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## **Ecopreneurship: Rationale, current issues and futures challenges**

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There are limits to resources but none to human creativity.

### **Introduction**

Entrepreneurship is widely acknowledged to be the engine of economic growth. It was Schumpeter (1934) who argued convincingly that the innovations made by entrepreneurs are the strategic factors in economic development and the central factors in the trade cycle. Yet, mounting evidence in the natural environment has suggested over the past decades that growth does not go hand in hand with the preservation of nature. Increasing pollution levels, loss of biodiversity, land degradation, and climate change are only a few examples of this. This suggests an increasing need for environmental responsibility in entrepreneurship or, in other words, ecopreneurship.

The issue is not entirely new. In the late 1980s, the World Commission on Environment and Development (WCED 1987) led by Gro Brundtland developed the concept of sustainable development in an attempt to reconcile economic growth with environmental and social issues. At the Rio Earth Summit in 1992, the agenda for sustainable development as stated in Agenda 21 (1992) related two sets of issues. On one hand, there are problems of affluence that arise from the material consumption and production processes of developed, industrialized nations. On the other hand, problems of poverty beset the people of the poorest nations. Sustainable development seeks to resolve the environmental problems of affluence and the social problems of poverty within a transformed approach to the process of development.

By nearly universal agreement, these grand aspirations have fallen flat in the decade since the summit. Little headway has been made with environmental problems such as climate change and loss of biodiversity. Such progress as has been achieved has been largely due to three factors: more decision-making at local level, technological innovation, and the rise of market forces in environmental matters (The Economist, 2002a). Entrepreneurs play a central role in the two later factors: they identify opportunities and bring new technologies and concepts into active commercial use (Shane and Van-kataraman 2000).

We suggest in this article that there is a growing number of opportunities in ecopreneurship, which is fuelled by both the consumers' and authorities' demand for "green products". Therefore, there is not always a conflict between business and ecological goals, albeit the situations where it is difficult to allocate property rights – such as with public goods – remains problematic. The article is divided into four sections. The first section presents an overview of the limits of current production systems and builds a case for environmental responsibility. The second section details the inherent problems of public goods. The third section outlines the entrepreneurial opportunities linked to sustainable development. The fourth section presents a typology of ecopreneurs.

## The case for environmental responsibility

There is increasing evidence to suggest that major changes in the global and industrial system are needed if the world is to achieve a sustainable state before the middle of this century. Indeed, our economic subsystem has already reached or exceeded important “source and sink limits” (Constanza et al. 1997, p.8). Problems are particularly acute with sink limits. Those limits – contrary to source ones – are global, not open to substitution, and involve common property where markets fail.

- *Finite resources.* Human societies and the business which operate within them are substantial consumers of natural resources. Both organic (such as fish and flowers) and non-organic stocks (such as minerals or gas) are limited in their capacity, and are a finite resource. Once consumed, many of them cannot be recreated. Without sufficient resources, firms cannot service consumers and so generate a profit. Therefore, organizational survival requires biological survival (Barnes 1994, Arber, Speich 1992).
- *Growing population.* The world population is poised to expand by 50% by 2050 and with it comes an extraordinary growth in consumption (WBCSD 2002). In emerging countries this expansion of population has been doubled by fast growth in income. This has allowed people to expand their consumption of everything to meat and dairy products, computers, cars, and refrigerators. Although part of this consumption is essential to relieving poverty in many nations, the high consumption of the world’s affluent consumers can have a negative impact on ecosystems disproportionate to their numbers. Industrial countries overconsume per capita, consequently overpollute, and so are responsible for by far the largest share of our approach to the limits.
- *Natural resources degradation.* Today’s economies act as a linear system: most materials and energy are taken from the natural environment, put to a brief useful life, and then become waste in the atmosphere, on land, or in water. As a result, pollution take a large toll on human and ecosystem health. In many cities, levels of SO<sub>2</sub>, NO<sub>2</sub> and suspended particles exceed healthy limits recommended by the World Health Organization. The CO<sub>2</sub> released from burning coal, oil and natural gas is accumulating in the atmosphere, leading to greenhouse gas accumulation and potential climate change.
- *Biodiversity loss.* The scale of human economy has grown so large that there is no longer room for all species in the ark. The rates of takeover of wildlife habitat and of species extinction are the fastest they have ever been in human history and are accelerating. According to Goodland (1991), the world’s richest species habitat, tropical forest, has already been 55% destroyed, and the current rate of loss exceeds 168 000 square kilometers per year.

For some, the doom and gloom is widely exaggerated. Lomborg (2001), for example, suggested that known reserves of fossil fuel and ore have risen. Agricultural production per head has risen; the numbers of people facing starvation have declined. The threat of biodiversity loss is real but exaggerated, as is the problem of tropical deforestation. And pollution diminishes as countries grow richer tackle it energetically. Although there is

still much to be done in order to document the state of the ecosystem, a major risk is often skated over. The possibility that some environmental processes involve irreversible “triggers”, which, once pulled, lead to sudden and disastrous deterioration (The Economist 2002b). For example, climate scientists believe that too much warming could lead to irreversible bad outcomes such as the collapse of the mid-Atlantic “conveyor belt” (an ocean current that warms Europe). The science here is thin: nobody knows what level of greenhouse gases in the atmosphere would trigger such as calamity. But the risk argues for caution.

Although there is not yet a scientific consensus on the extent of the needed changes, it is clear that they will involve significant technological elements, as well as major investments. Entrepreneurs, as catalysts for change and innovation in society, will play a central role in the shift from a techno-economic “trajectory” based on exploiting natural resources – soil, water, biodiversity, climate – that, once lost can never be replaced, to one that could lead to a future that preserves and conserves these resources. Never has there been such an opportunity and imperative for innovation that meets the needs of consumers without damaging the planet’s natural resource base.

The road to long-term sustainability will require more eco-efficiency – a management strategy that promotes environmental and economic performance. The World Business Council for Sustainable Development (WBCSD), which first coined the concept of eco-efficiency, defined it as “The delivery of competitively priced goods and services that satisfy human needs and bring quality of life, while progressively reducing ecological impacts and resource intensity throughout the life-cycle, to a level at least in line with the earth’s estimating carrying capacity.” (WBCSD 1997, p.3).

### **The problem with public goods: Valuation and externalities**

Ecology and economy have often been seen as conflicting, because the prevailing view is that there is an inherent and fixed trade-off between the two. On one side of the trade-off are the social benefits that arise from strict environmental standards. On the other side are enterprise’s private costs for prevention and cleanup – costs that lead to higher prices and reduced competitiveness. This antagonism stems firstly from the fact that the ecosystem components (air, oceans, topsoils, wild species) are public goods, which makes them particularly difficult to value and lead to sub-optimal global consumption. Secondly, since the consumption of these public goods can create some externalities.

Valuing environmental goods is a daunting task because they are a subset of a general class of goods called “public goods”. The distinction between public goods and private goods has nothing directly to do with whether they are publicly provided, although it turns out that they will have to be. Rather, being a pure public good hinges on two critical properties: (1) a public good is non-rivalrous in consumption (e.g. your breathing of clean air or looking at a scenic view, does not affect my ability to do so), and (2) a public good is also non-excludable in consumption (e.g. we cannot be prevented from seeing the view or breathing the air).

Two important problems stem from those properties. Firstly, it will never be profitable to produce public goods privately, because the producer who incurs the cost of production cannot prevent the consumer from using the good freely. Therefore, the government must be in charge of supplying public goods (e.g. clean air or police protection). Secondly, how is the government to decide how much to provide? Samuelson (1954) suggested that governments should be guided by what people would be willing to spend on public goods if those could be bought in a market. One difficulty is discovering what people would be willing to spend.

Not only it is difficult to value public goods, but their consumption can create externalities, also known as spillovers or neighbourhood effects. Externalities are any cost or benefits of production and exchange that are not taken into account by those creating the costs or benefits. Examples of positive externalities include the benefits to a passerby of a beautiful garden on a busy street, or a safer neighbourhood for others that results from some residents hiring private security patrols. Examples of negative externalities include an unmowed lawn in a suburban neighbourhood, or automobile exhaust.

Hardin's (1968) classic paper on the tragedy of the commons (more accurately the tragedy of open-resources) is an illustration of externalities: it refers to the lack of incentive to husband resources (like fish in open water) that are owned by everyone, and thus by no one (until they are caught). Externalities lead to "social traps" (Costanza, Perrings 1990). In this situation, individuals (or firms, or countries) pursuing their own private self-interest in the absence of mechanisms to account for community and global interests, frequently run afoul of those larger goals and can often drive themselves to their own demise. For example, overfishing in open water is a social trap because by following the short-run economic road signs, fishermen are led to exploit the resource to the point of collapse. Here again, as Pigou (1920) demonstrated, the intervention of the State is needed to devise policy instruments such regulations and taxes that can restore economic efficiency and increase global welfare. Still other approaches are currently being explored, such as tradable permits and quotas.

### **Sustainable development and new entrepreneurial opportunities**

Considering the apparent antagonism between environment and economics, there seems to be no painless pathway to sustainable growth. Ayres (1997, p.26) remarked that, "assuming technological and economic feasibility, it is difficult to conceive a painless (or near-painless) development trajectory such that each incremental socio-economic change leaves every politically powerful interested party better – or, at no worse off – than before." In other words, there are hardly any "win-win" solutions or "free lunches" in the economic world of profit maximizing and perfect information.

Similarly, Walley and Whitehead (1994) remarked that the current talk of win-win solutions are cheap, while environmental initiatives are not, because of four main factors:

- Easy environmental problems have been fixed.
- As environmental challenges become more complex, costs are rising.

- Costs are destined to increase even more, especially since the increase in regulations shows no signs of abating.
- New policy instruments such as tradable permits, pollution taxes, and quotas require in-depth cost-benefit analysis and complicate the manager's decision.

While these hurdles must be acknowledged, we nevertheless argue that there will be an increasing number of “green” entrepreneurial opportunities in the future because of several factors.

### *The nature of homo economicus and market failures*

First, the homo economicus – entrepreneurs, consumers, and citizens – is not as blind to the necessary conditions for social behavior as suggested by critics of economics science. In mainstream economics, to say that people are rational is not to assume that they never make mistakes, as critics usually suppose. It is merely to say that they do not make systematic mistakes – i.e., that they do not keep making the same mistake over and over again. And then when economists talk of self-interest, they are referring not just to satisfaction of material wants, but to a broader idea of “preferences” that can easily encompass, among other things, the welfare of others (The Economist 1998). This implies that the homo economicus may not be so oblivious to environmental concerns as critics of the dismal science often suggest.

Furthermore, entrepreneurs are constantly finding opportunities, including environment-related ones, for making extraordinary profits. If no profitable opportunities existed, there would be no entrepreneurs. Since there are many entrepreneurs, it follows logically that many more such profit opportunities exist. In recent years, since environmental concerns have become pressing, surprisingly many profitable opportunities have been found to reduce environmental pollution. Indeed, contrary to neo-classic economics teachings, (free) markets are characterized by a constant disequilibrium, which allows the emergence of extraordinary profits. The entrepreneurs who improve their technology, organization and processes, and innovate are the catalysts of this disequilibrium.

Such imbalance in the market are not only the result of the creative destruction of entrepreneurship. They originate also in numerous “market failures”. For example, industry and consumers have not always chosen the optimal energy technologies, even at present prices. Entrenched oligopolies or monopolies, established regulatory bodies, institutional separation between decision-makers and final consumers who pay the costs, lack of technical information are the most likely failures (Ayres, 1994).

### *The push factors: Regulations, costs of waste disposal, and scarcity of natural resources*

A variety of “push” factors can trigger environment-related business opportunities. Among those, Porter and Van der Linde (1995) argued that properly designed environmental standards can induce innovation that may partially or more than fully offset the costs of complying with them. Such “innovation offsets” can not only lower the net cost of meeting environmental regulations, but can even lead to absolute advantages over firms in foreign countries not subject to similar regulations. For example, the Clean Air Act created a massive new market in the 1990s. US industry, especially pe-

troleum refiners, vehicle makers, power utilities, and manufacturers spent billions of dollars yearly on improved air-pollution-control systems. Similarly, the Clean Water Act and the Safe Drinking Water Act boosted demand for wastewater treatment technologies. Regulations like these mean opportunities for entrepreneurs.

Similarly, the cost of waste disposal forces companies to innovate in order to reduce the quantities of waste generated by their products. Product disposal costs have increased significantly in recent years as landfill and incineration capacity is being depleted. Purchasing programs favor products that are reusable or that have reused content. At the same time, some natural resources have become scarcer and more expensive. Hence, business strategies built around the radically more productive use of natural resources can solve many environmental problems at a profit. (Lovins et al. 1999) Start-ups, which have a more efficient production process – consuming less raw material or less energy – enter the market place with a competitive advantage. This is a good “win-win” solution, whereby profit maximizing entrepreneurs try to economize on their scarcest resources.

#### *The pull factors: Consumers’ demand and green partnerships*

Yet another source of opportunities for environmental-friendly goods and services comes from the market place. Clancy (1991) remarked in the early 1990s that consumers said they were willing to spend up to 10 percent more for products which are environmentally safe. The recent scandals in the food industry (e.g. mad cow disease, dioxin contaminated chickens, contaminated mineral water and Coca-Cola) have also made consumers more aware of the environment and what they eat.

The ever increasing demand for ecological goods and services has largely been fuelled by some companies having established what amounts to a complete “green philosophy”. The cosmetic industry is perhaps the epitome of this new approach that covers the ingredients, production, packaging, advertising, and general image. Green became first a marketing tactic, then with time it evolved into a philosophy, with nearly every public act of the company closely geared to saving, nurturing or restoring the environment. Sponsorship of programs to plant trees, clean up streams, restore to pristine beauty parks all were taken on by some cosmetic companies (e.g. The Body Shop, Redken, Borlind and others).

Over the last two decades, a variety of interorganizational partnerships and networks have been formed to raise consciousness, share best practice, and co-ordinate action. Examples of such networks include the Social Ventures Network, Business for Social Responsibility, and the World Business Council for Sustainable Development. There have been instances, too, of companies working jointly with non-profit organizations to promote environmentalism and business. Ben & Jerry’s and The Body Shop, for example, work with Cultural Survival in their rain forest ventures. Yet another example of green partnership is the China Energy Technology Program devised between ABB and the Alliance for Global Sustainability to develop cost-effective and efficient power generation in China.

## Toward a typology of ecopreneurs

We distinguish between two categories of ecopreneurs. The first category, we shall call “environment-conscious entrepreneurs”, are essentially those who are well aware of environmental issues, but they are not in the environmental marketplace. Such entrepreneurs typically pursue business-centered opportunities which have an environmental dimension. In doing so, they strive for eco-efficiency – producing better goods and services while using fewer resources and generating less impact, thereby improving both their environmental performance and bottom line. We can find this type of entrepreneur in virtually all industries, although the most prominent are found in the cosmetics, chemical, car manufacturing, transportation, petroleum and mining industries.

The opportunities available can lead environment-conscious entrepreneurs to independent start-ups (e.g. The Body Shop, Ben & Jerry’s, Patagonia – see case 1) or to various forms of corporate venturing initiatives, such as new divisions, new subsidiaries, joint-ventures or spin-offs. For example, Cargill and Dow Chemical chose to set-up a joint-venture, Cargill Dow, to manufacture and market polymers for producing fibres and packing materials that are derived entirely from annually renewable resources). More broadly, we consider environment-conscious entrepreneurs to be the individuals who develop any kind of innovation (product, service, process) that either reduces resource use and impacts or improves cost efficiencies while moving towards a zero waste target.

### Case 1: Patagonia

At Patagonia, a visitor’s first impression blurs myth and reality. Tucked behind the company’s main building like a well-preserved shrine stands a corrugated-tin shed, in which Yvon Chouinard began, back in 1957, forging mountain-climbing hardware for his friends. Chouinard developed a new kind of piton to handle the climb’s crux, a hairline crack. The new piece of hardware, which he dubbed a Realised Ultimate Reality Piton (RURP), was key to the advancement of climbing. Between first ascents in Yosemite Park, Chouinard began selling hand-forged chrome-moly pitons from the back of his car. In 1970 he and Tom Frost started the Great Pacific Iron Works – which would later become Patagonia Inc. and Chouinard Equipment (now Black Diamond).

A mountain climber by calling and an entrepreneur, it appears, by accident, Chouinard has made building a company look easy. With Patagonia’s sales as much as doubling yearly in the 1980s, Chouinard, you’d think, was a driven man with a shrewdly devised business plan. Not to hear him tell it. “I’m a craftsman who had a better idea of how to make things,” he says. “It so happened people wanted them.” To Chouinard, however, business seems an afterthought; saving the world has become his primary mission. For him Patagonia exists to serve as a model for corporate responsibility. Chouinard first became interested in the environment in the 1970s through the Ventura River. A young man stopped by the offices to make a pitch. He called himself, ambitiously, “Friend of the Ventura River”, and his plan was to restore the filthy trickle near the company headquarters to its former, wild self. Chouinard, who is also a fisherman, saw that he had to become involved to try to save this river. His environmental activism became stronger in the 1980s, as climbing had become trendy and attracted too many irresponsible climbers who were harming the mountains.

Today, Patagonia’s staff numbers more than 1 000 world-wide, with sales exceeding \$200 million. Alpinism remains at the heart of the company’s business that now makes clothes for paddlers, anglers, endurance athletes and others who aspire to move more freely through the natural world. Although Chouinard stepped down as CEO, Patagonia remains committed to grassroots environmental activism. The company defines itself as “Environmentally conscious makers of quality outdoor clothing”. Its main environmental projects and achievements are as follows.

*Environmental grants.* Since 1985, Patagonia donated 10 percent of their annual profits (or 1 percent of sales, whichever is greater) to over 1 000 grassroots environmental groups – \$17 million in cash and an-

other several million in gear. Grants target primarily innovative groups overlooked or rejected by other corporate donors. The company privileged activists who take radical and strategic steps to protect habitat, wilderness and biodiversity at the grassroots level.

*Cleaner and socially responsible production.* In 1991, Patagonia started a comprehensive environmental review to examine all of the methods and materials used in its clothing. As a result, it introduces cleaner production components and processes. For example, in 1993, the company began using fleece made entirely of post-consumer recycled fleece spun from recycled soda bottles throughout its very popular line of jackets and vests. In the same year it announced that it had given up using any cotton other than organically-grown. The production staff regularly travel to every production location in the U.S. and abroad to manage the traditional agenda of the business such as quality control, delivery schedules and cost negotiations, as well as to observe the working environment. In addition, the company funds independent ethical audits of every production facility. These audits include an examination of issues such as wages, hours of work and age of workers, among other criteria.

*The Patagonia Environmental Internship Program.* This program allows employees to take paid leave for up to two months to work full or part-time for the non-profit environmental group of their choice. More than 150 employees have interned for organisations around the world since the program began in 1993.

*Conservation and restoration – The Patagonia Land Trust (PLT).* This is a non-profit organisation focused on buying, protecting and restoring grasslands, forests and coastal lands in the Patagonia region of South America. Established in 2000, PLT has already protected over a quarter of a million acres in Patagonia, and seeks funds to save at least a million acres more over the next five years.

*Source: Patagonia*

The whole issue of product recovery management (PRM) is a good example of a domain, which spans all manufacturing industries, where numerous opportunities have emerged for environment-conscious entrepreneurs. PRM encompasses the management of all used and discarded products, and materials that are produced by a manufacturing company (Thierry et al. 1995). In doing so, the company recovers as much of the economic (and ecological) value, thereby reducing the ultimate quantity of waste. Recovery options include repair (restoring a product to working order), refurbishing (replacing and upgrading some modules), remanufacturing (replacing worn-out components by new ones), and recycling (reusing materials to produce new products or parts). The manner in which opportunities are pursued varies greatly. It may be rational for a firm to engage itself in recovery activities, or alternatively, to sub-contract those activities, or to encourage corporate spin-offs to assume the responsibility (Guide, Van Wassenhove 2000).

The second category of ecopreneurs, called “green entrepreneurs”, are those who are both aware of environmental issues and whose business venture is in the environmental marketplace. Such entrepreneurs pursue environmental-centered opportunities which show good profit prospects. Green entrepreneurs are found in the environmental industry which is traditionally divided into five categories: (1) recycling or disposal of solid waste, (2) remediation of polluted areas, (3) air pollution control, (4) water treatment, and (5) engineering and consulting services (Fischetti 1992).

As more and more entrepreneurs consider first the environment rather profit, more categories can be added to the environmental industry. Consider farmers who engage in the production of products through the use of ecological principles (respecting the natural capacity of plants, animals and landscapes). Organic agriculture (also called biological or ecological farming) dramatically reduces external inputs by refraining from the use of chemical fertilizers, pesticides and drugs. This is a fast growing industry. According to Yussefi and Willer (2002) the world retail market for organic food



and beverages increased from an estimated US\$10 billion in 1997 to an estimated US\$17.5 billion in 2000. In 2002, more than 17 million hectares are managed organically worldwide. But perhaps the best, and to some extent, most extreme examples of green entrepreneurship are those in the conservation and restoration of flora and fauna. Earth Sanctuaries (see case 2) illustrates perhaps the world's most audacious attempt yet to marry stock-market capitalism with back-country conservation.

#### Case 2: Earth Sanctuaries

When Earth Sanctuaries Ltd listed on the Australian Stock Exchange in May 2000 it offered a new twist to conservationists: here was the world's first company to list on a stock exchange with conservation as its primary business and profit as its motive. It was a tiny company – the initial public offering raised just A\$ 12.1 million – with a pioneering idea. No longer did people have to donate money if they wanted to save endangered species; instead, by funding private reserves open to paying visitors they could invest it to the same end.

Earth Sanctuaries makes money from tourism, merchandise sales, and educational and conference revenues derived from the land, as well as through the sale of outsourced consulting and contract services for wildlife and conservation management. John Wamsley, founder and managing director of Earth Sanctuaries, believes that when it comes to the conservation business, the company can do as good as or better than government and non-profit organisations. "Conservation is about the only thing still operating world-wide on a socialist model," says Wamsley. "These days, you won't be able to save anything unless you do it in a proper commercial environment, with proper dollar values on things."

Wamsley has always had a concern for the native wildlife he grew up with as a child. In the 1970's he set up a private wildlife sanctuary on a property in outer Adelaide, called Warrawong. He fenced off the area, removed the introduced animals (such as cats and foxes) in the area, and gradually restocked it with the native wildlife and plants that had existed there before European settlement. Today, Warrawong is thriving. It is the home of many rare and endangered species found only in a few places in Australia, and the only facility outside of a zoo to have successfully bred platypus in captivity. It also boasts accommodation facilities and a plant nursery, and has been the recipient of numerous tourism awards over the years since it opened to the public.

Under Australian accounting rules, Earth Sanctuaries can list wildlife and other conservation holdings as "Self-Generating and Regenerating Assets" – just as if they were wheat crops, apple trees, or cattle. Using this quirk of accounting standards, a single "endangered" platypus is worth A\$ 5 500, while a "vulnerable" long-nosed potoroo is worth A\$ 2 750 and a "rare" southern brown bandicoot just A\$ 1 375. As the company breeds the animals successfully, it can claim growth in its animal stock as part of its revenues. But in some cases that alters the company's financial profile considerably, even though gains are unrealisable because there is no legal market for the threatened species. To address this problem, the company has begun campaigning for change in the law that would have allowed it to export animals to zoos.

Up until 2002, the firm owned or managed ten different properties spread through South Australia, New South Wales, and Victoria. After a company restructure in 2002, the firm scaled down to three properties open to the public (Warrawong, Little River near Melbourne, and Hanson Bay on Kangaroo Island). These are open to the public, and are profitable.

*Source: Donnan 2002, Earth Sanctuaries Ltd; Schaper and Volery 2001, p. 198f.*

If one considers that the role of the entrepreneur is to monitor the environment for opportunities, Casson (1999) identified two types of environmental shocks generating opportunities: shocks that generate opportunities for establishing new markets tend to persist for considerable time, while shocks to already existing markets tend to be more transitory. The latter are handled by routine procedures typically set up by large firms, while small entrepreneurial firms are often better at responding to new market opportunities, especially if they require new organisational forms. Most green entrepreneurs have responded to new market opportunities, establishing start-ups and creating a new environmental industry. A similar phenomenon took place in the Internet business,

where small entrepreneurial firms have been key players – introducing breakthrough innovations.

As figure 1 shows, the two types of ecopreneurs we identified – environment-conscious and green entrepreneurs – nevertheless share common features. Firstly, they both strive for sustainable development, although it is the environmental responsibility – rather than social responsibility – that is emphasized here. Secondly, they innovate to create marketable solutions to sometimes conflicting demands of consumers and environmentalists. In doing so, ecopreneurs often capitalize on recent technological advances in areas such as nanotechnology, information technology, biotechnology, and alternative energy technology, which have the potential to contribute markedly to sustainability (Roome and Park, 2000).

Consistent with Mirvis (1994), we single out three common characteristics among eco-entrepreneurs. Firstly, they strive to develop healthy products using natural ingredients, environmentally safe and sustainable sourcing, packaging and disposability. Secondly, they are constantly implementing healthy production processes in their quest for continuous improvement in minimizing their consumption of resources, reducing environmental burdens and limiting concomitant risks and liabilities. Cleaner production, eco-efficiency, environmental life-cycle accounting and audits are part of this quest. Thirdly, ecopreneurs exhibit healthy values. To focus exclusively on market opportunities, technological innovation and profit, risks missing the guiding and cohering roles that values play in their environmental and social agendas. This invites a look at (among other things) the vision of the entrepreneur, the corporate culture, the employees' motivation and involvement in community environmentalism.

## Conclusion

The rise in world affluence holds promise for better lives and also comes with significant risks to ecosystems if prevailing patterns of production and consumption persist. The need to reduce energy consumption, pollution and wastes create new opportunities for entrepreneurs to introduce innovation and set up new business ventures. Happily, there are signs of an emerging bottom push for greenery. Even such icons of western consumerism such as Unilever and Procter & Gamble now sing the virtues of “sustainable consumption”. It would be naive to label such approaches as expressions of “corporate social responsibility”. Rather, this new approach is probably for the most part a green marketing technique, and companies embrace greenery because they see profit in it. In other words, consumers are more and more demanding for healthy products.

It remains, however, difficult to reconcile ecology and economics when property rights cannot be allocated. In this situation, governments must intervene to regulate. Today, governments are adopting market-like schemes to get prices right, in addition to traditional regulations. Amongst those schemes, resource-based taxes and exchangeable permits are seen as a method of internalization of environmental damage costs. This is certainly painful for some companies, but it also provides new opportunities for entrepreneurs who can develop more efficient products, services and processes.

#### ENVIRONMENT-CONSCIOUS ENTREPRENEURS

- Aware of environmental issues, but
- Not in the environmental marketplace

#### *Opportunity*

- Business-centered with environmental dimension
- Origin: Shocks to already existing markets
- Mode of exploitation: corporate venturing initiatives (new division, new subsidiary, joint venture) or de novo start-ups

#### *Industry*

- All industries, especially
- Cosmetics
- Chemicals
- Energy
- Mining

#### GREEN ENTREPRENEURS

- Aware of environmental issues, and
- In the environmental marketplace

#### *Opportunity*

- Environment-centered with profit prospects
- Origin: Shocks that generate opportunities for establishing new markets
- Mode of exploitation: in general, de novo start-ups

#### *Industry*

- Typically, the “environmental industry”:
- Recycling and disposal of solid waste
- Remediation of polluted areas
- Air pollution control
- Organic agriculture

#### COMMON FEATURES

- Strive for sustainable development
- Innovate to create marketable solutions to sometimes conflicting demands
- *Healthy products*: use of natural ingredients, environmental safe sourcing and packaging
- *Healthy processes*: cleaner production, eco-efficiency, environmental audits
- *Healthy values*: vision, corporate culture, social responsibility agenda, involvement in community environmentalism

Figure 1: Types and characteristics of ecopreneurs

This paper distinguished two types of ecopreneurs: environment-conscious and green entrepreneurs. Both types differ essentially along four characteristics: the emphasis they give to environmental vs. business considerations, the origin of the entrepreneurial opportunity, the mode of exploitation of the opportunity, and the industry in which they evolve. However, both types of eco-entrepreneurs share some common characteristics (sustainable development agenda, healthy products, healthy processes and healthy values). We focused essentially on the need for sustainable development and on opportunities for ecopreneurship. In doing so, we ignored the personality of the entrepreneur. This is certainly a limitation of the paper, because, as Bruyat and Julien (2000, p. 165) suggested “we will not understand the phenomenon of entrepreneurship if we do not consider the individual (the entrepreneur), the project, the environment and also the links between them over time.”

It is perhaps the personality of the entrepreneur that generates what Scott and Rothman (1994) characterized as “companies with a conscience”. This might well give companies a competitive edge firstly by timely identifying and exploiting “green opportunities”, and later by maintaining the enterprise ahead of “me too” competitors. It seems worthwhile, then, to study whether and how products, processes and the personality of the entrepreneur interconnect over time in corporate culture. This could teach us more

about environmentalism and about deeper interconnections between nature and humankind.

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