Assessment of Potential Biodiversity Market Partnerships in Ontario

UNIVERSITY OF WATERLOO

AMOVEO

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EXECUTIVE SUMMARY

Understanding the true value of ecological services is not a recent phenomenon; neither is the concept of developing systems to properly compensate the environment and those engaged in agriculture for providing these services. One compensation approach is known as Payment for Ecological Services (PES), which, for the purpose of this report is defined as, “voluntary transactions where a service provider is paid by or on behalf of service beneficiaries for agricultural land… management practices that are expected to result in continued or improved service provision beyond what would have been provided without payment” ("The state of," 2007).Evidence shows that PES is effective and fair, successfully engaging all three dimensions of sustainability – economically, socially, and environmentally – in practical ways. One organization that currently participates in the Canadian voluntary compensation market is Alternative Land Use Services (ALUS), a non-profit organization based in Ontario that manages the rehabilitation of ecological services in communities across the nation. ALUS acknowledges that identification of its target market is essential for the brand development and attraction of PES.
Thus, the purpose of this research project was to first establish a list of potential target markets for ALUS to focus its marketing strategy around, to provide a recommendation of which target market ALUS should pursue and how to effectively do so. More specifically, the financial, automotive and mining industries were researched to identify which one is the appropriate target market for ALUS. The three industries were selected after an environmental scan demonstrated the industries with the highest interest in ecosystem services or environmental protection. In each industry, 5 to 6 Ontario-based companies were selected. The framework used to analyze the industries is the revision of the company’s Corporate Social Responsibility (CSR), while paying particular attention to each industry’s awareness of the biodiversity credit market, their stakeholder demand for biodiversity preservation, their willingness to pay for ecological services, and their existing biodiversity preservation programs within Ontario.

All three industries support biodiversity conservation initiatives; however, the automotive and mining industries have shortcomings that make them unsuitable for ALUS. The biodiversity projects of automotive companies are mostly implemented internationally, companies are focused on reducing carbon emissions and technology development, and there is a lack of involvement in carbon markets. Also, mining companies are already engaged in partnerships with NGOs that are similar to ALUS, biodiversity offsetting may not be part of the companies’ interests, and majority of biodiversity conservation efforts are away from where ALUS’ projects are located.

Thus, the results, discussion and analysis established that the financial industry is the most suitable target market for ALUS. There is a rise in financial institutions that understand the issues while capturing business opportunities by investing in environmental initiatives, encouraging environmentally responsible business practices, and establishing environmental criteria in their lending policies. Despite a positive view of the literature, there are shortcomings in targeting the financial industry, including, barriers to communicating long term benefits, biodiversity is often seen as a public good, and there are no standards for biodiversity credit mechanisms.

Recommendations for ALUS were made to assist in developing the organization’s operations and provide assistance when targeting potential investors. It is suggested for ALUS to first conduct primary research of financial institutions to further understand their perception of the biodiversity market. Second, to develop a business plan is important for the organization position, brand awareness and the execution of an effective marketing plan. Third, ALUS must implement a marketing communication strategy to offer insights to the organization’s forecasts and project costs. Lastly, to hire additional staff is beneficial for the proper implementation of these recommendations.

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1.0 INTRODUCTION

Understanding the true value of ecological services is not a recent phenomenon, neither is the concept of developing systems to properly compensate those who provide these services, specifically, the environment and those engaged in agriculture. The Food and Agriculture Organization of the United Nations (2007) defines Payments for Ecological Services (PES) as:

> "[V]oluntary transactions where a service provider is paid by or on behalf of service beneficiaries for agricultural land, forestry, coastal or marine management practices that are expected to result in continued or improved service provision beyond what would have been provided without payment" ("The state of," 2007).

PES is acclaimed to be the most current ideal solution to compensate the environment for its indispensible services (Wunder & Wertz-Kanounnikoff, 2009; Zilberman, Lipper, McCarthy, 2009). Such programs are designed to achieve environmental conservation by economic means. Evidence shows that PES is effective and fair, successfully engaging all three dimensions of sustainability – economically, socially and environmentally – in practical ways. PES is a powerful market-based mechanism in the biodiversity credit market, which can be divided into areas of voluntary compensation, compensatory mitigation, and tradable hunting rights (Sustainable Prosperity, 2012). By participating in the biodiversity credit market, firms invest in conservation funds to offset environmental degradation, and thus, gain a competitive advantage. However, the widespread adoption of PES is undoubtedly stunted by the lack of awareness of ecological services and the guaranteed funding required to compensate the service providers. Within the Canadian voluntary compensation market, there are many government-mediated programs; however they lack specific detail on how the funds are being distributed. In addition, there is no universal agreement yet on set standards as stakeholders value different attributes when factoring in benefits from the environment.

One organization that currently participates in the Canadian voluntary compensation market is Alternative Land Use Services (ALUS), a non-profit organization based in Ontario that manages the rehabilitation of ecological services in communities across Canada. ALUS strongly believes in the principles of PES and offers farmers an opportunity to improve farmland design while securing ecological services on marginal (unused) farmlands in exchange for monetary compensation. Despite the

organization's efforts to engage with firms and private investors to procure funding to supply compensation, ALUS must reconsider their funding strategies in order to stay operational.

Demand for ecological services payment schemes in Ontario are largely unknown, which is reflected in a lack of research available. However, this knowledge is critical for ALUS to develop future organizational plans. The literature suggests that the challenges of adopting PES are commonly overcome by government interventions that regulate the market (Brown et. al, 2006; Engel et. al, 2008; Hartwell& Aylward, 2010). For this reason, a partnership between ALUS and AMOVEO was formed to explore industries which could be potential investors of ALUS' ecological services program. AMOVEO will also provide recommendations to aid ALUS in developing a marketing communication program to effectively attract the potential target market.

Objectives & Deliverables

The aim of this research is to investigate ALUS' potential target markets (automotive, mining and financial industries), select the most suitable industry for ALUS, and provide recommendations on how to effectively market the concept of the biodiversity credit market, particularly PES, to those industries. Specifically, the research will answer the question: *Who will be the ideal target market for ALUS to appeal to?* The final report addresses the following key objectives:

1. To evaluate the awareness of biodiversity credit market among ALUS' desired target markets
2. To assess the social demand for biodiversity preservation in the target market's operations
3. To determine the industry's potential willingness to pay for ecological services
4. To explore the existing biodiversity preservation funding programs within the target markets

The accomplishment of these objectives will allow ALUS to reevaluate their marketing strategy and framework, and recommend avenues to reposition themselves effectively in the biodiversity credit market. We will provide Mark MacNeil, our client representative, a package including a final research report, a 4-page executive summary describing the details of this report and a supplementary presentation slide deck adaptable to ALUS' needs.

2.0 OVERVIEW OF PAYMENTS FOR ECOLOGICAL SERVICES AND ALUS

2.1 The Existing ALUS Brand

In 1990s, Alternative Land Use Services (ALUS) implemented Payments for Ecological Services (PES) program in Canada to compensate ecological service providers and to provide an opportunity for biodiversity conservation (M. MacNeil, personal communication, March 5, 2013). The non-profit

organization has since built a reputation as a biodiversity (or ecological) service conservationist among local farmers. ALUS engages with farmers with marginal farmlands to work towards sustainable agriculture and improved management of natural resources, such as soil, water, and vegetation. Each project is context specific, offering knowledge easily transferrable and customized based on community needs and alternatives. Maintaining strong relationships with farmers is among one of ALUS' many strengths. Their ability to effectively educate rural communities on land management practices established the brand for land stewardship and restoration.

ALUS has also become a leader among biodiversity credit providers, servicing the Voluntary Credit Trading Market in Ontario (Sustainable Prosperity, 2012). ALUS has emerged in the market with a desire to be the preferred delivery agent of Biodiversity Credit Services through creating awareness of the Ontario Biodiversity Credit Market, a new market mechanism trading biodiversity credits similar to carbon credits. Currently, ALUS uses a Payments for Ecological Services (PES) scheme as a market instrument that offers financial incentives for local actors to provide ecological services. On a global scale, PES is a recognized market-based mechanism with positive contributions to sustainability, offering inherent environmental gains and subsequent social and economic benefits (Wunder & Wertz-Kanounnikoff, 2009). However, a lack of understanding and awareness of ecological services and willingness to participate in PES prevents the market-based mechanism from reaching its full potential.

ALUS is nearing the end of its financial resources garnered from government funding and other donors and is currently investigating sustainable and consistent funding sources to further expand its biodiversity credit scheme. The organization has identified that it would like to pursue the automotive, mining and financial industries as potential sources for financial support.

2.2 Market Analysis

ALUS participates in the Voluntary Conservation Market within the larger Habitat and Biodiversity Market. Voluntary conservation is an activity that is neither regulated nor required under legislation, but is enacted voluntarily and proactively, often non-fungible and has public transparency. These conservation activities are valued at approximately $254 million and represents 48% of the Habitat and Biodiversity Market (Sustainable Prosperity, 2012).The remaining 52% of the market is comprised of programs used for mitigation purposes (51%), or intended to offset foreseen environmentally damaging activities, and licensed rights to hunt (1%). Participation in the market is often attractive to stakeholders due to the resulting positive and visible advancements in biodiversity conservation.

3.0 METHODOLOGY

For the purpose of this study, three literature review sessions were conducted, followed by a desktop study to further examine the potential target markets for ALUS to pursue, and to investigate each industry's participation in biodiversity conservation initiatives. Each of the information gathering methods are discussed in the following section.

3.1 Literature Reviews

The literature review for this project was carried out to provide information on the general background and context of PES, as well as its connection to the three pillars of CSR: social, economical and environmental (refer to appendix for the full literature reviews). The review focused specifically on literature available in the United States and Canada. Information was collected to prepare a foundation of knowledge on why corporations might consider biodiversity offsetting. The literature highlighted recurring themes of brand image, social pressure, and economical market trends as indicators of investing in the biodiversity credit market.

The first literature review examined the incentives and the willingness to pay of corporate firms and governments for Payment for Ecological Services. The role of government influence and drivers for investing in ecological services were also investigated. The second literature review investigated economic theory and value on ecological systems. Finally, the third review examined the socioeconomic and environmental advantages of PES programs; as well as how stakeholder involvement can motivate change in corporations.

3.2 Desktop Study

A desktop study was carried out to acquire existing data on the current Canadian environmental markets, the automotive industry, the mining industry, and the financial industry. The corporate social responsibility (CSR) reports of organizations from the three target market industries were reviewed to obtain the views of top-ranked companies on environmental issues, and to acquire information on the environmental initiatives, specifically biodiversity conservation, to address these issues.

ALUS verbally communicated a list of potential sectors to investigate. After an environmental scan of key economic industries in Ontario was conducted, it was revealed that the automotive, mining and financial industries demonstrated the highest interest in ecological services or environmental protection. Leaders within these three industries (**Table 1**) were identified through further desktop research, and their respective CSR reports were acquired through the company's official website. In particular, Barrick Gold, in the mining industry, was selected because it is currently involved with a significant project in Ontario (InfoMine, 2012).

	Industry Leaders
Automotive Industry	Toyota, Chrysler Fiat Group, Honda, Ford and General Motors
Mining Industry	Goldcorp Canada, Vale Inco Limited, Xstrata, Teck Resource Limited, and Barrick Gold Corporation
Financial Industry	BMO, CIBC, TD, RBC, Scotiabank and National Bank Financial Group

Table 1: Results of the environmental scan of top-ranked industry leaders in Ontario

3.4 Limitations

This research project has several limitations. First, there were many unforeseen restrictions when developing the direction of this research project. The earlier research focused on the awareness and willingness of farmers and municipalities to participate in Payments for Ecological Services programs was unsuccessful. The initial research involved conducting interviews and circulating surveys in the City of Waterloo, City of Brantford and Municipality of Thames Center (which then changed to the City of Woodstock).

However, due to the temporal and resource limitations, in combination with little interest and poor responses from participants, the project shifted away from a field research towards a desktop research on potential target markets for ALUS. It became apparent that branding and corporate engagement by ALUS was a much more important issue than previously conceived by ALUS. ALUS critically needs to engage industry in order to develop partnerships and corporate clients as a means of financing further development of ALUS and therefore financing increasing conservation and ecological services via the ALUS model.

Second, literature on biodiversity markets and potential customers of such markets is constrained by its limited nature and limited relevant case studies in the Canadian and Ontario contexts. This is especially true with regards to company CSR reports, which is why it is assumed that all environmental initiatives, unless otherwise stated, can be, or are already, applied in Ontario. The researchers were required to rely on global literature. This is because there is a weak presence of the biodiversity credit market in Canada, especially regarding funding opportunities. There is not a lot of academic literature, and majority of what is available is considered as “Grey Literature”, consisting of reports written by NGOs, governments and industry members. Additionally, due to limited resources, the literature used in the research may not reflect the true value of activities within the Habitat and Biodiversity Market.

Third, there were some limitations identified through the research study undertaken. Much of the literature outlined a great uncertainty when defining the biodiversity market and the difficulties in establishing what is encompassed within this market.

Lastly, working with a developing organization, like ALUS, poses limitations, evidenced by lack of existing branding strategy, and few human and financial resources to position themselves in an, as of yet, largely non-existent market—voluntary biodiversity offsets in Canada based on farmlands. ALUS currently lacks strategic and marketing plans, making it attractive for the research team to help the client identify priorities and strategies, but also making it a challenging endeavor for the team as interactions with the client involve a high-degree of brainstorming and mutual learning to identify needs and marketing priorities.

4.0 RESULTS

The results gathered from the literature review and desktop research are presented here. This section provides a background on the biodiversity conservation initiatives participated and supported by the top-ranked industry leaders within the automotive, mining and financial industries.

4.1 AUTOMOTIVE SECTOR

The five automotive companies with manufacturing plants in Ontario were chosen for this study. These companies include, Toyota, Chrysler Fiat Group, Honda, Ford and General Motors. Each company's CSR report included an environmental regional report which contains information on the company's biodiversity conservation initiatives. The context of these initiatives is applied in all manufacturing facilities, and it is assumed that they are applied in Ontario, unless otherwise mentioned.

Toyota

Toyota is driven towards implementing environmental educational programs, such as their Everygreen Learning Ground program. The program was designed to transform school grounds into natural learning environments. Activities included planting native trees, vines, shrubs and creating vegetable gardens with seating areas (Toyota Canada, 2012).Furthermore, Toyota introduced Toyota Earth Day scholarship programs, where the company honours young passionate Canadian students to further their education and careers in environmental responsibility.

According to the company's 2012 Sustainability Report, Toyota is focused on reducing global carbon emissions by promoting "low-carbon societies", supporting low carbon transportation systems, and producing hybrid cars. In order to create an incentive for households to conserve energy, the company has developed data management systems to measure and monitor energy consumption in Canadian

households. Moreover, Toyota was successful in reducing waste and water consumption by implementing Environment Management Systems (EMS), and recycling and selling used manufacturing materials ("Sustainability report 2012,").

Internationally, Toyota is working towards implementing reforestation and biodiversity efforts similar to ALUS' activities. Toyota's most significant environmental initiative is the *Biodiversity Action Plan* at the Toyota Manufacturing plan based in the United Kingdom. Toyota Manufacturing works with community provincial parks or wildlife management organizations to enhance and protect species (birds, amphibians and mammals), plants (native flowers and vascular) and habitats (wetlands, lowland meadows and grassland management) ("Biodiversity action plan", 2010).In Australia, Philippines, China and Japan, Toyota has previously worked with local governments and communities to achieve environmental and biodiversity conservation (Shibusawa, 2011). Some of the activities include environmental education, prevention of desertification, tree-planting, rainforest and species protection.

Honda

Honda established an environmental initiative, involving a clean-up and protection of a spring creek or a stream that flows through one of its plants. The clean-up is conducted by Honda associates and their families volunteering on the first Saturday of May each year. Over time, the project developed and more protection efforts towards wildlife inhabiting the river's basin. In addition, the program initiated a range of environmental activities such as the removal of plant species harming the local ecosystem, construction of bird boxes for eastern bluebird's habitat, and planting of seedlings (Honda CSR Report, 2012).

Honda strives to combat climate change through the reduction of CO^2 emissions of its vehicles by collaborating with governments and regulators. The company is aiming to reduce carbon emissions by 30% from their automobiles, motorcycles and power equipments (Honda CSR Report, 2012).Honda has also established goals to eliminate waste to landfill from its operations. However, similar to Toyota, Honda works towards producing fuel-economic and hybrid vehicles.

In the United States, Honda is supporting a number of environmental and biodiversity conservation efforts such as the Miami urban nature preserve and mobile bay coastal restoration in Alabama. In the form of charitable giving, financial donations, product donation or Honda associate volunteering in their local communities. For example, the Jane Goodall Institute of Canada received financial assistance towards wildlife research, conservation and education which aims to increase awareness for endangered animals ("Honda North America" 2012).

Chrysler and Fiat Group Canada, Inc.

One of the main biodiversity initiatives by Chrysler and Fiat Group Canada, Inc. (the Group) is the Fiat Biodiversity Value Index which is used to measure and value the biodiversity surrounding their manufacturing plants. The index is used to ensure that any environmental damage caused by the plant is identified and the company will intervene to alleviate the issue. The index reflects the level of biodiversity found in the area measured through an analysis and assessment of specific indicators. Also, it measures the level of environmental pressure from human activities in the area. The index was particularly successful in Italy, where the Fiat plant reduced waste, water consumption and emissions from raw materials (2011 Sustainability Report, 2011). The Group also worked with local governments to build an artificial pond for endangered species, maintain natural wetlands, contain shrub overgrowth and restore habitat.

The Group is determined to reduce toxic chemicals from its operations. By implementing equipment upgrades and monitoring processes of its equipment, the company was able to reduce the volume of chemicals such as the ozone depleting substances, carbon dioxide, volatile organic compounds (VOC), nitrogen, sulfur oxides and dust ("2011 Sustainability Report,").

Ford Canada

Ford's environmental projects are committed to greenhouse gas reduction and fuel economy of its fleet. There is a huge interest in water reduction and conservation in Ford plants. Ford has worked towards reducing water consumption through assessing manufacturing plants in water stressed areas. The company has been efficient in revising its supply chain to satisfy environmental standards, starting from educating sustainability management and conducting supplier training to understanding the environmental impacts form the supply chain (Niemann, 2012). Furthermore, the company is committed to building their sustainability strategy around transparency, accountability and stakeholder engagement (Niemann, 2012).

General Motors

General Motors (GM) built their sustainability model around four visions: design, sell, build and reinvest (Schafran, 2012). They aim to design advanced technologies to reduce emissions, improve fuel economy and reduce petroleum dependency. GM also produces environmentally conscious vehicles, such as hybrid cars, and builds environmentally efficient operations and facilities. GM is committed to reinvest in communities to enhance the quality of life of its stakeholders.

Additionally, the company established biodiversity protection initiatives, such as the construction of McLaughlin Bay Wildlife Reserve in Ontario. These reserves are usually certified by Wildlife and Habitat councils and contain endangered species or animals such as owls, foxes or turtles (Schafran, 2012). They usually features walking trails, plants, ponds and nesting boxes for owls and bats. The wildlife reserves are the extent of GM's plans towards resource and environment conservation.

4.2 MINING SECTOR

The sustainability values and efforts in the CSR reports of Goldcorp Canada, Vale Inco Limited, Xstrata, Teck Resource Limited, and Barrick Gold Corporation are evaluated in the study for the mining industry as they currently have active mines in the province of Ontario. The first four companies were selected as they have the most number of metal mining projects in Ontario, according to a list of mining and mineral processing operations in Canada from Natural Resources Canada (List of Mining and Mineral Processing Operations in Canada, 2013).

Barrick Gold

As stated in its 2011 Responsibility Report, Barrick Gold (Barrick) recognizes that while it is not usually possible to restore a mine site exactly as it was prior to mining as significant impacts to biodiversity cannot be avoided, sites should be minimized, mitigated or compensated with the goal of "no net loss" to biodiversity. In 2009, Barrick developed a Biodiversity Standard which requires the company to integrate biodiversity into project planning and decision making, assess its impacts on ecological services, and design projects that avoid potentially significant impacts on biodiversity ("2011 Responsibility Report," 2011). To demonstrate its commitment in the protection of biodiversity, Barrick has been implementing projects that protect rare or significant plant and animal life and habitat. Currently, Barrick manages land areas of land, owned or leased, with less than 1.5 percent of this land being disturbed for mining activities and the rest left in its natural state or utilized for agriculture and livestock grazing ("2011 Responsibility Report," 2011). Also, the Environmental Impact Assessments for Barrick's sites addressed the protection of globally-threatened plant and animal species identified in the International Union for Conservation of Nature (IUCN) Red List of Threatened Species (Red List), which is the world's most comprehensive inventory of the global conservation status of plant and animal species.

Barrick partners with government agencies, non-governmental organizations (NGOs), and non-profit organizations including Trout Unlimited, Bighorn Unlimited, the Nature Conservancy, Conservation International, and Ducks Unlimited to understand biodiversity lands involved in the mining process, as

well as to protect and enhance plant and animal habitat on its sites. In 2011, Barrick piloted the Nature Conservancy's "Development by Design" conservation and mitigation program at the Kanowna mine in Australia. It was a science-based program that blends landscape-level conservation planning with the mitigation hierarchy – to avoid, minimize, restore, and compensate (or offset). The program was intended to reduce conflicts between development needs and conservation, increase cost-effectiveness of mitigation efforts and direct funding to higher-value conservation.

Xstrata

Xstrata works with customers, industry associations, academia and other parties to improve the lifecycle impacts and risks of their products, including recycling and investing in technologies to mitigate carbon emissions from coal. Xstrata takes a lifecycle approach to protecting land resources: Environmental and Social Impact Assessment (ESIA) is focused in the project planning stage of the mining lifecycle; air emissions and biodiversity impacts are focused in the project construction stage; while rehabilitation and land reclamation is focused in the closure stage. Recognizing that recycling has the twofold benefit of extending the life of these metals and reducing landfill volumes, Xstrata takes pride in being one of the world's leading recyclers of electronic scrap.

Xstrata owns, leases, and operates more than 1.5 million hectares of land and of which about 530,000 hectares are in areas rich in biodiversity. Xstrata stated in its 2011 Sustainability Report that when evaluating the potential impact of land disturbance, the company takes into account the ecological services associated with the land as it understand the important role wetlands and forests play in preserving soil and preventing erosion, which can benefit agricultural users and downstream aquatic species ("Sustainability Report 2011," 2011). Xstrata requires all managed operations to document an annual review of biodiversity conservation and land management plans, and ensures that no loss of IUCN Red List or endangered species are on the leases of managed operations. In 2011, regular biodiversity monitoring lead to the identification of the presence of a family of peregrine falcons at the Kidd Mine copper site in Canada. As a result, plans are in place to prevent the disturbance of the regulated habitat of this threatened species ("Sustainability Report 2011," 2011).

Xstrata also works closely with local communities and government to ensure that their post-closure rehabilitation efforts leave the site in a state that either allows for residential, agricultural or commercial use, or return to its natural pre-operational state. Site closure plans address aspects such as topographic maintenance, run-off prevention and soil quality preservation. Also part of the closure plans, Xstrata annually estimates the future costs of rehabilitating their sites over the life of the operations and provide the government of a particular country with a bond (usually a bank guarantee) that would cover the

costs of close and post-closure monitoring. Furthermore, the company looks for opportunities to create biodiversity “offset” reserves, the ecologically important areas within its mining or exploration leases that it can set aside as protected land. In Australia, a total of 9,612 hectares for were set aside for biodiversity offsets. Xstrata’s nickel operations in Sudbury, Ontario participate in “Green Mines, Green Energy”, a joint government-industry consortium, to test the use of non-productive mining lands for growing biofuel crops ("Sustainability Report 2011," 2011). Running for three to five years, this project uses a two-hectare test plot in an Xstrata tailings area, which has been covered with compost materials and seeded with canola, corn and switch grass.

Vale

While Vale recognizes areas such as climate change, energy, and water as topics of high relevance for Vale and its stakeholders in Vale’s Materiality Matrix, land use has a medium and biodiversity has a low relevance indicator. Vale protects or helps to protect an area that is 3.5 times larger than the area occupied by its oepartions, which are often located in areas that have already been impacted by human acitivity or are used for industrial purposes. Including the operations for which Vale is responsible, the total area affected by the company in 2011 was 17.2 km^2. During the year, restorataion activities were started in a total area of 25.2 km^2, involving permanent restoration of 29% of the area and temporary restoration of 71% of the area. Vale also maintains a nursery in certain areas of interest used for replanting land with native and multi-purpose tree speicies ("2011 Sustainability Report," 2011).

Vale stated in their Sustainability report that it aims to set the benchmark in the mining sector for the management and sustainable use of the resources of the regions where it operates. To achieve this goal, Vale invests in technological innovation and establishes control systems to prevent and minimize regional impacts. The Vale Technology Institute is working in partnership with the Federal University of Vicosa in Brazil on a research project that assesses the potential for using tropical grasses for re-vegetation. Due to the hardy and fast-growing nature of the species, they will enable a natural ecological process at decommissioned extractive areas and at deposits of waste rock or tailings. The two institutes are also implementing a research project into carbon sequestration and the recovery of deforested mangrove biomes on the Ajuruteua peninsula in Para, in hopes to restore degraded areas of mangrove swamp while involving local riverside communities and raising their environmental awareness.

Recognizing the complexity of the biodiversity topic, more specifically the issue of environmental restoration, Vale established a management area dedicated exclusively to environmental restoration of minded and degraded areas in 2011. This management area has the objectives of producing standards,

establishing indicators, conducting research, and looking for and reporting best practices in environmental restoration at Vale. As part of its biodiversity conservation efforts, a specific global regulatory document guiding biodiversity management is being prepared at Vale. Along with the recent study of methodologies for measuring the impact of its operations, one of the main targets for 2012 was to have the standard approved for global application.

It is noteworthy that Vale is heavily engaged in reducing its emissions of sulfur dioxide (SO2) and the company has been investing in the Clean Atmospheric Emissions Reduction (AER) project in Sudbury, Ontario. The AER project is the largest environmental investment in the history of the province of Ontario, and Vale's emissions will be well below the maximum level of 66,000 tons per year that the Canadian federal and Ontario governments are establishing for 2015 and beyond ("2011 Sustainability Report," 2011).

Goldcorp

Goldcorp defines productive land as land covered by its mining leases and land that it owns or manages, and only 5 percent of this land is disturbed as a result of its mining activities ("2011 Online Sustainability Report," 2011). However, Goldcorp does not own, lease, or manage any land in, or adjacent to, protected areas or areas of high biodiversity value outside protected areas, other than The Black Hills National Forest in western South Dakota and northeastern Wyoming, as well as Mexico. As stated in their 2011 sustainability report, Goldcorp is committed to operating in a manner that minimizes its impact on biodiversity and, where possible, actively increases biodiversity values. Thus, its primary biodiversity focus is on habitat protection and restoration. Four of its nine operations are required to have some form of biodiversity management plan, all of which are currently in place. Regardless of regulatory requirements, all of its operations have voluntarily developed and implemented biodiversity management practices. Biodiversity offsets are not part of Goldcorp's overall policy and approach.

In Canada, 12 of the 14 fauna species identified on the IUCN Red List are wide-ranging species that potentially live in the Boreal Forest region of northern Ontario, and are recognized in the wildlife management plans in both Red Lake and Mussel white sites in Ontario. These species have been identified as "species at risk" and are protected by federal legislation called the Species at Risk Act, 2003 (SARA). Other biodiversity-related precautions include minimizing disturbances to vegetation and bodies of water, maintaining cyanide levels in all open waters below levels that pose a threat to wildlife, promoting employee and community awareness programs regarding wildlife, and reclaiming disturbed areas as quickly as possible and promoting habitat diversity within these reclaimed areas. Moreover, Goldcorp's closure plans focus on the environmental and social aspects of closure by making them as

environmentally productive as possible post mining and considering the economic implications of it on local communities ("2011 Online Sustainability Report," 2011).

Teck Resources Limited

To achieve Teck Resources Limited's (Teck) vision of having a net positive impact on biodiversity in areas where it operates, one of its goals is to identify and implement biodiversity improvement and conservation opportunities. Teck worked with the Nature Conservancy of Canada, the Ktunaxa Nation and local communities to acquire a 127-hectare parcel of land located on the east Shore of Columbia Lake in British Columbia. This land provides key habitat for bighorn sheep, elk and a number of rare and endangered species and includes important wetlands that are part of the longest uninterrupted wetland in North America.

As a progress on Teck's 2015 sustainability goals, Teck has launched its biodiversity guidance manual which provides practical tools for identifying and addressing key biodiversity concerns at each phase in the mining lifecycle; worked with communities of interest to identify and prioritize potential biodiversity offset projects and biodiversity conservation partnerships; invested in biodiversity research projects; and explored opportunities for restoration or stewardship for properties outside its direct operating footprints. Other biodiversity conservation strategies include re-vegetation programs that result in self-sustaining landscapes compatible with post-mining uses. Teck's Trail Operations is involved with the White Sturgeon Recovery Initiative (WSRI) to help develop and carry out a recovery strategy for the endangered white sturgeon species in coordination with a national recovery strategy under the Species at Risk Act ("2011 sustainability report," 2011).

As well, Teck is an industry participant in the Canadian Intermountain Joint Venture (CIJV), collaboration between government agencies, Aboriginal groups, non-governmental organizations, industry, universities and landowners. The CIJV complements and facilitates existing conservation initiatives, conserving habitat for the benefit of wildlife and people. As part of its habitat conservation efforts, Teck's Highland Valley Copper (HVC) Operations in BC has been building nesting boxes for bluebirds called the "Bluebird Nesting Box Monitoring Program" in reclaimed areas of the mine site and conducting monitoring of the boxes and the birds that make them their homes ("2011 sustainability report," 2011).

4.3 FINANCIAL SECTOR

A broad review of the Canadian financial sector revealed that 90% of Canada's assets are controlled by six major financial companies (BMO, CIBC, TD, RBC, Scotiabank and National Bank Financial Group) (Weber, 2011). Weber (2011) suggested that Canadian banks are the most vulnerable to environmental risk than any other banks around the world because of the high proportion of environmentally harmful

activities financed through them. Thus, all six major financial companies were selected and their CSR reports and environmental policies were reviewed and analyzed.

RBC

RBC's Environmental Blueprint™ indicated that the company believes that through environmentally responsible practices, RBC can lead to benefits for their shareholders, clients, employees and communities. RBC implemented an environmental policy that strives for reducing the company's environmental footprint, educating employees and customers, while remaining compliant and transparent on their key environmental performance indicators. Furthermore, RBC seeks to establish and maintain partnerships with experts, as well as support non-for-profit organizations, to ensure that the company is well informed and well-positioned to manage their environmental risks and opportunities ("Rbc environmental blueprint").

A priority environmental issue for RBC is biodiversity, in particular forests and Indigenous Peoples' lands. The company recognizes the importance of protecting Canada's biodiversity to "maintain healthy communities, cultural values and shareholder value" ("RBC Environmental Blueprint"). Furthermore, one of RBC's Three Environmental Objectives is to offer environmental products and services that "provide long-term environmental benefits, are clearly distinguishable from comparable non-environmentally focused products, and empower clients with options to reduce their environmental footprint at little or no additional cost to the client" ("RBC Environmental Blueprint").

Most importantly, the company is committed to participate in market-based initiatives that focus on a variety of environmental issues, especially protecting Canada's biodiversity. In 2012, RBC traded approximately 125 million tonnes of carbon credits through their Capital Markets carbon emissions trading group. The company also trades in the California Cap-and-Trade Program, Regional Greenhouse Gas Initiatives, Climate Action Reserve, and other offset and voluntary markets ("2012 RBC Corporate," 2012).

BMO Financial Group

BMO believes that success is achieved when integrating economic growth and environmental sustainability concepts. BMO is committed to reducing the environmental impact of their business operations and to demonstrate environmental leadership by incorporating environmental considerations in the company's business practices ("BMO Financial Group's," 2008).

BMO specifies goals which they commit to in their Policy Content, as well as allocated "environmental tasks" for each level of the company's organizational structure. Additionally, BMO has identified specific business activities in which the company has a direct and indirect impact on the environment, what the

impacts are, and the opportunities that arise from mitigating the activity ("BMO Financial Group's," 2008).

BMO's ECO[5] Strategy identifies five environmental "focus areas" (energy consumption, transportation, material consumption, waste generation and procurement), which will be addressed by a corresponding environmental program. However, despite that BMO does not regard biodiversity as a key concern, the company claims to be eager to donate to or sponsor environmental initiatives. The company is also committed to reviewing and improving the Environmental Policy and Action Plan through consultations with employees, external organizations, and customers ("BMO Financial Group's," 2008).

TD Canada Trust

As a part of TD's Corporate Social Responsibility Report, the company published an Environmental Policy which focused on reducing the company's environmental footprint while integrating the environment with business activities. TD based its environmental strategy on Four Environmental Pillars: reducing the environmental footprint of business operations, responsible financing that includes proactive management of environmental and related social risks, developing green product and service options for customers, and engaging employees and communities to raise environmental awareness ("2012 Corporate Responsibility Report," 2012).

TD established goals, and fully committed to reporting on environmental performance. Additionally, TD "integrates environmental, social and corporate governance consideration into investment decision-making in order to maximize the value of its clients' investments without undue risk of loss" ("2012 Corporate Responsibility Report," 2012).Through TD Asset Management (TDAM), the company supports shareholder proposals on environmental and social issues, such as waste recycling and greenhouse gas emissions. Also, TD does not finance transactions relating to "activities that would result in the degradation of protected critical natural habitats as designated according to World Conservation Union classification and International Financial Corporation standards" ("2012 Corporate Responsibility Report," 2012).

CIBC

As a part of their Corporate Social Responsibility Report, CIBC has demonstrated evidence of being committed to environmentally responsible business practices through implementing environmental risk management policies and procedures, "initiatives to minimize CIBC's impact on the environment, promotion of environmental stewardship practices, and support of strategically aligned environmental organizations"("CIBC 2011 Corporate" 2011). However, despite the lack of interest in biodiversity and conservation, the company does support global environmental initiatives, such as the Carbon Disclosure Project and the United Nations Environmental Programme Finance Initiative. CIBC also incorporates

“responsible lending and investing” in projects that have minimal environmental risks, renewable energy and clean technology ("CIBC 2011 Corporate" 2011).

Scotiabank

The driving force of Scotiabank’s Environmental Strategy within their Corporate Social Responsibility report is the company’s Environmental Policy, which consists of principles that guide Scotiabank’s approach to tackling its environmental impacts. These principles encourage the company to adhere to environmental regulations, support environmental initiatives while promoting environmentally responsible business activities within the company.

Scotiabank’s environmental strategy does not include a focus on specific environmental issues, rather the company tackles environmental issues by understanding how climate change impacts its employees and internal operations, suppliers, customers and the communities where they operate. Scotiabank supports environmental initiatives by partnering with non-for-profit organizations, such as the Banff Centre Revitalization that focuses on revitalizing natural landscapes through reforestation, re-introducing montane vegetation and meadow grasses. In Nova Scotia, the company supported the Nature Conservancy of Canada’s efforts in protecting forests, wetlands and lakes in the Deep Cove Natural Area (Scotiabank).

Furthermore, Scotiabank applies environmental risk management policies in lending and investment activities, and financially supports renewable energy and environmental projects. Recently, the company formed an environmental markets group which supported carbon credit trading, compliance and voluntary markets to reduce greenhouse gas emissions (Scotiabank).

National Bank Financial Group

National Bank’s CSR report discusses their efforts in encouraging their clients, employees and service providers to adopt environmentally responsible practices. National Bank’s CSR report is very brief due to their belief that the nature of their business operations has a limited impact on the environment, and that the company is currently developing environmental performance measures ("Our Social Responsibility 2011," 2011).

National Bank highly focuses on improving energy efficiency by obtaining LEED certification, achieving net zero carbon emissions, and measuring and reporting its greenhouse gas emissions through the Carbon Disclosure Project. The company also seeks to develop relationships with green businesses by supporting environmental initiatives, encouraging responsible investment of companies, while incorporating environmental criteria into their loan policies to ensure that properties taken as security meet environmental standards ("Our Social Responsibility 2011," 2011).

5.0 ANALYSIS AND DISCUSSION

Analyzing the CSR reports of the top-ranked companies within the automotive, mining and financial industries illustrated strengths and weaknesses for ALUS to target these industries. **Table 2** highlights the interesting aspects of each industry's awareness of the biodiversity credit market, their stakeholder demand for biodiversity preservation, their willingness to pay for ecological services, and their existing biodiversity preservation programs within Ontario. Each company's environmental initiatives are nationwide, but it is assumed that they have been, or can be, implemented in Ontario.

5.1 AUTOMOTIVE SECTOR

The results demonstrated that the automotive sector is committed towards environmental responsibility and biodiversity protection. Companies are driven by external stakeholder pressures and industry competition to become efficient in developing technologies to address carbon emissions, to participate in market-based mechanisms, and to establish biodiversity conservation initiatives. On the other hand, biodiversity projects are mostly implemented in international manufacturing companies, companies are solely focused on reducing carbon emissions and technology development, and there is a lack of involvement in carbon markets, thus making it an unfit target market for ALUS.

The main motivators for the auto "green movement" are reputation, stakeholder pressure, ecological responsibility and environmental impact (Bartels, 2011). Additionally, there is pressure for the automotive sector to be more transparent and accountable in their business practices (Niemann, 2012). Furthermore, there are industry specific incentives and opportunities for auto companies to reduce carbon emissions in their manufacturing practices and automobiles, such as the growing social preference for low-carbon vehicles, regulatory tax incentives and carbon emission regimes, such as the "cap and trade" (Bartels, 2011). Additionally, auto companies, such as Honda, provide financial assistance for environmental research and wildlife protection, which provides an opportunity for a partnership with ALUS (Honda CSR Report, 2012).

The automotive industry is highly competitive, and as a result, companies are constantly pressured to reform their fleet portfolios in order to coincide with the growing environmental movement. Majority of auto companies are producing hybrid and fuel economic vehicles, traffic-safety equipments, and recycling and energy saving innovations, fostering technological competition within the industry ("Sustainability report 2012"). Becoming green in the auto industry strongly means developing new technologies to achieve environmental goals.

On the other hand, environmental and biodiversity projects are implemented internationally because all of the manufacturing plants in Ontario belong to foreign companies that have different environmental

goals which are sometimes inconsistent with Canadian requirements. Results showed that it is easier for these companies to implement biodiversity projects in developing countries such as India and China. This is because it is cheaper for foreign companies to build plants and produce vehicles in countries where manufacturing costs are much lower (Bartels, 2011).

Further, there is a lack of biodiversity projects in Ontario, because automotive companies are more focused on reducing carbon footprint and developing environmentally-friendly technologies. This is a major hindrance for ALUS when targeting the automotive industry. Additionally, Nissan Motor is the only company that is committed towards protecting, researching and developing projects for ecological services. It recognizes that car manufacturing impacts ecological services and developed an ecosystem review that demonstrates how activities affect different services (Kuroda, 2011). Unfortunately, the company has established ecological services conservation projects mainly in developing countries such as India. Unfortunately, Nissan has no manufacturing plants in Ontario which limits it involvement in conservation programs in the province.

Finally, the automotive industry may not have an interest in participating in biodiversity credits because of their low presence in carbon credit markets. Most CSR reports do not address company involvement in carbon markets possibly due to being global with scattered operations.

5.2 MINING INDUSTRY

The results of this study indicated that the mining industry is committed towards biodiversity conservation and protection. Aside from motivational factors such as improving brand image and pressure from stakeholders, there are more industry-specific incentives for the mining industry to participate in biodiversity conservation initiatives (Bartels, 2011). Mining companies understand the impacts of mining on the environment, thus they strive to apply good land-use management practices, invest in biodiversity conservation, and adhere to best practices guidelines. Even so, partnerships with NGOs that are similar to ALUS already exists, biodiversity offsetting may not be part of the companies' interests, and majority of biodiversity conservation efforts are in areas in Northern Ontario, away from where ALUS' projects are located.

It is evident that the impacts of mining on the environment are a significant motivation for mining companies to conserve ecological services. Companies analyzed in this study recognize that while it is not usually possible to restore a mine site exactly as it was prior to mining, sites should be minimized, mitigated and the site's biodiversity must be compensated as part of the mining life cycle. Thus, good land-use management is a key consideration in the industry. Toxic chemicals, waste management, mine

closure, and post-closure rehabilitation of the mining lifecycle are always a concern to mining companies, while air emissions and pollution are their externalities and companies have been taking actions with regards to reducing greenhouse gas (GHG) emissions. Implementing these best practices which reduces conflicts between development needs and conservation may also act as a cost reduction factor for mining companies.

Another major incentive for mining companies to invest in biodiversity conservation is regulatory compliance, as required by the federal and provincial governments' policies and their Environmental Assessment (EA) processes. Environmental and social impacts occur throughout the mining lifecycle and EA process that the policies and regulations are almost unavoidable to mining practices. Mining companies also have to take into account the Species at Risk Act (SARA) in Canada, which plays a crucial role in species protection in mining practices. Moreover, best practices guidelines within the industry further pressure companies to develop their own sustainability best practices. These guidelines include, Towards Sustainable Mining (TSM), a CSR initiative of the Mining Association of Canada (MAC) which has been developing performance indicators related to issues such as Aboriginal People and biodiversity conservation (Fitzpatrick et al, 2011);the Green Mining Initiative which is led by Natural Resources Canada, as well as Clean Mining Alliance. It is important to note that these best practices guidelines may drive innovation. Pressure from local communities and Aboriginal peoples is also an important factor in biodiversity conservation as their land and lifestyle may be changed as a result of the mining practices. In addition, sustainability reporting and disclosure standards have been pressured by multiple stakeholders such as governments, investors, the society, and local communities.

Unfortunately, the results of this study found disadvantages for ALUS to work with mining companies on biodiversity conservation and protection. Majority of the mining companies discussed above have invested in biodiversity conservation efforts such as species protection and developed land use management practices. Government regulation and EA processes also provide mining companies with opportunities to work with NGOs such as the Nature Conservancy of Canada and Nature Conservancy to protect and enhance plant and animal habitat on its sites. This can serve as an opportunity for ALUS as ALUS' approach is also to partner with firms towards biodiversity conservation.

However, since some of these NGOs have similar business models as ALUS, it becomes a disadvantage to ALUS as there are partnerships that already exist and ALUS would be a new entrant. In contrast, driven by existing government regulation, industry-led initiatives and EA processes, mining companies have been addressing sustainability issues and cumulative effects, which are able to fulfill some of the needs for biodiversity conservation while lessening the priority for additional conservation efforts (Lawrence,

2005). On the other hand, some companies have invested in biodiversity offsets, which is the direction ALUS is heading towards.

Since the mining industry is driven to innovate, there has been joint government-industry opportunities, such as Xstrata's "Green Mines, Green Energy" consortium which tests the use of non-productive mining lands for growing biofuel crops in Sudbury, Ontario. The openness to innovation demonstrates that mining companies may be interested in ALUS' emerging ecological credit concept. However, biodiversity offsetting may not part of some mining companies' policy and interest at the moment, including Goldcorp.

Another disadvantage to ALUS is that the biodiversity conservation efforts of the studied mining companies have been area-specific; some biodiversity conservation efforts focus on land that mining companies own, while others are in areas with species at risk or areas that have gone through mining activities. Although there are mines in Southern Ontario where the Ontario ALUS projects are located, most of the mining activities are located in Northern Ontario. More opportunities could be available to ALUS if some projects are established in the south.

5.3 FINANCIAL INDUSTRY

Environmental issues are recognized as challenges for a wide range of financial institutions (Mulder, 2007). There is a rise in financial institutions that understand the issues while capturing business opportunities by investing in environmental initiatives, encouraging environmentally responsible business practices, and establishing environmental criteria in their lending policies. Many of the key business drivers that catalyze environmental reporting include investment returns, liability risk, brand and reputation, and the desire to reduce ecological footprint (Bartels, 2011). Be that as it may, there are shortcomings in targeting the financial industry, including, barriers to communicating long term benefits, biodiversity is often seen as a public good, and there are no standards for biodiversity credit mechanisms.

Financial service companies are increasing their investments in environmental initiatives, clean energy technologies and sustainable projects because they forecast increased revenues or cost savings associated with these investments. Based on the desktop research results, it is clear that financial companies such as BMO, CIBC and National Bank identify potential revenue gains from investing in green companies, environmentally responsible products and renewable and clean technology. ALUS seeks to build an agriculture business framework with the capability to profitably deliver ecological services. The desire for financial companies to invest in and fund environmental projects is an opportunity for ALUS to attract financial resources.

Additionally, with the rising awareness of environmental issues, there are incentives for financial companies to adhere to legislation and establish corporate policies that decrease their liabilities on business activities that may impact the natural environment. Financial companies, such as TD, CIBC and Scotiabank have established environmental risk management policies in their lending and investment activities, in order to ensure environmentally responsible lending and investing in projects that have minimal environmental risks. This is another opportunity for ALUS to provide options for financial companies to take a proactive role in environment and conservation.

Moreover, banks are working to reduce their own carbon footprints through such measures as encouraging both employees and customers to adopt “paperless” initiatives, increase use of ATMs and move to online transactions. Such practices, combined with an internal focus on using resources more efficiently and incorporating cleaner energy practices will also have a positive impact on the bottom line for banks.

Lastly, the major driver for sustainable reporting and policies in financial companies is reputational and brand considerations. Financial companies desire for a competitive advantage, to improve client or stakeholder relationships, and to create new business opportunities. Banks are leading providers of capital, thus they are uniquely placed to promote sustainability by encouraging business and individuals to use capital and resources in ways that benefit themselves, society and the environment. In the CSR reports of the financial companies, each company strongly believes that they are the industry leaders of sustainability. Banks, like RBC, seek to establish relationships with community members, environmental experts and organizations to ensure that the company is directed on the right path to sustainability. Scotiabank and RBC are eager to donate and support environmental initiatives, such as reforestation, to revitalize landscapes. ALUS can introduce the concept of paying farmers for ecological services, as a market approach to address stakeholder demands for biodiversity preservation on private land.

Conversely, there are some impediments when targeting the financial industry. There are barriers to communicating long-term benefits of biodiversity projects for financial companies to see a profitable return. There is a lack of predictability to forecast future trend in the biodiversity credit market since there are no universal benchmarks to track the company’s progress (Bartels, 2011). Additionally, biodiversity is considered to be a public good and must fall under the responsibility of governments and society, instead of financial companies. This is a concern for ALUS when targeting the financial industry, because the organization solely focuses on land-use management and biodiversity conservation. Also, there is an inability to quantify the biodiversity credit mechanism and their different functions depend on the scale of development or practice. There are no universal standards for biodiversity credit mechanisms, as different stakeholders place different values on environmental benefits.

	Automotive Industry	Mining Industry	Financial Industry
Awareness of the biodiversity credit market	The CSR reports of all companies within each industry do not discuss participation in the biodiversity credit market. However, each industry does participate in biodiversity conservation initiatives relative to their industry business practices		
Stakeholder demand for biodiversity preservation	Stakeholders of automotive companies demand for more fuel efficient vehicles and focus on carbon emission reductions	NGOs and Aboriginal peoples pressure mining companies to invest in biodiversity conservation as a result of mining practices	There is no significant evidence of demands for sustainability practices, but companies are aware of their responsibility to establish relationships with community members and environmental experts and organizations to improve business practices
Willingness to pay for ecological services	Nissan Motor is the only automotive company that is committed towards conserving ecological services; however, their initiatives are established in other countries Most companies are not involved in carbon credit markets, thus they may not be interested in participating in PES markets	Through participation in a variety of initiatives, mining companies already address sustainability and biodiversity issues, thus additional conservation efforts are not a priority There are some companies who have invested in biodiversity offsets, similar to PES. However, it is not a pressing interest	Financial service companies are increasing their investments in environmental initiatives, clean energy technologies and sustainable projects But, there is a lack of predictability to forecast future trend in the biodiversity credit market since there are no universal benchmarks to track the company's progress. This may hinder banks from paying for ecological services
Existing corporate biodiversity preservation programs	Companies financially support environmental research and wildlife protection, biodiversity preservation projects. However most of these are established in other countries	Companies strive to apply good land-use management practices, invest in biodiversity conservation, and adhere to best practices guidelines (such as Towards Sustainable Mining)	Companies invest in environmental initiatives (such as reforestation) and establish environmental criteria in their lending policies to reduce environmental impact on ecosystem biodiversity.

Table 2: Summary of the analysis of ALUS' potential target markets

6.0 RECOMMENDATIONS

Based on the analysis above, it is recommended that Alternative Land Use Services (ALUS) focus on attracting the financial sector. Here are the recommendations that may enhance the implementation of ALUS' brand:

1. Conduct Primary Research

This report has provided a foundation to better understand the needs and wants of financial institutions with regards to the biodiversity credit market. However, ALUS should engage a research team to gain further insight on how to appeal specifically to Ontario financial branches. This would address some of the limitations of this report and enable ALUS to further evaluate the financial industry's demand of the biodiversity market.

2. Develop a Business Plan

ALUS should develop business plan in order to create greater transparency with internal and external stakeholders. Creating a business strategy would also help ALUS set goals and objectives given the current position of the organization, enabling the organization to provide an identity separate from the host funder. This plan would support future development of the ALUS brand by identifying future steps. A formal business plan would establish a common vision and a set of priorities across all ALUS branches, as well as attract financial support.

3. Marketing Communication Strategy

A marketing strategy of the ALUS brand would promote the organization as well as attract private investment. Elements of the strategy include translating the mission and vision of the organization, generating a cost breakdown for average costs of projects, and offering insight into where the organization is headed by providing a five year forecasted report. Some of these can be embedded in a proposal pitch to financial institutions, demonstrating how ALUS projects might be applicable and beneficial to them. Additionally, a media communication strategy for ALUS could further develop the organization's social media. This would include consistently updating ALUS' current social media tools, staying on top of social media outlets, and making ALUS' website more functional.

4. Hire Additional Staff

All of the recommendations above would require adding additional staff in order to provide the necessary administrative oversight and expertise in business planning of NGOs.

7.0 CONCLUSIONS

Payments for Ecological Services (PES), a market-based mechanism within the Biodiversity Credit Market, is acclaimed to be an ideal solution to compensate the environment for its services because it is effective, fair, and engages all three dimensions of sustainability—economically, socially, and environmentally. Unfortunately, the demand for ecological services payment schemes in Ontario are largely stunted and unknown, which is reflected in a lack of research available. However, knowledge of the market is critical for ALUS to develop future organizational plans.

Thus, the purpose of this research project was to establish a list of potential target markets for ALUS to focus its marketing strategy around; to determine which industry to pursue; and to provide recommendations on how to effectively approach the target market. After conducting an environmental scan of potential markets, three industries – automotive, mining, and financial industries had the highest interest and activities related to biodiversity conservation. The goal of the analysis was to evaluate the awareness of Biodiversity Credit Market, assess social demand for biodiversity preservation in target market operations, and determine the willingness to pay for ecological services and explore the existing biodiversity funding program within target markets. These objectives would allow ALUS to develop a marketing strategy to effectively reposition the organization in the biodiversity market.

All three industries support biodiversity conservation, however, the automotive and mining industries have shortcomings that make them less suitable for ALUS. The biodiversity conservation projects of automotive companies are mostly implemented internationally, companies are focused on reducing carbon emissions and technology development, and there is a lack of involvement in carbon markets. Also, mining companies are already engaged in partnerships with NGOs that are similar to ALUS, biodiversity offsetting may not be part of the companies' interests, and majority of biodiversity conservation efforts are away from where ALUS' projects are located.

The study has shown that the financial industry is the appropriate target markets for ALUS.Financial institutions understand the pressing issues concerning biodiversity conservation. They capture business opportunities by investing in environmental initiatives, encouraging green business practices, and establishing environmental criteria in their lending policies. Reputation and brand consideration is highly regarded by financial institutions. Many of the key business drivers that catalyze environmental reporting include investment returns, liability risk, brand and reputation, and the desire to reduce ecological footprint. Although there is a lack of awareness of the Biodiversity Credit Market, based on existing corporate diversity preservation programs, financial companies are willing to attend to stakeholder demand for biodiversity preservation and may have an interest in PES.

Recommendations for ALUS were made to assist in developing the organization's operations and to provide assistance when targeting potential investors. The findings of this study suggest that ALUS first

conduct primary research of financial institutions to further understand their perception of the biodiversity market. Secondly, develop a business plan, which is important for the organization position, brand awareness and the execution of an effective marketing plan. Thirdly, ALUS must implement a marketing communication strategy to offer insights to the organization's forecasts and project costs. Lastly, hiring additional staff is beneficial for the proper implementation of these recommendations.

REFERENCES

(2010). *Biodiversity Action Plan*. Retrieved from Toyota Motor Manufacturing website: http://www.toyotauk.com/media/Bio-Diversity-leaflet-indd.pdf

Arriagada, R., & Perrings, C. (2009). Making payments for ecosystem services work. Ecosystem Services Economics, Retrieved from http://bioecon-network.org/pages/UNEP_publications/02 PES.pdf

Bartels, W. (2011). *Kpmg international survey of corporate responsibility reporting 2011*. Retrieved from KPMG website: http://www.kpmg.com/Global/en/IssuesAndInsights/ArticlesPublications/corporate-responsibility/Documents/2011-survey.pdf

Barrick Gold Corporation, (2011). *2011 responsibility report*. Retrieved from Barrick Gold Corporation website: http://www.barrick.com/files/responsibility-report/2011/Barrick-2011-Responsibility-Report.pdf?noexit=true

BMO Financial Group, (2008). *Bmo financial group's environmental policy and action plan*. Retrieved from website: http://www.bmo.com/bmo/files/images/7/1/BMO Enviro Action Plan v3 ENG.pdf

Brown, T., Bergstrom, C., and Loomis, J. (2006). Ecosystem Goods and Services: Definition,Valuation and Provision.

CIBC, (2011). *Cibc 2011 corporate responsibility report and public accountability statement*. Retrieved from website: https://www.cibc.com/ca/pdf/cibc-2011-crrpas-fullreport.pdf

Corporate Planning Division , (2012). *Sustainability report 2012* (EA-1209). Retrieved from Toyota Motor Corporation website: http://www.toyota-global.com/sustainability/report/sr/

CSR Promotion Office, (2012). *Honda CSR Report 2012.* Retrieved from Honda Motor website: http://world.honda.com/CSR/report/pdf/2012/report_2012.pdf

CSR Promotion Office, (2012). *Honda North American Environment Report* . Retrieved from Honda Motor website: http://corporate.honda.com/images/banners/environment/Honda_2012_North_American_Environmental_Report.pdf

Engel, S., Pagiola, S., & Wunder, S. (2008). Designing payments for environmental services in theory and practice: An overview of the issues. *Ecological Economics*, 65. Retrieved from http://server-t86.e2enetworks.net.in/files/file/environmental%20services.pdf

Fitzpatrick, P., Fonseca, A., & McAllister, M. (2011). From the whitehorse mining initiative towards sustainable mining: lessons learned. Journal of Cleaner Production, 19, 376-384. Retrieved from http://journals1.scholarsportal.info.proxy.lib.uwaterloo.ca/tmp/12001949898828511412.pdf

Food and Agriculture Organization of the United Nations (FAO). (2007). The State of Food andAgriculture: Paying farmers for environmental services. *FAO Agriculture Series (38).*

Goldcorp, (2011). *2011 online sustainability report*. Retrieved from Goldcorp website: http://csr.goldcorp.com/2011/index.php?noexit=true

Hartwell, R. and Aylward, B. (2010). Ecosystem Service Market Development: The Role andOpportunity for Finance. Bullitt Foundation.

Kuroda, T. Corporate Planning Department, (2010).*Ecosystem services and the automotive sector*. Retrieved from Nissan Motor Limited website: http://www.nissan-global.com/EN/DOCUMENT/PDF/ENVIRONMENT/SOCIAL/ecosystem_services_and_the_automotive_sector.pdf

Lawrence, D. (2005). Significance criteria and determination in sustainability-based environmental impact assessment.

MacNeil, M. (2013). [Personal Interview].

Mulder, I. IUCN The World Conservation Union, (2007). *Biodiversity, the next challenge for financial institutions?*. Retrieved from website: https://cmsdata.iucn.org/downloads/ivo_bb_report.pdf

National Bank Financial Group, (2011). *Our social responsibility 2011*. Retrieved from website: http://www.nbc.ca/bnc/files/bncpdf/en/2/bilan_2011_en.pdf

Niemann, T. Customer Relation Center, (2012). *Ford sustainability report*. Retrieved from Ford Motor website: corporate.ford.com/go/sustainability

Schafran, M. Sustainability, (2012). *General Motors Sustainability Report*. Retrieved from General Motors website: http://www.gmsustainability.com/_pdf/GeneralMotorsSustainabilityReport.pdf

Royal Bank of Canada, (2012). *2012 rbc corporate responsibility report and public accountability statement*. Retrieved from website: http://www.rbc.com/community-sustainability/_assets-custom/pdf/RBC-CRR-Report-e.pd

Royal Bank of Canada, (n.d.). *Rbc environmental blueprint: Policy, priorities and objectives*. Retrieved from website: http://www.rbc.com/environment/pdf/RBC-Environmental-Blueprint.pdf

Scotiabank. (n.d.). *Scotiabank corporate responsibility: Our environment*. Retrieved from http://www.scotiabank.com/ca/en/0,,381,00.html

Shibusawa, J. Corporate Citizenship Division, (2011).*Toyota's forestry* . Retrieved from Toyota Motor Corporation website: http://www.toyota-global.com/sustainability/feature/forest/

Sustainability, (2012). *2011 Sustainability Report*. Retrieved from Fiat Group website: http://www.chryslergroupllc.com/sustainability/documents/2011 sustainability report.pdf

TD Canada Trust, (2012). *2012 corporate responsibility report*. Retrieved from website: http://www.td.com/document/PDF/corporateresponsibility/TD-2012-CR-Report.pdf

Teck Resources Limited, (2011). *2011 sustainability report*. Retrieved from Teck Resources Limited website: http://teck.com/Generic.aspx?PAGE=Teck Site/Responsibility Pages/Sustainability Pages/Report Archive&portalName=tc

Toyota Canada. (2012). *Toyota Canada supports the activities of the Toyota Canada foundation*. Retrieved from http://www.toyota.ca/cgi-bin/WebObjects/WWW.woa/7/wo/Home.Environment-ZRUjv9EZbP7ffLbEqVxQ0g/3.7?e420000e.html

Vale, (2011). *2011 sustainability report*. Retrieved from Vale website: http://www.vale.com/EN/aboutvale/sustainability/links/LinksDownloadsDocuments/RS2011_en.pdf

Wunder, S. & Wertz-Kanounnikoff, S. (2009). Payment for ecosystem service: a new way of conserving biodiversity in forests. *Journal of Sustainable Forestry, 28*(3-5), pp.576-596.

Xstrata, (2011). *Sustainability report 2011*. Retrieved from Xstrata website: http://www.xstrata.com/content/assets/pdf/x_sustainability_2011.pdf

Zilberman, D., Lipper, L., McCarthy, N. (2009). Putting payments for ecosystem service in the context of economic development. In Lipper, L. et al, Payment for Environmental Services in Agricultural Landscapes: Economic Policies and Poverty Reduction in Developing Countries. *Natural Resource Management and Policy,* Vol. 31, pp. 9-33, Springer New York.

APPENDIX: LITERATURE REVIEWS

Socioeconomic and environmental advantages/benefits of PES programs

Payments for Ecosystem Services (PES) are recognized as the up and coming solution to compensating the environment for its services (Wunder & Wertz-Kanounnikoff, 2009; Zilberman, Lipper, McCarthy, 2009). These programs aim to develop proper ecosystem management for the preservation or conservation of environmental services through payments from its beneficiaries. While weaknesses and challenges of PES abound, the objective of this literature review is to identify the linkage between PES and socioeconomic and environmental benefits created from PES programs, as well as to identify the benefits themselves. The scope of the benefits is not limited to the industry or type of PES, rather benefits from PES programs of all kinds will be considered. Case studies presented here may not fully represent all the benefits of PES, however they are meant to demonstrate the extent of possible impacts from these programs.

What is a PES?

Understanding the true value of ecological services is not a recent phenomenon, nor is the concept of developing systems to properly compensate the environment and its carers for their service. As defined by the FAO (2010), a Payments for Ecosystem Services (PES), refers to,

> "[V]oluntary transactions where a service provider is paid by or on behalf of service beneficiaries for agricultural land, forestry, coastal or marine management practices that are expected to result in continued or improved service provision beyond what would have been provided without payment."

PES are touted to be the most ideal solutions to date intended to compensate the environment for its indispensible services (Wunder & Wertz-Kanounnikoff, 2009; Zilberman, Lipper, McCarthy, 2009). Such programs are designed with environmental conservation and or preservation ends, fulfilled by economic means. In asking external beneficiaries to compensate landowners who practice proper ecosystem restoration, conservation or preservation on environmentally sensitive lands and services, therein lays recognition for the land services previously taken for granted. A desire to sustain these finite resources for the future is fundamental motivation for present efforts to ensue (Tallis, Kareiva, Marvier, Chang, 2008).

Elements for Successful PES

A shift to a people-focused, conservation paradigm was ushered in post-Rio 1992 (Wunder, 2005) as international efforts to decrease poverty and prevent future environmental degradation were not effective, independent of each other (Adams, Averling, Brockington, Dickson, Elliott, Hutton, Roe, Vira, Wolmer, 2004). Strong correlations between environmental well-being and socioeconomic health are being made with great stride; environmental and socioeconomic prosperity are not mutually exclusive. "[I]t's becoming increasingly clear that the goals of conservation and the goals of alleviating poverty and improving human health are deeply interwoven" (Tallis et al, 2008). As majority of poor are most susceptible to the damages of climate change, developing accessible programs to engage the poor in maintaining and restoring the environment have clear implications on breaking the cycle of poverty (Landell-Mill, 2002).

Still, in order for a PES to succeed, proper governance and participation, equitable land distribution and fair remuneration are all required. Landell-Mill (2002) reinforces the need to promote equity for the poor while considering the potential for the emerging market mechanism of PES. She recommends four elements to contemplate while developing PES, all of which ought to be held in proper tension for success. These elements include (1) establishing property rights to resource-based assets, (2) building

sufficient capacity for market participation, (3) organizing program spaces for optimal information sharing and market transactions, and (4) reduce barriers to financial assistance for the poor.

With these elements in mind, PES governance varies along with the size and scope of the projects, while participation can fluctuate based on economic policies surrounding the PES that limit accessibility. Ensuring accountability and transparency between service providers and PES payers is also the responsibility of governing parties, a possible reason for skeptical stakeholders to participate.

What distinguishes PES from other schemes is the explicit recognition that financial compensation is a sure solution to bridging the gap of resource exploitation (Wunder, 2005). Nevertheless, the resource must be capable of providing an ecological service; alternatively, PES will act to mitigate further damages and restore ecosystems to offer services once again.

Environmental Benefits

Inherent in their design, PES are fundamentally created to compensate and provide environmental benefits (Wunder & Wertz-Kanounnikoff, 2009). This is manifested in increased biodiversity, improved water quality, forest preservation and braking land degradation (Miranda, Porras & Moreno, 2003), most of which have direct implications on welfare of the surrounding community. Carbon sequestration is another prevalent benefit of PES, often carrying economic implications and creating value beyond the immediate scope of the PES to international carbon markets (Montagnini & Finney, 2011; Garbini, 2012). Depending on the nature of the resource, preservation or restoration demonstrate the severity of the environmental degradation and the needs to mitigate future damage.

As in the case of China, a federally governed PES encouraged farmers to plant forests and grasslands to counter the soil erosion from fields on steep slopes (Liu, Li, Ouyang, Tam & Chen, 2005). This study showed that in reverting these crop fields into tree plantations and grasslands, one province saw an increase of 55% in forested area (p.9479). From 2000 to 2005, the nation experienced improvements to soil structure and nutrient retention a decrease in soil erosion of 30%, and decrease in surface run-off by over 75%. Tree plantations were especially useful for mitigating desertification in more arid regions. This was a strategy to promote local economic development while decreasing poverty.

Socioeconomic Benefits

Aforementioned in this literature review, improvements to the environment have clear implications on the socioeconomic prosperity of the immediate communities. Poverty alleviation is a substantial benefit in developing nations, although ecological service providers in developed countries have received remuneration for their stewardship efforts, too. The Nature Conservancy's Conservation and Poverty

Reduction Project (The Nature Conservancy, 2008) concluded that the poor are less likely to reap benefits of PES since majority of them are not land owners, an element of successful PES implementation provided by Landell-Mill. However other literature suggests the PES may trigger other socioeconomic benefits including job creation and employment, gender equality and market growth for local goods and services (Tallis et al, 2008; Wunder, 2005). Local communities benefit from the innovative techniques employed to preserve the environment while simultaneously raising awareness and activism. This specific alternative local development strategy is attractive for empowering local knowledge and engaging communities for a global cause.

Supplying small-scale subsistence farmers with a steady and guaranteed stream through the PES is a direct means of alleviating poverty. Miranda, Porras & Moreno (2003) suggest PES also foster "voluntary agreements for environmental improvement" (p.32), particularly when personal health and firm wellbeing is compromised. Moreover, specific policies directed to make PES more accessible for the poor, whether it is a tax exemption or promoting sectoral industry growth by creating jobs, account for decreases in unemployment and fostering economic development. For example, Ecuador developed a water fund strategy to protect water resources and rescue biodiversity. Rather than creating a new payment scheme, the government redirected current funds from usage fees and taxes to meet their environmental ends. In doing this, benefits include job creation, infrastructure and capacity building, and education program development (Tallis et al, 2008).

Enabling ecotourism may not be an obvious benefit of PES, yet it is widely practiced with improvements to ecosystems. In the research of Tallis et al.(2008), an industry evolved when Kenya initiated a plan to protect native endangered species. Local businesses prosper from providing the unique safari experiences and the communities have further vested interests to protect these species. The study goes on to share that Namibia's Conservancy Program resulted in over 3,500 jobs, the majority of which were held by women. Successes in combined conservation and development programs are possible with proper governance and policies that limit accessibility of most vulnerable people groups.

Conclusion

To conclude, PES offer dual benefits to the environment and to society. Independently, efforts to improve the environment and the socio-economy on their own are not as effective as programs with both goals in mind (Tallis et al, 2008). The connection between environmental degradation and socioeconomic welfare is demonstrated by the known dependence on the natural environment amongst the poorest populations, those most vulnerable and susceptible to impacts of environmental degradation (The Nature Conservancy, 2012). It has been said that PES contribute to society through poverty reduction and stimulating local community engagement (Pagiola, 2004; FAO, 2010). Although

socioeconomic benefits were not the primary goal of the program, these by-products attribute to the greater reception of PES. Strong evidence proves the need to reconnect beneficiaries of ecosystem services back to nature through empowerment of service carers.

References

Adams, W.M., Aveling, R., Brockington, D., Dickson, B., Elliott, J., Hutton, J., Roe, D., Vira, B., & Wolmer, W. (2004). Biodiversity conservation and the eradication of poverty. Science, 3006, pp.1146-1149.

FAO. (2010). PES and the poor. Retrieved on 3 November, 2012. Retrieved from http://www.fao.org/es/esa/pesal/aboutPES8.html

Garbini, S. (2012). Agricultural landscape, practice, and identity in transition. University of California. PhD Dissertation. ProQuest Dissertations and Theses. 236. Retrieved from http://search.proquest.com.proxy.lib.uwaterloo.ca/docview/1023120180?accountid=14906. (1023120180).

Landell-Mill, N. (2002). Developing markets for forest environmental services: an opportunity for promoting equity while securing efficiency? Philosophical Transactions: Mathematical, Physical and Engineering Sciences, 360 (1797), pp. 1817-1825.

Liu, J., Li, S., Ouyang, Z., Tam, C., Chen, X. (2008). Ecological and socioeconomic effects of China's policies for ecosystem services. Proceedings of the National Academy of Science, 105(28), pp. 9477-9482.

Miranda, M., Porras, I.T., Moreno, M.L. (2003). The social impacts of payments for environmental services in Costa Rica: A quantitative field survey and analysis of the Virilla watershed. International Institute for Environment and Development, London, UK.

Montagnini, F. & Finney, C. (2011). Payments for environmental services in Latin America as a tool for restoration and rural development. AMBIO: A Journal of Human Environment, 40(3), pp. 285-297.

Nature Conservancy, The. (2010). Biodiversity as a mechanism for poverty reduction: A state of knowledge review. Retrieved from http://conserveonline.org/library/biodiversity-as-amechanism-for-poverty-reduction/view.html

Nature Conservancy, The. (2012). Signature science - Conservation & human well-being: the CPR project. Retrieved on 14 November 2012. Retrieved from http://www.nature.org/ourscience/conservation-and-poverty-reduction-project.xml

Pagiola, S. (2004). Can payments for environmental services help reduce poverty? An exploration of the issues and the evidence to date from Latin America. World Development, 33(2), pp. 237-253.

Tallis, H., Kareiva, P., Mavier, M., Chang, A. (2008). An ecosystem services framework to support both practical conservation and economic development. Proceedings of the National Academy of Science, 105(28), pp. 9457-9464.

Wunder, S. (2005). Payments for environmental services: some nuts and bolts. CIFOR Occasional Paper No. 42. CIFOR, Bolgar, Indonesia. Retrieved from http://www.cifor.org/publications/pdf_files/OccPapers/OP-42.pdf

Wunder, S. & Wertz-Kanounnikoff, S. (2009). Payment for ecosystem service: a new way of conserving biodiversity in forests. Journal of Sustainable Forestry, 28(3-5), pp.576-596.

Zilberman, D., Lipper, L., McCarthy, N. (2009). Putting payments for ecosystem service in the context of economic development. In Lipper, L. et al, Payment for Environmental Services in Agricultural Landscapes: Economic Policies and Poverty Reduction in Developing Countries. Natural Resource Management and Policy, Vol. 31, pp. 9-33, Springer New York.

Economic Theory and Value on Ecological System

The interest in putting a value on ecological services has been growing since the recognition that the availability of these resources is limited (Sagoff, 2011). Ecological services are identified as "ecosystem functions" that humans benefit and draw from (Millennium Ecosystem Assessment, 2005; Porter et al., 2009). The payment systems for these ecological services can be viewed as either a stepping stone or a band-aid solution; in either case they are represented as a quick fix and not a long-term solution. Furthermore, it was evident that there is a gap in academic view in regard to putting a value on these ecological services. The aim of this paper is provide an overview of the shift in economic theory towards adopting a framework to value ecological services.

Economic Theories

There has been a shift in economic theories towards putting a value on ecological services. As Gomez-Baggethun et al. (2009) depict through historical information regarding ecological services and economic theory. These authors begin with an analysis of theories and practice from the Classical economics period that considered nature as a costless commodity. Classical economic theory suggests the value of the market consists of labour and the capacity to produce at valuable exchange. However, they also remind the reader that the discipline of ecology did not yet exist. So, within this era it would have been hard to put value on ecological service because of lack knowledge within this area of study.

With the collapse of Classical economics there was a shift towards Neoclassical economics. Neoclassical economics was based in "theory [of] consumer choice, perfect information and marginal productivity theory of distribution (Gomez-Baggethun et al., p. 4). This era invested in technology in order to maximize the production of inputs/outputs. In addition, some of the externalities were beginning to be taken into consideration as a part of the economic equation. There was a realization that maximizing growth of outputs resulted in depletion of natural resources, therefore a utilitarianism perspective was adopted.

The literature reveals that Ecological economics developed side by side with Classical and Neoclassical economics, but the primary advocates for this non-mainstream theory of economics were ecologists (Engel et al., 2008; Gomez-Baggethun, et al., 2009). The authors explain that this type of economics can easily be confused for Environmental economics. There is not much difference between the two other than Environmental economics works together with theories of Neoclassical economics, providing a cost-benefit analysis of the environmental impact of a given economic activity while taking into account

consumer behaviour. However, while Ecological economics also factors in concerns for human-nature interaction, it also takes into account ecological limitations. Authors make obvious that these ideas are still outside mainstream economics thinking and are still finding a place in the larger market. Which show the lack of understanding in current theory that involving the evaluation for the environment.

Nevertheless, Gomez-Baggethum et al. have illustrated through a meta-analysis of literature on this subject that there is a common theme of an approaching era where there is a shift with regards to the views on the limitations of natural resources. The authors suggest that the two types of economics theory will come together to change how value will placed on items that were not previously seen as free goods (e.g. ecological services). Since Ecological economics takes into consideration externalities and does account for human interaction, there is the possibility for a relationship between Neoclassical economics and Ecological economics. The authors also explain that there could be a market for this concept, but there are inconsistencies in the literature regarding the use of Ecological economics in practice. They conclude that only way to create awareness of this market is to put in place extensive policy options to create responsiveness to the value of ecological services.

There are several meta-analyses on the topic of ecological services and their place in the current marketplace (Ma & Stern, 2006; Kroeger & Casey, 2007; Turner & Daily, 2007; Engel et al., 2008: Liu et al., 2010; Sagoff, 2010). Ma and Stern (2006) demonstrated that in the environmental and economic disciplines, there is a lack of exploration of the methodologies used to review environmental services. They concluded that neo-classical theory is the key influencer in putting a value on environmental services. On the other hand, Gomez-Baggethun et al. (2009) provided a detailed analysis of the payment of environmental services, economic theory and payment schemes. They provided and reviewed a clear timeline of the relationship between economic and environmental theory, and concluded that “cost-benefit analyses can be largely blinding” to the true value of environmental services (p. 7-8). Overall, they concluded that no academic researchers have agreed upon a streamline method that is available to evaluate the value of ecological services. Therefore, no clear method(s) have been developed with apparent influencers or framework to evaluate the valuation on ecological service, which is widely accepted.

Sagoff (2010) suggests there is too big of a gap between the frameworks of intangible traditional economics and the science-based evaluation of ecological services. He examined the steps needed to put a quantitative value on ecological services and concluded that in an ideal world, combining the two markets would be hard to translate to all stakeholders. Other authors have maintained a similar position, the reason being that ecological services do not have any rival to compete with in the market, and their goods and services are available to everyone openly (Wackemagel & Rees, 1997; Gerowitt, Isselstein &

Marggraf, 2003; Kroeger & Casey, 2007). However, the literature also illustrates that payment for ecological services are more accepted if there are regulations in place (e.g., cultural policies) that put value on these services (Gerowitt, Isselstein & Marggraf, 2003; Kroeger & Casey, 2007).

In order to put a value on ecological services, market behaviour should be considered. Porter et al. (2009) reflect on broad perceptions of agriculture quality in ecological services as being relatively low. These authors illustrate that "agro-ecosystems cover 28% and 37% of the Earth land surface and are divided about 70:30" (p. 186). Within this scope, there are 17 potential areas in which ecological services can be developed, but since there is a limited amount of data environmental services have only recognized as "pollination, biological control and food production" so far. Porter et al. conclude that there are inconsistencies in this developing market and gaps in the literature, which prevent the recognition of the broader scope of ecological services. However, they suggest that for success in the market, value should be sought through regulations and increased willingness of farmers to consider external factors. In conclusion, this reveals that there is gap in the literature about the availability of the use of farm land and how to provide an evaluation of land if it was transformed into working ecological services.

Conclusion

Overall, Gomez-Baggethun et al. was able to provide the historical shift in economic theories. In addition, exhibit that economists agree, since there is no rival in the market for ecological services, it is harder to put a value on these items. On the other hand, the majority of authors consider the payment of ecological services as being introduced to the market through the application of environmental economics, and therefore as abiding by neoclassical economics and the market rules. In conclusion, it is evident there is no consistent framework or evaluation system in place to value on ecological services.

References

Engel, S., Pagiola, S., & Wunder, S. (2008). Designing payments for environmental services in theory and practice: An overview of the issues. Ecological Economics, 65. Retrieved October 20, 2012, from http://server-t86.e2enetworks.net.in/files/file/environmental%20services.pdf

Gerowitt, B., Isselstein, J., & Marggraf, R. (2003). Rewards for ecological goods—requirements and perspectives for agricultural land use. Agriculture, Ecosystems & Environment, 98, 1-10. Retrieved October 22, 2012 from http://www.sciencedirect.com/science/article/pii/S0167880903001129..

Gomez-Baggethun, E., Groot, R. d., Lomas, P. L., & Montes, C. (2009). The history of ecosystem services in economic theory and practice: From early notions to markets and payment schemes. Ecological Economics, 70. Retrieved October 22, 2012, from http://foreststofaucets.info/wp-content/uploads/2010/03/The-History-of-Ecosystem-Service-in-Economic-Theory-and-Practice-Journal-Citation.doc.pdf

Kroeger, T., & Casey, F. (2007). An assessment of market-based approaches to providing ecosystem services on agricultural lands. Ecological Economic, 64. Retrieved October 25, 2012, from http://www.defenders.org/publications/an_assessment_of_market-based_approaches_to_providing_ecosystem_services_on_agricultural_lands.pdf

Liu, S., Costanza, R., Farber, S., & Troy, A. (2010). Valuing ecosystem services Theory, practice, and the need for a transdisciplinary synthesis. Ecological Economics,1185. Retrieved October 16, 2012, from https://www.pdx.edu/sites/www.pdx.edu.sustainability/files/Liu%20et%20al.%202010%20-%20Valuing%20Ecosystem%20Services.pdf

Ma, Chunbo, Stern, David I.,(2006) Environmental and ecological economics: A citation analysis, Ecological Economics, 58(3), 491-506, ISSN 0921-8009, 10.1016/j.ecolecon.2005.07.023. Retrieved November 5, 2012, from (http://www.sciencedirect.com/science/article/pii/S0921800905003368)

Millennium Ecosystem Assessment. (2005). Ecosystems and human well-being: Synthesis

report. Island Press, Washington. Retrieved November 5, 2012, from www.millenniumassessment.org/documents/document.356.aspx.pdf

Porter, J., Costanza, R., Sandhu, H., Sugsgarrd, L., & Wratten, S. (2009). The Value of Producing Food, Energy, and Ecosystem Services within an Agro-Ecosystem. AMBIO: A Journal of the Human Environment, 38(4), 186-193. Retrieved November 5, 2012, from http://www.bioone.org/doi/full/10.1579/0044-7447-38.4.186

Sagoff, M. (2011). The quantification and valuation of ecosystem services. Ecological Economic,70. Retrieved October 30, 2012, from http://www.sciencedirect.com/science/article/pii/S0921800910004246

Turner, R., & Daily, G. (2007). The Ecosystem Services Framework and Natural Capital Conservation. Environment Resource Economic, 39. Retrieved October 30, 2012, from http://profwork.org/eee/support/Turner_Ecosystem_Services_Natural_Capital.pdf

Wackemagel, M., & Rees, W. E. (1997). Perceptual and structural barriers to investing in natural capital: Economics from an ecological footprint perspective . Ecological Economics, 20, 3-24. Retrieved October 25, 2012, from http://profwork.org/eee/support/Wackernagel_NK_footprint.pdf

Firm incentives and willingness to pay for Payment for Ecological Services (PES)

There are consistent findings that show how government intervention and private ventures must participate in the market for the payment for ecological services in order for the market to exist (Brown et al, 2006; Engel et al 2008; Aylward et. al, 2010). Following mainstream economic rationality, ecological services are externalities to firms since they provide benefits which are not paid for and are not internalised in economic decisions (Kosoy and Corbera, 2010). Therefore, it is important to identify a firm's main incentives and benefits for investing in PES to determine why and firms' are willing to pay for PES.

Reasons for firms' willingness to pay for PES vary. Some private-sector PES is based on compliance with regulation while others are done voluntarily for ethical, competitive, or pre-compliance reasons (Madsen et al, 2010; Narloch, 2011). Koellner et al (2010) has identified three components of classification of firms' benefit expectations for engaging in PES. The first component is direct financial benefits, including financial income, cost reduction, firms' natural resources, and clients' demand. The second component is non-direct financial benefits, including shareholders' requirement, legal compliance, voluntary compensation, image benefits, and pressure from NGO's). The last component is non-financial benefits, where firms invest in PES for human welfare and ecological responsibility. Among the three components, Koellner et al's (2010) survey revealed that the non-financial benefits (human welfare and ecological responsibility) were rated the highest, and non-direct financial benefits (firm image benefits and voluntary compensation of firms' impacts) were rated second highest as a motivation for investment in PES.

On the contrary, the findings from Narloch (2011) and Food and Agriculture Organization of the United Nations (FAO) (2007) are inconsistent with Koellner's survey results: Narloch found that certain PES such as ecolabelling, certification and potential future product development and product markets may raise the financial profitability, which makes direct financial benefits a substantial incentive. FAO also found that firms are concerned about maximizing sales to environmentally aware consumers and pressure from shareholders and consumers for greater Corporate Social Responsibility (CSR) is a motivation for PES.

In addition, Madsen et al (2010), Narloch (2011) and Kate et al (2004) found that drawing on the concept of biodiversity offsets, regulatory obligations and CSR could be used to motivate firms to pay for investments aimed at mitigating their negative impacts (Madsen et al, 2010; Narloch, 2011). A strong environmental reputation can help firms establish trusting relationships with regulators, and they will be more likely to avoid costly legal fees and delays. Because access to land depends on permission from

authorities and community members, firms that move first within their sector to establish the best environmental practices and reputation can find that they hold a competitive advantage (Kate et al, 2004).

Unfortunately, one of the reasons why firms' incentives and motivations for PES deviate significantly is because they vary across different industries and sectors. According to Koellner et al's survey, the different sectors the firms are in had a significant influence on the type of PES firms are willing to invest, while the origin of the firm only had a significant influence on the stated benefit expectations for biodiversity conservation. The difficulty in identifying the main firm incentives and motivations for PES has created a research gap of understanding the value of PES for firms.

References

Aylward, B. and Hartwell, R. (2010). Ecosystem Service Market Development: The Role and Opportunity for Finance. Bullitt Foundation.

Brown, T., Bergstrom, C., and Loomis, J. (2006). Ecosystem Goods and Services: Definition, Valuation and Provision.

Engel, S., Pagiola, S., & Wunder, S. (2008). Designing payments for environmental services in theory and practice: An overview of the issues. Ecological Economics, 65. Retrieved from http://server-t86.e2enetworks.net.in/files/file/environmental%20services.pdf

Food and Agriculture Organization of the United Nations. (2007). The State of Food and Agriculture: Paying farmers for environmental services. FAO Agriculture Series (38).

Kate, K., Bishop, J., and Bayon, R. (2004). Biodiversity offsets: Views, experience, and thebusiness case. International Union for Conservation of Nature and Natural Resources and Insight Investment Management (Global) Ltd.

Koellner, T., Sell, J. and Navarro, G. (2010). Why and how much are firms willing to invest in ecosystem services from tropical forests? A comparison of international and Costa Rican firms. Ecological Economics (69), 2127-2139.

Kosoy, N. and Corbera, E. (2010). Payments for ecosystem services as commodity fetishism. Ecological Economics (69), 1228-1236.

Madsen, B., Carroll, N., and MooreBrands, K. (2010). State of biodiversity markets report: offset and compensation programs worldwide. Ecosystem Marketplace.

Narloch, U., Drucker, A., and Pascual, U. (2011). Payments for agro biodiversity conservation services for sustained on-farm utilization of plant and animal genetic resources. Ecological Economics (70), 1837-1845.