



# **Current Uses of the Notion 'Stewardship': Survey and Preliminary Analysis in the Canadian Biotechnology Context**

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The views expressed in this document are the views of the authors and do not necessarily reflect those of the Institute On Governance or its Board of Directors.

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## Context and Introduction

“... the notion of stewardship can be viewed as an ethically informed or “good” form of governance” (Richard B. Saltman and Odile Ferroussier-Davis, WHO, 2000)

In its *Canadian Biotechnology Strategy*, the Federal Government has committed itself to the good stewardship of biotechnology – What does this mean? The notion ‘stewardship’ is by no means straightforward. It has a complex etymology in the English language going back 500-1000 years throughout which changes in meaning have been documented. Current dictionary meanings describe a steward as a caretaker, manager or servant, and stewardship as “the careful and responsible management of something entrusted to one's care” (Websters).

The biblical use of stewardship in both the old and new testaments is often cited but interpretations, especially in the environmental context, are controversial. Current uses of the notion range from the stewards and stewardesses on ships and aircrafts to official titles in the British monarchy – Prince Charles, for example, carries the title of “the great steward of Scotland.” In the government context, as we shall see later, the notion is also conceptualized and used in diverse ways. Common to all meanings is an *ethical* component – concepts such as ‘care’ and ‘responsibility’ clearly describe ethical commitments.

In a nutshell, ‘stewardship’ has something to do with an ethical commitment (which provides a positive connotation) and is, at the same time, a very malleable concept (which invites critical analysis).

The prominent use of the term ‘stewardship,’ for example by the Minister of Health in her speech last June at the International Biotechnology Convention and Exhibition (Bio 2002, Toronto) and its status as an important component of a *strategy*, provide incentives to come crystal clear about what it means to be a good steward of biotechnology in Canada. This report is intended to support the refinement of the stewardship concept in the Canadian biotechnology context.

The malleability of the stewardship concept provides an opportunity – the concept will likely be suitable to express the role of the Federal Government wants to play in the biotechnology context. We argue, however, that any conceptualization should be based on (a) a clear understanding of how the notion is used elsewhere

in Canada and internationally and (b) an understanding of the ethical commitments that are packaged into the various conceptualizations.

This paper is first and foremost a *catalogue* of the various stewardship concepts utilized in Canada and abroad, particularly as they relate to the regulatory context and the biotechnology sector. This selective review of the grey literature will begin by providing a brief theoretical examination of the current use of ‘stewardship,’ followed by a focus on various conceptualizations in Canada and abroad, and lastly within the context of the biotechnology sector. The paper also provides a *preliminary ethical analysis* of the main uses and, finally, some *recommendations* for further research and activities.

## Methodology

In order to be able to grasp varying conceptualizations of term “stewardship” we conducted a “grey literature” review<sup>1</sup> of what is being done in the name of “stewardship,” both in Canada and abroad. To this end, we have examined how Canada, the United States, the United Kingdom, the European Union, Australia, and New Zealand’s governments, as well as selected international bodies and organizations, such as the World Health Organization (WHO), and the Organisation for Economic Co-operation and Development (OECD), conceptualize “stewardship.” The literature review was conducted by researching these governments and organizations’ Web sites. In cases where “stewardship” had not been explicitly defined, the authors derived the conceptualization of the term through implicit means, that is to say by extracting the meaning and significance of the term from the context within which the concept of “stewardship” had been utilized. A more complete review of printed literature could not be attempted within the scope of this assignment – however, the methodology used here should cover the most important and most current uses of “stewardship.” Note that the information presented here is necessarily very selective – a current Google search for “stewardship” results in more than 1 million hits.

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<sup>1</sup> A review of available information over the Internet.

# Conceptualizations of “Stewardship” – A Catalogue

## 1. *Stewardship in a Theoretical Context*

Stewardship is a governance concept and, consequently, notions of stewardship vary in accordance with how a particular social, economic and political system is structured. For example, in a tyranny only the tyrant is the steward, while in democracies that role is extended to a series of individuals, groups and organizations. Notions of stewardship will also vary within democratic states, depending on which structure of the system one chooses to review. Nevertheless, all conceptions of the term “stewardship” share the principle of “assumption of responsibility,” that is the notion that a steward ultimately assumes responsibility for outcomes. What is often debated is the interpretation of *who* is or should be the steward, and *how* should stewardship-related activities be carried out, that is to say should they be mandatory (legislated) or voluntary. Not surprisingly, the varying interpretations are greatly affected by the predominant ideological views within a system, particularly as they relate to the role of the state *vis-à-vis* that of the individual.

This view is shared by Saltman and Ferroussier-Davis,<sup>2</sup> who claim “stewardship can infuse normative, content-oriented values into a set of largely technical, process-oriented institutions.”<sup>3</sup> In other words, stewardship can introduce ethical commitments that go beyond a narrow focus on efficiency. Saltman and Ferroussier-Davis’ thoughtful paper draws a comparison between two distinct theories of “policy approach,” namely agency theory and stewardship theory. While the former views the state and civil servants as agents for its citizens (thus ascribing to them a purely economic, efficiency-oriented and market-like function), stewardship theory combines this managerial approach to governance with trust-based, ethical forms of decision-making. This normative approach to policy, in fact, leads Saltman and Ferroussier-Davis to conclude that “stewardship, an explicitly ethically based, outcome-oriented policy approach, is substantially more interventionist than the economically driven agency approach to state regulation.”<sup>4</sup> However, a warning is also provided: “while stewardship is potentially a model of governance which can infuse state policy-making and regulatory functions with an explicitly normative dimension, it requires clear and consistent strategic direction.”<sup>5</sup>

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<sup>2</sup> Saltman R.B., and Ferroussier-Davis O. “The concept of stewardship in health policy,” in *Bulletin of the World Health Organization*, 2000, 78 (6). This issue can be accessed at: [www.who.int/bulletin/pdf/2000/issue6/bu0614.pdf](http://www.who.int/bulletin/pdf/2000/issue6/bu0614.pdf)

<sup>3</sup> *Ibid.*, p.735.

<sup>4</sup> *Ibid.*, p.736.

<sup>5</sup> *Ibid.*, pp.736-7.

The research presented in this report supports much of the theoretical work done by Saltman and Ferroussier-Davis. However, it appears that the word “stewardship” has quite frequently been used to name what Saltman and Ferroussier-Davis and others<sup>6</sup> have described as the *agency approach* to policy-making – it is somewhat confusing if the shifting of responsibility away from the state and onto the individual (citizen) is called “stewardship.” Not surprisingly, this notion of stewardship is most often used by governments that have historically promoted a less interventionist role for the state, but that nevertheless may wish to appropriate themselves what is commonly regarded as “positive” concept. Interestingly, a majority of the documents found in the grey literature reflect the almost overwhelming inclination of governments and organizations to make use of the term “stewardship” within the context of “product stewardship” (and related programs), as well as within the environmental context, particularly in terms of environmental protection. An initial Web-based search for the term “stewardship,” in fact, produces links to organizations (NGOs) that tend to promote the preservation and effective management of natural resources (e.g., the Forest Stewardship Council, the Marine Stewardship Council).<sup>7</sup>

## **2. Stewardship in the Broad Regulatory Context**

Governments have a tendency to use the term stewardship within the context of policy and regulation. The overwhelming majority of government documents scanned, in fact, deal specifically with notions of “product and ecological stewardship” and their related policies and programs.

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<sup>6</sup> See Jim Armstrong, *Stewardship and Public Service*, 1997. A discussion paper prepared for The Public Service Commission of Canada. The paper makes the argument that an alternative to market theory (agency approach) is essential to the public service, and proposes stewardship theory as such an alternative. This paper is accessible on the Web at: [www.psc-cfp.gc.ca/research/merit/stewardship\\_e.pdf](http://www.psc-cfp.gc.ca/research/merit/stewardship_e.pdf)

<sup>7</sup> These organizations’ web sites are: [www.fscoax.org/](http://www.fscoax.org/) and [www.msc.org/](http://www.msc.org/), respectively.

## 2.1 The Canadian Regulatory Context

Canada's role as a promoter of the concept of "stewardship" in the context of regulation is noticeable from the series of Internet searches undertaken in this study, particularly with regard to international organizations' Web sites.<sup>8</sup>

### 2.1.1 The Federal Government

The Canadian Federal Government has established a significant number of stewardship programs and initiatives. One such initiative (a federal-provincial collaboration) dates back to May 1996, with the release of the *Guiding Principles for Packaging Stewardship*.<sup>9</sup> In the document, the Canadian Council of Ministers of the Environment (CCME) stated that "packaging stewardship is a concept by which industry, governments and consumers assume greater responsibility for ensuring that the manufacture, use, reuse, recycling and disposal of packaging has a minimum impact on the environment." This statement introduced two of the key elements of the concept of stewardship: 1) Concern about environmental impacts throughout a product's lifecycle; and 2) the assumption of responsibility for those impacts by various actors other than – or in addition to – the party who has physical control of the product at any given point in time.

Within the context of the federal government's *Habitat Stewardship Program* (Species at Risk), Environment Canada (who in conjunction with the Department of Fisheries and Oceans and the Parks Canada Agency manages the program) defines "stewardship" as "the wide range of voluntary actions that Canadians take to care for the environment."<sup>10</sup> Stewardship activities range from monitoring and conserving wildlife species and the places where they live (their habitat), to protecting and improving the quality of soil, water, air and other natural resources. Partnership activities figure prominently within this program: "The first year (2000/2001) of the program has seen the establishment of over 60 partnerships with First Nations,

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<sup>8</sup> Please refer to the following document from the Secretariat for the Convention on Biological Diversity Web site [www.biodiv.org/doc/case-studies/cs-inc-ca-01-en.pdf](http://www.biodiv.org/doc/case-studies/cs-inc-ca-01-en.pdf), as well as the following documents from the OECD Web site: [www.oilis.oecd.org/olis/1997doc.nsf/3d0f5ae71b96add38025656400595b54/c125692700623b95c12569ba002ac366/\\$FILE/00044463.PDF](http://www.oilis.oecd.org/olis/1997doc.nsf/3d0f5ae71b96add38025656400595b54/c125692700623b95c12569ba002ac366/$FILE/00044463.PDF), and

[www.oilis.oecd.org/olis/1999doc.nsf/97dfd3458ed2506bc125685f003fcdeb/c125685f0037ebabc12568a500602b7f/\\$FILE/00074110.PDF](http://www.oilis.oecd.org/olis/1999doc.nsf/97dfd3458ed2506bc125685f003fcdeb/c125685f0037ebabc12568a500602b7f/$FILE/00074110.PDF)

<sup>9</sup> These principles are accessible at: [www.ec.gc.ca/epr/en/stewardship\\_princ.cfm](http://www.ec.gc.ca/epr/en/stewardship_princ.cfm)

<sup>10</sup> Accessible on the Web at: [www.speciesatrisk.gc.ca/media/policy1\\_e.cfm](http://www.speciesatrisk.gc.ca/media/policy1_e.cfm).

landowners, resource users, nature trusts, provinces, the natural resource sector, community-based wildlife societies, educational institutions, and conservation organizations at every scale.”<sup>11</sup>

The *Agricultural Environmental Stewardship Initiative (AESI)*<sup>12</sup> at Agriculture and Agri-Food Canada emphasizes projects that address the regional impacts of agricultural practices on water, soil, and air quality, biodiversity and greenhouse gas emissions. This initiative addresses these issues through education and awareness, technology transfer, and stewardship tools including environmental clubs, environmental management systems, and land use planning.

In 1998 Natural Resources Canada instituted the *Forest Stewardship Recognition Program (FSRP)* aiming to create public awareness and appreciation for those practising good forest stewardship, and to encourage better forestry practices and biodiversity conservation.<sup>13</sup> In the same year, Fisheries and Oceans Canada instituted the *Habitat Conservation and Stewardship Program (HCSP)*. The vision of this program is “Partnership to enhance habitat protection and expand community capacity to steward fish habitat.” In *Administration and Enforcement of the Fish Habitat Protection and Pollution Prevention Provisions of the Fisheries Act: Annual Report 1999-2000*, Fisheries and Oceans Canada recognizes habitat management as a responsibility of all Canadians, and as such encourages “community involvement in the development of management plans and stewardship” that seek to conserve and protect fish habitat.<sup>14</sup>

Within the Canadian federal government there also exists the *Canadian Code of Environmental Stewardship* (a non-statutory requirement within government). Under the Code of Environmental Stewardship, all federal government employees are responsible for applying the principles of sustainable development to their work, thereby helping to ensure the “greening” of federal government operations. This conceptualization of environmental stewardship can be traced back to the Code of Environmental Stewardship released in 1992. The Code of Environmental Stewardship set out the due care and diligence that the government expected of departments in managing resources judiciously to prevent waste and

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<sup>11</sup> *Ibid.*

<sup>12</sup> Accessible on the Web at: [www.agr.gc.ca/policy/environment/eb/public\\_html/ebe/aesi.html](http://www.agr.gc.ca/policy/environment/eb/public_html/ebe/aesi.html)

<sup>13</sup> Accessible on the Web at: [www.forest.ca/browsesearch/158/0/5191/](http://www.forest.ca/browsesearch/158/0/5191/)

<sup>14</sup> p. 26. This Report is accessible on the Web at: [www.dfo-mpo.gc.ca/canwaters-eauxcan/infocentre/publications/reports-rapports/ann99/pdf/annual\\_report\\_1999-00\\_e.pdf](http://www.dfo-mpo.gc.ca/canwaters-eauxcan/infocentre/publications/reports-rapports/ann99/pdf/annual_report_1999-00_e.pdf)

minimize environmental damage. The Code outlines the areas to be addressed through the development and use of individual departmental action plans.<sup>15</sup>

Industry Canada defines stewardship as follows: “Good stewardship relies on a strong knowledge base, access to specialized expertise, and a willingness to think and partner globally. Governments need to make pro-innovation policy choices and pro-innovation investments to create a climate that is predictable and efficient, accountable to the public, and deserving of the confidence of investors.”<sup>16</sup>

## 2.1.2 The Provincial Governments

### **British Columbia**

The term “stewardship” resonates loudly within the Government of British Columbia, particularly within the Ministry of Water, Land and Air Protection. A government document, in fact, states that “other jurisdictions and international bodies have recognized British Columbia as a leader in developing innovative product stewardship programs which shift the responsibility of managing specific wastes from general taxpayers to industry and consumers.”<sup>17</sup> For instance, within the Environment Management Branch of this department, a *Product Stewardship Program* has been instituted, whereby Product Stewardship is defined as “a management system based on industry and consumers taking a life-cycle responsibility for the products they produce and use,” as well as their impact on the economy and the environment.<sup>18</sup> This program is limited to products that contribute to the household hazardous waste stream.<sup>19</sup>

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<sup>15</sup> Accessible on the Web at: [www.dfait-maeci.gc.ca/sustain/environman/system/greenop/ref/thecode-en.asp](http://www.dfait-maeci.gc.ca/sustain/environman/system/greenop/ref/thecode-en.asp)

<sup>16</sup> *Achieving Excellence: Investing in People, Knowledge and Opportunity*, p.20. Accessible on the Web at: [www.innovationstrategy.gc.ca/cmb/innovation.nsf/vRTE/PDF/\\$file/achieving.pdf](http://www.innovationstrategy.gc.ca/cmb/innovation.nsf/vRTE/PDF/$file/achieving.pdf)

<sup>17</sup> *British Columbia Industry Product Stewardship Business Plan 2002/03 - 2004/05*, September 30, 2002. Accessible on the Web at: [http://wlapwww.gov.bc.ca/epd/epdpa/ips/prodstew\\_plan.pdf](http://wlapwww.gov.bc.ca/epd/epdpa/ips/prodstew_plan.pdf)

<sup>18</sup> Accessible on the Web at: <http://wlapwww.gov.bc.ca/epd/epdpa/ips/index.html>.

<sup>19</sup> For a discussion of BCs industry stewardship programs (began in 1992) and a list of common required elements see “The British Columbia Experience in Monitoring and Reporting on EPR Programs” by Ronald J. Driedger (Pollution Prevention & Remediation Branch, Ministry of Environment, Lands & Parks, British Columbia. Accessible on the Web at:

[www.oecd.org/olis/1999doc.nsf/97dfd3458ed2506bc125685f003fcdeb/c125685f0037ebabc12568a500602b7f/\\$FILE/00074110.PDF](http://www.oecd.org/olis/1999doc.nsf/97dfd3458ed2506bc125685f003fcdeb/c125685f0037ebabc12568a500602b7f/$FILE/00074110.PDF) (pp.62-74).

Within the same Ministry, the B.C. government has established the *Environmental Stewardship Division*. This Division is entrusted to maintain and restore the natural diversity of provincial ecosystems by developing, promoting and measuring achievement of provincial goals for the conservation of living resources, managing protected areas, and providing park, fish and wildlife recreation services. The Division plans to meet these objectives by using “science-based information and knowledge in the development of policy, legislation and regulations, setting clear environmental standards and performance expectations, and ensuring compliance through monitoring, auditing and public reporting.”<sup>20</sup> Last, the Minister of Water, Land and Air Protection appointed a *Recreation Stewardship Panel* in 2002; the function of this panel is to make recommendations on a new management and funding model for fish, wildlife and park recreation.<sup>21</sup>

### **Alberta**

Within the Protection and Stewardship Section of the Ministry of Community Development of the Alberta government, the term “stewardship” relates to community-based partnerships programs with specific emphasis placed on creating effective land and water stewardship, as well as the management and long-term protection of historical resources in Alberta.<sup>22</sup> Interestingly, in a report entitled *Cattle Wintering Sites: Managing for Good Stewardship*, the Alberta government defines “stewardship” within the context of livestock operation as “an individual’s responsibility to manage their resources with proper regard to the rights of others.”<sup>23</sup> Not surprisingly, this interpretation of the meaning of stewardship is consistent with Alberta’s political culture, which ascribes to the state a less interventionist role associated with greater individual responsibility.

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<sup>20</sup> This Web-based document also states that the Division will “emphasize shared stewardship by encouraging others to accept a greater role in environmental stewardship and facilitating community initiatives to protect and restore local environments.” Accessible on the Web at: [http://wlapwww.gov.bc.ca/esd/esd\\_main.htm](http://wlapwww.gov.bc.ca/esd/esd_main.htm).

<sup>21</sup> The panel’s initial work included a review of available research and an evaluation of other jurisdictions’ approaches to managing and funding fish, wildlife and parks. Significantly, this work included consultation with stakeholder groups, such as First Nations, local communities, and tourism operators. Further, the Panel is to ensure that its recommendations are based on sound technical input and can be supported by recreational users, First Nations and the general public. A public consultation plan figures prominently within the Panel’s activities. Accessible on the Web at: <http://wlapwww.gov.bc.ca/esd/recpanel/recpanel.htm>

<sup>22</sup> Accessible on the Web at: [www.cd.gov.ab.ca/preserving/heritage/pands/index.asp](http://www.cd.gov.ab.ca/preserving/heritage/pands/index.asp)

<sup>23</sup> Accessible on the We at: [www.agric.gov.ab.ca/sustain/cattlewintering.pdf](http://www.agric.gov.ab.ca/sustain/cattlewintering.pdf). (p.3)

## **Saskatchewan**

The Saskatchewan Wetland Conservation Corporation through its Native Prairie Stewardship Program encourages individual landowners to voluntarily conserve their existing native grassland through a verbal stewardship agreement. The land and all decisions on its management rest squarely in the hands of the individual landowner.<sup>24</sup>

## **Manitoba**

The Manitoba government has instituted the *Livestock Stewardship Initiative*, which seeks to build on existing livestock industry regulations and programs. Within the context of the environmental impact of livestock industry development, the strategy involves a series of actions aimed at protecting the environment and ensuring the future of the province's livestock industry. The public consultation process is a major focus of the initiative.<sup>25</sup> A *Used Oil Products and Material Stewardship Program* came into effect in the province following the *Used Oil, Oil Filters and Containers Stewardship Regulation*.<sup>26</sup> The program was developed with input from industry, environment groups, governments and other stakeholders. Similar programs exist with relation to the recycling of tires and the control of ozone depleting substances. These programs also stress their dependency on close partnerships with different stakeholders.

## **2.2 The Regulatory Context Abroad**

Much work has been undertaken abroad on the conception of stewardship, both explicitly and implicitly. One organization whose thoughtful work in this area warrants attention in this area is the World Health Organization (WHO).

### **2.2.1 The World Health Organization (WHO)**

Interestingly, within the WHO a considerable effort has been expended in order to attain a better understanding of various conceptions of “stewardship.” Albeit the focus of this work has been within the context of health, there are considerable implications for notions of stewardship and regulation. In *The*

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<sup>24</sup> Accessible on the Web at: [www.wetland.sk.ca/lev2-programs.html](http://www.wetland.sk.ca/lev2-programs.html)

<sup>25</sup> Accessible on the Web at: [www.gov.mb.ca/agriculture/news/1steward/stewardship9.html](http://www.gov.mb.ca/agriculture/news/1steward/stewardship9.html)

<sup>26</sup> This industry-operated program was initiated in 1997 by manufacturers and marketers of lubricating products, to promote and facilitate the cost-effective collection and disposal of used oil, used oil filters and used oil containers in Manitoba. Accessible on the Web at: [www.gov.mb.ca/environ/pages/emd/pollprev/usedoil/main.htm](http://www.gov.mb.ca/environ/pages/emd/pollprev/usedoil/main.htm)

*World Health Report 2000*,<sup>27</sup> the WHO states: “Governments should be ‘stewards’ of their national resources, maintaining and improving them for the benefit of their populations. In health this means being ultimately responsible for the careful management of their citizens’ well-being. Stewardship in health is the very essence of good government... Stewardship encompasses the task of defining the vision and direction of health policy, exerting influence through regulation and advocacy, and collecting and using information.”<sup>28</sup> The Report goes on to say: “Good stewardship needs the support of *several* strategies to influence the behaviour of the different stakeholders in the health system. Among these are a better information base, the ability to build coalitions of support from different groups, and the ability to set incentives, either directly or in organizational design.”<sup>29</sup>

In a separate WHO publication,<sup>30</sup> “stewardship” is defined as “a function of governments responsible for the welfare of populations and concerned about the trust and legitimacy with which its activities are viewed by the general public.” Yet another WHO publication,<sup>31</sup> speaks to the importance of “product stewardship,” specifically with regard to the impact that products may have on human health and the environment, throughout their life-cycle. In the latter publication “product stewardship” is defined as “the responsible and ethical management of health, safety and environmental aspects of a product throughout its life-cycle.”<sup>32</sup>

In a subsequent WHO paper entitled *Towards Better Stewardship: Concepts and Critical Issues*,<sup>33</sup> Travis *et al.*, speaking in the context of health delivery, make the claim that “a country’s government,...remains the ‘steward of stewards’...with a responsibility to ensure that *they* collectively provide effective stewardship.”<sup>34</sup> Further, the paper outlines six domains of stewardship that “are constructed from prevailing notions of what

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<sup>27</sup> *The World Health Report 2000. Health Systems: Improving Performance*. This report can be accessed at:

<http://w3.who.org/healthreport/>

<sup>28</sup> *Ibid.*, pg. 117.

<sup>29</sup> *Ibid.*, pg. 121.

<sup>30</sup> Saltman R.B., and Ferroussier-Davis O. 2000, (pg. 735).

<sup>31</sup> WHO Drug Information, Vol. 15, No. 1, 2001. This publication is available at:

[www.who.int/druginformation/vol15num1\\_2001/15-1WHOdrug1.PDF](http://www.who.int/druginformation/vol15num1_2001/15-1WHOdrug1.PDF)

<sup>32</sup> This definition is borrowed from the European Chemical Industry Council (CEFIC).

<sup>33</sup> Phyllida Travis, Dominique Egger, Philip Davies, Abdelhay Mechbal. Evidence and Information for Policy, World Health Organization, 2002. This report is accessible on the web at:

[http://www3.who.int/whosis/discussion\\_papers/pdf/paper48.pdf](http://www3.who.int/whosis/discussion_papers/pdf/paper48.pdf)

<sup>34</sup> The “*they*” in this quote refers to sub-national health authorities, local government, other ministries, planning, civil service commissions, parliamentarians, professional associations, ombudsmen, etc.

together constitute the function of stewardship.” They are as follows: 1) Generation of intelligence (intelligence contributes to more informed decisions); 2) formulating strategic policy direction (including feasibility of change); 3) ensuring tools for implementation (powers, incentives and sanctions); 4) building coalitions/partnerships (must involve other actors if positive change is to occur); 5) ensuring a fit between policy objectives and organizational structure and culture; and lastly 6) ensuring accountability. Significantly, Travis *et al.* conclude that because “stewardship” is a relatively new construct, the monitoring and performance assessment of its domains needs further development.

### 2.2.2 The United States

Good stewardship is a personal responsibility of all of us. And it's a public value. And that's what's important for Americans to understand, that each of us have a responsibility, and it's a part of our value system in our country to assume that responsibility.

US President George W. Bush. Remarks made on Earth Day (April 22, 2002)<sup>35</sup>

The United States, just as Canada, has a fairly extensive set of policies and programs that address, either explicitly or implicitly, notions of “product and ecological stewardship.” Interestingly, a great many of the programs are of a voluntary nature. One such program is the *Pesticide Environmental Stewardship Program* (PESP) operated under the auspices of the Environmental Protection Agency. PESP is a voluntary program that forms partnerships with pesticide users to reduce the health and environmental risks associated with pesticide use and implement pollution prevention strategies. The EPA started the program in 1994.<sup>36</sup> Another significant program is the Department of Agriculture’s (USDA) *Forest Stewardship Program*.<sup>37</sup> “The purpose of the Forest Stewardship Program (FSP) is to assist private forest landowners in more actively managing their forests and related resources; to keep these lands in a productive healthy condition for present and future owners; and to increase the economic and environmental benefits of these lands.” The

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<sup>35</sup> The speech is accessible on the Web at: [www.whitehouse.gov/news/releases/2002/04/20020422-1.html](http://www.whitehouse.gov/news/releases/2002/04/20020422-1.html)

<sup>36</sup> There are two categories of membership in PESP. 1) Partners: Organizations that use pesticides or represent pesticide users. 2) Supporters: Organizations that do not use pesticides, but have significant influence over the pest management practices of pesticide users (food processors, for example, may influence the use of pesticides on produce they buy, even though they do not apply pesticides to the produce themselves). Supporters may also include public interest groups whose constituencies have a strong interest in pesticide risk reduction. Accessible on the Web at: [www.epa.gov/opppbd1/PESP/](http://www.epa.gov/opppbd1/PESP/) Another voluntary program is part of the Pollution Prevention Strategy. Information on this program can be accessed at the following Web address: [www.fsis.usda.gov/OM/strategy.htm](http://www.fsis.usda.gov/OM/strategy.htm)

<sup>37</sup> Information on the program is accessible on the Web at: <http://svinet2.fs.fed.us/spf/coop/fsp.htm>

aim is “to increase the likelihood that private forests will remain productive and healthy, and that the social, economic and environmental benefits of these lands will be realized.” Environmental stewardship is also the objective of the Plant Protection and Quarantine (PPQ) unit within Animal and Plant Inspection Services (APHIS) of the USDA.<sup>38</sup> The unit’s mission is to protect the health of US plant and animal resources. Accordingly, the unit plays a role in “environmental stewardship.” The unit’ conceptualization of stewardship includes “taking an active role in protecting ecosystems and improving the quality, safety, and security of the food supply and in educating the public in environmental stewardship.” This includes “seeking the participation of a diverse group of stakeholders in program planning.”<sup>39</sup>

The United States Environmental Protection Agency defines Product Stewardship as “a product-centered approach to environmental protection. Also known as extended product responsibility (EPR), product stewardship calls on those in the product life cycle--manufacturers, retailers, users, and disposers--to share responsibility for reducing the environmental impacts of products.”<sup>40</sup> Similarly, the U.S. based Product Stewardship Institute<sup>41</sup> defines Product Stewardship as “a principle that directs all actors involved in the life cycle of a product to take responsibility for the impacts to human health and the natural environment that result from the production, use and disposal of the product.”

### 2.2.3 The United Kingdom

In the UK, just as is the case in the United States, the conceptualization of stewardship within a regulatory framework seems to favour the voluntary enactment of stewardship principles, as opposed to legislated means. For example, in December 1999, the UK government released its chemical strategy. Amid recommendations by the Royal Commission on Environmental Pollution (an independent standing body established in 1970 to advise the Queen, government, Parliament and the public on environmental issues), for statutory backing for the chemical industry’s “product stewardship” programme, the UK government

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<sup>38</sup> Information on the program is accessible on the Web at: [www.aphis.usda.gov/biotech/](http://www.aphis.usda.gov/biotech/)

<sup>39</sup> [www.aphis.usda.gov:80/oa/pubs/vision.pdf](http://www.aphis.usda.gov:80/oa/pubs/vision.pdf)

<sup>40</sup> Accessible on the Web at: [www.epa.gov/epr/about/index.html](http://www.epa.gov/epr/about/index.html)

<sup>41</sup> Based at the University of Massachusetts at Lowell, the Product Stewardship Institute is a national organization that assists state and local government agencies in establishing cooperative agreements with industry and developing other initiatives that reduce the health and environmental impacts from consumer products. The Institute seeks out the active input from, and cooperates with, environmental groups, business interests, academic institutions, the federal government, and related organizations to achieve product stewardship goals. Accessible on the Web at: [www.productstewardshipinstitute.org/index.html](http://www.productstewardshipinstitute.org/index.html)

opted instead to focus on an enhanced programme of chemical risk assessment based on *voluntary* co-operation by industry. In essence, the Commission recommended that component principles of “product stewardship” be enacted through legislation.<sup>42</sup>

Another significant report points to the UK’s line of thinking on the issue of stewardship. In *Risk: Improving Government’s Capability to Handle Risk and Uncertainty* (November 2002) the Strategy Unit of the Cabinet Office states: “Governments have a stewardship role to protect individuals, businesses and the environment from risks imposed on them from outside.”<sup>43</sup> However, the Report draws a clear distinction between governments’ *stewardship* and *regulatory* roles. While the former is to be associated with managing risk from natural hazards (e.g., natural disasters, risks to public health), the latter is to be associated with the managing of technological and social hazards (from industrial and commercial activity).<sup>44</sup> Further, the Report states, “where risks cannot be attributed to any specific individual or body, governments may take on a stewardship role to provide protection or mitigate the consequences.”<sup>45</sup>

The Joint Nature Conservation Committee (JNCC), the UK Government's wildlife adviser, in a recent Report on Marine Stewardship speaks to the government’s commitment to a framework of new initiatives that will enhance marine nature conservation.<sup>46</sup> Central to the framework for Marine Stewardship is the adoption of an “eco-based approach,” which includes: Working within a set of clear environmental objectives; greater use of socio-economic assessments; taking policy decisions that ensure sustainable development; making better use of scientific knowledge; develop more focused research and monitoring; and full stakeholder involvement. Significantly, the Report defines Stewardship as “entrusting people with a responsibility to care for the community they belong to. It means involving people in protecting the oceans and seas and using the resources they offer wisely. The benefits of stewardship include better decision-making, reduced reliance on regulation, generating a positive role for people and organisations and greater inclusiveness.”<sup>47</sup>

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<sup>42</sup> Royal Commission on Environmental Pollution. *Review of Activities: 1998/99 and 1999/2000*. This report is available on the Web at: [www.rcep.org.uk/pdf/review98-00.pdf](http://www.rcep.org.uk/pdf/review98-00.pdf)

<sup>43</sup> P.10. The Report is accessible on the Web at: [www.cabinet-office.gov.uk/innovation/2002/risk/report/downloads/su-risk.pdf](http://www.cabinet-office.gov.uk/innovation/2002/risk/report/downloads/su-risk.pdf)

<sup>44</sup> The Report does recognize that there is some overlap between the two roles.

<sup>45</sup> *Ibid.*, p.9.

<sup>46</sup> *The Marine Stewardship Report* (May 2002). The report is accessible on the Web at: [www.defra.gov.uk/environment/marine/stewardship/pdf/marine\\_stewardship.pdf](http://www.defra.gov.uk/environment/marine/stewardship/pdf/marine_stewardship.pdf)

<sup>47</sup> *Ibid.*, p.7.

Examples of voluntary stewardship schemes are offered by the Department for Environment Food and Rural Affairs (DEFRA). Two Stewardship Schemes (the *Countryside and the Arable Stewardship Schemes*) seek to sustain landscape beauty and diversity, to protect and extend wildlife habitats, and to address the problem of negative environmental externalities triggered by intensive arable farming methods. The schemes offer payments to farmers for conservation of the English countryside.<sup>48</sup>

#### 2.2.4 Australia

A great lack of uniformity and consistency seems to exist within Australia's strategy towards product stewardship. While within the context of waste oil the argument is made for the need of a strong legislated state-imposed regime for product stewardship, in the case of electronic products there is support for an industry led voluntary strategy. There therefore seems to be a product or case specific approach to "product stewardship," and as such a lack of an overarching strategy that deals uniformly with the issue of "product stewardship."

Australia's *Comprehensive Product Stewardship System for Waste Oil* claims that "Product stewardship embraces the concept that the producers of a good have a degree of 'cradle to grave' responsibility for their product. As far as possible the cost of this should be born within the producer's markets, and not passed onto other markets, or subsidised by public moneys."<sup>49</sup> Australia's new product stewardship arrangements (PSO) establish a *partnership* for the effective management of waste oil involving oil producers, oil recyclers, State and Territory governments and the Commonwealth. By Environment Australia's own admission, this approach to product stewardship is consistent with that of the European Union, whereby an authority enforces standards (through legislative means), as opposed to instituting an industry-based voluntary system of product stewardship.

Environment Australia's *Electrical and Electronic Product Stewardship Strategy*, on the other hand, is being developed by peak electrical and electronic industry associations with a view to establish an industry wide voluntary product stewardship strategy. Their work is being guided by an Environment Protection and Heritage Council (EPHC) Working Group composed of representatives of Commonwealth, State and

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<sup>48</sup> Information on these Schemes is accessible on the Web at: [www.defra.gov.uk/environ/envsch/css.htm](http://www.defra.gov.uk/environ/envsch/css.htm)

<sup>49</sup> Accessible on the Web at: [www.ea.gov.au/industry/waste/oilrecycling/cpps.html](http://www.ea.gov.au/industry/waste/oilrecycling/cpps.html)

Territory environmental agencies, the Australian Industry Group (Ai Group), the Australian Chamber of Commerce and Industry (ACCI), and the electrical and electronic industry associations.<sup>50</sup>

### 2.2.5 New Zealand

New Zealand's Minister for the Environment, the Hon. Marian Hobbs, stated in a speech that "Stewardship implies a duty of care on those producing, retailing and using environmentally harmful products. The nature of the duty may vary according to the operator. Those at the production end who know the environmental risks have a responsibility to ensure that appropriate information is passed down the chain. This includes providing information about responsible disposal of the product."<sup>51</sup>

### 2.2.6 The European Union

Interestingly, no pertinent information was found on any of the European Union Web sites investigated (this includes the Agencies that have specific competencies in the area of biotechnology regulation). The only notable reference to stewardship was in a European Commission document, which stated "sound stewardship is not a task for governments alone."<sup>52</sup> The implication was that communities must also assume some responsibility for the protection of the environment. The other references dealt with the notion of stewardship of public funds.<sup>53</sup>

Two definitions of product stewardship are provided by Europe-based industries. The UK Chemical Industries Association defines Product Stewardship as "the responsible and ethical management of the health, safety and environmental aspects of a product from its invention through its process of production to

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<sup>50</sup> Information on this strategy is accessible on the Web at: [www.ea.gov.au/industry/waste/ieu/index.html#electrical-product-stewardship-strategy](http://www.ea.gov.au/industry/waste/ieu/index.html#electrical-product-stewardship-strategy)

<sup>51</sup> This speech was given in August 2000, and was given within the context of "Extended Producer Responsibility" (The notion that manufacturers take a lifecycle approach to their responsibilities for a product). EPR can be supported by a wide range of voluntary, negotiated and regulatory programs and activities. The speech is accessible on the Web at: [www.ermanz.govt.nz/newsandevents/files/speeches/sp20000829.htm](http://www.ermanz.govt.nz/newsandevents/files/speeches/sp20000829.htm)

<sup>52</sup> European Commission. *Agenda 21 - The First 5 Years: Implementation of Agenda 21 in the European Community*, 1997, p.10. This document can be accessed on the Web at: <http://europa.eu.int/comm/environment/agend21/agend21.pdf>

<sup>53</sup> For an example, please refer to [http://europa.eu.int/comm/dgs/internal\\_audit/documents/reform\\_ias\\_pcg\\_en.pdf](http://europa.eu.int/comm/dgs/internal_audit/documents/reform_ias_pcg_en.pdf)

its ultimate use and beyond.”<sup>54</sup> A WHO publication,<sup>55</sup> utilizes the European Chemical Industry Council’s definition of Product Stewardship: “the responsible and ethical management of health, safety and environmental aspects of a product throughout its life-cycle.”

### **3. Stewardship in the Biotechnology Context**

Good stewardship relies on a strong knowledge base, access to specialized expertise, and a willingness to think and partner globally. Governments need to make pro-innovation policy choices and pro-innovation investments to create a climate that is predictable and efficient, accountable to the public, and deserving of the confidence of investors.

*Achieving Excellence: Investing in People, Knowledge and Opportunity*, Government of Canada, 2002, pg. 20.<sup>56</sup>

#### **3.1 The Canadian Biotechnology Context**

In *Achieving Excellence: Investing in People, Knowledge and Opportunity*, the Canadian government sets out its strategy with regard to the innovation sector of the economy. The document claims that “A primary government responsibility is to protect and promote the public interest. Key tools for fulfilling this role include *legislation, regulations, codes and standards*... Taken together, these *stewardship instruments* help governments respond to health, environment, safety and privacy concerns. They also offer direction for public and private sector conduct... Innovation extends our capabilities and allows us to do things we have never been able to do before. Ensuring that we use these capabilities wisely, safely, and equitably is the role of good stewardship.”<sup>57</sup> Borrowing from *A Framework for Science and Technology Advice*<sup>58</sup> “the Government of Canada is vigorously implementing recommended principles and guidelines to ensure the

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<sup>54</sup> Accessible on the Web at: [www.rcep.org.uk/pdf/review98-00.pdf](http://www.rcep.org.uk/pdf/review98-00.pdf) (pg. 18)

<sup>55</sup> WHO Drug Information, Vol. 15, No. 1, 2001. This publication is available at: [www.who.int/druginformation/vol15num1\\_2001/15-1WHOdrug1.PDF](http://www.who.int/druginformation/vol15num1_2001/15-1WHOdrug1.PDF)

<sup>56</sup> This document can be accessed on the Web at: [www.innovationstrategy.gc.ca/cmb/innovation.nsf/vRTF/PDF/\\$file/achieving.pdf](http://www.innovationstrategy.gc.ca/cmb/innovation.nsf/vRTF/PDF/$file/achieving.pdf)

<sup>57</sup> *Ibid.*, p.64.

<sup>58</sup> Government of Canada, 2000, *A Framework for Science and Technology Advice: Principles and Guidelines for the Effective Use of Science and Technology Advice in Government Decision Making*. Accessible on the Web at: [http://strategis.ic.gc.ca/pics/te/stadvice\\_e.pdf](http://strategis.ic.gc.ca/pics/te/stadvice_e.pdf)

effective use of science and technology in decision making. Key elements of the proposed framework include: *Early Issue Identification* — anticipating public policy issues arising from new knowledge. *Inclusiveness* — ensuring that advice is drawn from many disciplines, all sectors and, when appropriate, international sources. *Sound Science and Science Advice* — applying due diligence to advice to ensure its quality, integrity and reliability. *Transparency and Openness* — ensuring that processes are transparent, and that stakeholders and the public are consulted. *Review* — keeping stewardship regimes up to date as knowledge advances.”<sup>59</sup>

Another significant document relating to the federal government’s approach to stewardship in the biotechnology sector is the Overview of the CFIA’s Corporate Business Plan 2003-08. This document states that “the CFIA is a key partner in Government of Canada stewardship initiatives involving biotechnology” as part of the Canadian Biotechnology Strategy.<sup>60</sup> This strategy involves the modernization of the regulatory system for biotechnology through such activities as 1) the negotiation of international principles of safety and guidance, sharing information and providing expertise; 2) the fostering of citizen engagement and greater awareness of federal biotechnology regulation; 3) the seeking of public involvement in regulatory policy developments; 4) and the meeting of Canada’s international obligations

The Minister of Health, A. Anne McLellan, characterized stewardship as follows in her presentation at the *Bio 2002: International Biotechnology Convention and Exhibition* (Toronto, June 10, 2002):

“Our approach is rooted in a commitment to stewardship. That includes helping to ensure people and the environment can benefit from innovation. And it includes creating the capacity to respond effectively and efficiently to the advances of new applications or a revolutionary technology. Our model is science-based and detailed. But the principle that guides us is simple: we are committed to ensuring – for now and the future – the safety, health and well-being of our citizens and the environment by responsible management of risk. It is only by operating by this principle that the potential benefits of biotechnology can be fostered.”<sup>61</sup>

In 1999, at the Inaugural Meeting of the Canadian Biotechnology Advisory Committee, the (then) Industry Minister John Manley presented innovation and stewardship as separate issues – they represent two of the three pillars of the Canadian Biotechnology Strategy:

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<sup>59</sup> *Achieving Excellence: Investing in People, Knowledge and Opportunity*, p.65.

<sup>60</sup> Please refer to the *Canadian Food Inspection Agency Corporate Business Plan 2003-2008*, accessible on the Web at: [www.inspection.gc.ca/english/corpaffr/busplan/2003-2008/fed/biotechbe.shtml](http://www.inspection.gc.ca/english/corpaffr/busplan/2003-2008/fed/biotechbe.shtml)

<sup>61</sup> Complete speech available at <http://www.hc-sc.gc.ca/english/media/speeches/20june2002mine.html>

“[Following innovation, the] second key area where Canada can play a lead role is responsible stewardship. By this, I mean concern for the health and safety of Canadians, and protecting the quality of the environment. We must ensure that the products and processes of biotechnology are subject to the highest standards of scientific testing for health and safety. Again, yesterday's Speech from the Throne reflected the importance of stewardship, including commitments to: strengthen the research and science capacity to promote health, safety, a cleaner environment, and economic well-being; strengthen Canada's food safety program; and, explore new environmental clean-up technologies. There is another element of stewardship I hope your committee will take close to heart: the protection of our values as a society. Canadian values must be at the heart of the public discussion on biotechnology. This brings me to the third area where we must strengthen Canada's role in biotechnology: the engagement of Canada's citizens. Biotechnology involves fundamental values that we hold as a society. Should we patent higher life forms? Should we allow research that may lead to the cloning of humans? Canadians want to be involved in the formulation of policies and regulations that affect them. They don't want policies and regulations formulated in secret. They want to see their values reflected, both in the discussions and in the results. These three key areas -- innovation, stewardship, and citizen engagement -- lie at the heart of the Canadian Biotechnology Strategy.”<sup>62</sup>

## 3.2 The Biotechnology Context Abroad

### 3.2.1 The United States

A *Biotechnology and Environmental Protection* program aims to co-ordinate biotechnology regulatory activities within the USDA and with other federal US agencies. Among the goals of this program is the assurance of environmental stewardship by monitoring impacts of Animal and Plant Health Inspection Service (APHIS) programs.<sup>63</sup> Further, the USDA Advisory Committee on Agricultural Biotechnology (ACAB) discusses stewardship within the context of “environmental protection” in *Public Plant Breeding Programs*, and recommends the USDA “sponsor a series of workshops with stakeholders including plant breeders, ecologists, farmers, and citizens to generate and discuss a plant breeding research agenda targeted toward new tools for environmental stewardship.”<sup>64</sup>

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<sup>62</sup> Complete speech available at <http://biotech.gc.ca/archives/engdoc/bh00254e.html>

<sup>63</sup> Information on this program is accessible on the Web at:  
[www.aphis.usda.gov:80/bad/refbook2000/BiotechEnvironProtection.pdf](http://www.aphis.usda.gov:80/bad/refbook2000/BiotechEnvironProtection.pdf)

<sup>64</sup> Information on this program is accessible on the Web at: [www.usda.gov/agencies/biotech/acab/meetings/mtg\\_8-01/ppbprpt\\_8-01.html](http://www.usda.gov/agencies/biotech/acab/meetings/mtg_8-01/ppbprpt_8-01.html)

The Environmental Protection Agency's (EPA) biotechnology regulatory program is based on five important principles that guide their decision-making policy. These principles are congruent with similar notions of stewardship (although not explicitly mentioned here). The principles are as follows: 1) Using sound science; 2) ensuring transparency of the decision-making process; 3) maintaining consistency and fairness; 4) collaborating with our regulatory partners; and 5) building public trust.<sup>65</sup>

### 3.2.2 Australia

Australia's *National Biotechnology Strategy* spells out a series of goals consistent with the government's vision of "safeguarding human health and ensuring environmental protection."<sup>66</sup> Although the term "steward" is not used, the goals outlined in the strategy are consistent with conceptualizations of stewardship encountered thus far. The goals are: "1) To ensure that in research into, and in applications of biotechnology human health and the environment are safeguarded, in particular through a rigorous, efficient and transparent system of regulation for gene technology research and for genetically modified organisms and products; and the highest ethical standards are observed. 2) To ensure that the community has access to quality information about biotechnology, the potential risks and benefits of its applications, the ethical issues they raise, and has confidence in the way risks are assessed and managed and that it can contribute to public policy in this area. 3) To enhance the economic and community benefits of biotechnology through an internationally competitive environment for investment and enterprise development; stronger links between the biotechnology research sector and industries that apply biotechnology; and better management of intellectual property. 4) To maintain and develop the infrastructure for generating biotechnology applications through productive investment in biotechnology research and development; world class education in biotechnology; secure access to genetic and biological resources; and conserving genetic and biological resources."<sup>67</sup>

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<sup>65</sup> Information on this program is accessible on the Web at: [www.epa.gov/pesticides/biopesticides/](http://www.epa.gov/pesticides/biopesticides/)

<sup>66</sup> *Australian Biotechnology. A National Strategy*. 2000. The strategy is accessible on the Web at: [www.biotechnology.gov.au/library/content\\_library/BA\\_Biotech\\_strategy.pdf](http://www.biotechnology.gov.au/library/content_library/BA_Biotech_strategy.pdf)

<sup>67</sup> *Ibid.*, p.7.

## A Preliminary Ethical Analysis of Stewardship Concepts

One may be inclined to believe that the string ‘stewardship’ within the notions ‘environmental stewardship,’ ‘product stewardship,’ ‘technological stewardship,’ etc., denotes approximately the same – this is a deception. In this section we discuss very briefly some of these different concepts to illustrate important differences and to show that all stewardship concepts are indeed value-laden in significant ways.

### Environmental Stewardship

Stewardship does not have a positive connotation in all circles. The root of the stewardship concept in the Old Testament is an issue for many environmentalists who believe that the Judeo-Christian belief systems are the cause of the environmental problems that we are currently experiencing.<sup>68</sup> Within environmental ethics, the stewardship concept is considered *anthropocentric* (i.e., human centred). Within anthropocentric ethical theories only humans have moral standing – the environment counts only insofar as it is important to humans. Many environmentalists espouse an *ecocentric* ethic. Ecocentric theories such as the *land ethic* provide arguments that non-humans may have moral standing. Under the land ethic, humans are “plain citizens of the land” rather than conquerors. The stewardship claim is viewed at least with suspicion from this ethical perspective. At the same time one has to acknowledge that less radical environmentalists would find environmental stewardship a very useful metaphor to emphasize the responsibility humans have for the environment.

This is important for two reasons. First, non-anthropocentric considerations are not only confined to the most radical environmentalists. The new Species at Risk Act (SARA), for example, could be considered at least in part motivated by non-anthropocentric values systems. Second, a major source of opposition to biotechnology is coming from environmental circles – arguably, it is not possible to fully understand and address the biotech controversy without understanding and addressing the value system of environmentalists. One should note that biotechnology is a special case from an environmental perspective because the environment is not only the recipient of the effects of biotech, but it is also the provider of the technology itself (i.e., all biotech, including apparently non-environmental applications, such as contained

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<sup>68</sup> This argument was made in the seminal paper by Lynn White, “*Historical Roots of Our Ecological Crisis*,” *Science* 155 (March 10, 1967), pp. 1203-1207.

fermentations or the xenotransplantation of organs from pigs into humans become “environmental issues” because the source of the fermentation agent and the well-being of pigs are environmental ethics issues).

## **Product Stewardship**

The ethical issues surrounding product stewardship are entirely different. Product stewardship is organized around the life cycle of a product. One can, for example, distinguish the following steps:

1. Framework setting (e.g., innovation framework), availability of funding sources and partners
2. Early research and patenting of innovations
3. Design and development of product; efficacy and safety testing
4. Regulatory assessment and registration of product
5. Market launch, advertising and labelling (“informed choice” issues)
6. Market surveillance and user education
7. Product re-evaluation

Each of these steps has its own ethical issues associated with it, and at each step a different group of potential stewards can be identified.<sup>69</sup> The key stewardship issue is the partitioning of power and accountability among all parties (e.g., stakeholder involvement, voluntary vs. mandatory requirements, provision of centralized and standardized vs. decentralized and contextual decision-making).

## **Stewardship of Technology**

A key issue in technology stewardship is the identification of values that can guide the “appropriate balance” between fostering innovation and regulating for safety (broadly understood – may include safety of economic stability and social goods). It is at this point where the value-laden concept “precautionary approach/principle” can have a major effect on decision-making – how does one balance the benefits and costs associated with doing a certain activity (commission) with those of *not* doing the activity (omission). Technology stewardship intersects with a number of additional and diverse government activities – for

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<sup>69</sup> For much more detail, please see Marc Saner, “*Towards an Ethics Management System for Biotechnology*,” available at [http://www.iog.ca/view\\_publication.asp?area=10&publicationItemID=163](http://www.iog.ca/view_publication.asp?area=10&publicationItemID=163). A PowerPoint presentation of this talk is available at the website of the GE3LS Winter 2003 Symposium organized by Genome Canada.

example, funding priorities, patenting regimes, regulatory approaches, risk management methods, and international trade standards.

The choice of subsuming the innovation concept *under* stewardship vs. *juxtaposing* innovation and stewardship is in itself a key ideological commitment. The former appears to be the choice of supporters of biotechnology who wish to *highlight the potential costs of missed opportunities*. The latter, in contrast, implies that safety, regulation, and control should be the primary focus of the steward (innovation would be the concern of somebody else in this model) – a position that can be used to *highlight the potential costs of using risky biotechnological methods and products*. This is quite an important point in the Canadian context because innovation and stewardship are separate pillars under the Canadian Biotechnology Strategy (see speech by Minister Manley quoted above). One could read this separation into different pillars as an intention to exclude innovation from stewardship. However, it is quite clear that the Federal Government is quite supportive of biotechnology, as exemplified by the creation of Genome Canada, and does consider biotech innovation to fall within its stewardship mandate. Clarity on this point is desirable.

A quite different question from the stewardship *of* biotechnology is the effect biotechnology may have *on* existing stewardship models. Biotechnology can be considered a transformative technology and one should not only reflect on how to govern it – it is probably more important to reflect on how current approaches to good governance may be threatened by a technology that is evolving so rapidly that is certainly not under the full control of governments. This lack of control is an ethical issue in itself (but it is not unique to biotechnology).

### **Stewardship as a General Governance Issue**

This topic has already been discussed in the first chapter and throughout the report. Some summary comments using ethical terminology follow. An overarching driver in the divergence of stewardship concepts is *political*. In a nutshell, governments that emphasise the principle of *liberty* as a key foundation of the constitutional democracy (e.g., the U.S. and the U.K.) will advocate limited government intervention and emphasize the importance of market forces and the stewardship obligations of industry and citizens. The steward in this model could be visualized as a humble and dedicated servant. In contrast, governments that emphasise the principle of *equality* (e.g., in the form of distributive justice) as the key foundation of the constitutional democracy will advocate comparatively greater responsibility, involvement and power for governments. The steward in this model could be visualized as a guardian. It is easy to cast the stewardship

concept in a way that one of the two ideological preferences is clearly highlighted – although the former libertarian approach should probably be called an “agency model” rather than a “stewardship model” following the discussion by Saltman and Ferroussier-Davies (see Chapter 1.) The debate over the relative merit of the servant vs. guardian models is old and reaches back to the ancient Greek philosophers.

## **Why Biotech?**

Ethical issues are probably the key reason for why biotech stewardship has received special attention in Canada. Minister McLellan, for example, states in the speech referred to above: “this is the one technology that gives us the ability to alter the very building blocks of life.”<sup>70</sup> It is certain that some ethical issues are unique to biotechnology – for example, the fear that cloning techniques and gene therapy would result a re-emergence of human eugenics programs (a eugenics program based on the sterilization of “imbeciles” was in craft in California up until 1927). Other ethical issues are not unique to but may seem particularly applicable to the case of biotechnology – especially to the casual observer.

But biotechnology has also some features that make it stand out from a *risk* perspective. The patenting of biotechnology allows new abilities for industry to control biological resources (during the 20 year-long patent protection) – a potential social risk because the control structure over fundamental resources such as food is important. Further, some biotechnological products freely reproduce in nature. From an epidemiological or an environmental risk perspective, products that are environmentally persistent are in a class of their own, because persistence (and associated mobility) reduces the availability of effective risk management tools. A risk perspective lends support to the view that stewardship models for highly persistent products or agents may have to be different from those for more manageable products and agents. Again, the issue of precaution needs to be considered in this context. This perspective links a portion of the available biotechnology products to stewardship of other products with persistent features, such as some chemicals, the management of some non-indigenous species and also some of the planned products of nanotechnology. The alignment of the biotech stewardship model to those used for non-biotech products with similar ethics and risk profiles would be an important component of a coherent stewardship framework.

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<sup>70</sup> Complete speech available at <http://www.hc-sc.gc.ca/english/media/speeches/20june2002mine.html>

## Recommendations

- Based on the research presented here, a logical next step would be an investigation into the practical implications of the concepts listed in this report – how do countries and organizations implement the stewardship concepts? And what experiences could they gain as a result of their approach?
- A more in-depth ethical analysis of the various stewardship concepts would deepen the understanding of meaning of different stewardship options. However, conducting such a project in the abstract would not be the best approach. Instead, such work could be an accompanying measure during the development of the Canadian approach. In this context it would be meaningful to first find out what the ethical commitments that key decision-makers want to have reflected in the Canadian approach are. In a second step one could analyze how these values and standards can be built into the Canadian conception of biotech stewardship. Finally, one could analyze how these commitments compare to those in Canada, in other stewardship contexts, and to those made by other countries.<sup>71</sup>
- Stewardship concepts do not exist in a vacuum. There is a very close link to several high-profile issues in the Federal Government. Tie-ins with the concept of *smart regulations*, the *Innovation Strategy*, modern comptrollership and *risk management*, the Canadian interpretation of the *precautionary approach/principle*, the *Values and Ethics Initiative*, and (last but not least) concepts of *good governance* should be made clear. A champion for stewardship is only well served if these connections are made, if conflicts are addressed, and if the various communities in government working on these related issues would be willing to buy into a Canadian stewardship concept (model, framework).
- Like many ethical concepts, stewardship is difficult to translate into French. At the same time, this difficulty provides an opportunity to further explore its meaning and to investigate cultural differences in Canada in the context at hand. An early dialogue on this issue with the Francophone community seems advisable.

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<sup>71</sup> The results of a recent event hosted by the Institute On Governance would be interesting in this context.

Approximately 60 opinion leaders and decision-makers in the Federal Government and the non-government sector were tasked to develop the characteristics of a good stewardship framework. A summary of this event will be available at [http://www.iog.ca/knowledge\\_areas.asp?pageID=13](http://www.iog.ca/knowledge_areas.asp?pageID=13) very shortly.

Concluding note: It appears to us that Canada could lead the way in the biotechnology stewardship domain. Canada's stewardship concepts in the regulatory and environmental sectors already show a strong presence on the internet (including important sites, e.g., the OECD website) and it is highly plausible that a well-formulated stewardship concept would be widely considered in the international community.

## **Appendix – International Internet Resources on Biotechnology**

### **United Kingdom**

Advisory Committee on Releases to the Environment

[www.defra.gov.uk/environment/acre/index.htm](http://www.defra.gov.uk/environment/acre/index.htm)

Bioguide (an interactive guide to biotechnology support and regulations in the UK)

<http://dtiinfo1.dti.gov.uk/bioguide/bioguide.htm>

Human Genetics Commission

[www.hgc.gov.uk/](http://www.hgc.gov.uk/)

Department for Environmental Food and Rural Affairs

[www.defra.gov.uk/](http://www.defra.gov.uk/)

Food Standards Agency

[www.food.gov.uk/](http://www.food.gov.uk/)

Institute of Food Science and Technology

[www.ifst.org/](http://www.ifst.org/)

Rowett Research Institute

[www.rowett.ac.uk/](http://www.rowett.ac.uk/)

Agriculture and Environment Biotechnology Commission

[www.aebc.gov.uk/](http://www.aebc.gov.uk/)

### **United States**

*Environmental Protection Agency*

Biopesticides

[www.epa.gov/pesticides/biopesticides/](http://www.epa.gov/pesticides/biopesticides/)

Biotechnology Program

[www.epa.gov/opptintr/biotech/](http://www.epa.gov/opptintr/biotech/)

Prevention, Pesticides, and Toxic Substances

[www.epa.gov/oppts/](http://www.epa.gov/oppts/)

*US Department of Agriculture*

Food Safety Inspection Service

[www.fsis.usda.gov/](http://www.fsis.usda.gov/)

Agricultural Biotechnology

[www.aphis.usda.gov/biotech/](http://www.aphis.usda.gov/biotech/)

## *US Food and Drug Administration*

Center for Food Safety and Applied Nutrition - Biotechnology

<http://vm.cfsan.fda.gov/~lrd/biotechm.html>

Center for Biologics Evaluation and Research

[www.fda.gov/cber/](http://www.fda.gov/cber/)

National Institutes of Health

[www.nih.gov/](http://www.nih.gov/)

Executive Office of the President - Office of the Science and Technology Policy

[www.ostp.gov/html/012201.html](http://www.ostp.gov/html/012201.html)

## **European Union**

European Commission - Biotechnology Programme

<http://europa.eu.int/comm/research/biot1.html>; [http://europa.eu.int/comm/research/fp6/p1/index\\_en.html](http://europa.eu.int/comm/research/fp6/p1/index_en.html)

European Environment Agency

[www.eea.eu.int/](http://www.eea.eu.int/)

European Agency for the Evaluation of Medicinal Products

[www.emea.eu.int/](http://www.emea.eu.int/)

European Food Safety Authority

[www.efsa.eu.int/](http://www.efsa.eu.int/)

## **Australia**

Australian Quarantine and Inspection Service

[www.affa.gov.au/content/output.cfm?&OBJECTID=3E48F86-AA1A-11A1-B6300060B0AA00014](http://www.affa.gov.au/content/output.cfm?&OBJECTID=3E48F86-AA1A-11A1-B6300060B0AA00014)

Australian Department of Health and Ageing

[www.health.gov.au/](http://www.health.gov.au/)

Environment Australia

[www.ea.gov.au/](http://www.ea.gov.au/)

Food Standards Australia New Zealand

[www.foodstandards.gov.au/](http://www.foodstandards.gov.au/)

Therapeutic Goods Administration

[www.health.gov.au/tga/](http://www.health.gov.au/tga/)

Office of the Gene Technology Regulator

[www.health.gov.au/ogtr/index.htm](http://www.health.gov.au/ogtr/index.htm)

Biotechnology Australia

[www.industry.gov.au/content/controlfiles/display\\_details.cfm?objectid=D037243F-A12A-44AA-B85A56287D7E69B7&typeid=5D93D74B-E1B9-4674-8718D4A8E3A32887](http://www.industry.gov.au/content/controlfiles/display_details.cfm?objectid=D037243F-A12A-44AA-B85A56287D7E69B7&typeid=5D93D74B-E1B9-4674-8718D4A8E3A32887)

## **New Zealand**

Environmental Risk Management Authority

[www.ermanz.govt.nz/](http://www.ermanz.govt.nz/)

The New Zealand Biotechnology Association

[www.biotech.org.nz/](http://www.biotech.org.nz/)