com)

Located in Berwick, Homestead Organics (HO) is a leading organic farm service and supply company serving the organic agriculture industry in Eastern Ontario, Québec, Atlantic Canada, and northern New York. HO is an organic grain processor, feed mill, seed cleaner, and farm supplies and services company. HO provides organic field crop farmers in Ontario and Quebec with whole grain marketing and services including elevating, storage, cleaning and packaging. HO supplies whole clean food grade grains to soy processors and flour millers and whole feed grains to farmers and other feed mills. HO's organic feed mill grinds and mixes complete livestock grain rations for organic farm animals including dairy, poultry, pork and others. HO has a wide range of organic farm and garden supplies such as animal health supplements, pests controls, seed and soil amendments. HO sells directly to farmers and through a large network of farm supply dealers. HO has identified that 80 per cent of the billion dollar organic food market in Canada is imported. There is a tremendous business opportunity for import replacement by domestic organic food producers, processors and distributors.

NEED: HO seeks additional customers and distributors for its food products.

CONTACT: Tom Manley Tel: (877) 984-0480  
Homestead Organics Fax: (613) 984-0481  
1 Union St. tom@homesteadorganics.ca  
Berwick, ON  
K0C 1G0

## 7. Derks Elevator

Derks Elevator is a custom soy bean roaster located in Chesterville. Derks has an elevator and roasting facility and is installing an organic soybean press. Extracted oil is food grade although it could also be sold as a livestock feed additive or could be used for biodiesel. Derks sells organic soybean pellets which are in high demand by the local dairy industry.

NEED: Derks seeks additional customers and distributors for its food products.

CONTACT: Gary Derks Tel: (613) 448-2522  
Derks Elevator Inc. Fax: (613) 448-1025  
3063 Forward Rd. S  
Chesterville, ON  
K0C 1H0

## 8. Alltech Biotechnology

Alltech Biotechnology, headquartered in Lexington, KY, is a world-leading animal health and nutrition company with offices, manufacturing facilities and distributors in 120 countries. Alltech's mission is to improve animal health and performance by adding nutritional value to feed naturally. Alltech's flagship products are its Bioplex Trace Minerals which provide trace mineral nutrition to animals in a form as close to nature as possible. By presenting minerals in the same types of compounds found in grains and forages, Bioplex trace minerals are better able to meet the higher nutrient needs of modern livestock for rapid growth, maximum reproductive efficiency and animal health.

Alltech's Alexandria facility houses three spray driers capable of manufacturing the full range of Bioplex Trace Minerals with a capacity reaching 20,000 tons per year, making it one of the largest organic minerals facilities in the world. The facility primarily serves dairy, swine and poultry farms in Québec and the Maritimes. Soy protein and trace metal are major inputs.

Alltech has first class quality control. Alltech has total traceability and all sites are subject to rigorous quality assurance systems which exceed standards set by local, regional and international regulatory bodies.

Alltech produces health and nutrition products for 6 segments: beef & dairy, pig, poultry, aquaculture, equine and pets.

NEED: Alltech seeks additional customers for its products.

CONTACT: Jeannine Leroux Tel: (613) 525-0096  
Alltech Biotechnology Inc. Fax: (613) 525-5185  
181 Bishop St. N [jleroux@alltech.com](mailto:jleroux@alltech.com)  
Alexandria, ON  
K0C 1A0

## 9. Kraft

[www.kraft.com](http://www.kraft.com)

Kraft is the second largest food company in the world with \$42 billion in revenues. Kraft trades on the NYSE under KFT. Kraft has 168 manufacturing facilities worldwide, 12 are in Canada. The Kraft facility in Ingleside manufactures natural cheese products. Of the 98,000 Kraft employees worldwide, 350 work at the Ingleside plant.

CONTACT: Kraft Canada Inc. Tel: (613) 537-2226  
70 Dickinson Dr. Ingleside, ON Fax: (613) 537-8043  
K0C 1M0

## 10. Parmalat

[www.parmalat.ca](http://www.parmalat.ca)

Parmalat Canada is one of the largest food companies in Canada employing more than 2,900 employees in 18 operating facilities across the country. The facility in Winchester employs 190 and is focused on the production of milk powders, cheese products and butter. The parent company, Parmalat Finanziaria SpA, is listed on the Italian Stock Exchange in Milan under the ticker symbol PLT.

NEED: Parmalat is shifting from manual to automated processes and needs programmable logic expertise. These computer programming professionals are hard to find and retain in SD&G.  
Parmalat produces an abundance of whey permeate by-product that gets sold as low cost pig feed. Parmalat is looking at ways to turn this into a value-added product.

CONTACT: Stephen Wilson Tel: (613) 774-2310  
Parmalat Fax: (613) 774-3897  
490 Gordon St. [stephen\\_wilson@parmalat.ca](mailto:stephen_wilson@parmalat.ca)  
Winchester, ON  
K0C 2K0

## 11. Glengarry Cheesemaking

<http://glengarrycheesemaking.on.ca>

Glengarry Cheesemaking is an artisan cheese factory which supplies cheesemaking equipment, dairy supplies and accessories for cheese production, including cheese molds and other cheese ingredients for self-sufficiency and commercial cheesemaking establishments.

NEED: Glengarry Cheesemaking seeks additional customers for its products.

CONTACT: Margaret Morris Tel: (888) 816-0903  
Glengarry Cheesemaking Fax: (613) 347-1167  
5926 HWY 34 [info@glengarrycheesemaking.on.ca](mailto:info@glengarrycheesemaking.on.ca)  
RR #1 Lancaster, ON, K0C 1N0

## 12. Laflèche Environmental

[www.laflecheenvironmental.com](http://www.laflecheenvironmental.com)

Serving Eastern Ontario, Laflèche Environmental (LEI) is an innovative and advanced waste management company located in Moose Creek using cutting-edge technology to provide long-term waste disposal solutions.

LEI operates a state-of-the-art landfill site, known as the Laflèche Environmental BioReactor, which transforms organic waste (300,000 MT/yr from Ottawa and surrounding area) into a valuable asset that can provide benefits to society for decades to come. LEI has begun to extract methane gas from the landfill which will result in the construction of a 4 MW electric power generator, supplying green power into the Ontario grid. The methane will also be used to generate thermal energy to provide energy for partner companies such as greenhouses and aquaponics operations (i.e. tilapia, etc.) to be co-located on LEI's 90 acre Agri-Eco Industrial Park.

LEI also treats leachate at its wastewater treatment facility, operates a 40,000 tonnes/year agitated aerated channel compost facility, operates a 150,000 tonne/year soil remediation facility that biologically treats hydro-carbonated soils, and has tire and metal recycling operations. LEI's goal is to be the last landfill in Eastern Ontario by maximizing diversion opportunities. LEI has established R&D collaborations in the field of waste management with potential knowledge partners from educational and research institutes.

NEED: LEI seeks companies and municipalities interested in establishing value-added solutions to handling their waste.

LEI is interested in companies locating in LEI's Agri-Eco Industrial Park.

CONTACT: Brian King, President Tel: (613) 538-2776  
Laflèche Environmental, Inc. Fax: (613) 538-2779  
17125 Laflèche Road Brian@laflecheenvironmental.com  
Moose Creek, Ontario  
K0C 1W0

## 13. Imperia Brand Strategies & Solutions Ltd.

[www.imperia-solutions.com](http://www.imperia-solutions.com)

Imperia Brand Strategies & Solutions (IBSS) provides comprehensive consulting services to manufacturers and distributors in the natural health product, mass market and multi-level market industries. Imperia helps manufacturers of natural health products (NHPs), functional foods and cosmetics to find large distributors. Imperia also offers regulatory compliance services and private label solutions to large US distributors of NHPs that are currently offside with respect to Canada's NHP Regulations.

NEED: IBSS seeks companies looking for assistance with distribution of innovative differentiated natural health products, functional foods and cosmetics.

CONTACT: Paul Milne, Vice President Tel: (613) 826-3413  
Imperia Brand Strategies & Solutions Fax: (613) 482-3917  
5523 Lion St. [phmpm@sympatico.ca](mailto:phmpm@sympatico.ca)  
Osgoode, Ontario K0A 2W0

#### 14. Maple Ridge Farm

[www.mapleonline.com](http://www.mapleonline.com)

Maple Ridge Farm (MRF) is a family owned maple syrup farm, 550 acres, located at Apple Hill. The farm has produced maple syrup since 1850 and the farm's products are licensed through the Canadian Food Inspection Agency. The farm holds FSC certification<sup>50</sup> and was one of the first maple syrup farms in the world to hold this.

Maple trees produce the sap required to make maple syrup for only 4-6 weeks each year. MRF collects the maple sap using a vacuum system with more than 10 miles of plastic tubing that stretches from tree to tree. The sap is pre-heated using steam, boiled in an evaporator fuelled by a wood fire and then in a smaller, oil-fired evaporator. This ensures the maple syrup produced is of the highest quality possible. Recently Maple Ridge Farm installed a new Force 5 Lapierre Evaporator which makes very fine maple syrup with lots of flavour.

In the off-season, MRF makes maple candy, maple butter, maple sugar, maple jelly, gift baskets, and other products from pure maple syrup.

NEED: MRF seeks customers for its maple syrup products.  
MRF seeks financing for expansion of operations.

CONTACT: Gary Ivens, Owner Tel: (613) 527-5234  
Maple Ridge Farm Fax: (613) 527-1263  
18035 Highway #43, R.R.#2 [info@mapleonline.com](mailto:info@mapleonline.com)  
Apple Hill, ON  
K0C 1B0

#### 15. Levac Apiaries

Operating since 1945, Levac Apiaries (LA) is a 3<sup>rd</sup> generation family of beekeepers producing honey and gourmet flavoured honey, Ontario Foodland and Kosher certified. LA is a member of the Ontario Food Association, Ontario Beekeepers Association and the Canadian Honey Council. LA also produces beeswax skin cream, beeswax candles, honey soaps and gift baskets.

NEED: Levac Apiaries seeks distribution for products.

CONTACT: Joanne & Mark Lauterbach Tel: (613) 347-3480  
Levac Apiaries Fax: (613) 347-2320  
20389 Concession Rd 5 [levacapiaries@xplornet.com](mailto:levacapiaries@xplornet.com)  
Green Valley, ON K0C 1L0

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<sup>50</sup> <http://www.fscscanada.org/fsccertifiedforestsincanada.htm>

## 16. GroundSoap

[www.groundsoap.com](http://www.groundsoap.com)

GroundSoap is a local producer of unique, hand-crafted bars of soap formulated from only organic and wild crafted ingredients. GroundSoap produces nine soap products. Using a cold-process method, vegetable fats are saponified using lye in precise amounts to produce the soap. Extra virgin organic olive oil and organic coconut oil are the main inputs.

NEED: Ground Soap seeks increased access to distribution channels.  
Ground Soap seeks to source some ingredients locally.

CONTACT: Angela Youngs, Owner  
GroundSoap  
111 Augustus St.  
Cornwall, ON  
K6J 3V9  
Tel: (613) 937-3002  
[info@groundsoap.com](mailto:info@groundsoap.com)

## 17. Fleury Manufacturing & Packaging Inc.

[www.fmpdrying.com](http://www.fmpdrying.com)

Fleury Manufacturing & Packaging, Inc. (FMP) is a toll spray dry operation located in Morrisburg. FMP operates its Rotary Dehydration Facility, purchased from Chinook in 2008, to transform 1000 MT per month of choline chloride from Balchem Corporation into a spray dried solid finished product. Currently FMP operates at 1/3 capacity and thus has the capacity to fulfill the drying needs of any new customers.

FMP has 6 loading docks, storage for dry & liquid raw materials, 2 steel tanks capable of holding 2 million lbs of liquid each, 3 storage bins capable of holding 120,000 lbs. of dry material, rail access, a packaging room to fill valve bags from 20-25 kg and bulk totes from 500-1,000 kg, and an overhead loading system to load bulk finished product.

NEED: FMP seeks new customers with spray drying needs.  
FMP also seeks customers with packaging needs.

CONTACT: Marty Fleury, Plant Manager  
Fleury Manufacturing & Packaging, Inc.  
67 Prospect Rd.  
P.O. Box 1082  
Morrisburg, ON  
K0C 1X0  
Tel: (613) 543-2248  
Fax: (613) 543-3966  
[martinfleury@bellnet.ca](mailto:martinfleury@bellnet.ca)

## 18. Eastern Ontario Millwrighting Inc.

[www.eomillwrighting.com](http://www.eomillwrighting.com)

Eastern Ontario Millwrighting Inc. (EOM) is a 7,200 ft<sup>2</sup> millwrighting firm, welding fabrication and machine shop located in Morrisburg. EOM employs 20 including millwrights, tradesmen, apprentices and labourers. Main business is sales and services to the industrial and agriculture industry including:



The plant will have excellent water, rail and highway access. Most importantly, the facility will have close proximity to required feed stock from private and sustainable forests from Quebec, Ontario and the United States.

NEED: CBP seeks sources of available feedstock for biopellets.

CONTACT: [info@canbiopellet.ca](mailto:info@canbiopellet.ca)

## 21. Canadian Resin Recovery

[www.canadianresinrecovery.com](http://www.canadianresinrecovery.com)

Canadian Resin Recovery Inc. (CRR) is a family owned and operated plastic recycling company that specializes in toll grinding services for plastic product manufacturers. CRR accepts scrap plastic from manufacturers, shreds, grinds and/or pelletizes it, then returns the plastic back to clients in a form suitable for use as a low-cost input for the production of plastic products. CRR processes more than 250,000 kilos of plastic waste per week. CRR is based in Cornwall and Cobourg and provides its plastic recycling services to plastic product manufacturers, primarily located in the Toronto-Montreal corridor.

CRR has set up a testing laboratory to further develop methods of blending and recapturing usable material. CRR accepts waste material from a manufacturer and uses a variety of test processes to find a way to treat the material in such a way that it can be reused by the source. Through constant experimentation, CRR seeks creative uses for materials formerly destined for municipal landfill sites. As the company looks forward, CRR's strategy is to convert waste plastics into value-added finished manufactured goods such as plastic lumber composites.

NEED: CRR seeks sources of waste industrial plastics that are destined for landfills. CRR is looking for human resources in the areas of communications and marketing who will assist in promoting the advantages of plastic lumber and who will assist in finding distribution channels.

CONTACT: Eric Lang, President  
Canadian Resin Recovery Inc  
1800 Vincent Massey Rd.  
Cornwall, ON  
K6H 5R6  
Tel: (613) 932-2496  
Fax: (613) 932-3005  
[elang@knorplast.com](mailto:elang@knorplast.com)

## 22. Knor Plast Inc.

[www.knorplast.com](http://www.knorplast.com)

Knor Plast is an industrial plastics recycling brokerage that specializes in the purchase and sale of wholesale commodity and engineering grade polymers. Knor Plast operates in association with Canadian Resin Recovery. Launched in 2000, Knor Plast was recognized as the 5<sup>th</sup> fastest growing company in the Ottawa area in 2006.

NEED: Knor Plast seeks sources of waste industrial plastics that are destined for landfills.

CONTACT: Eric Lang, President  
Knor Plast Inc.  
Tel: (613) 932-3313  
Fax: (613) 938-3303

1800 Vincent Massey Rd.  
P.O. Box 561  
Cornwall, ON  
K6H 5R6

[elang@knorplast.com](mailto:elang@knorplast.com)

### **23. Lang Flax Farm**

The Lang Flax Farm is under consideration. The Lang family owns hundreds of acres of farmland in SD&G. If a feasibility study in 2010 shows that the re-introduction of flax into SDF&G is viable, the Lang family intends to plant hundreds of acres of flax starting in 2011. Flax fibre will be sold to Canadian Resin Recovery. Flax will also be sold to regional food companies.

CONTACT: Eric Lang

Tel: (613) 932-2496

Fax: (613) 932-3005

[elang@knorplast.com](mailto:elang@knorplast.com)