

Investigating the sustainability and resilience criteria for evaluation
of land use plans and related policies:
The case of rural Niagara

by

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Author's declaration

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners.

I understand that this thesis may be made electronically available to the public.

Abstract

Most land use plans and policies, including those concerning growth management, are created in urban hubs (Afshar, 1994; Summer, 2005). My interest in this thesis started by asking the question: What are the criteria that ensure that land use plans and related policies serve rural livelihoods and stewardship under the lens of sustainability and resilience? Being a citizen residing in Niagara Region, I was inspired to find out the criteria to judge plans and policies in rural Niagara as a case study.

This thesis uncovers the categories of consideration for rural areas close to urban centres in developed countries, and the context-specific criteria pertaining to rural Niagara. The eight context-specific categories, merged with sustainability and resilience imperatives, are presented as evaluation criteria in a brief form as follows:

1. Plans and policies should provide for building communities' capacity in participative and collaborative governance including overlap in governance;
2. provide means for reconciling different interests in a way that celebrates diversity and ensures sufficiency and opportunity for all towards intragenerational equity while supporting community solidarity to acknowledge slow variables and feedback signals;
3. provide for the support of viable farming by fostering livelihood sufficiency and preserving resources for future generations within a regional character;
4. provide for strengthening the socio-economic base integrity in ways that also maintain/rehabilitate the socio-ecological base by reducing threats to its long-term integrity while encouraging diversity and innovation.

5. Plans and policies are to be used as tools to reduce intragenerational and intergenerational inequities in livelihood sufficiency and opportunity through collective responsibility, and innovative solutions to the local poverty problems.
6. Plans and policies should allot specific clauses to alleviate land stressors through institutionalized adoption of the precautionary principle, socio-ecological system integrity and the application of all sustainability imperatives while rewarding voluntary stewardship.
7. Plans and policies should acknowledge and foster multi-functionality in agriculture as one of the means to foster livelihoods, socio-ecological system integrity, and sustainable use of resources through the integration of all sustainability imperatives. Multi-functionality entails fostering diversification, the building of a regional modular character while acknowledging slow variables and system feedbacks through innovative local solutions
8. Plans and policies should cater for Preparedness for the Future by institutionalizing the adoption of precaution and adaptation as one of the means to prepare for uncertainty and applying all sustainability imperatives to seek mutually supportive benefits while nurturing a resilient Niagara character through all resilience imperatives

The above eight categories relate to all the sustainability imperatives (listed in appendix C) and all the resilience imperatives (listed in appendix D) in various ways.

The research used the technique of triangulation for corroborating evidence. By reviewing a purposeful sample of Niagara government and non-government documents, the presence of the eight categories was confirmed. A sample of articles in a local paper also

confirmed the presence of the categories. By counting the number of mentions for each category, the priority order was inferred.

In the case of Niagara the top priority is given to “Viable Farming” as concerns grow over the mounting challenges faced by family farms. “Stewardship” is the second priority to enable the rural and farming communities to play the role of land stewards.

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Dedication

This thesis is dedicated to the hard working men and women of the family farms who inhabit rural Canada. Their attachment to the land and their perseverance in a hostile economic environment inspire our endeavours to think and contribute our humble efforts in finding ways to preserve a healthy and prosperous rural Canada, the true heartland of our country.

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List of Abbreviations

CAP – Common Agricultural Policy [In the European Union]

CBNRM – Community-Based Natural Resource Management

COFSP – Canada-Ontario Farm Stewardship Program

CLI – Canada Land Inventory

CSA – Community Supported Agriculture

EFP – Environmental Farm Plan

FFPPA – Farm and Food Production Protection Act

FMNP – Farmers Market Nutritious Program

GGH – Greater Golden Horseshoe

LEAR – Land Evaluation and Area Review

NDP – New Democratic Party

NLT – Niagara Land Trust

NPCA – Niagara Peninsula Conservation Authority

OFA – Ontario Federation of Agriculture

OLA – Ontario Landowners' Association

OLTA – Ontario Land Trusts Association

OMAFRA – Ontario Ministry of Agriculture, Food, and Rural Affairs

OMB – Ontario Municipalities Board

OMMAH – Ontario Ministry of Municipal Affairs and Housing

OMNR – Ontario Ministry of Natural Resources

OMPIR – Ontario Ministry of Public Infrastructure Renewal. (Later it became the Ontario

Ministry of Energy and Infrastructure. By 2012, it became the Ontario Ministry of

Infrastructure)

ONHL – Ontario Natural Heritage League

ORMCP – Oak Ridges Moraine Conservation Plan

OSCIA – Ontario Soil and Crop Improvement Association

PC – Progressive Conservative

PLC – Public Liaison Committee (serves the Niagara Region Council)

RMN – Regional Municipality of Niagara

Chapter 1 – Introduction

1.1 - Thesis subject and agenda

Plans are path-defining social structures that influence the direction of progress in society by building pragmatic consensus (Holden, 2008) and setting a normative basis for decision making (Stein & Harper, 2005). This applies to land use planning initiatives of the province of Ontario, Canada centred on the Greenbelt Plan of 2005 and the Growth Plan of 2006. Together with relevant parts of the Provincial Policy Statement; these plans are referred to here as “green planning initiatives” because of their implicit/ explicit orientation to the pursuit for sustainability. This research is an investigation of the criteria that should be used to evaluate plans and policies for their potential effects on the sustainability and resilience of rural livelihoods and land stewardship using rural Niagara as an example case. The concepts of sustainability, resilience, rural livelihoods, and land stewardship are defined below in this chapter and in chapter two.

The Greenbelt Plan introduces regulations including zoning protection for agricultural lands against urban sprawl. The complementary provincial Growth Plan is meant to encourage intensification of development, especially in identified nodes in urban areas, and more generally to limit urban and suburban expansion onto rural agricultural lands. The 2007 Niagara Region Policy Plan and the 2008 Growth Management Strategy are drafted to comply with the provincial plans and policies. Other Regional initiatives of relevance will be elaborated later.

The main motive behind this research is the concern that the planning regime seems to be driven mostly by urban growth management priorities while paying little attention to addressing rural concerns (Mikulica, 2007; Afshar, 1994; OLA, 2006; Ontario Fruit & Vegetable Growers, 2010). As University of Guelph Professor, Farokh Afshar states, “we planners (with notable exceptions) are largely strapped to both our urban traditions and our seats in the urban areas”

(Afshar, 1994, p. 273). Moreover, authors of some formal reviews criticized the Greenbelt Plan for anticipated negative effects on rural agricultural economic interests (Vanclief & Bedggood, 2004).

This research seeks to uncover major concerns, characteristics and aspirations for rural livelihoods and stewardship and to group them in categories of consideration in Chapters Two. The categories of consideration are then examined in the context of Niagara Region in Chapter Three, and merged with the imperatives of sustainability and resilience to present them as criteria for evaluation. The research sets the criteria to assess the extent to which plans and policies address those categories using rural Niagara where agriculture is the major rural activity (Regional Municipality of Niagara, 2003) as a case study. For evaluating plans and for taking decisions pertaining to plans' and policies' modifications, what are needed are criteria to guide choices (Gibson et al., 2005). Such criteria facilitate meaningful participation of diverse stakeholders. Gibson et al. (2005, p. 93) explain, "the set of core criteria will serve mostly to indicate the key issues that require attention, the common realities to be respected and the broadly shared objectives to be pursued". The subsequent specification of the criteria in light of rural systems close to urban centres helps to ensure that the criteria suit the particular circumstance of the application context here. The above explain the rationale behind investigating criteria for evaluating land use planning and related policies. Linking the generic criteria to a case study serves the purpose of framing the criteria within a real life situation to elucidate their applicability.

Robert Yin (2003) provides the rationale for a single case study to include a critical case, a unique case, or a representative case. The choice of Niagara Region falls under the rationale of,

while being unique in certain aspects, Niagara also shares many characteristics with other regions in developed countries. The study design is explained in section 1.6 of this chapter.

Ontario is the most populous province in Canada and continues to attract new immigrants (Statistics Canada, 2008). Ontario's land use planning initiative represents a response to the growth pressures faced by the Greater Golden Horseshoe located in south-central Ontario, of which Niagara Region is part, being one of the fastest growing areas in North America (Ontario Ministry of Municipal Affairs and Housing, 2005; Ontario Ministry of Infrastructure Renewal, 2006). Since the Greenbelt Plan is due for review in 2015, one of the aims of this research is to contribute towards this review, albeit focusing only on rural livelihoods and stewardship in the Niagara Region as part of the geographical coverage. Appendix A is a map of the Greater Golden Horseshoe area indicating the area covered by the Greenbelt and the Niagara Region.

Setting the criteria for evaluating any plan may be conducted through various lenses. Sustainability is one lens that is commended by virtue of the realisation that many of our practices threaten the ongoing availability of the goods and services that nature provides and they also threaten the enhancement of social infrastructure provided by our modern institutions (Berkes & Folke, 2000). The sustainable use of land as a resource entails the alleviation of stresses on the resource, including urban encroachment over fertile productive lands. Michael Troughton (1995, p. 290) describes a contention that "the natural environment, agricultural economy, and rural society should be studied as a functioning entity". Statistics Canada (2001) in its definitions of Rural and Small Town refers to the population living outside the commuting zones of Census Metropolitan Areas and having populations less than ten thousands. Thus, rurality is associated with low populations and open spaces associated with the natural environment and agricultural lands. By the mid-twentieth century, urbanization and

industrialization created a core-periphery distinction between urban and rural areas (Troughton, 1995), but recently population mobility, “created zones of exurban expansion and differentiated rural landscapes between an urban-adjacent fringe and areas beyond” (Troughton, 1995, p. 292). Rural areas in Canada are now undergoing a period of losing distinctiveness and varying degrees of growth and decline. That is why sustainability is an essential lens for examining path-defining plans, including those affecting rural livelihoods and stewardship. Resilience or the capacity of our socio-ecological systems to withstand shocks, while maintaining their structure and function is another lens that complements sustainability, because whichever structure is constructed, it must be constructed to resist shocks in complex socio-ecological systems where uncertainty is an inherent condition (Waltner-Toews & Kay, 2008). Ontario’s provincial initiatives for land use planning in the Greater Golden Horseshoe (GGH), of which Niagara Region constitutes the south easterly corner, comes in response to persisting problems which threaten sustainable progress. An example is the loss of fertile agricultural lands, a priceless resource, to urban sprawl (Ontario Ministry of Municipal Affairs and Housing, 2005). One of the Greenbelt Plan visions for land as a resource, is to describe it as,

“[A] broad band of permanently protected land which:

- Protects against the loss and fragmentation of the agricultural land base and supports agriculture as the predominant land use;
- Gives permanent protection to the natural heritage and water resource systems that sustain ecological and human health and that form the environmental framework around which major urbanization in south-central Ontario will be organized; and provides for a diverse range of economic and social activities associated with rural communities, agriculture, tourism, recreation and resource uses” (Ontario ministry of Municipal Affairs and Housing, 2005, p.4).

At the same time, the Growth Plan focuses on encouraging urban intensification and the containment of most urban growth within delineated urban boundaries. It offers a vision for

growth till the year 2031 for the Greater Golden Horseshoe (GGH) as, “The GGH will offer a wide variety of choices for living. Thriving, liveable, vibrant and productive urban and rural areas will foster community and individual well-being.” (Ontario Ministry of Public Infrastructure Renewal, 2006, p.9).

The research focus on rural livelihoods and stewardship stems from the fact that, while urban centres remain the driving machines for the knowledge economy and innovation inviting migrants (Hutton, 2010; Stockdale, 2004; Homer-Dixon, 2001) and the seat of political power, the rural areas will continue to serve the expanding urban centres with essential factors of survival including food and nature’s goods and services without which our cities will succumb to pathologies (Jean, 2003; Homer-Dixon, 2007). Working towards safeguarding the rural milieu’s thriving existence is part of ensuring an overall thriving national economy. Consequently, the rural milieu must remain a vibrant space which maintains the means of making a living in order to continue its role as a provider of food and fibre and as a steward to nature’s goods (water supply, food products and non-food products like timber, among others) and services (flood mitigation, filtering of water supplies, biodiversity habitat, among others) (Costanza et al., 1997). The preservation of rural livelihoods and ecological stewardship should be one of the main concerns of forging plans and policies which aim at working toward more sustainable modes of progress in any region or country in the world. Rural economic and social viability are crucial. Allowing rural spaces to decline under the pressures of low incomes, migration to urban areas, and natural resources degradation, will ultimately be reflected in declining urban spaces, and, consequently, the national economic and social structures (Summer, 2005). The future trajectory for rural areas will be influenced by the official plans and policies that delineate paths of progress. Such plans and policies need to be subject to scrutiny and enriched with stakeholders

input. For meaningful inputs, a set of criteria is needed to provide a framework of understanding. Hence, the need for criteria to ensure that plans, the path-defining social structures, cater for rural needs for sustainable livelihoods and ability to carry out the stewardship duties. The above argument defines my stance as a researcher and the bias I bring to the study. In the words of John W. Creswell, one of the requirements in a research design is to, “clarify the *bias* the researcher brings to the study. This self-reflection creates an open and honest narrative that will resonate well with readers. Reflectivity is a core characteristic of qualitative research” (Creswell, 2009, p. 192). Reflective thoughts will be pointed to throughout the research to shed light on my interpretations of the data.

Lee-Ann Small (2007, p. 28) explains sustainable rural livelihoods as being based on a 1992 definition by Chambers and Conway of sustainable livelihoods as: “A livelihood comprises the capabilities, assets (stores, resources, claims and access) and activities required for a means of living: a livelihood is sustainable which can cope with and recover from stress and shocks, maintain or enhance its capabilities and assets and provide sustainable livelihood opportunities for the next generation; and which contributes net benefits to other livelihoods at the local and global levels and in the short and long-terms.”

In this research, the term stewardship chiefly pertains to land stewardship, which the Canadian Land Stewardship Centre defines as follows:

“ In its broadest sense, stewardship is the recognition of our collective responsibility to retain the quality and abundance of our land, air, water and biodiversity, and to manage this natural capital in a way that conserves all of its values, be they environmental, economic, social or cultural”.(Land Stewardship Centre, 2010, p.1)

This research, then, centres on the creation of criteria which can be used for the evaluation of the Ontario and Niagara land use planning initiatives and their implications for rural livelihoods and stewardship; stewardship.

1.2 - Thesis question

The research poses the overarching question: What are the criteria to facilitate the evaluation of the provincial and regional land use planning initiatives (see section 1.4 below) for strengthening rural sustainability and resilience, especially rural community and working farm viability, and land stewardship in Niagara Region?

In answering the above question, the following research questions are addressed:

- What are the generic sustainability and resilience imperatives and how can they be used as a basic theoretical framework towards building the context-specific criteria?
- What are the specific influences, concerns, and opportunities that need to be considered to specify the criteria for evaluating land use plans and associated initiatives affecting rural livelihoods and stewardship in developed countries?
- How can the criteria be further specified for the Niagara context?
- How well do the results fit with the nature and priority of considerations recognized in recent Niagara Region documents and news sources?

The findings discussed below will answer the research question by identifying the criteria that facilitate the evaluation of the provincial and regional initiatives in land use plans and

policies. This was done through the following steps: Identifying the generic sustainability and resilience imperatives adapted from the sustainability criteria from the book by Gibson et al. (Gibson, Hassan, Holtz, Tansey &Whitelaw, 2005) and the resilience criteria from the book by Walker & Salt (Walker & Salt, 2006). Literature review to identify specific areas of consideration related to land use in rural socio-ecological systems close to urban areas in developed countries and applying such areas of consideration to a case study of Niagara Region, the case-specific criteria of plans' evaluation were developed.

The examination of the categories of consideration through document analysis and local press content analysis confirmed the presence of the categories and added the identification of the order of emphasis on different criteria reflecting an order of prioritisation. The order of prioritisation indicated similarities within the document analysis and local press content analysis; the two approaches agree on attaching the highest priority to Viable Farming followed by Stewardship and on placing Preparedness for the Future at a low priority. While this can guide the evaluation exercise, it simultaneously points to the need for raising awareness regarding Preparedness for the Future as an area not to be overlooked in our contemporary world of complexity and surprises.

1.3 – Introduction to the focal system and its context

The focal system or case study is the Niagara Region rural regime. This region is chosen mainly because the writer is familiar with it, being a local citizen who has lived the debates and conflicts in the region. Another reason for the choice of the case study area is that the most significant rural activity, farming, still occupies more than 50% of the total land mass area (Regional

Municipality of Niagara, 2003). One of the major arguments in this research is that farming activities are crucial for the enhancement of rural livelihoods and stewardship in the region.

Niagara Region is a peninsula occupying the land mass between Lake Erie, Lake Ontario, and Niagara River. It consists of twelve municipalities named from North to South and from East to West as follows:

- Five cities: Niagara Falls, St. Catharines, Thorold, Welland, and Port Colborne.
- Five towns: Niagara-on-the-Lake, Lincoln, Grimsby, Pelham, and Fort Erie
- Two townships: West Lincoln, and Wainfleet

The Peninsula's physiography consists of three distinct regions: the Niagara Escarpment dividing the peninsula along an East-West axis, the Iroquois Plain between the Escarpment and Lake Ontario, and the Haldimand Clay Plain between the escarpment and Lake Erie. The majority of Niagara's soil is of class 1, 2, & 3 which are considered Prime Agricultural Lands according to the Canada Land Inventory (CLI) system of ranking mineral soils (Regional Municipality of Niagara, 2003). Considering the fact that only 5% of Canada's land mass is prime agricultural land (Regional Municipality of Niagara, 2003), Niagara Region stands as a significant agricultural area for Canada; this makes Niagara Region a good example for illustrative purposes. The well drained sandy soil of the Iroquois Plain with its microclimate of a long growing season with long frost-free periods and infrequent extreme minimum temperatures make it one of two fruit belts in Canada; the other is in Okanagan, British Columbia. (Shaw, 1994). The case study area of Niagara Region will be further discussed in Chapter Three.

The spatial context of the focal area is the Greater Golden Horseshoe (GGH), one of North America's fastest growing areas in urbanization (Ontario Ministry of Municipal Affairs and Housing, 2005; Ontario Ministry of Public Infrastructure Renewal, 2006). The GGH includes the cities of the Peninsula which, like other cities in Ontario, started as agricultural trading centres, then expanded onto high quality agricultural lands (Statistics Canada, 2005).

1.4 – Introduction to the provincial and regional planning initiatives

The provincial and regional land use initiatives present an example for applying the criteria identified through this research. Realising the danger of urban sprawl, the province of Ontario came up with a land use planning initiative centred on the 2005 Greenbelt Plan which imposes a zoning regime to protect agricultural lands by limiting their sale to agricultural use only (Ontario Ministry of Municipal Affairs and Housing, 2005). To answer the question on where to grow, the 2006 Growth Plan defines where urban expansion can take place within set intensification indices inside defined urban boundaries (Ontario Ministry of Municipal Affairs and Housing, 2006). The major Niagara Region's plans and policies complementing the above are the Regional Policy Plan, 2007, the Growth Management Strategy, 2008, and the Agricultural Value Added Activities Policies, 2009.

The Greenbelt Plan was established under section 3 of the Greenbelt Act, 2005 and is administered by the Ministry of Municipal Affairs and Housing. The Greenbelt Area is defined by Ontario Regulation 59/05 (Ministry of Municipal Affairs and Housing, 2005). The area includes the geographical coverage of the Niagara Escarpment Plan (NEP), the Oak Ridges Moraine Conservation (ORMC), and the Parkway Belt West Plans.

The Growth Plan, known under the title Places to Grow, sets Ontario's vision for the growth of residential areas and businesses inside the GGH. Such growth is to be directed within a strategy of utilising brownfields in urban cores and of adopting intensification indices that make best use of space while also facilitating an efficient use of infrastructure services and transportation in the cities. The Growth Plan was prepared under the Places to Grow Act, 2005 and was administered by the Ministry of Public Infrastructure Renewal then (now the Ministry of Infrastructure). The Provincial Policy Statement 2005 and reviewed in 2010, sets the main framework within which the provincial and regional initiatives function.

1.5 – The research rationale, contributions, and limitations

1.5.1 – The overall rationale

Southern Ontario is home to a rich heritage of First Nations and early settlers' cultures which are based on rural values, an attachment to nature, and a valuing of the land. At present it is also home to one of the fastest expanding urbanisation areas in North America (Ontario Ministry of Municipal Affairs and Housing, 2005; Ministry of Infrastructure Renewal, 2006). And it has fertile agricultural land and a unique fruit- growing and grapes-growing zone together with a large proportion of class 1, 2, & 3 soils (Regional Municipality of Niagara, 2003). It is also part of a small stretch of land mass known as Carolinian Canada, a geographical area that is "both Canada's richest and most endangered ecosystem" (Carolinian Canada Coalition, 2004, p.1), and a part of the Niagara Escarpment with its rich biodiversity. Given a region with such attributes, the province is faced with the duty to reconcile different, and sometimes, conflicting interests. This resulted in proposing the Greenbelt Plan and the Growth Plan among other policies and measures as guidance for land use planning that considers natural heritage.

Provincial and Regional plans including the Greenbelt Plan, represent important devices to work towards sustainable progress in the various areas of activity in both the rural and urban areas. This research utilises the lenses of sustainability and resilience. When it comes to developing criteria to evaluate or critique the plans, different stakeholders will look at the plans and policies from their different angles of view. I choose to look at the plans through the lens of sustainability and resilience from the angle of the rural communities' thriving continued existence. With this outlook I seek new knowledge as the available literature reveals an emphasis on urban interests in both the drafting of plans and in their reviews. My research seeks to cover the less emphasised rural interests.

1.5.2 –Research contributions

1.5.2.1 – Academic contributions

The research employs a holistic interdisciplinary approach to the attributes of the socio-ecological system under study. This approach is commended by virtue of the fact that system's components are interdependent (Sunde, 2008; Forsyth, 2003). This research combines the imperatives of sustainability and those of resilience to develop sustainability and resilience-based criteria for evaluating plans and policies in Niagara Region. The imperatives of sustainability and those of resilience are comprehensive and flexible; they serve short-term as well as long-term benefits for socio-ecological systems. By combining the two imperatives, this research merges their strengths. The literature is rich with examples of addressing, in isolation, the problems of agriculture (De Gregory, 2004; Godden, 1997; Robertson, 2008;Sultani, 2006), and rurality (Burtniak, 1981; Whittaker, 2004; Blake, 2003). By employing a holistic outlook integrating all characteristics together and identifying common sustainability and resilience factors linked to the

key areas of consideration while investigating their interactions, this research presents its contribution. Combining of sustainability imperatives with what a resilient world should be, adds the strength of widening the angle of vision in order to take full advantage of the perspectives of both visions to develop all-embracing criteria. Another contribution is experimenting with the critical review of documentary evidence of various kinds instead of conducting interviews as a means to uncover how the categorised concepts are presented by both the government officials and the relevant non-governmental organizations.

This research contributes to the rural planning literature by offering criteria that combine the strengths of sustainability theory with resilience theory to be used for evaluation of plans and policies in land use.

1.5.2.2 – Practical contributions

The research addresses daily challenges of rural livelihoods and stewardship in Niagara Region. It develops a set of criteria in order to contribute to the various plans' reviews envisaged in future such as the upcoming greenbelt review of 2015. The research conclusions reflect on the implications of its findings on rural Niagara and the GGH through suggesting hypotheses for further investigation, besides rendering its criteria applicable to the evaluation of Niagara Region plans and policies.

1.5.3 – Research focus

The research focuses on how the land use planning initiative can be judged for its effect on rural livelihoods and stewardship adopting Niagara Region as a case. Thus the thematic limitation is the focus on rural livelihoods and stewardship and the geographical limitation is the focus on Niagara Region.

The study is inspired by the green planning initiatives and planning documents at the provincial and regional levels. It is recognised that other planning efforts by other provincial and federal ministries affect rural communities including those in Niagara Region; this is also the case with local municipalities Official Plans. Such efforts will be pointed to only in so far as they relate to the development of the criteria; this is a limitation dictated by space and time constraints. As for the case study, Niagara Region is not completely representative of all rural Ontario, but obviously it shares many characteristics with the other regions while displaying some unique attributes. Within the caveats of regional specifics, lessons can be drawn from the research findings to be applied to other rural communities.

An inherent limitation in a criteria-developing study is that a researcher is bound to adopt a certain perspective in looking at the system and its components. To understand any complex system, the system's description needs to be carried out from different perspectives (McCarthy, 2008; Kay, 2008a). In the words of James Kay (2008, p. 29), "[C]omplex socio-ecological situations can be understood only from multiple, non-equivalent perspectives. There exist multiple windows to investigate different aspects of the situation. A truly complex situation cannot be adequately captured or represented from any single perspective." This research is carried out from the perspective of an observer within the system and interacting with its components. The research is driven by the outlook that a viable and prosperous rural milieu is crucial for healthy urban and rural integrated progress. An alternative perspective may be that of a corporate industrial farming operation keen on maximising profits or the perspective of a farmer who is keen to sell his property for the highest bid. Various perspectives can be employed; they will all result in different system issues being brought to the forefront and subsequently different sets of criteria. This limitation of describing the system from one

perspective is not a weakness of the argument, but rather a focusing of the argument within a confined, clearly stated angle of view.

On adopting sustainability and resilience, the research is stating a stance and hence accepting a limitation. My world view is that working towards sustainability and resilience is a target of necessity, rather than a choice, if socio-ecological systems are to continue offering the goods and services to our social and economic viability over the long term. Resilience imperatives are complementary to the sustainability imperatives. However, there is no single universal solution due to the diversity of contexts (Gibson, Hassan, Holtz, Tansey and Whitelaw, 2005) and the development of the criteria could have been performed using other frameworks.

1.6 – Research strategy and design

This is a thesis based on exploratory qualitative research. The qualitative research approach is adopted for being more appropriate than the quantitative approach for the research question. Since the research question is concerned with developing evaluation criteria, the nuances of meanings carried by the descriptions of the illustrative case cannot be reduced to numbers but rather interpreted under the theoretical lens chosen (Berg, 2009; Neuman & Robson, 2009; Yin, 2003). The same considerations apply to the triangulation methods employed being documents' interpretations, and local press qualitative content analysis. The qualitative approach allows a researcher to capture the richness of the social features and processes and to emphasise the social context in trying to understand the social world (Neuman & Robson, 2009). Document analysis, rather than interviews, was adopted. The available literature covers interviews through various studies; some are on topics close to this topic (Mikulica, 2007; Mackenzie, 2008), others are on

related topics (Regional Municipality of Niagara, 2003), but document analysis and press content analysis are relatively lacking. This research seeks to cover this gap.

Within the tradition of the qualitative approach, the research design did not follow a linear path of steps, but rather a spiral one (Berg, 2009). Most of the concepts were developed during data collection while studying the illustrative case, consulting documents and conducting content analysis rather than at the forefront. Bearing in mind the spiral nature of this research design, the initial step was a literature review conducted to establish the generic categories of consideration in rural areas close to urban centres of developed countries and bounded by a focus on livelihoods and stewardship. In qualitative research several strategies for gathering data are utilized to provide multiple sources of evidence in order to establish the findings validity (Creswell, 2009; Yin, 2003; George & Bennett, 2005). In the words of John W. Creswell, “Qualitative researchers typically gather multiple forms of data, such as interviews, observations, and documents analysis, rather than rely on a single data source” (Creswell, 2009, p. 175). In this research the strategies employed include the case study, evidence from documents, and local press content analysis.

A case study for Niagara was conducted as a representative case to facilitate the creation of context-specific categories of consideration guided by the generic categories emerging from the literature review. The research strategy of the case study was used, because case studies have a distinctive place in evaluation-oriented research as they lend themselves to investigate phenomena within a real-life context (Yin, 2003). Complementing the case study, are the qualitative documents’ analysis and local press content analysis; the use of coding and counting techniques in both analyses answered the last part of the research question pertaining to the criteria order of prioritization.

Yin (2003) recommends the observation of three principles in conducting data collection in case studies that will serve increasing the reliability. These are:

- 1) The use of multiple sources of evidence. This is done by diversified sources of documents;
- 2) Creating a case study data base. This is done by including Appendix E, the annotated bibliography, for the documents, and
- 3) Maintaining a chain of evidence. This is done by following a protocol describing the process of extracting evidence from the sources and the coding system.

The theoretical lens to view the information and data is that of sustainability and resilience as discussed above. So, I start from theoretical grounds to examine details in the documents. This indicates a deductive approach.

My research method adopts an unobtrusive technique of consulting government and non-government documents together with a content analysis of the local press to provide the multiplicity of methods for triangulation checks and findings' validation. The review of documents was conducted using the "Directed Content Analysis" (Berg, 2009) as interpretations of the "categories derived from existing theories and explanations relevant to the research focus" (Berg, 2009, p. 341) and guided by empirically measurable indicators. On the other hand, the local press content analysis was carried out in the standard methods of measuring frequency (interval measure), judging direction (nominal measure) and tone (ordinal measure) starting with relevant words or phrases in the text itself (raw data) to check if the same categories identified in the case study also emerge in documents and press analyses.

The overarching methodology is the Interpretive Social Science described by W. Lawrence Neuman as follows:

“A researcher conducts a ‘reading’ to discover meaning embedded within text. Each reader brings his or her experience to a text ... true meaning is rarely simple or obvious on the surface; one reaches it only through a detailed study of the text, contemplating its many messages and seeking the connections among its parts” (Neuman, 2003, p. 76).

The above is a general description of the methods used. Detailed description of the research method for each step is outlined at the beginning of each chapter or section as deemed necessary.

1.7 – Outline

The next chapter provides a literature review with the aim of identifying the generic areas of consideration for rural areas close to urban centres in developed countries. It starts by introducing the underpinning theory of sustainability and resilience and combines these ideas to apply them to the concerns of socio-ecological systems for rural areas in developed countries. In section 2.3 I review the relevant literature to uncover the key attributes of such rural areas by consulting the experiences of developed countries in Europe, Australia, and the United States.

Chapter Three presents the case study of Niagara by examining the governmental and non-governmental documents. Context-specific criteria are derived in section 3.4, table 3.1. In Chapter Four, the same categorized concepts developed in chapter two are checked with document analysis and the local press content analysis. Thus multiple methods are used to check the same concepts. Chapter Five presents the conclusions and identifies further research. Chapter five concludes by considering the implications of the findings on rural Niagara and the broader context of the Greater Golden Horseshoe rural areas. The implications for the research

approach are also reviewed in retrospect in order to refine the approach and to explore areas for future research.

Chapter 2 –Generic areas of consideration and generic conceptual framework

2.1 – Agenda and chapter outline

In this chapter the overall theoretical framework for the thesis is presented. This framework will form the basic structure for development of the more detailed set of case and context criteria for Niagara region in the following chapter three.

This chapter starts with a presentation of the theoretical underpinnings of sustainability and resilience imperatives in section 2.2. Section 2.3 is to present a literature review of key issues pertaining to rural livelihood and stewardship in rural areas close to urban centres in developed countries. Section 2.4 is to integrate the above two sections in a generic conceptual framework. Details of the methodology employed to conduct the literature review will be presented in subsection 2.3.2.

My aim is to cover the complex interweaving of the recognised major factors affecting long term socio-ecological wellbeing and persistence. Hence, the focus is on the foundations in sustainability and resilience theory in subsections 2.2.2 and 2.2.3 respectively. An integration of the two theories will be presented in subsection 2.2.4. Since the targeted evaluation criteria are meant to be applied to the Ontario and Niagara plans and policies, relevant literature on similar areas in developed countries is provided in section 2.3. However, the review focuses only on considerations pertaining to rural areas close to urban centres.

2.2 – The underpinning theory: sustainability, and resilience

2.2.1 – Introduction

The topic of sustainability has been covered by a vast number of writings. However, a relatively recent book by Gibson et al. (2005) was found to be most comprehensive in coverage and most inclusive of previous ideas; this book is: *Sustainability Assessment: Criteria and Processes*. Various other books are reviewed on the topics of sustainable rural development and agricultural sustainability

As for the topic of resilience, the literature is pioneered by the Resilience Alliance writers, including David Walker and Brian Salt. The literature of the Resilience Alliance formed the broad base of the literature review in the area of resilience. Seminal works by Lance Gunderson and C. S. Holling, besides others, were also reviewed. Adrian Du Plessis VanBreda's (2001) paper "Resilience theory: A literature Review" guided access to other works on rural and agricultural settings.

2.2.2 – Sustainability theory and criteria

In academic discourse, sustainability is often described as having three sides or pillars: economy, ecology and equity (3Es). However, the pervasive term of "Sustainable Development", as it is widely used in government policy, is biased toward the economy by emphasizing "development", the noun, over the adjective "sustainable". A better substitute term may be "developing sustainability" as proposed by the Environmental Commissioner of Ontario (Miller, 2002).

As put by Scott, Park, and Cocklin (2000, p.436), “The notion of ‘sustainable development’ which is expressed in so much government policy today is therefore more about encouraging economic growth, ostensibly to encourage sustainable lifestyles, than about achieving either ecological goals or social equity”. Intuitively, one is inclined to think about sustainability as a goal yet to be achieved. In working toward achieving sustainability, all three Es: economy, ecology and equity must be respected in efforts to find ways of building an economy and society that preserve and rehabilitate ecosystems. However, in practical application, tradeoffs between and among the three sides may not be avoidable according to the conditions of the case.

Gibson et al. (2005) list eight points to describe the essential requirements for progress towards sustainability including the recognition of links and interdependencies, especially between humans and the biophysical foundations of life as follows:

1. Socio-ecological system integrity;
2. Livelihood sufficiency and opportunity;
3. Intragenerational equity;
4. Intergenerational equity;
5. Resource maintenance and efficiency;
6. Socio-ecological civility and democratic governance;
7. Precaution and adaptation;
8. Immediate and long-term integration.

The first requirement calls for building human-ecological relations to protect nature's goods and services. The second requirement calls for social justice in ensuring material wellbeing and opportunity. The third requirement calls for equity among classes and groups within the same generation. The fourth requirement emphasizes equity across generations; thus opting for actions that will ensure future generations' ability to live sustainably. The fifth requirement calls for avoiding waste and gaining more benefits from each unit of a resource. The sixth requirement calls for collective responsibility and involvement in decision making. The seventh requirement calls for respecting uncertainty by avoiding possible risks while managing for adaptation to surprises. The final requirement calls for starting to work toward sustainability by simultaneously applying all the above principles to seek mutual reinforcement between the various requirements.

The above generic criteria address all three pillars of sustainability - the economic, social and ecological. They will help form a basic framework for building specific criteria for Niagara Region rural communities and ecosystems.

2.2.3 – Resilience theory and criteria

The notions of stability and resilience are commonly used to describe systems' behavior. Specifically Lance Gunderson (2000) quotes C. S. Holling characterizing stability as, "persistence of a system near or close to an equilibrium state". By contrast, resilience was introduced to indicate behaviour of dynamic systems far from equilibrium, by defining resilience as "the amount of disturbance that a system can absorb without changing state" (Gunderson, 2000, p. 426). We are interested in socio-ecological systems' resilience, because such systems are dynamic and subject to continuous human interventions; the existence of multiple potential

stable states and systems subject to dynamic pressures of various kinds, can mean the flipping from one state to another which may be undesirable.

Brian Walker and David Salt (2003, p. 37) describe resilience as the cornerstone of sustainability and define it as, “the capacity of a system to absorb disturbance without shifting to another regime”. Interest in resilience came as a result of failures of management practices based on the dominating modern outlook to nature that reflects a belief in being able to master it (Westley, 1995). Aided by modern scientific achievements, humans in recent centuries practiced the philosophy of controlling nature by, for example, draining marshes and wetlands, stopping forest fires, killing pests by chemical pesticides and damming river flows, to mention just a few examples. Such interference with nature’s dynamics has led to short-term gains, but typically reduced the resilience of the targeted natural systems, as experience proved when subsequent disturbances occurred and systems collapsed. Resilience derives from replication of functions across spatial and temporal scales together with a diversity of similar but different functions within a scale (Gunderson & Pritchard, 2002). Walker and Salt (2006) identify nine factors that characterise a resilient world; they are as follows:

1. Diversity in all forms (biophysical, social, and economic)
2. Ecological Variability.

The above implies that we should refrain from trying to control nature’s variability and learn to adapt to it.

3. Modularity; A resilient world is to consist of modular components.

The above implies that an over connected system is not as resilient as one with smaller largely self-reliant modules.

4. Acknowledging Slow Variables.

The above implies that policies are to be directed at the slow controlling variables associated with thresholds where a system can shift from a desirable state to a non-desirable state.

5. Tight Feedbacks.

The above implies that the maintaining or tightening the strength of feedbacks allows for the detection of thresholds before they are crossed.

6. Social Capital.

The above calls for the promotion of trust and “the capacity of the people in the system to respond together” (Walker & Salt, 2006, p. 147).

7. Innovation.

The above emphasises “learning and experimentation, locally developed rules and embracing change” (Walker & Salt, 2006, p. 147).

8. Overlap in Governance.

The above favours some redundancy in the governance structures.

9. Ecosystem Services.

The above implies recognising the unpriced ecosystem services which are normally taken as free in our deficient accounting system.

In developing a procedure for resilience assessment, one has first to decide the resilience of what desirable system qualities to what potential disturbances] this entails bounding a system to define it by relating it to an issue, a geographical scope, and a time horizon. Ideally resilience assessment must include ecological, social, and economic features as well as a diversity of perspectives (Resilience Alliance, 2007). Once a core issue is chosen for study (for example, the declining profitability of farm products in a certain geographical region at present time), the valued attribute or package of attributes relating to the issue should be defined. In this example, a major valued attribute may be rural economic viability. The next step is to define organisational scales above and below the focal scale as well as the spatial and temporal contexts of the focal system, through defining the geographical context, institutional hierarchy and reviewing historical records and analysing present trends (Kay, 2008a).

The research organization Resilience Alliance produced a workbook for practitioners based on resilience theory. The practitioners' workbook offers an approach to the management of socio-ecological systems that acknowledges change and uncertainty and aims at sustainable delivery of environmental benefits (Resilience Alliance, 2010).

The main exercise of Resilience Assessment is to assess alternative possible states of the system and the processes that could cause the system to shift from one state to another (Resilience Alliance, 2010). One possible state in a particular region may be a subsidised farming regime which could encourage a thriving agricultural sector and another state could be mass abandonment of farmlands due to unfavourable economic conditions. It is crucial to

understand the possible alternative states of a system and the forces that could drive it over a threshold to flip into another state (Resilience Alliance, 2010)

Resilience assessment is an evaluation of system's vulnerability by studying its variables, feedback loops and controls to avoid shifting into an undesirable alternative state. Such a shift may be reversible, irreversible or practically irreversible (Walker & Salt, 2006). Managing for resilience requires a paradigm shift from controlling natural systems to seeking to understand cycles of change and adapting to such cycles (Walker & Salt, 2006). In this case study, drought and excess precipitation cycles that strike the Niagara region are to be addressed not by drainage and irrigation control structures, but rather by adaptation through, for example, wetland maintenance, crop diversity, rotational cropping and mixed crop / dairy farming activities that can produce biogas to diversify agricultural income and energy source options and save on energy costs.

2.2.4 – Integration: sustainability and resilience

Judith McKenzie (2002) describes sustainability as a continuum concept lying between the ecocentrism of sustainable society and the anthropocentrism of sustainable development. McKenzie's point about the diverse framings of the concept leads to the imperative of defining the observer's perspective of looking at the system under study and the context within which the system is being viewed. It is equally important to identify desirable aspects of a system from a defined perspective driving a study where resilience needs to be enhanced and undesirable aspects where resilience needs to be broken. This will help working towards sustainability in a way that respects the three pillars of economy, ecology, and equity. In this respect, a systems approach which encompasses the most relevant components in the economic, ecological, and social realms provides the tool for identifying interdependencies, feedback

loops, and slow and fast moving variables (Kay, 2008a). Thus, sustainability and resilience theory viewed through a systems approach complement each other. In this research the case study - rural Niagara livelihoods and stewardship - is used to build a set of criteria that may be applied to examine the provincial and regional plans' adherence to the concepts of sustainability and resilience. The case is viewed from the perspective of an observer within the system viewing it from the angle of the need to preserve desirable aspects for the stakeholders of the rural regime under study and to build sustainability through transition from undesirable aspects. What is desirable is what helps working towards sustainable livelihoods and stewardship in the rural milieu for the healthy progress of both the rural and urban regimes.

Appendix C summarizes the generic sustainability requirements as decision criteria (Gibson et al., 2005). Appendix D, which summarizes the generic requirements of a resilient world according to Brian Walker & David Salt (2006), indicates the complementarities of resilience with the guiding requirements of sustainability. For example, diversity, the first requirement of resilience, helps to elucidate the sustainability imperatives of livelihood sufficiency and opportunity, intragenerational equity and intergenerational equity. Moreover, the resilience requirement, tight feedbacks, helps to explain the Adaptive Cycle - which is linked with the systems approach— depicting socio-ecological systems as passing through the exploitation and growth phase to conservation, then creative destruction followed by reorganisation (Walker & Salt, 2006). This, in turn, provides the support to the sustainability imperative of precaution and adaptation. Thus, the theoretical underpinnings used in this research are to be used in their complementarities sharing concepts of adaptation, systems integrity, and the realisation that socio-ecological systems are complex and dynamic. Resilience theory offers the concepts of non-linear, multi-scalar interdependencies which are adopted by sustainability theory and

the systems approach. The above integrated outlook will be used in the following sections as the theoretical lens of identifying relevant literature.

2.3 – Literature review of areas of consideration in rural systems close to urban centres.

2.3.1 - Introduction

This section reviews the relevant literature on rural areas close to urban centres in developed countries. However, a brief description of the focal case, rural Niagara, is provided to place the broader discussion in perspective.

The case study area, Niagara region, is characterized by the close proximity of rural areas and farms to the region's five cities, and to the neighbouring city of Hamilton. The region's width at its wider East-West axis is 68 kilometers. Hence, distances between its farthest rural areas from any city, are below 20 kilometers; the areas of consideration in rural Niagara can, therefore, be termed as rural areas close to urban centres. However, the aim of this research is to examine key considerations of rural Niagara within the general rural context, including the rural-urban proximity context and not confined to it. The word rural carries the attributes discussed above in section 1.1.

Agricultural activities continue to represent the backbone of the rural economy even when urban centres start to encroach on the surrounding rural areas (Walker, 1999). At present, the agro-economic system of many Canadian farming areas, including south central Ontario on the urban periphery of the Greater Golden Horseshoe, is a mix of industrial agriculture, small scale farming, and emerging bio-products farming (Troughton, 2004). The continuing role played by agriculture in the rural areas constitutes the economic and social context for understanding the key areas of consideration in rurality.

By consulting the literature on key areas of consideration of rural areas, including considerations resulting from proximity to urban centres, my aim is to identify the generic sustainability and resilience considerations pertaining to rural livelihoods and stewardship. Such identification is aimed at developing the combined theoretical underpinnings with the key considerations to arrive at the generic framework in section 2.4. The generic framework is to set the stage for Chapter Three on the Rural Niagara system.

In sub subsection 2.3.3, the generic sustainability and resilience concerns will be reviewed as reflected in the relevant literature. This will include the experiences of other developed countries to set a broad picture. The review is conducted bearing in mind the focus of this research being rural livelihoods and stewardship.

2.3.2 –Method

The following literature review is based on the search for recent journal articles pertaining to the area of interest, the sustainability and resilience concerns in rural areas close to urban centres, and how such concerns reflect on livelihoods and stewardship.

It was decided to list down a reasonable number of journal titles to base a search for the specific areas of interest in such short list of most relevant journal titles. The library of the University of Waterloo web site was accessed to utilize the combined resources of the universities of Waterloo, Guelph, and Wilfrid Laurier. The University of Waterloo library databases were accessed. Choosing the subheading of “Environmental Studies”, a search was conducted under “Environment Abstracts” limiting the search to journal articles in English Language between the years 2000 and 2011. First, the three search words were used: Rural, Developed Countries, and Policies. Only one result was returned (it was on Salmonellosis).

Confining the search to the words: Rural AND Policies, returned 478 results of which 434 were peer-reviewed articles. The peer-reviewed articles were examined to note their relevance and the subsequent relevance of the journal titles. A short list of the most relevant journal titles constituted the basis for browsing the journals in search for the words of interest: Livelihoods, Stewardship, Preservation of Agricultural Lands, Urban Sprawl, Rural-Urban Fringe, and Developed Countries. Whenever a very high number of results were returned, the search was limited by combining several search words. When no returned results were obtained, a different word or combination of words was used. The most recent articles returned were examined for highest relevance.

The short list of most relevant journals arrived at, is as follows in the order in which they appeared:

1. Land Use Policy
2. Environmental Science & Policy
3. Environment, Development and Sustainability
4. Ecological Complexity
5. Natural Resources Forum
6. Landscape and Urban Planning
7. Journal of Rural Studies
8. Agriculture and Human Values
9. Sociologia Ruralis (of the European Society for Rural Sociology)
10. Journal of Environmental Management
11. Local Environment
12. Journal of Environmental Policy and Planning

13. Agricultural Systems
14. Ecological Economics
15. Geoforum
16. Natural Resources Journal

As the pages were scrolled, articles of lower relevance to the search words were noted, but the whole 434 articles were examined. The journal titles left out were mainly on Energy Policies, Water Issues, Urban Planning, International Issues, and Developing Countries.

Text books with titles pertaining to the topic of interest were consulted for a background understanding, but the main reliance rested with journal articles.

2.3.3 –Key categories of consideration of sustainability and resilience for rural areas close to urban centres

Reviewing the literature is the initial step towards the recognizing the sustainability and resilience areas of consideration in rural settings of developed countries. What follows is a discussion major themes identified through the literature review that are used to deduce categories of consideration presented in bold writing. Such categories will constitute the initial step of identifying key areas of consideration pertaining to sustainable and resilient rural livelihoods and stewardship for the case of rural Niagara.

It is the aim of this section to identify a comprehensive list of areas of consideration to be used as a generic guide to shape the context-specific criteria for Niagara Region in section 3.4.

Robinson et al. (1990, p. 27) look upon sustainability as a normative ethical principle and describe cultural sustainability as,

“Cultural sustainability depends on the ability of a society to claim the loyalty of its adherents through the propagation of a set of values that are acceptable to the populace and through the provision of socio-political institutions that make realization of those values possible”

Cultural sustainability is needed to rally the populace behind plans and policies which target a desirable future. To work towards such a future, plans need to be responsive to the imperatives of sustainability and resilience and, therefore need to be judged under such lenses while identifying major categories of consideration characterizing rural areas close to urban centres, the topic of this research. Troughton (1995, p. 290) articulates the changing position of rural areas as, “If one assesses the last 50 years, rural Canada has moved from a dominant position to that of dependence and residual status ... the result is a system that is fragmented, increasingly powerless and near collapse”.

With urban sprawl over agricultural lands, many rural areas become close to urban centres. Rural areas close to urban centres are contested spaces due to urban sprawl (Kalantaridis, 2010; Bruncckhorst, 2010; Manzo, 2006). While it cannot be claimed as a panacea, a participatory approach to public policy and planning may provide an effective way to address various issues in a contested space like the rural space close to expanding urban centres. On the one hand, the urban dwellers view the space as an area to accommodate the natural expansion for the city. Conversely, the rural dwellers view it as an area for continuing their livelihood activities in farming, forestry, or any other rural activity. Planners are faced with the dilemma of meeting the needs of stakeholders’ groups while also achieving the goals of set strategies which respond to the interaction between evolving landscapes and evolving institutions (Brunckhorst, 2010). Hence, a participatory approach to planning and policy-making presents one part of a larger solution; this entails the creation of evaluation criteria which foster the participatory decision-making processes. A recent study from Australia develops a sustainable

land use scenario framework that adopts a participatory approach prompting the stakeholders to join in a discussion of possible future triggers of change leading to the developing of possible scenarios. Pearson et al. (2010, p. 88) explain,

“[P]olicy makers have typically used *scenarios and futures* to inform planning policy due to their ability to incorporate uncertainty and community values...In undertaking a scenario approach it is argued that the interests and needs of different landscape users and managers must be accounted for in the process”

The above quote verifies the need for reconciling stakeholders’ perspectives, particularly in developing appropriate collective objectives for a sustainable and resilient future

The Australian study above looked at an evaluation of four possible scenarios for agricultural production in Rocky Point of South East Queensland, Australia. The researchers concluded that stakeholder perceptions of future possible scenarios are crucial in guiding policy decisions. The study recognized a divide between, on the one hand, the local and regional planning authorities who viewed the area as an inter-urban break between two cities, and, on the other hand, the local stakeholders’ expectations of developing the land to its highest conventional economic value as residential canal estates. This Australian study approach was to develop an iterative process of defining evaluation criteria, generating scenarios, and identifying triggers for change. The third task, identifying triggers of change, “was highlighted by all stakeholders as crucial to establishing credible, reliable and plausible scenarios ... and is in line with adopting a complex systems approach which requires non-linearities or thresholds to be taken into account in scenario designs” (Pearson et. al, 2010, p.90). Resulting from the use of “Focus Group” research techniques, the writers recognized that the events likely to trigger change were perceived differently by different players. In a cane growing area, the triggers for change were presented as parts of the four scenarios. The triggers for change were identified as: land

fragmentation resulting in the lack of viable produce, the main sugar mill closing down, sale of lands with the protection of ecosystem provision, and sale of lands without provisions to protect the ecosystem. Another study that looked at conflicting interests was conducted in the U.S. Corn Belt which is witnessing an emerging interest in corn-based ethanol. The study looked at the residents' concerns about the impact on the environment (Atwell, Schulte, & Westphal, 2010). One of the solutions suggested, was to create perennial vegetation (pasture, riparian buffers or restored wetlands) which is accepted by rural stakeholders in the local areas though not supported by the regional policies. This invokes the need for devolution of responsibility down to the local areas as a response to the catering for locality and to be inclusive of all community groups. Plans are also to accommodate long-term visions based on local grassroots knowledge (Atwell et al., 2010). Hence, there is a need for evaluation criteria based on the use of local knowledge and devolution of power and decision-making to the local level. This implies the process of governance shifting from a top down process to a bottom up one. In the following paragraph the sustainability and resilience imperatives implicated, lead to the identification of a major category or area of consideration.

Democratic governance (S6 in appendix C) and overlap in governance (R8 in appendix D) are sustainability and resilience imperatives of paramount importance. **The category of consideration identified here is: Democratic governance that is participatory, inclusive, and reconciling different perceptions adopting overlap in governance through devolution of responsibility.**

The above criterion addresses several sustainability imperatives especially to address the basic needs of the local inhabitants, intragenerational equity (S3 in appendix C) through recognition of inclusion, and socio-ecological civility & democratic governance (S6 in appendix

C). They also address at least some aspects of several resilience imperatives including, especially, acknowledging slow variables (R4 in appendix D) such as consequences of the fragmentation of agricultural lands, tight feedbacks (R5 in appendix D) through engagement of multiple stakeholders, social capital (R6 in appendix D) exemplified in the capacity of the stakeholders to respond together, and overlap in governance (R8 in appendix D) exemplified in empowering local stakeholders to guide policies.

On the same theme of participation and the role of official plans in promoting sustainable rural communities, Mark Shucksmith (2009) points to what he calls a re-theorisation of concepts of spatial planning in rural areas to address needs for capacity building and neo-endogenous development. While the old concept of integrated rural development relied upon top-down government-sponsored programs pooling different sectors' resources at the municipal level, the new concept, as suggested by the study, is that of broad governance where the state acts as, "co-coordinator, manager or enabler rather than as provider and director". (Shucksmith, 2009, p.4). In such scenarios, governance implies a partnership between governmental and non-governmental (private sector, volunteers, NGOs, among others) parties.

One of the key challenges for collaborative governance is that current rural culture at the rural-urban fringe involves some tension between the livelihood perspectives of long term rural residents and the aesthetic values and perspectives of more recent urban-based residents (Layard, 1994; Summer, 2005; He, Lewis, Baer, & Nigh, 2010; Cadieux, 2008). The socio-ecological systems, besides aesthetic and stewardship drivers, include economic drivers and activities, together with biophysical relations as exemplified in the relations between agricultural inputs and the surrounding natural setting. The practical values lie in the exploitation of natural resources in a rural setting; one such resource is land and its use in various facets including agricultural

activities. This makes the rural setting a place of work and earning a living. Urbanites moving to live in the surrounding rural areas, while maintaining links with the urban centre, ascribe a new role to the rural system, the aesthetic role (Cadieux, 2008; Richmond, Filson, Paine, Pfeiffer & Taylor, 2000; Kopits, McConnell, & Walls, 2007; Zasada, 2011); the different value systems underlie the conflict. With the ease of commuting, more and more urbanites seek to live in the tranquility of a rural setting which is not very far from the convenience of an urban centre (Richmond et al., 2000; Cadieux, 2008). Although newcomers impose relatively less pressure than the sprawl of whole suburban areas onto rural settings, yet the newcomers bring problems of a social nature. Lying at the heart of the cultural conflict between the rural inhabitants and the urban newcomers is the question of place attachment (Brunckhorst, 2010; Pearson et al., 2010; Menzo & Perkins, 2006). For a thriving rural milieu, positive relations are needed between newcomers to the rural setting and those who made a living in the rural setting for decades and centuries. Conflict starts between the newcomers' perspective of the countryside as romanticised tranquility thus objecting to odours, noise of tractors, etc. and the rural residents' perspective of the countryside as a place of work (Masuda and Garvin, 2008; Maruani & Amit-Cohen, 2010).

Both the newcomers and original inhabitants' perceptions of rurality can be understood through theories on "place attachment". Lynn Manzo explains, "Theory on place attachments and meaning, explored largely in environmental and community psychology, can help us to understand how particular preferences, perceptions, and emotional connections to place, relate to community social cohesion" (Manzo, 2006, p. 336). Lynne Manzo describes how people's relationship to "place" affects their involvement in their communities. Manzo (2006) points to studies linking "place attachment" to length of residence. This dimension of the length of residence marks a divide between newcomers and original inhabitants. Such divide can be

bridged by the newcomers getting involved in community activities including community planning, community-based resource management, and volunteering in stewardship efforts (Hajkovicz & Colline, 2009; Brunckhorst, 2010). The lack of such participation can hinder public commitment to plans (Manzo, 2006; Masuda & Garvin, 2007). Collective endeavour by the community members builds social capital and paves the way for official plans and policies to devise mechanisms of ensuring the protection of diverse interests, thus working towards intragenerational equity (Graymore, Sipe, & Rickson, 2010; Klug & Jenewein, 2010)

The salient point identified from the above review is the need to build positive social relations in the rural milieu. It is, therefore, deduced that **the category of consideration emerging here is: Building positive social relations inside the rural milieu.**

This addresses the sustainability imperatives of intragenerational equity (S3 in appendix C), socio-ecological civility and democratic governance (S6 in appendix C), and the resilience imperatives of diversity (R1 in appendix D), as the interaction between the rural dwellers and newcomers, modularity in a region (R3 in appendix D), as all community members endeavour to adopt a unified character of their locality, and social capital (R6 in appendix D), as trust and social networks get strengthened.

In places where farming is a major rural activity, the producer-consumer relationships assume an important dimension of building social capital described by Manzo as, “[It] refers to the extent and effectiveness of formal and informal human networks, as well as the impact of social ties on opportunities” (Manzo, 2006, p. 341). One phenomenon that influences positive producer-consumer relationships, and hence, social capital, is Community Supported Agriculture (CSA) whereby consumers seek membership arrangements with small farmers to supply them

with fresh produce. This is part of encouraging Small Farm Movement across Europe and North America (Ontario Ministry of Agriculture, Food, and Rural Affairs, 2008; Shucksmith, 2009; Masuda, 2008; Juska, 2010). Small scale commercial agriculture is looked upon as a response to a “resurgence of consumer and institutional interest in locally-produced foods.” (Tufts University, 2011). The Tufts University in Boston, MA initiated a program to support new farmers in collaboration with the federal and state government agencies; this is similar to the “Farm Start” initiative of Guelph, Canada. In the U.S. local food consumption is linked to health and welfare programs; an example is the Farmers Market Nutrition Program (FMNP). FMNP is a federal-state partnership that provides fresh produce to low income participants (Dollahite, Nelson, Frongillo, & Griffin, 2005). This initiative serves the purpose of efficient use of resources by cutting down the cost of transporting the products over long distances, besides the preservation of food lands. Moreover, the initiative was linked to the promotion of healthy habits and was extended to a health education effort; this makes it more attractive to consumers. The above initiatives illustrate the effectiveness of citizens’ efforts to sustain the local agricultural industry which, on its part, enhances the viability of farming. A viable farming community is the cornerstone of protecting food lands from land abandonment (Paniagua, 2008). Moreover, stronger rural-urban links manifested by a growing Local Food Movement enhance initiatives for building social capital. While farmers markets are considered a step towards fostering local produce, CSA takes it a step farther in building social capital through sharing risks of farming. Social capital anchored in a strong Local Food Movement depends on local food and associated farming capacities, thus indirectly links to the preservation of foodlands. Local food systems are linked to sustainable agriculture, partly through lowering costs of transport and packaging associated with agri-business consumption patterns (Hinrichs, 2000; Guzy, Smith, Bolte, Hulse &

Gregory, 2008). The community supported agriculture (CSA), as part of the local food system, builds community solidarity “around the interwoven issues of food, land and nature” (Hinrichs, 2000, p. 299). CSA provides an incentive for farming; this can preserve both the agricultural system and the natural heritage system. As put by Guzy et al. (2008, p. 1), “policies that constrain urban growth and create incentives for farming and forest enterprises to preserve and enhance habitat can protect ecosystem resilience and services.”

In pursuit of natural amenities, urbanites are enticed to relocate to rural areas developing what could otherwise be farming lands. Urban sprawl hinders farming viability and sustainability by creating a fragmented pattern of land usage (Wu, 2006). Plans are pivotal in directing urban and non-urban uses, and one way to curb urban sprawl is to foster farming viability. Beyond farming viability, land use patterns can affect social values and the very fabric that sustains communities. A study on Tel Aviv Metropolitan Region (Maruani & Amit-Cohen, 2010) indicates how shifts in the planning regime effectively compromising agricultural lands, resulted in shaking the Zionist ideology prioritizing farming activities and the unique experience of *kibbutz* communities. “Shifts in institutional and land policy in Israel in the 1990s had far-reaching long-range effects not only on spatial planning, land management and development, but also on social processes, values, and ideological norms of Israeli society at large” (Maruani & Amit-Cohen, 2010, p. 678). Furthermore, the effects of policies that encourage initiatives to support local farms can go beyond preserving farmlands and social values to include boosting the local economy by shielding it from the market forces (Midmore & Whittaker, 2000). Reflecting the British experience, Peter Midmore & Julie Whittaker (2000, p. 175) argue that “rural development policies based on exposure to more vigorously competitive market conditions are likely to result in an unsustainable use of rural resources”. Thus, rural economies need to be

protected against the market forces through the adoption of local initiatives to support farming and through value shifts from money values to life values (Summer, 2005). Money values look upon natural capital as a productive asset and as a substitute to human-made capital (Midmore & Whittaker, 2000). On the other hand, sustainable rural economies thrive on the support of life values (Summer, 2005, Midmore & Whittaker, 2000; Guzy et al., 2008; Maruani & Cohen, 2010).

From the above arguments, it is deduced that **the category for consideration is: Initiatives to support viable farming and its links to the preservation of food lands and social values, while invigorating local economies.**

The above category addresses the sustainability imperative of socio-ecological integrity (S1 in appendix C) while protecting livelihood sufficiency and opportunity for rural inhabitants (S2 in appendix C). By catering for resource maintenance & efficiency (S5 in appendix C), contributions to intragenerational and intergenerational equity areas are facilitated (S3 & S4 in appendix C). By applying all or most of the sustainability imperatives, long-term integration (S8 in appendix C) is covered. The resilience imperatives addressed are those of modularity (R3 in appendix D) through regional coordinated actions, and social capital (R6 in appendix D). The above area of consideration covers the acknowledgement of slow variables and the thresholds that can tip the system over to an undesirable state (R4 in appendix D), while the recognition of interdependencies of economic, social and ecological pillars encourages awareness of tight feedbacks, which are otherwise blurred by globalization and market forces (R5 in appendix D).

The role of official plans and policies outlined in section 1.4 above, is to direct land use decision-making towards sustainable practices. This dictates the shaping of criteria for evaluating

plans; here, one has to reflect on the scale or government level at which the criteria need to be applied. Multi scalar influences are important as the local level gets influenced by the national and global levels, but policies directed at the regional level are considered by Gaymore et al. (2010) as most efficient because “regions are small enough that sustained and reflexive face-to-face relations and communications among strategic actors are possible” (Graymore, Sipe,& Rickson, 2010, p. 459). This research adopts the application of plans’ evaluation criteria at the regional level. The regional scale occupies the middle ground between the diverse national scale and the homogeneous municipal scale. Regions can constitute units identifiable as modules within the national socio-ecological scale.

The European Union Common Agricultural Policy (CAP) and Rural Development Programs are examples of government’s intervention to support farmers and farming viability through the recognition of agricultural multifunctionality on regional scales (Klug & Jenewein, 2010; Shucksmith, 2009). Agriculture is now viewed not only as a provider of food and fibre but also as a venue for stewardship of nature’s goods and services; this additional role justifies the financial support for agriculture in developed countries (Shucksmith, 2010; Hajkowicz & Collins, 2009; Klug & Jenewein, 2010). National food security is invoked when defending financial subsidies to farmers. Subsidizing the farmers and/or paying them for maintaining ecological services for the broader public interest, represent a valuation of the role of providing local food and protecting nature’s goods and services (Klug & Jenewein, 2010; Phillipson et al., 2004)

At present, the EU has a plan for the period 2007- 2013 (European Commission, 2010a), but it also produced a blueprint for renewal of the Common Agricultural Policy (CAP) after 2013 setting assistance payments to farmers based on what is described as, “basic cross-compliance

rules”. These rules, which concern green cover, crop rotation, permanent pasture or ecological set-asides, (European Commission, 2010b), indicate how subsidies are linked to sustainability practices. Public benefits are provided when farmers are motivated to put environmental considerations ahead of economic considerations (European Commission, 2010b; Brunckhorst, 2010). However, environmental stewardship is hard to quantify or put a monetary value against. A study conducted in Tasmania, Australia starts with the premise that, “valuation metrics, which quantify the environmental benefits of services supplied by farmers, are essential for the effective operation of stewardship programs” (Hajkowicz & Collins, 2009, p.93). The study uses statistical techniques to evaluate community preferences using field investigations on several stewardship sites divided into seven themes: “remnant bush, riparian reserves, active revegetation, soil conservation, cultural heritage reserves, weed and/ or pest removal, and community sports reserves” (Hajkowicz & Collins, 2009, p. 98). Placing a value on stewardship roles helps investment decisions and subsidy decisions. The study authors point to the monetary support extended by the European Union to farmers under the rubric of “preservation and management of natural resources” (Hajkowicz & Collins, 2009, p. 94). However, the study findings do not point to the effects of putting a market value to such crucial services as nature’s goods and services. An alternative approach for conservation of natural resources is the Community-Based Natural Resource Management (CBNRM) whereby social and ecological systems entwine to achieve long-term social and ecological sustainability across different scales (Brunckhorst, 2010; Graymore, Sipe & Rickson, 2010). CBNRM is a collective effort towards sustainable conservation. It is, “a focus on the repair and future nurture of ecosystems and natural resources” (Brunckhorst, 2010, p. 17). The CBNRM is basically a voluntary initiative by local groups, including farmers. However, farmers’ values and environmental attitudes are found

to be weakly linked to behaviour (Holmes, Bradshaw, Yang & Smithers, 2011). This is a result of not considering the complexities related to interplay between agency and structure, according to Holmes et al. (2011). In Canada, a survey of 1,794 rural landowners in 2006 revealed that declining economies is the overriding concern of farmers of whom less than half are aware of the term “ecological goods and services” (Environics Research Group, 2006).

A common factor in various studies (Brotherton, 1989; Canadian Institute for Environmental Law and Policy, 2010; Cary & Wilkinson, 1997; Centre for Environmental Stewardship and Conservation, 2009; Corbera, Gonzalez, & Brown, 2009) is the recognition that stewardship efforts by communities or individual farmers need to be rewarded in order to ensure continuity. Holmes et al. (2011, p. 7) explain, “Programs for remunerating landowners for the provision of ecological goods and services are proliferating the world over ... In Australia, ‘conservation tenders’ are used to encourage and reward the provision of EG&S [Environmental Goods and Services]”. If stewardship is viewed through the free market rationale, then it is a service where the sellers are farmers and the buyer may be a government agency; this service needs a pricing signal in order to ensure its supply (Hajkowicz & Collins, 2009; Ruto & Garrod, 2009). An obstacle to the trade may be the lack of valuation metrics. The authors of an Australian study explain, “Both buyers and sellers lack a consistent means of quantifying the value of a complex bundle of non-market goods. The matter is further complicated because the buyer is usually a government agency attempting to represent the preferences of a diverse community” (Hajkowicz & Collins, 2009, p. 93). Farmers can play the role of stewards of nature, but they cannot fulfill their duty of providing a valuable service for the public good if they are struggling financially. Hence, the support of farmers is a payment for achieving a “public good”.

To better understand rural areas close to urban centres, a look at how perspectives on rural spaces have evolved in recent times is needed. Michael Woods refers to Cloke's *Handbook on Rural Studies* of 2006 describing three theoretical framings as evolving from functional perspectives in the 1970s, to political-economic perspective in the 1980s, and to rural space as a social construct of a romanticised world of cultural and moral values in the 1990s (Woods, 2009). The last perspective seems to persist at present; this may support the revival of non-economic ethics against the efficient market rationale (Guzy et al., 2008). However, Woods (2009) calls for understanding the rural at a level where "imaginative, material, and practised realities are intrinsically and dynamically entwined" (Woods, 2009, p. 852). The fact that urban fringe areas flourish at commuting distance from urban centres, indicates the tendency for continued use of urban services while enjoying rurality. Smart growth planners seek to delineate hard boundaries between urban and rural areas in order to stop sprawl and to protect rurality, but the hard boundaries are barriers to suburban residential subdivisions, not to urbanites purchasing rural estate residences. Two decades ago, a study of a site in Glasgow's greenbelt (Pacione, 1990) drew attention to the transfer of land use from rural to urban purposes driven by capital accumulation as resulting in adverse social and economic effects. In 1989 Christopher Bryant of the Department of Geography in the University of Waterloo drew a bleak picture of farming and rural reaction to what he called "parameters exogenous to rural areas" highlighting the vulnerability of rural economies when left unprotected (Bryant, 1989). For Bryant, the solution lay in entrepreneurship defined within innovative thinking. Over the last few decades, populations in rural areas in advanced countries, generally, declined. However, recent years witnessed growth in population and business in rural and small town areas in the rural-urban fringe within 120 km. of metropolitan centres (Dahms, 1995; Kalantaridis, 2010; Cadieux,

2008). Some see this as a welcome counter-urbanisation and rural renaissance (Dahms, 1995; Cadieux, 2008). Such trends can contribute to the revitalisation of rural areas. It is noted that most of the newcomers are relatively urban affluent people with wider networks of connections seeking tranquility in countryside living while maintaining links with urban centres (Masuda and Garvin, 2008; Dahms, 1995; Kalantaridis, 2010). Creative interaction between the newcomers and their new rural milieu introduces positive diversity. Diversity is one of the cornerstones of building resilience (Walker & Salt, 2006). Moreover, the rural-urban fringe enjoys rural proximity to the diversified services in urban centres. Urban centres are hubs for innovation, academic research, and entrepreneurship; this can help the rural milieu to adapt to changes. Adaptability is another cornerstone to resilience. According to Christos Kalantaridis (2010, p. 418), “New arrivals are often viewed in the literature as contributors in new venture creation, as well as catalysts in enhancing rural-urban interdependencies in the countryside”. Kalantaridis study of the case of East Cleveland, a rural locality in North East England, revealed that the in-migrants for this particular location, had a modest effect. However, in comparing East Cleveland with Cumbria, described as a more attractive destination, the author illustrates the importance of three factors: the number of migrants (higher in Cumbria than in East Cleveland), the human capital endowments of the arrivals, and the vicinity to metropolitan centres. According to the study findings, the first two factors positively contribute to the impact on entrepreneurship and rural-urban interdependencies. For the third factor, little evidence supported the thesis that closer proximity to the urban core increases entrepreneurship and rural-urban interdependencies. Accessibility and favourable local opportunity structures, as opposed to proximity, make a positive contribution to rural-urban interdependencies. In favourable rural areas, in-migrants bring with them extensive national and international networks (Kalantaridis, 2010). The

opportunity created by the in-migration of urbanites with their wider networks to the rural milieu, can enhance entrepreneurship to the betterment of livelihoods and stewardship.

From the above arguments, it is deduced that **the category of consideration here is the need to build a stronger economic base for rural areas benefiting from urban in-migrants while also rehabilitating/ maintaining the ecological base.**

The above category incorporates attention to the sustainability imperatives of socio-ecological system integrity (S1 in appendix C), livelihood sufficiency and opportunity (S2 in appendix C), intragenerational equity (S3 in appendix C), and resource maintenance and efficiency (S5 in appendix C). It also provides an opening for considering the resilience imperatives of diversity (R1 in appendix D), acknowledging slow variables (R4 in appendix D), and innovation (R7 in appendix D).

Urban in-migration to rural areas is analysed by several studies. Encroachment onto agricultural and forest lands results in processes that interact to yield complex disturbances and unanticipated negative events (Guzy et al., 2008; Bennett & McGinnis, 2008; Moreno-Mateos, 2010; Graymore, Sipe & Rickson, 2010). For example, in the realm of biodiversity conservation, Nina-Marie Lister (2008) portrays complexity as, “A complex systems-based perspective of science accepts uncertainty, complexity, and diversity as natural phenomena ... scientific inquiry must confine itself to illuminating choices and trade-offs” (Lister, 2008, p. 97). Socio-ecological systems can be understood through recognition of the interactions among its components and the trade-offs that result from making choices requiring some sacrifice. For example, urban encroachment upon fertile agricultural land or a pristine forest has repercussions on biodiversity, the food chain, foregone farming or forestry opportunity, and other system components while

introducing some benefits as described in the previous paragraphs. Hence, an assessment of long-term ecological and economic impacts should guide criteria-framing for policy makers on land use policies and the planner's role becomes one of sharing information about options and trade-offs and learning (Kay, 2008c). Urbanite newcomers to rural areas close to urban centres look for large plots as well as open space surroundings. A study by Kopits, McConnell, and Walls (2007) illustrates that urbanites prefer both amenities, but they would not trade off the large plot for open space. The study was carried out in the USA in Calvert County in southern Maryland. In order to mitigate the negative impact of low density residential areas, clustering or the arrangement of reducing the distances separating houses is used by regulatory bodies as a way of reducing the costs of services, but some communities make it mandatory while others only recommend it (Kopits et al., 2007). Local municipalities acting as hosts to urban migrants face a mix of benefits and drawbacks. On the one hand, the tax base is improved by large estate properties. On the other hand, the provision of services to low density residences is costly. As a result, services in rural areas are of a lower quality than in urban densely populated areas whether in health services (Coburn, 2001; McCulloch & Lynch, 1993), access to the internet (Grimes, 2003), or infrastructure and social services (Fox & Porca, 2001; Summer, 2005).

Rural areas hosting urban newcomers can benefit from innovative governance initiatives such as power devolution to local communities through Community-Based Resource Management (CBRM) which encourages desirable participatory planning. However, without capacity-building and empowerment of marginalized and less privileged groups, equity will emerge as an issue in the rural space shared by original inhabitants and more privileged newcomers. Such marginalization, besides other social factors, results in out-migration of the rural youth (Stockdale, 2004; Shucksmith, 2004). The rural youth are considered a marginalized

group in a milieu of adults of affluent incomers and retirees. The rural youth form an alienated group lacking social space (Shucksmith, 2004). Their marginalization is manifested in studies that focus on rural groups excluding the rural youth or simply focusing on in-migration to rural areas and ignoring out-migration (Seroka, 1989; Stockdale, 2004). Whereas in-migration is accompanied by a mixed effect of advantages and pitfalls, out-migration's effects negatively impact the progress prospects in rural areas through a loss of human capital (Stockdale, 2004; Shucksmith, 2004; Manzo, 2006). Rural areas need the renewal of population from within, with young blood attached to the place in order to prosper. Moreover, besides depletion of the human capital in rural areas, out-migration may result in difficulties for the individuals migrating to urban centres. Stockdale (2004) refers to a study conducted by Phillips and Skinner in 1994 concluding that, "an increasing number of homeless youths in London originate from rural areas (Stockdale, 2004, p. 171). This indicates that out-migration by the rural youth results in an overall negative effect on the national level. Alienation of youth in rural areas is further exacerbated by issues of gender, race and class where a poor woman of an ethnic minority may face multi-layered effects of alienation (Shucksmith, 2004; Shucksmith, 2009; Cunningham et al., 2007). Exclusion of some groups in rural areas is an issue, but an overarching issue is the status of privilege enjoyed by the urban newcomers being of higher social class and naturally seeking social dominance in local governance, in school boards, and participatory planning (Kalantaridis, 2010; Wu, 2006; He et al., 2010). The meaning of place varies over time (Masuda & Garvin, 2008). With the recent in-migration, rural places are undergoing identity changes dictated by new power relations. The least privileged groups then suffer alienation. Shucksmith (2009, p. 209) argues, "attempts to address inequality and social exclusion must seek both to

alter the structures which constrain individuals' actions and also to build the capacity to act of those actors with the least power and opportunities".

Public policy and planning strategies are seen by some writers (McCulloch & Lynch, 1993; Seroka, 1989; Pugh, 2007) as the starting point to alleviate some of the equity issues in the rural milieu. The underlying issue is rural inequities. From the above arguments, it is deduced that **the category of consideration here is: Equity.**

This category is centred on intragenerational equity (S3 in appendix C) and intergenerational equity (S4 in appendix C), but also encourages attention to the sustainability imperatives of livelihood sufficiency and opportunity (S2 in appendix C) and socio-ecological civility and democratic governance (S6 in appendix C). The resilience imperative addressed maintenance or expansion of social capital (R6 in appendix D).

Moving away from economic and social dimensions, a major role played by rural areas is enhancing links with nature. The land resource base is an important asset that needs to be protected against deterioration. Cutting down parts of the forest for building towns and for farming created islands of woodlots separated from each other; such separation results in isolation from potential seed sources (Moss & Davis, 1989). Recognising the threats of nature's degradation is a crucial first step toward effective stewardship and sustainable socio-ecological systems. Wooded areas, wetlands, and other non commercial biotic resources perform vital roles in ecosystem integrity such as species replacement, system adaptation, nutrient cycling and biophysical processes affecting soil and water conservation and other ecological goods and services for humans (Costanza et al., 1997). Such processes are vital for the continuity of the human habitat. In rural areas where agriculture is a major activity, agricultural land drainage

results in the loss of wetlands which provide invaluable services such as flood protection, soil erosion control, wildlife habitat, water quality and groundwater levels (Walters & Shrubsole, 2003). Thus, agricultural practices need to be kept in harmony with ecosystem's protection.

Farmers and rural inhabitants in general, can play the role of stewards to nature's services to maintain sustainability in its three sides of ecology, economy, and equity. On a collaborative federal and provincial level in Canada, the program of the Environmental Farm Plan aims at enhancing the role of farmers as stewards. The Canada-Ontario Farm Stewardship Program (COFSP) involves cost share funding of sound environmental practices in farms; the program is managed by the Ontario Soil and Crop Improvement Association (OSCIA). Eligible farmers voluntarily apply to participate (Ontario Ministry of Agriculture, Food and Rural Affairs, 2012). Voluntary participation in programs like the Environmental Farm Plan (EFP) program represents part of the stewardship role. However, stewardship as a public good needs to be rewarded in order to entice rural stewards to continue their role (Hajkowicz & Collins, 2009). A valuation of stewardship roles linked to sustainability practices can justify payments for goods and services. Jennifer Summer (2005a) proposes what she calls a new vision of sustainability in which the theoretical underpinnings are: counter-hegemony, dialogue, and life values linking it to the concept of the civil commons. Summer quotes John McMurtry in defining the civil commons as, "any co-operative human construct that enables the access of all members of a community to life goods" (Summer, 2005a, p. 12). This definition emphasises co-operative modes over competitive ones. It also emphasises inclusion over benefiting the few elites. Examples of civil commons are: public education, universal health care, parks, and safety and environmental regulations (Summer, 2005a). Moreover, natural capital is not just a productive asset rendered as substitutable with human-made capital (Midmore & Whittaker, 2000). Present day domination of

the market values, the neoliberal ideologies, and the denial of social and ecological threats resulting from such trends, are signs of cultural degradation leading to other forms of degradation (Summer, 2005a; Maruani & Amit-Cohen, 2010).

Just as the preservation of nature's goods and services is considered a public good role of farming and rural societies, so is the preservation of cultural heritage in rural areas. Stewardship can be extended to include the upkeep of cultural sites and cultural practices in the rural milieu. Such cultural sites can also play an important role in the diversification of rural economies through green and rural tourism; this is resilience-building beyond the ecological arena to cover the economic and social arenas. The Norwegian experience integrates cultural heritage with experience-based knowledge of resource utilization accumulated by the farming and rural communities as manifestation of the rural and farming communities' multi-functional role (Daugstad et al., 2006; Zasada, 2011). Stewardship for natural heritage is already well accepted and promoted, but the cultural heritage is still overshadowed by the focus on natural heritage (Natural Heritage Parks Canada, 2009; The Land Conservancy in British Columbia, 2009; Stewardship and Conservation in Canada, 2009) or encouraged but isolated from natural heritage conservation (Burnett Thorn Cultural Tourism, 2009). Karoline Daugstad (2006) describes the connection between cultural heritage, as a collective good, and agriculture as stemming from the multi-functionality debate on agriculture and its role in land stewardship.

The Environmental Farm Plan and the inclusion of cultural heritage with natural heritage are signs of multifaceted environmental and land stewardship. An aspect of unsustainable practices recognized by the literature is the intensification of agriculture resulting in the loss of farmland biodiversity, the unbroken monotony of landscape reducing its amenity value, and degradation of the soil, among other undesirable effects (Moreno-Mateos & Comin, 2010).

Another aspect of unsustainable practices is the destruction and loss of wetlands; this is offset by recent years' appreciation of wetlands importance resulting in the restoration of, and creation of, new wetlands (Costanza et al., 1997; Moreno-Mateos & Comin, 2010). In the greenbelt of Glasgow, Scotland, a case study (Pacione, 1990) uncovered the relations between various actors such as speculators, rural producers, governments, pressure groups, and builders-developers in the arena of nature protection and land stewardship. The study critiques the lack of coordination between different rural authorities and the formative approach to planning by the central authorities and concludes by linking new development with revitalizing local economies; a project of dispute between the actors was a greenfield development called the Tower Farm. The study also points to the tradeoffs resulting from the economically desired development and manifested in the loss of agricultural lands and the associated amenity. Pacione (1990, p. 115) ends the case study by articulating the role of government as, "The task of government is to adjudicate these divergent interests and at the same time resolve its contradictory goals of maintaining capital accumulation and promoting social legitimation".

Guzy et al. (2008, p. 37) explain, "Policies that constrain urban growth and create incentives for farming and forest enterprises to preserve and enhance habitat can protect ecosystem resilience and services". The relevant policies here are those that establish and influence multifaceted land management.

From the above arguments, it is deduced that **the category for consideration here is: Stewardship in the rural system: the reinforcing of the stewardship role of rural inhabitants while adopting non-material values besides market values. Stewardship in rural areas can also cover cultural heritage stewardship.** This category addresses the sustainability imperatives of socio-ecological system integrity (S1 in appendix C) by recognizing

the interaction between system components, resource maintenance and efficiency (S5 in appendix C) by reducing waste as part of stewardship practices, precaution and adaptation (S7 in appendix C) by catering for uncertainty, and the immediate and long-term integration (S8 in appendix C) by promoting interdependencies between system components. It also recognizes the resilience imperative of diversity (R1 in appendix D) by encouraging tourism through cultural heritage stewardship, ecological variability (R2 in appendix D) by preservation practices, acknowledging slow variables (R4 in appendix D) by combating the cumulative effects of degradation, tight feedbacks (R5 in appendix D) by establishing relationships between different facets of degradation, and ecosystems services (R9 in appendix D) by conservation practices associated with stewardship.

Future directions for rural areas are perceived to witness less centralization of decision making and more devolution of responsibility to lower levels of government (Dwyer, 2011; Shucksmith, 2009). There is also a tendency toward more public-private partnerships and stakeholder involvement aiming to shield rural economies from the vagaries of free markets (Dwyer, 2011; Midmore & Whittaker, 2000; Summer, 2005b). In rural areas close to urban centres, the continuation of farming practices faces numerous pressures as indicated above. One way to support a struggling agricultural industry in advanced countries, pioneered by Europeans, is to recognize and reward the multiple functions performed by the small farm (Barbieri, 2010; Bruntstad, 2005).

Acknowledging the multi-functional character of agriculture entails the recognition of moving beyond the production of food and fibre. Agriculture now is viewed within multiple roles including nature's stewardship (Hajkowicz & Collins, 2009; Graymre, Sipe & Rickson, 2010; Moreno-Mareos & Comin, 2010), producer of biofuels (Atwell, Schulte, & Westphal,

2010), and direct marketing and recreation farming (Zasada, 2011). Adopting a multifunctional role is seen by some researchers as one way of regaining farming viability (Zasada, 2011; Atwell, Schulte, & Westphal, 2010; Hajkowicz & Collins, 2009) and a way for the future (Dwyer, 2011; Zasada, 2011). In the rural areas close to urban centres, multi-functionality is dictated by the special local character of such areas. Zasada (2011) quotes G. Wilson depicting multi-functionality as characterized by, “local embeddedness, short supply chains, low farming intensity, a high degree of diversification, and open-minded societies (Zasada, 2011, p. 641). Such characteristics qualify multi-functionality as a response to challenges including the assertion that rural areas are getting more unsustainable demographically and economically (Midmore & Whittaker, 2000; Atwell, Schulte, & Westphal, 2010; Summer, 2005a).

In land use planning, the UK land use future is described by Janet Dwyer as,

“Policy has moved away from a ‘top-down’ process designed in Whitehall towards a multi-layered structure within which international agreements and negotiations must be reconciled with regional and local, partnership-based approaches to planning and management via national frameworks and a complex mix of regulatory and market-based instruments” (Dwyer, 2011, p. 674).

The planning process is witnessing devolution of responsibility, recognition of the importance of involving multiple players, and a tendency to flexibility (Dwyer, 2011; Shucksmith, 2009). Agricultural multi-functionality fits well with the new tendencies in planning as it emphasizes local conditions and characteristics. Multi-functionality is believed to show elements of post-productivism characterized by less intensification of farming associated with reduced external inputs together with diversification in farms’ activities (Wilson & Rigg, 2003). Post-productivism is an evolutionary development reacting to the environmental degradation associated with productivism. The concepts of post-productivism and multi-functionality partly explain the changing face of agriculture and rurality. Geoff A. Wilson (2008) places multi-

functionality on a continuum from weak to strong multi-functionality whereby strong multifunctional farms embark on diversification and are weakly integrated in the global productivist networks. Productivist philosophy and actions, aim at maximizing production even at the cost of soil health and the environment (Wilson, 2008; Barbieri, 2010). On the other hand, multi-functionality is associated with post-productivist philosophy and actions giving priority to sustainable practices, enhanced food quality and local/ regional embeddedness (Barbieri, 2010).

Multi-functionality includes new forms of marketing such as short-chain, farm gate, and ‘you pick’ forms, for example, thus contributing to change which, in turn, impacts the environment. The environment has become a focal point for contestations in rural areas as expressed by John Smithers and Randall Wilson (2005, p. 375),

“These include critical attention to the evolving nature of agriculture, the broadening public interest in the amenity value of rural land, the (re)regulation of rural land use and the desire (and increasing necessity) to engage in, and demonstrate, environmental compliance to others”.

By demonstrating environmental compliance to the consumer, multi-functional post-productive farms will be strengthening social capital and effecting change of societal perceptions of farming; these are two factors that are seen as key components of multi-functionality (Wilson, 2008). Furthermore, local/ regional embeddedness fostering short food chains, specialty crops and farm tourism, is another character of multi-functionality aiming to project the local character and a local brand. One aspect of agricultural activities that lends itself to multi-functionality is agroforestry where trees are incorporated in the agricultural landscape with the biophysical interaction optimizing the ecological, economic and social benefits derived from the farm (Barbieri, 2010).

From the above arguments, **the category for consideration here is: Multi-functionality in agriculture is the path towards better socio-ecological system integrity, more regional modularity and effective environmental protection**

The sustainability imperatives involved here are: socio-ecological system integrity (S1 in appendix C), livelihood sufficiency and opportunity (S2 in appendix C) by offering more options to seek improvement in livelihoods, resource maintenance and efficiency (S5 in appendix C) by reducing threats to long-term integrity, precaution and adaptation (S7 in appendix C) by a precaution against the risks of a single path, and immediate and long-term integration (S8 in appendix C) by seeking mutual supportive benefits between various system components. The resilience imperatives covered are: Diversity (R1 in appendix D) by adopting new roles, modularity (R3 in appendix D) by projecting a local brand, acknowledging slow variables that can tip the system to an undesirable state (R4 in appendix D), tight feedbacks (R5 in appendix D) by ensuring the interaction between the social and ecological components of the system, and including the unpriced ecosystem services in development proposals (R9 in appendix D).

Multi-functionality in agriculture is one way to reinforce the agricultural system's resilience with diversity, modularity, and tight feedbacks. However, agriculture is only one aspect of rural life. An integrated overall approach to keeping rural prosperity and its contribution to national prosperity is needed to face complexity and uncertainty in the future. Mark Shucksmith (2004) articulates the contemporary risk society as, "Our ability to survive and prosper in this world will be more precarious because of the pace of change". The literature identifies globalization as one of the facets of change whereby shocks in far corners of the world are felt in every locality demanding continuous restructuring to respond to continuously changing conditions (Summer, 2005a; Lange, Sala, Vighi & Faber, 2010). To face the negative

effects of globalization on rural communities, resilience building is discussed in the literature embracing all three pillars of sustainability: ecological, social, and economic. It is a question of integrating environmental protection, social well-being, and economic prosperity.

It is reiterated here that ecological resilience is the ecosystem's capacity to recover after a disturbance recognizing that the ecosystem and the social system are to be viewed in their interaction rather than separately (Walker & Salt, 2006). From the above review it is seen that the rural ecological systems are subjected to various threats ranging from local sources such as urban sprawl on fertile lands and forests to the draining of wetlands threatening habitats of rich biodiversity and valuable system functions to global effects from climate change. To understand the building of ecological resilience, the literature introduces ecological vulnerability as the inability of the ecosystem to tolerate stressors over time and space (Lange et al., 2010; Gunderson, 2000). This entails the mitigation of recognized stressors. Stressors can shift a system across a critical threshold or tipping point to a different state. Thresholds are defined as, "levels of controlling variables where feedbacks to the rest of the system change crossing points that have the potential to alter the future of many of the systems that we depend upon" (Walker & Salt, 2006, p. 53). This may cause a resource crisis signaled by an ecosystem behaving in a surprising manner. Lance Gunderson (2000, p. 432). explains that "surprises occur when variation in broad scale processes (like hurricanes or drought) intersects with internal changes in an ecosystem due to human alteration" When a system shifts its stability domain, the management reaction may be one of three options: Waiting for a return to an acceptable state, intervene to return it to a desirable stability domain, or adapt to the new altered system (Gunderson, 2000). Adaptive management acknowledges the dynamics of ecosystems and human response becomes one of adjusting to changes. Martin Bunch, Dan McCarthy and David

Walter-Toews (2008, p. 133) describe adaptive management as, “an approach to resource and environmental management that deals explicitly with uncertainty”. Hence, policies need to be flexible and continually modified to adapt to surprises. Such considerations are to be inbuilt in the criteria to evaluate policies. Increasing a system’s resilience involves increasing buffering and organizing capacities and managing for processes at multiple scales. Buffering capacity can be increased through diversity in resources and approaches, and redundancy in structures. Multiple scale management can be achieved through understanding cross-scale interactions at higher scales (provincial, national and global) and lower scales (Walker & Cooper, 2011).

For social groups that rely on environmental resources for their livelihoods, as most rural areas do, ecological resilience and social resilience are linked. One definition of social resilience is, “The ability of groups or communities to cope with external stresses and disturbances as a result of social, political, and environmental change” (Adger, 2000). Institutions or the social rules and norms and formal institutions like property rights decide the relationship between a community and its natural resources. Walker & Salt (2006, p. 147) explain, “Resilience in social-ecological systems is very strongly connected to the capacity of the people in that system to respond, together and effectively, to change any disturbance. Trust, strong networks, and leadership are all important factors in making sure this can happen.” The factors mentioned contribute to social capital, an imperative of resilience. Walker & Cooper (2011) quote Holling (1973) from his widely cited paper on Resilience and Stability of Ecological Systems describing resilience framework as, “it does not require a precise capacity to predict the future, but only a qualitative capacity to devise systems that can absorb and accommodate future events in whatever unexpected form they may take” (Walker & Cooper, 2011, p. 146). The above

indicates that social resilience is achieved through maintaining relationships within the community by enhancing social capital and fostering social cohesion.

Gunderson & Holling's (2002) panarchy theory which describes the Adaptive Cycle of: growth, conservation, release, and reorganization, is applicable to economic systems as well as ecological and other systems. What unites the three systems is the concept of capital which may grow, get accumulated, and experiences collapse, and reorganization (Walker & Cooper, 2011). While Holling was developing his systems approach on ecology in the 1970s and universalizing it to other arenas, the Austrian neoliberal philosopher Fredrich Hayek was developing a roughly parallel systems explanation in economics (Walker & Cooper, 2011). Hayek espoused the notions of complexity, limited knowledge and uncertain futures. According to Walker & Cooper (2011), Hayek's Theory of Complex Phenomena suggested Hayek's theory of spontaneous order and social evolution. The interrelations between the ecological and economic arenas are taken a step further by Beveridge & Guy (2005, p. 666) who assert that, "economic and environmental goals are a positive sum game, that the health of one is entirely dependent on the health of the other ... that capitalism's drive for innovation can be harnessed to realize environmental improvements". Thus, the building of economic resilience is dependent on the building of ecological resilience.

From the above arguments, it is deduced that **the category of consideration here is: Preparedness for the future to face uncertainty by building the system's resilience in the ecological, social and economic arenas in a mutually supportive manner.**

The most relevant sustainability imperative connected with the above category is precaution and adaptation (S7 in appendix C), asking for respect of uncertainty and designing for

surprise. Many other sustainability imperatives are linked to Preparedness for the Future such as socio-ecological systems integrity (S1 in appendix C), livelihood sufficiency and opportunity (S2 in appendix C), intragenerational equity (S3 in appendix C), intergenerational equity (S4 in appendix C), resource maintenance and efficiency (S5 in appendix C), socio-ecological civility and democratic governance (S6 in appendix C), and immediate and long-term integration (S8 in appendix D). All the resilience imperatives apply to this category of building preparedness for the future (R1- R9 in appendix D).

Other articles from the journals above were reviewed. However, the same themes kept recurring indicating that a point of saturation was reached as most existing perspectives were covered.

2.4 – The combined theoretical underpinning and categories framework for rural areas close to urban centres

The Literature Review above was carried out bearing in mind the ultimate categorization of identified key areas of consideration integrated with the eight imperatives of sustainability (Appendix C) and the nine imperatives of resilience (Appendix D). The seventeen sustainability and resilience imperatives are integrated with the key areas of consideration recognized in the above review to constitute the major categories of a framework incorporating the theoretical underpinnings with the practical considerations as table 2.1 below detailing subcategories under each category.

Working towards sustainability, including the building of ecological, economic, and social resilience, should be a goal of all plans including plans which aim at fostering rural livelihoods and stewardship in the rural areas close to urban centres. This guides the construction

of criteria for plans' evaluation. Combining the sustainability and resilience imperatives with the key areas of consideration recognized in the literature review above, is an exercise guided by systems approach of finding interdependencies between the key systems components to identify mutually reinforcing factors and tradeoffs.

Table 2.1: Generic Categories of Consideration in rural livelihoods and stewardship in areas close to urban centres in developed countries.

Category of Consideration and subcategories integrated with sustainability and resilience imperatives	The sustainability and resilience imperatives given at least some consideration by a subcategory and their interconnectedness with each other
<u>1 – Democratic governance and overlap in governance</u>	
1.1 – Adopting a participatory approach to the planning process by building capacity and motivation of communities, and facilitating informed deliberations while fostering social capital	S6 – R6 Enhances 8.1, 8.2, & 8.3. Mitigates 2.1 & 5.2 & 6.1
1.2 – Reconciling different perspectives by reducing intragenerational gaps in sufficiency between different groups, emphasizing collective responsibility, celebrating diversity, acknowledging slow variables that configure the system and may lead to violent conflict, monitoring feedbacks to detect thresholds, and building social capital	S3, S6 – R1, R4, R5, R6 Enhances 2.2, 4.2 & 8.2. Mitigates 5.1 & 5.2
1.3 – Devolution of responsibility from the provincial level to the region, and to local groups to effect the building of collective responsibility and achieving overlap in governance	S6 –R8 Enhances 2.2, 3.1,8.1, 8.2 & 8.3 Mitigates 2.1

<u>2 – Building positive social relations in the rural milieu</u>	
2.1–Conflict in stakeholders’ perspectives to be addressed through intragenerational equity, fostering reciprocal awareness and collective responsibility, building regional modularity & pride in a regional brand and encouraging mutual trust	S3, S6 – R3, R6 Enhances 5.1 & 5.2. Mitigates 3.1, 4.2
2.2 – Building community solidarity through democratic governance and well-developed social networks	S6 – R6 Enhances 1.2 & 8.2. Mitigates 5.1 &5.2
<u>3 Viable Farming and its links to the preservation of foodlands and social values</u>	
3.1 –Addressing urban sprawl by emphasizing integrity of socio-biophysical systems, safeguarding rural livelihood sufficiency, catering for future generations, acknowledging slow variables and tight feedbacks to protect the system from tipping into an undesirable state, and allot value to the unpriced ecosystem services	S1, S2, S4, S5 - R4, R5, R9 Enhances 7.2. Mitigates 6.1. Trade off with 4.1 & 4.2.
3.2 – Promoting local food consumption aiming at socio-ecological system integrity, intragenerational equity by supporting rural livelihoods while reducing material and energy use. This will enhance social cohesion regional modularity, and awareness of feedback signals	S1, S2, S3, S5 – R3, R5, R6 Enhances 2.2, 4.1 7.2, 8.1, 8.2, & 8.3. Mitigates 5.1
<u>4 – Building a strong socio-economic base benefiting from urban in-migrants while maintaining/ rehabilitating the ecological base</u>	
4.1 – Diversifying the rural economy thus building intra & intergenerational equity, adopting recycling to reduce waste and the need for landfills in rural areas, catering for	S2, S3, S4, S5 – R1, R4, R7 Enhances 4.2, & 7.2. Mitigates2.1, 5.1 & 6.1

slow variables and encouraging innovation	
4.2 –Entrepreneurship by urbanite in-migrants to harness opportunities linked with in-migrants for improving livelihoods, intragenerational equity, achieve diversity and innovation.	S2, S3 - R1, R7 Enhances 2.2, 7.2 & 8.3. Mitigates 2.1 & 5.2
4.3 – Maintaining/ rehabilitating the ecological base through socio-ecological integrity by reversing ecological degradation, reducing waste to cater for future generations and targeting ecological variability and the valuing of ecosystem services	S1, S4, S5, – R2, R9 Enhances 7.1, 7.3 & 8.1. Mitigates 6.1 Mutual reinforcing with 6.2
<u>5 - Equity</u>	
5.1 –Recognizing the exclusion and alienation of some groups by improving livelihood opportunities for all and achieving intragenerational equity and enhancing social capital.	S2, S3 - R6 Enhances 2.1, Mitigates 1.2 & 2.2
5.2 –Competition for socio-economic hegemony in the rural milieu in a way that does not threaten livelihoods and equity, or the social fabric	S2, S3, S6 – R6 Enhances 2.1. Mitigates 1.2 & 2.2
<u>6 – Stewardship in the rural system</u>	
6.1–Countering environmental degradation in multiple dimensions by building human-ecological relations and sustainable use of resources through adopting the precaution principles and fostering ecological variability and focusing on slow variables	S1, S5, S7 – R2, R4 Mitigates 4.1 & 8.1 Mutual reinforcing with 3.1
6.2 – Rewarding stewardship by monitoring its effects on socio-ecological integrity and resource utilization to encourage ecological variability and monitor slow variables and system feedbacks working towards	S1, S5 – R2, R4, R5, R9 Enhances 1.2, 2.2, & 8.1. Mitigates 6.1. Mutual reinforcing with 7.3

acknowledging the unpriced ecosystem services	
6.3 –Embracing stewardship for cultural heritage to attain full socio-ecological integrity and integration seeking supportive benefits to preserve heritage for future generations while building diversity	S1, S8 – R1 Enhances 4.1, 7.2, & 8.3. Mitigates 5.1
<u>7 – Agricultural multi-functionality</u>	
7.1 –Fostering Socio-ecological system integrity through the protection of life support functions by seeking long-term integrity, building rural diversity and innovative approaches	S1, S8 –R1, R7 Enhances 8.1. Mitigates 6.1 Mutual reinforcing with 6.2
7.2 - Invigorating rural economy within farming activities to safeguard agricultural livelihoods, intra and intergenerational equity. Farming introduces diversity, the marketing of a modular regional brand, and acknowledges slow controlling variables to avert a threshold associated with a disintegrated local farming	S2, S3 - R1, R4, R5 Enhances 1.2, 2.2, & 4.1 Mitigates 2.1 & 5.1
7.3– Establishing links between multi-functionality and environmental protection by consolidating socio-ecological system integrity and adopting the precautionary principle while encouraging diversity and monitoring slow variables and feedbacks and acknowledging the unpriced ecosystem services	S1, S7, – R1, R4, R5, R9 Enhances 3.2, 4.1 & 8.1. Mitigates 2.1 & 6.1
<u>8 – Preparedness for the future</u>	
8.1 – Building ecological resilience through socio-ecological system integrity and long-term integration of sustainability imperatives while fostering ecological variability and watching slow variables and system feedbacks and valuing the free	S1, S4, S8 – R2, R4, R5, R9 Enhances 6.2, 7.1, 8.1, 8.2 & 8.3. Mitigates 6.1

ecosystem services	
8.2 – Building social resilience through the providing of livelihood sufficiency and equity protected by democratic governance which builds social capital and introduces overlap in governance	S2, S3, S4, S6 – R6, R8 Mutual reinforcing with 1.2, 2.2, 8.1 & 8.3. Mitigates 2.1 & 5.2
8.3 – Building economic resilience through the fostering of livelihood sufficiency and opportunity and sustainable use of resources while encouraging diversity, regional modularity and innovative locally developed economic solutions	S2, S4, S5 – R1, R3, R7 Mutual reinforcing with 3.2, 4.1, 8.1, 8.2 & 8.3. Mitigates 5.2

In the above table, all the sustainability imperatives and all the resilience imperatives are covered at least to some extent; some recur more often than others. Column one integrates insights from the literature review with the sustainability and resilience imperatives as categories of consideration together with the subcategories. Column two indicates the particular sustainability and resilience imperatives covered by a subcategory while also highlighting the interconnectedness between subcategories to highlight the systems approach of recognizing the system’s components links.

Merging the areas of consideration of table 2.1 above with the sustainability and resilience imperatives they cover, produces eight categories of consideration for planning and policy making to better serve rural regions:

- 1. Democratic governance and overlap in governance that foster participatory governance and includes redundancy structure;**

2. **Social relations in the rural milieu that foster intragenerational equity, socio-ecological civility and build social capital within modularity;**
3. **Viable farming and its links to the preservation of socio-ecological system integrity, livelihood sufficiency, preserving and maintaining the land resource for future generations and acknowledging slow system variables, modularity and ecosystem services;**
4. **Building a strong socio-economic base benefiting from urban migrants while maintaining/ rehabilitating the ecological base to cater for livelihood sufficiency and intragenerational equity through diversity and innovation while acknowledging slow variables;**
5. **Equity in the rural milieu through livelihood sufficiency and intragenerational equal opportunity guided by democratic governance that builds social capital;**
6. **Stewardship in the rural system to reverse environmental degradation through socio-ecological system integrity, resource maintenance, the adoption of the precautionary principle and adaptive management that respects ecological variability and ecosystem services in a modular approach to acknowledge slow system variables and feedback signals;**
7. **Embracing agricultural multi-functionality that targets socio-ecological system integrity and protects ecosystem services while seeking livelihood sufficiency and intragenerational equity through the adoption of diverse activities to cater for slow variables and tight feedbacks, and**

8. **Preparedness for the future through achieving socio-ecological system integrity, respecting ecological variability to acknowledge slow variables and system feedback by building ecological, social, and economic resilience and seeking mutually supportive benefits of applying all sustainability principles**

Chapter 3 –The Rural Niagara System

3.1 – Introduction and agenda

The aim of this research is to establish criteria for evaluating plans and policies for their effects on rural livelihoods and stewardship taking Niagara as an illustrative case. Criteria are needed to enable stakeholders to conduct a meaningful critique of plans and policies pertaining to land use, in this case. A description of rural Niagara under the major areas of consideration identified in Chapter Two for rural areas close to urban centres in developed countries, which address all sustainability and resilience imperatives, will inform the establishment of the context-specific criteria.

In the following discussion, section 3.2 presents the research method and section 3.3 presents the historical background. Section 3.4 describes rural Niagara system under eight subsections in accordance with the eight broad categories of table 2.1 above. The final section 3.5 is for presenting the eight categories as criteria emerging from the case study in a table form.

3.2 – Method

This chapter is a case study of rural Niagara's circumstances, issues, challenges and opportunities under the eight categories of consideration typical of rural areas close to urban centres in developed countries. The case study method is useful for thick description allowing a researcher to uncover the complexity of social life as it allows identification of details of the various sides of the case (George & Bennett, 2005; Yin, 2003). Yin (2003, p. 13) explains, "A case study is an empirical inquiry that investigates a contemporary phenomenon within its real-life context". In this case the phenomenon is the planning regime and the context is rural Niagara. Yin (1993) posits that the case study method has an advantage over other methods for

conducting evaluations, hence the adoption of the case study approach to this evaluative research. My choice of a single case rather than multiple cases comparison is based on the research agenda of presenting Niagara as a focal area of interest. Yin (2003) identifies two types of single cases, holistic and embedded case study design. My research adopts the holistic design by examining the overarching nature of the system emphasizing interconnectedness as opposed to dividing the system into separate units as required by the embedded design.

My approach is interpretive whereby I attempt to see the meaning of a practice or tendency within the social context of the study (Neuman & Robson, 2007). The social context in this case is the Niagara rural livelihoods and stewardship. Since my target is to construct a set of evaluation criteria using sustainability and resilience imperatives as a lens, I started by presenting a category of consideration within the Niagara context. The context-specific category of consideration is then merged with the most relevant sustainability imperative(s) and the most relevant resilience imperative(s) to yield a criterion.

The rigour of the case study was achieved by observing construct validity, external validity and reliability. Yin (2003) refers to construct validity through the use of multiple sources of converging evidence; this was achieved through consulting a diverse range of literature sources. Whereas construct validity in quantitative methods means the match between a concept and the measure, qualitative methods are more concerned with authenticity as described by Neuman & Robson (2009, p. 113).

“Authenticity means giving a fair, honest, and balanced account of social life from the view point of someone who lives it every day ... Qualitative researchers are less concerned with trying to match an abstract concept to empirical data and more concerned with giving a candid portrayal of social life”

In this research adherence is made to the core principle of validity, and that is truthfulness by ensuring a tight fit between the ideas and what is being identified as representative of such ideas; this is aided by personal observations facilitated by my involvement in the activities of various organizations concerned with environmental and social issues. Validity is further consolidated by presenting sources containing discrepant information, where it is available, and by reflectivity comments of the researcher (Creswell, 2009).

External validity is a measure of generalizability. Whereas quantitative methods rely on statistical generalizability, qualitative methods rely on analytical generalizability (Yin, 2003). Analytical generalization is covered by pointing to the domain in which the findings can be used to draw lessons from. Moreover, by covering broad theoretical issues drawn from beyond the immediate case, I enhance the generalizability with the caveat of observing the research boundaries of applicability to rural areas close to urban centres in developed countries and observing regional specifics.

Reliability can be demonstrated by replicability; this is covered by specifying the steps taken in the discussion to represent a protocol. Unlike other methods, the case study method does not have a recognized routine to follow (Yin, 2003). Robert K. Yin (2009, p. 60) posits that, “very few case studies end up exactly as planned, you will have to make minor if not major changes”. In this research, the original plan was to closely follow the categories of consideration developed in Chapter Two as a guide for developing context-specific criteria in this chapter three. During the process of data collection, categories were reframed to better fit the case conditions. On the sources of information for data collection, Yin (2003) suggests documents, archival records, direct observation, interviews, participant observation, and physical artifacts. My research uses the first three sources.

The first step was to get immersed in the case and develop a chronological narrative to help the researcher and the reader get an outline of the case (George & Bennett, 2005). This is presented in the following section 3.3 as a historical background. Section 3.4 consults government and non-government documents and archives to describe the case; thick descriptions in this section extracted from the most relevant documents together with direct observations, complement the historical background of section 3.3. An annotated bibliography of the major documents is presented in Appendix E as part of the Document Analysis triangulation check of evidence.

Peer reviewed academic articles and books were consulted throughout the data collection process, especially when the official, public and private literature contents required a theoretical explanation. However, reliance was mainly on non- academic sources in order to uncover the daily practices, philosophies and practical approaches. The above approach resulted in the set of criteria in table 3.1 in the last section of this chapter.

For the following section 3.3 on the historical background, academic and non-academic sources were consulted to present a brief historical background of Niagara in a chronological order. Since tender fruit lands represent a focal area in the preservation of agricultural lands in this region (Janice, 1993; Regional Municipality of Niagara, 2003), a brief history of its significance and impact on the development of policies is justified to shed light on the roots of present day conflicts. The tender fruit historical significance was covered by consulting the archives section in St. Catharines Public Library; such archives are constituted mainly of newspaper articles.

3.3 – Historical background

The major physical factors characterising Niagara Region are: the relative abundance of fresh water resources, the topography, and the resulting microclimate (Turner, 1994). Farming in Niagara Region started even before the European settlement. When the first French explorers arrived in the seventeenth century, the First Nations in the region - they were named the Neutrals for being neutral in the war between the Iroquois and the Huron - practiced farming (Rennie, 1967).

The first European settlers were the United Empire Loyalists who fled the American Revolution of 1776. After the independence of the thirteen colonies which constituted today's U.S. in 1783, the British Crown rewarded those loyalists with land to farm in Niagara Region. It is estimated that around one hundred townships were surveyed between 1783 and 1799 (Wood, 2000). Villages first grew around the portage passage circumventing the Niagara Falls for merchant-military purposes. In 1829, the Welland Canal was officially opened to facilitate navigation between Lake Erie in the south and Lake Ontario in the north; the village of St. Catharines grew around a shipyard on the northern end of the canal (Styran, 1981). Between St. Catharines and today's City of Hamilton, villages grew on the fertile land along the wagon road (Jackson, 1980).

Between 1812 and 1814 a major war was fought between Great Britain in Canada and the emerging U.S. power. A U.S. expansionist threat to invade Canada was defeated by the British army with the help of local militias formed by the Loyalists and also with the aid of the Iroquois First Nations under Chief Tecumseh. Major General Isaac Brock, in whose honour the region's university is named, was the war hero who lost his life leading his men to victory (Rennie, 1968).

Peace ensued after 1814. For the first farmers in the region, the Loyalists, the land represented refuge and compensation for their loss of property by leaving revolutionary America. This provided a basis for a heritage attachment with the land that was also developed by subsequent waves of immigrants to the area. Farms were handed down from generation to generation (Ladell, 1979). Since the nineteenth century, settlers farmed the region for crops and specialty products such as grapes and tender fruit (Smith, 1909).

Tender fruit, such as peaches, plums, and cherries, occupies a special position in the region's economy. Niagara is one of two areas in Canada that can grow tender fruit; the other is the valley of Okanagan in British Columbia. Niagara's fruit belt which lies between Lake Ontario and the Niagara Escarpment, became the focus of land preservation debates since early twentieth century. Today the fruit belt remains the main focus of preservation advocacy for the Preservation of Agricultural Lands Society (PALS). The Special Collection Archives in the Central Library of St. Catharines were consulted to produce the following brief history of the evolution and rise to significance of the tender fruit farming in the region.

Prior to mid-nineteenth century there was little production and no export of tender fruits (Smith, 1909). Grantham Fruit Growers Association 1891 publication mentioned the sale of white fleshed peaches at the low rate of forty to sixty cents a basket in order to compete with imports from central New York and northern Ohio states (Daryll & Mathews, 2005). The above provides evidence of the introduction of tender fruit in mid-nineteenth century. Exports of peaches to Europe started in 1930, according to an article in the St. Catharines Standard of Tuesday August 12, 1930, with a shipment to be presented to the Prince of Wales. The peaches were grown by C. Howard Fisher of Queenston and sent by the St. Catharines Flying Club (St. Catharines Standard, 1930). By 1955, the importance of Welland Canal in the Great Lakes-St.

Lawrence Seaway Project resulted in the early stages of “the Niagara Fruit Belt vanishing as housing took the biggest bite. Some farmers became estate operators selling homesites for high profits” (Macleans Magazine, 1955, p. 26). The problem of urban sprawl reducing the Fruit Belt area was felt as early as 1956 when Pleva (1956, p. 320) wrote,

“It is obvious that where a subdivision is put on what was a farm the farm ceases its existence as a producer of food stuffs, fibres, and industrial products. The indirect destruction is more subtle but just as effective in destroying farm values ... The rural municipality must provide more and more services for the urban fringe. Many fringe homes have too low a valuation to carry the costs of schools, roads, police, welfare and other needed services. The tax load is extended to the farmers and since property taxes represent a large part of a farmer’s fixed costs, taxes may rise to the point where the farmer feels he can no longer remain in farming”

From the above brief history of the fruit belt, it is obvious that land use issues continued to fuel debates over the past sixty years.

Late in the nineteenth century, Irish immigrants came to Niagara region escaping the potato famine of 1845-52; the thriving industrial town of Welland attracted Irish labourers (Richard & Young, 1981). The Polish immigrants came in 1861. In 1915, the Armenian immigrants came mainly from Keghi, an agricultural district in North East Turkey escaping massacres as a Christian minority in a Muslim country. Later on, Europeans from Italy and other parts of Europe including the pioneering sources, Britain and France, came to the region. “Large numbers of Dutch immigrants, with a background in horticulture settled in Niagara and became involved in horticultural operations. Their descendants continue to be prominent among growers today (Regional Municipality of Niagara, 2003, p. 3.2).

After World War II, communist take-over of some European and Asian countries brought waves of immigrants. Later on, the breakup of the British Empire left some groups in the past colonies subject to oppression by the new regimes; this also contributed to immigrants’ influx

from Africa and Asia. All these immigration waves constituted people escaping tyranny or poor economic conditions and feeling grateful for arriving in Canada. The Regional Agricultural Economic Impact Study observed that, “immigrants from around the world now provide vital entrepreneurial and technical skills to both urban and rural communities in Ontario” (Regional Municipality of Niagara, 2003).

After 1830s, railways were developed by Canadian and American companies. With Niagara Region lying between the states of Michigan and New York, the railway lines attracted new settlements on the trade routes (Gayler, 1994). At the end of the nineteenth century, hydro-electric power from Niagara Falls attracted industries. Heavy industries for which power constituted a high proportion of input such as pulp and paper plants and chemical industry, were attracted to the region. Later, the auto industry flourished in the region as well as other parts of southern Ontario (Gayler, 1994). Industrial expansion with the associated growth of towns and cities was occurring on some of Canada’s best agricultural lands. The changing socio-economic conditions impacted the land resource as land use policies responded to such socio-economic conditions. In Niagara Region, the growth of industry and the volume of trade exchange with the U.S. gave rise to the expansion of highways; one such busy highway is Queen Elizabeth Way (QEW). The portion of the QEW that runs through Niagara Region cuts through the fruit belt north of the escarpment. The QEW facilitated trade exchange with the U.S and attracted industrial and commercial installations; such installations swallowed more agricultural lands. Furthermore, trade exchange was reinforced by Free Trade Agreements, which opened Canadian markets to competition with American products including fruit, grapes and other agricultural products. The 1988 Free Trade Agreement with the U.S. coincided with two below average crops in southern Niagara because of a drought in 1988 followed by excess moisture in 1989 (Info

Results, 1989). An air of uncertainty followed the Free Trade Agreements marked by a reduction in acreage for grapes and general readjustments in other products (Info Results, 1989).

Between 2001 and 2006 the Niagara Region population grew by 4.1%, a rate which is much higher than the 1.8% growth for the equal period between 1996 & 2001, but still lower than the Ontario average of 6.6% (Ontario Trillium Foundation, 2008). This population growth is a combination of natural growth with immigrants' influx; one third of the immigrants came from Asia and the Middle East. Niagara is not lacking in diversity as one in every six of its population speaks a mother tongue other than English or French and seventy languages are spoken in the region (Ontario Trillium Foundation, 2008). In economic and social trends, the percentage of the population who attained a high school diploma or higher in 2006 was lower than the provincial average (70.3% compared to 74.3%), but the unemployment rate of 5.8% was slightly lower than the provincial rate of 6.1%. However, the provincial median income is 12% higher than that of Niagara (Ontario Trillium Foundation, 2008). This reflects the availability of lower paying jobs in Niagara where 17% of the residents live in poverty (Caledon Institute of Social Policy, 2006). The recent decline in the auto industry and the closures of food processing plants may explain the actual drop in some of the Region's cities' population, according to the 2011 census (Regional Municipality of Niagara, 2012).

Conclusions

From the above brief history, it is concluded that the Niagara Region has a legacy of economic prosperity linked with early industry, which has been waning over the last decades, and an agricultural industry struggling to be a major economic driver. However, farming jobs offer lower wages than the industrial jobs. This, in part, explains the higher than provincial average

poverty rate, which will be discussed later in this chapter. The Region is declining and in transition. This makes Niagara an important case to investigate sustainability and resilience criteria for evaluating plans and policies that may help in turning the Region's fortunes around.

Fertile unique agricultural lands were lost at the rate of 7.8% of farmland acres loss between 1971 and 2001 (Regional Municipality of Niagara, 2003). The loss continued at the rate of 1.3% between 2001 and 2006 (Regional Municipality of Niagara, 2010). The remaining parts are operating under the urban shadow. This, in part, explains grassroots initiatives like the founding of PALS, Community Supported Agriculture, and other initiatives to protect what remains of the unique agricultural lands. Niagara's fruit belt is one of two areas in Canada that can grow tender fruit. The protection of tender fruit lands has been a focal area in the defence of agricultural lands for the last sixty years; it continues to be a focal area at present.

3.4 – Examining the eight categories of consideration in the Niagara case

Niagara is a prosperous region, though suffering from economic disparity between the rich and the poor, within a developed country, Canada. It shares the generic issues of challenges and opportunities with other regions in developed countries. Nonetheless, it has its own particular character, stresses and opportunities. The following subsections describe the Niagara case within the framework of the areas of consideration of table 2.1 above.

Method

In each subsection, an area of consideration is presented within the Niagara context. After a thick description of the context-specific category, it is merged with the most relevant sustainability and resilience imperatives to present a criterion as explained in section 3.2 above.

In qualitative research, operationalization “describes how the researcher collects data, but it includes the researcher’s use of preexisting techniques and concepts that were blended with those that emerged during the data-collection process” (Neuman & Robson, 2009, p. 111). I did not use the procedure of Independent Variables and a Dependent Variable with the associated operationalization steps of identifying indicators and measuring variation as this research is not an explanatory one trying to uncover cause and effect (Berg, 2009). My research is exploratory and descriptive targeting the creation of evaluative criteria (Neuman & Robson, 2009). Thus, the case study is mainly a descriptive one using the identified eight areas of consideration as a vehicle.

3.4.1 – Democratic Governance

Background

Governments in advanced countries have been gradually shifting from governing with some consultations limited to powerful interests to the involving of multiple players in decision making.

The Niagara Region defines governance as, “government agencies, plans, policies and practices, strategic planning, public input ... a larger body working toward the common interest of the community” (Regional Municipality of Niagara, 2011, p.1). The Niagara Regional government structure is a Regional Council constituted of the twelve elected mayors of the twelve municipalities together with eighteen other elected councilors from the municipalities (six from St. Catharines, three from Niagara Falls, two from Welland, and one each from Fort Erie, Port Colborne, Grimsby, Lincoln, Thorold, Niagara-On-The-Lake and Pelham; the townships of Wainfleet and West Lincoln are only represented by their mayors). The Regional Council

appoints the Regional Chair after the municipal elections; he or she may or may not be an elected councilor. The Regional Councilors, apart from the Mayors, do not sit in their municipalities' councils. However, the presence of the mayors in both regional and municipal councils reflects a measure of overlap in governance between the two levels.

The category of governance in the Niagara context

Niagara Region puts democratic governance to practical application through the adoption of a participatory approach in the development of the long-term strategy under the "Sustainable Niagara 2060" initiative. The plan consists of eight goals based on citizens' input. I participated as a citizen in drafting the outline of the strategy during a workshop of open deliberations representing a wide spectrum of participants ranging from academics, planners, grassroots organizations, businessmen, farmers, and other stakeholders. Workshops seeking citizens' input are an ongoing activity; the latest I participated in was on May 04, 2012. This 50 year strategy has been outlined as follows:

"Sustainable Niagara will:
result in a 50+ year plan for Niagara, act as a guide for decision making, community planning and investment, and strengthen our understanding of how decisions in one area can impact outcomes in other areas.
Given that today's local challenges are connected to larger global issues, it is crucial that the Niagara community work together for a consistent, concerted approach that will help provide coordination and guidance for our residents and leaders. The Sustainable Niagara Plan will provide this focus" (Regional Municipality of Niagara, 2010e, p.2).

The wording above puts responsibility on the residents and leaders equally for implementing the strategy. This indicates an outlook that embraces participatory decision making and involvement in implementation encompassing government, the market forces, and concerned citizens (Regional Municipality of Niagara, 2010e).

In modern administration, centralization is being tempered by the devolution of some responsibilities to local authorities that may be more capable of dealing with problems by virtue

of being closer to them; this is the principle of subsidiarity. Subsidiarity is defined as, “the idea that a central authority should have a subsidiary function, performing only those tasks which cannot be performed effectively at a more immediate or local level” (Democracia Participativa, 2012)

In land use, the Provincial Policy Statement draws broad outlines as to where growth can be directed, but leaves the details for the municipalities’ Official Plans. With two tiers of local governments: the Region and the local municipalities of cities, towns, and townships, Niagara acquires resilience by virtue of its government structure’s provision of overlap in councils’ representations discussed above. Overlap in governance contributes to resilience. Moreover, the Regional Policy Plan, section 2, Planning Background, specifies the Region’s planning responsibilities in various areas and adds, “The Region’s responsibilities are complete in some of the above cases and are shared with the local municipalities in other cases, such as planning, the distribution of water and the collection of sewage” (Regional Municipality of Niagara, 2007, p.7). Section 12 “Implementation” of the Regional Policy Plan points to the possibility of conflict with the local municipalities’ Official Plans giving precedence to the more specific or restrictive policy (Regional Municipality of Niagara, 2011e). The above measures and arguments do not suggest the full inclusion of democratic governance in the Region, but rather provide a measure of current practices to construct a criterion for plans’ evaluation.

In the sustainability requirements as decision criteria, Robert Gibson et al. (2005, p. 117) have described “Socio-ecological civility and democratic governance” requirement as, “Build the capacity, motivation and habitual inclination of individuals, communities and other collective decision making bodies to apply sustainability requirements through more open and better informed deliberations” . For the category of governance, this is the most relevant sustainability

imperative (S6 in Appendix C) in the comprehensive list of requirements for sustainability. The most relevant resilience imperative is ‘overlap in governance’ (R8 in Appendix D).

Criterion for evaluation

By combining and adapting the works of Gibson (2005) and Walker & Salt (2006) as indicated above, I deduce that democratic governance can be specified for Niagara Region as the following criterion for evaluation: **Plans and policies should provide for building communities’ capacity in participative governance and resilience in governance including overlap in governance, and more devolved responsibilities.**

The following requirements are positive characteristics to be sought in evaluation of the plans and policies for the Niagara Region:

1. The vital role of civil society institutions participating in decision making
2. Institutionalizing public deliberations to modify plans
3. Awareness about enhancement of collective responsibility and collaborative effort
4. The importance of the incorporation of incentives and structural arrangements for responsive governance
5. The importance of the devolution of significant responsibilities from upper to lower levels of government

3.4.2 - Social relations in the rural milieu

Background

With an average width of approximately 40 kilometers between Lake Ontario and Lake Erie and a stretch of approximately 50 kilometers from Niagara-On-The-Lake to beyond Grimsby

(Regional Municipality of Niagara, 2003), any part of rural Niagara lies close to urban centres. In this context, a significant portion of social tension is manifested as competing perspectives of the countryside (Richmond et al., 2000; Masuda & Garvin, 2008; He et al., 2010). On the one hand we have ex-urban dwellers that escape urban centres to settle in the countryside viewing it as a place of tranquility and peace. On the other hand, we have landowners and farmers who view the countryside as a place for business activity. Conflicts over noise, odour, and sights are bound to arise, thus necessitating laws like the provincial 1998 “Farming and Food Production Protection Act” (FFPPA) to protect normal farm operations from litigation by non-farming residents. In a study about perceived life quality in the Ontario countryside, L. Richmond et al. (2000) indicated that non-farm rural residents exhibit a high level of satisfaction though they may object to some farming practices like the use of chemical pesticides (Richmond, 2000). In an effort to mitigate social tension, the Farming and Food Production Protection Act, 2006 version elaborates on determining Minimum Distance Separation Formula, a planning tool to determine minimum distance between odour-producing livestock facilities and surrounding dwellings and lots (Ontario Ministry of Agriculture, Food, and Rural Affairs, 2010b).

The category of Social Relations in the Niagara context

The presence of non-farm residents, with their perspective of the country, may act as a catalyst to promote stewardship on the farm and the surrounding natural setting (Cunningham, Espey, Gering, King & Lin, 2007; Woods, 2009). A program which is linked to on-farm stewardship is the Environmental Farm Plan (EFP) program in Ontario, a voluntary environmental education, awareness and funding program that aims at introducing farm practices that are more environmentally sound (Ontario Ministry of Agriculture, Food, and Rural Affairs, 2010).

The 1990 Regional Planning and Development Department document entitled *Responses to Where Next? A Look to the Future* was found to be of particular interest, because it presents for public deliberations the question of where should future development be located. The voluminous document reveals the tensions in the region as it reflects different perspectives ranging from academic views to farmers and non-farming residents' views. Such tensions are persistent and need to be managed at present. Managing conflict is a feasible target (NSW Department of Primary Industries, 2011) while resolving conflict may not be a possibility.

The above document demonstrated the responses revolving around the four options for future development in the region, namely: 1) Lake Erie shoreline urban expansion, 2) Central Niagara urban expansion, 3) Trends urban expansion and 4) Queen Elizabeth Way North urban expansion. Responses from three public meetings (Appendix VI of the Regional document) are hereby reviewed to uncover conflict on land use. Highlights from responses that reflect farmers concerns include the following:

- A resident from Grimsby asserted that there was no market for his fruit and he saw no reason for preserving fruitlands. A farmer from Niagara-On-The-Lake explained that without financial support tools, there would be no need to preserve a resource [land] which nobody knows how to manage. A farmer from Jordan Station expressed the view that there would be a possibility of saving land “by paying farmers to keep it out of production but in its raw state” (Regional Municipality of Niagara, 1990, p.199).

Responses that reflected non-farming residents' concerns included the following:

- A resident from Jordan Station regretted the continued reduction of good farmland and he found no relationship between the retail price and the price paid to the producer. Another

resident expressed how smaller communities have special appeal to people. A Beamsville resident asserted that if high priced houses were built on agricultural lands, they would pay their way [This implies that public services costs will be covered by the expanded tax base].

From the above the two distinct perspectives of down-to-earth views of making a livelihood and the opposing views of enjoying a living are in tension. Such tension is being managed by the Region through public meetings and through adopting policies aimed at reconciling the different views representing rural inhabitants as well as the urban newcomers.

Another Regional document pertaining to social tensions and the building of positive social environment is the Region's Planning and Development Department publication # 77 entitled "*Preserving Niagara's Agricultural Industry*" which points to required initiatives from all four levels of government, federal, provincial, regional and municipal (Regional Planning and development Department, 1990). On social issues, the publication points to the experience in the U.S. state of Oregon's Farmland Preservation Program. The Oregon program provides for several steps to support farming. For example, inheritance taxes on property being based on agricultural value rather than market value. Another example is property tax deferral. Reference to Oregon's experience is used to highlight areas where social justice can be introduced through the alleviation of financial difficulties for farmers. The publication presents many recommendations for how the four levels of government can alleviate the hardships faced by farmers.

Non-governmental initiatives in community solidarity

Community Supported Agriculture (CSA) is one way of building community solidarity in rural Niagara, which is famous for its fruits and vegetables, products which lend themselves to such arrangements. Local customers buy shares at the beginning of the year and products get delivered during season on weekly basis (Ontario Ministry of Agriculture, Food and Rural Affairs, 2008). “CSA farmers consider the relationship they have with their customers the most important part of their business model. There is a great deal of trust on the part of both the farmer and the customer... If it is a bad year, such as, for example, too dry or too wet, both the farmer and the customer share the result of the harvest” (Ontario Ministry of Agriculture, Food and Rural Affairs, 2008, p.1). Sharing risks is a model of social solidarity that builds social cohesion. In Niagara Region, various farms near St. Catharines and Jordan Station subscribe to such an arrangement (Personal observation, 2010).

Robert Gibson et al. (2005) allude to positive social relations in the sustainability requirement of livelihood sufficiency and opportunity (S2 in appendix C). For the category of Social Relations, this is the most relevant sustainability imperative to facilitate working towards intragenerational equity (S3 in appendix C) and democratic governance (S6 in appendix C). The most relevant resilience imperative is Social Capital (R6 in appendix D) to build people’s capacity to respond together to any disturbance, and to celebrate diversity that enhances responding to disturbances (R1 in appendix D), to acknowledge slow variables that configure a socio-ecological system (R4 in appendix D) and respond together to feedback signals (R5 in appendix D).

Criterion for evaluation

By combining and adapting the works of Gibson (2005) and Walker & Salt (2006) as indicated above, I deduce that the general positive social relations objective can be specified for Niagara Region as the following criterion for evaluation:

Plans and policies should provide means for reconciling different interests in a way that celebrates diversity and ensures sufficiency and opportunity for all towards intragenerational equity and democratic governance while supporting community solidarity and social capital to acknowledge slow variables and feedback signals.

The following requirements are positive characteristics to be sought in evaluation of the plans and policies:

1. The developing of social networks mixing rural and urban inhabitants.
2. Enhancement of collaborative & cooperative efforts such as Community Supported Agriculture on a regional scale

The external validity of the concept of “building positive social relations” is in its applicability in developed countries to any rural setting where farming is a main activity and where urbanites migrate to such setting.

3.4.3 –Viable Farming

Agricultural lands zoning had always been challenged by claims to rezone for development (Janes, 1993; personal observation, 2012). Over the last few decades, acres under cultivation witnessed reductions (Regional Municipality of Niagara, 2003). With urban sprawl, the areas remaining under farming are in the urban shadow and under speculations for sale (Preservation of Agricultural Lands Society, 1988; Regional Municipality of Niagara, 1989); this links the

topic of viable farming closely to the efforts of preserving agricultural lands through official plans' zoning policies. The following is an historical review of the conflicts pertaining to zoning policies.

The history of urban boundaries modifications

Land use planning, as a Niagara Region's activity, started in 1970 when 26 municipalities in what used to be the County of Lincoln and Wainfleet Township were regrouped into twelve municipalities and formed the Niagara Region for which planning was a major responsibility (Regional Municipality of Niagara, 2003). The first draft plan was produced in 1971 adopting the inherited outlook of the previous municipalities' 1950s mentality of assumptions on the probable demise of fruitlands in the face of a population boom in expanding urban centres (Preservation of Agricultural Lands Society, 1988; Regional Municipality of Niagara, 1989). In the 1970s, Niagara Region was actually facing low-growth compared to the provincial average; the exaggerated projections of a population boom were based on the municipalities' efforts to secure wide urban boundaries (Gayler, 2005). The draft plan was rejected by the province in 1977 when the Minister of Housing then, the Honourable John Rhodes, proposed further reductions in the urban areas' boundaries (Regional Municipality of Niagara, 2007; Preservation of Agricultural Lands Society, 1988). The Preservation of Agricultural Lands Society (PALS) commented on this draft plan by stating, "if accepted this draft plan would have added up to the urbanization of 40% of the fruitlands and a shadowing of the rest. Agriculture would have been reduced to a residual use" (Preservation of Agricultural Lands Society, 1988). The region's planning department then had to revise the draft plan for severe urban boundary reductions, but such policies faced opposition from some land owners and some municipalities' politicians. A ten year battle over agricultural land ensued till 1981 when the Ontario Municipal Board (OMB)

endorsed the first Regional Policy Plan as a revised version of the original 1971 Plan. The revised Regional Policy Plan, 2007 describes this part of OMB involvement as follows:

“The Ontario Municipal Board held a very lengthy hearing, continuing from November 13, 1979 to November 5, 1980, to consider the many portions of the Urban Areas Boundaries Maps for the City of St. Catharines and the Towns of Grimsby, Lincoln, Niagara-On-the-Lake and Pelham, and all of Amendment One” (Regional Municipality of Niagara, 2007, p. 5).

The OMB chairman at the time, described PALS role in this fight as, “PALS necessary role as a supporter of the Cabinet’s decision in 1977 and as a protector of the public interest in respect of preservation of the tender fruit lands, since there was no other volunteer to undertake the task” (Preservation of Agricultural Lands Society, 1988).

The above history reflects a continuing battle between interest groups of developers and some land owners against environmentalists and conservationists including the local Federations of Agriculture and individual farmers. Such battles continue at present with various applications for urban uses over good agricultural lands and effectively involving expansions of the urban boundaries (Bacher, 2010).

Non-agricultural land use concerns in rural Niagara are mainly due to the threat of urban boundaries’ expansion, land fragmentation by estate residential housing, and other non-farming encroachments on good agricultural lands. Living under the shadow of possible urbanisation, farmers tend to adopt a short planning horizon. Adelaja, Sullivan, & Hailu (2010), who studied the phenomenon in the northern states of the US, call it Impermanence Syndrome.

Like many other urban fringe areas in developed countries, Niagara had its share of farming lands being lost to urban sprawl in the past few decades. Krushelnicki and Bell (1989) reported on the crucial era from 1967 to 1981, which includes the preparation of Niagara’s first

Regional Plan and its lengthy approval process, and mention the loss of lands in northern Niagara unique fruit belt. The study relied on the Ontario Registry Office records and indicated that only 5% of land purchases were by other farmers compared to 32.4% purchased by speculators and developers (There is no mention of what happened to the balance). This period was the era before urban boundaries were established. The study urges establishing what the writers call the psychological function of the urban boundaries for inhibiting speculation and keeping farming property values at levels affordable to farmers, especially in the absence of easement arrangements.

Examining Regional initiatives/ Promoting local food as a preservation tool

Introduction

A prudent policy for any country in the world is to aim for self-sufficiency in provision of daily food. Canada is endowed with a vast area and abundance in natural resources for exports, but that is not to say that reliance on food imports is desirable from the point of view of sustainability or resilience. Local food production for daily necessities is a buffer against surprise and uncertainty in the global food supply system resulting from global environmental change including land degradation, changes in hydrology and climatic change (Cohen & Garrett, 2010; Environmental Science & Policy, 2009). A recent editorial in the journal “*Environmental Science & Policy*” states that, “ensuring food security while avoiding negative feedbacks to key ecosystem services places stiff demands upon the design and implementation of adaptation strategies and options” (Environmental Science & Policy, 2009, p. 373). One of the adaptation strategies to enhance food availability is to have local control over food production (Tarasuk, 2001; Renzaho & Mellor, 2010).

The Region's reaction to the concept of "Viable farming sustainability and resilience" is manifested in the initiative of promoting local food as a tool for promoting agricultural activities. Agriculture contributes an estimated \$2.8 billion in direct, indirect, and induced economic effects in 2006 (Regional Municipality of Niagara, 2003). However, the Region recognizes that marketing strategies for local products need special attention to protect the local products against cheaper imports. A report by the Regional Municipality presenting a Local Food Action Plan sets a strategy for promoting local food in the fresh and processing sectors (Regional Municipality of Niagara, 2008). The report is the outcome of The Local Food Action Forum which included the Minister of Agriculture, Food and Rural Affairs, representatives from the Vineland Research and Innovation Centre together with producers, processors, and consumers. A draft report was available to the general public for comments (Regional Municipality of Niagara, 2008). Such Action Plan is a first step towards achieving sustainable livelihoods by supporting the local farmer.

Marketing the fresh produce of Niagara is done, in part, through 11 farmers markets; each municipality has one farmers market except Wainfleet which is a predominantly rural municipality and the city of Thorold which shares the second market of St. Catharines located in Brock University at the border with Thorold. Farmers markets offer a guarantee for the environment-conscious citizen that he/ she can reduce their footprint by avoiding products transported over long distances; this is a contribution to sustainable practices besides other considerations such as the consumption of fresh products and the support to local farmers.

Wine making

The thriving wine tourism in Niagara provides another measure for the concept of the preservation of foodlands. Wine tourism is linked with bed and breakfast accommodation in farms' wineries for the nature enthusiasts seeking to live the full experience of farm life.

In 2008, the Niagara Economic Development Corporation, an agency of the Region, conducted a study under the title, *Energizing Wine Country Communities*; the recommendations of the study were incorporated into the Regional Policy Plan by an amendment in 2009 (Regional Municipality of Niagara, 2009b). The vision of the study is to promote a thriving wine, culinary, and hospitality industry. It also develops the Wine Route Map for tourists to appreciate, not only wine farming and wineries, but also the region's natural and cultural heritage. Such studies indicate possible opportunities for building a more vibrant countryside through tourism.

Robert Gibson et al. (2005, p. 117) have described Livelihood Sufficiency and Opportunity as, “[It] aims at ensuring that everyone and every community has enough for a decent life”. For the category of “Viable Farming”, this is the most relevant sustainability imperative (S2 in appendix C) in the comprehensive list of requirements for sustainability. Controlling urban sprawl is one measure to achieve socio-ecological system integrity to build human-ecological relations (S1 in appendix C) and to preserve ecosystems for future generations (S4 in appendix C) and achieve efficient use of the resource, land (S5 in appendix C). The most relevant resilience imperative is ‘modularity’ (R3 in appendix D) in the sense that regions can be considered as modular components within the national system.

Criterion for evaluation

By combining and adapting the works of Gibson et al. (2005) and Walker & Salt (2006) as indicated above, I deduce that the general viable farming objective can be specified for Niagara Region as the following criterion for evaluation:

Besides protecting farmlands, plans and policies should provide for the support of viable farming by fostering livelihood sufficiency and preserving resources for future generations within a modular regional character

The following requirements are positive characteristics to be sought in evaluation of the plans and policies:

1. Expanding the facilities for local food marketing
2. Protection of farmers living under the urban shadow
3. Controlling the rezoning of agricultural lands to urban uses

3.4.4 – Building the Socio-economic Base while maintaining/ rehabilitating

the ecological base

Ensuring the continuity of farming as a driving economic factor

Agriculture in Niagara is a major industry generating \$2.8 billion in economic activity in 2006 compared to \$2.1 billion in 2001 (Planscape Inc., 2010). The Regional Policy Plan recognises the need to ensure a viable agricultural industry through seven proposed approaches enumerated in Policy 6.A.3 of Section Six – Agriculture (Regional Municipality of Niagara, 2007). The seven measures include parts under federal or provincial jurisdictions. For example, the introduction of tariffs or quota protection from imports is a Federal Government responsibility and adequate

marketing procedures are a Provincial Government responsibility. The policy states that, “the Region recognizes the urgent need to improve economic conditions for the farmer. The Region has continuously encouraged a viable agricultural industry. Moreover, the Region holds the claim that the senior levels of government have major responsibilities in this area as indicated in Policy 6.A.3” (Regional Municipality of Niagara, 2007, p. 44). Tensions surrounding the need to protect agricultural lands represent a major and well-recognized issue in Niagara Region. This matter is especially salient because of urban growth pressures and the influence of economic incentives related to conversion of lands for urban and suburban use.

Canada’s historical rural legacy rests upon pioneer settlements based on farming. A paper by the Government of Canada on Sustainable Agriculture states, “there is a historical evidence to show that cultures rise and fall on their agricultural base’s ability to support the rest of society” (Government of Canada, 1992). Based on the above, Niagara’s agricultural production plays an important role, not only in the regional economy as indicated in previous sections, but also in national food security. Niagara Region’s products include its unique lands’ production of grapes and tender fruit as well as green house products and products from small grain and dairy operations (Regional Municipality of Niagara, 2003). This renders agriculture as a major economic driver in the region.

Attracting investments to Niagara

The Niagara Economic Development Corporation (NEDC) is a non-profit agency of the Region (Regional Municipality of Niagara, 2011f). The NEDC reports success stories of investing in Niagara including investments in green energy and in energy conservation. This is in line with

the Region's vision for Sustainability Niagara 2060. The NEDC partners with the private sector and other government agencies in projects that advance the prosperity of the region.

Revitalising the Niagara rural milieu

In Niagara Region, there is statistical evidence of population moving to rural areas. The population statistics for the years 1996, 2001, 2006, 2011 (Regional Municipality of Niagara, 2012) indicate the population for each municipality. By calculating percentage changes, I calculated percentages indicating that the rural municipality of West Lincoln township, witnessed a population increases of 6.5% and 7.3% for the periods 1996 -2001 and 2001- 2006 respectively. Similarly the other rural municipality of Wainfleet township witnessed 5.4% growth for the period of 2001 - 2006. By contrast, the major city of St. Catharines had growth rates of 1.3% and 2% for the periods 1996 - 2001 and 2001 - 2006 respectively and a slight decline in population between 2006 and 2011 census figures (Regional Municipality of Niagara, 2012, p.1). The highest growth was in the town of Grimsby, the most westerly town, close to Hamilton and opening to the rest of the fast growing Greater Golden Horseshoe as a small town attracting urban migration.

Venture Niagara is a private corporation offering financial support to entrepreneurs and businesses in small towns and rural areas in coordination with the federal Economic Development Agency for Southern Ontario (Venture Niagara, 2011). Venture Niagara currently serves six municipalities in the region. The projects include renewable energy, conservation of energy and other innovative ideas mostly in rural areas.

Tourism in Niagara

Niagara Region attracts tourists to visit its majestic Niagara Falls. It also has a potential for ecotourism which combines education with nature appreciation. Ecotourism can have a “transformative effect – that is, it may induce deeper understanding of the attraction and adherence to more ethical and environmentalist ethos in the attitude and/ or lifestyle of participants” (Fennell & Weaver, 2005, p.375). Thus, the economic activity of ecotourism contributes to the promoting of sustainable practices. The Niagara Escarpment Commission (NEC) encourages sustainable ecotourism. The NEC, based on statistics from the Ontario Ministry of Tourism, stated that “ecotourism is the fastest growing segment of the tourism industry (4 - 10% per annum) ... 82% of overseas visitors visited a provincial or national park” (Niagara Escarpment Commission, 2011, p.1).

The sustainability imperatives linked with the socio-economic base are the Socio-ecological System Integrity (S1 in appendix C) which calls for maintaining the long-term integrity of socio-biophysical systems, and Resource Maintenance and Efficiency (S5 in appendix C) which calls for sustainable livelihoods for all while reducing threats to the long-term integrity of the socio-ecological systems. The most relevant resilience imperatives are Diversity (R1 in appendix D), which calls for promoting diversity in all forms including the economic diversity, and Innovation (R7 in appendix D) which emphasizes learning, experimentation and locally developed rules.

Criterion for evaluation

By combining and adapting the works of Gibson et al. (2005) and Walker & Salt (2006) as indicated above, I deduce that the general objective of building the socio-economic base can be specified for Niagara Region as the following criterion for evaluation:

Plans and policies should provide for strengthening the socio-economic base integrity in ways that also maintain/ rehabilitate the socio-ecological base reducing threats to its long-term integrity while encouraging diversity and innovation.

The following requirements are positive characteristics to be sought in evaluation of the plans and policies:

1. Ensuring the continuity of farming
2. Revitalization of the rural milieu
3. Enhancement of tourism, especially wine tourism and ecotourism

3.4.5 – Equity

Livelihoods in rural Niagara

This subsection starts by drawing an overall picture of livelihood opportunities in the region, and then explores future opportunities with a focus on rural economic activities and reveals aspects of equity issues that are particularly significant in Niagara Region. The Caledon Institute of Public Policy (2006, p. 2) produced a report on Niagara's profile stating that, "17% of the region's residents lived in poverty [in 2006] - an increase of 30% over the last five years". It also indicates that the region has the second highest number of seniors in Canada and the highest

number of refugee claimants in Canada (Caledon Institute of Social Policy, 2006). The problem of poverty at present is aggravated by the decline in the auto industry and manufacturing in general (Nugent, 2011) together with signs of affluence of the rich. In the words of the Caledon Institute of Social Policy commenting on poverty alleviation programs (2009, p.4),

“Talking about poverty in a region that advertises the glamour of wine, the Shaw Festival and fabulous golf courses is never easy... However, as the initiative became more focused on programs and funding, the Regional Government itself shifted into a poverty awareness and advocacy role”

The US-Canada border town of Fort Erie has been the busiest Canadian point of entry for refugees and immigrants (Arai, 2007). Many of the newcomers remain in Niagara. Brock University Assistant Professor, Susan Arai’s research reveals that “Poverty among recent immigrant families in Canada has been increasing ... with 35% of new-immigrant men and women living below the Low Income Cut Off (LICO)” (Arai, 2007, p. 17). Arai explains poverty among newcomers as resulting, partly, from social exclusion and that poverty is not about provision of support but rather about access to such support (Arai, 2007). In addressing recommendations by Professor Arai, the Niagara Regional Municipality embarked on a poverty reduction investment of \$1.5 million in 2008 employing the Business Education Council as convener for the initiative (Regional Municipality of Niagara, 2010). The Business Education Council focused on services provision such as Back-to-School supplies and Good Food Box, which provides nourishing local produce for the poor (Eaton, 2007). However, engaging stakeholders themselves to make transformative changes at the neighbourhood level was seen as the way to address the roots of the problem (Regional Municipality of Niagara, 2011d).

Niagara Region offers job opportunities in the various sectors of the economy. However, with more than 52% of the land under cultivation (Regional Municipality of Niagara, 2003), the

percentage of the work force employed in agriculture is higher than the provincial average , being 4.3% in Niagara compared to 3.2% for Ontario in direct employment. Agriculture remains one of the main employment sectors in rural Niagara with the indirect effects touching many economic activities. While the highly urbanized municipalities like St. Catharines have a low percentage of employment in farming (3%), municipalities of the townships of Wainfleet and West Lincoln have more than 5% farming employment (Regional Municipality of Niagara, 2003). The region's unemployment rate in 2006 was 6.2%, slightly lower than the provincial rate of 6.4% (Regional Municipality of Niagara, 2003). The above picture portrays the region, on the whole, as fairly prosperous with an important contribution of farming in the rural areas that lie within 20 km. of urban centres thus being categorized as rural-urban fringe. One effect of living in the urban fringe on livelihoods is to provide unemployed urban dwellers with a chance of employment in farming within commuting distance in a region which resorts to hiring temporary offshore labour force during high demand seasons. Only farms producing certain approved commodity groups authorized by Human Resource Development Canada (HRDC) can bring offshore workers for a high peak period in the year (Regional Municipality of Niagara, 2003). Nonetheless, the availability of farming jobs, albeit at minimum wages, attaches special importance to the rural areas posing as potential areas for urban dwellers to find casual work rather than marginalised pockets, which is the case in other rural areas having conditions less favourable than Niagara's. However, the lack of public transport networks linking rural areas to urban hubs poses a challenge to job seekers, most of whom lack personal means of transport (Caledon Institute of Social Policy, 2006; Regional Municipality of Niagara, 2003).

Alienated groups of rural Niagara

Hugh Gayler (2005) points to the equity side of sustainability linked with exclusion. Public services such as public transit and affordable housing are lacking in rural areas (Caledon Institute of Social Policy, 2006). The suburban and exurban areas are only for home-owning and car-owning people, thus they exclude those who do not own or drive a car and depend on affordable rented housing.

An issue concerning working conditions of greenhouse workers is developing into a controversy (Personal observation, 2011). Greenhouse horticulture is relatively more labour intensive than other forms of farming where family members normally suffice. Hired workers in the greenhouse industry are paid low wages and are denied the right to organise and bargain collectively (Hofman, 2006); they represent one of the peripheral groups in rural Niagara.

The above social and economic aspects of equity highlight the role of plans and policies in alleviating injustices. Dan McCarthy (2006, p.46) quotes Yiftachel in describing planning as “a tool of social control that represents a paradox in that planning was introduced to assist in social reform and to improve society’s quality of life but can also be used to repress peripheral groups”. This double-edged tool of planning is to be borne in mind in producing criteria to evaluate plans and policies.

The most relevant sustainability imperatives are the Intragenerational Equity and Intergenerational Equity (S3 & S4 in appendix C) calling for reducing dangerous gaps in sufficiency and opportunity within generations and between generations. Alleviation of poverty in the Region covers the sustainability imperative of Livelihood Sufficiency and Opportunity (S2 in appendix C); this leads to motivating individuals and communities to foster collective

responsibility (S6 in appendix C). As for the resilience imperatives, the most relevant is Social Capital (R6 in appendix D) which calls for promoting trust and social networks, besides innovative solutions based on locally developed rules for alleviating inequity (R7 in appendix D).

Criterion for evaluation

By combining and adapting the works of Gibson (2005) and Walker & Salt (2006), together with other researchers' work as indicated above, I deduce that the general Equity objective can be specified for Niagara Region as the following criterion for evaluation:

Plans and policies are to be used as a tool to reduce intra-generational and intergenerational inequities in livelihood sufficiency and opportunity through collective responsibility, building trust and innovative solutions to the local poverty problems.

The following requirements are positive characteristics to be sought in evaluation of the plans and policies:

1. Alleviating the difficulties faced by immigrants and refugees and other marginalised groups
2. Encouragement of innovative transit solutions to connect the labour force with rural jobs
3. Improvements in rural public services

3.4.6– Stewardship

Introduction and agenda

Stewardship in Niagara Region is a community-based activity. Land Care Niagara is a not-for-profit community-based organization that provides information to rural land owners and other users of private and public lands through educational outreach and land stewardship activities (Land Care Niagara, 2011). Another active local organization is Niagara Land Trust (NLT) formed in 2008 from a group of concerned volunteers and experts to acquire and manage land for public interest. NLT adopts the standards and practices of Canadian Land Trust Alliance (Niagara Land Trust, 2007). A multiplicity of land protection mechanisms are in use in Niagara Region. The multiplicity of mechanisms indicates the recognized importance of land stewardship in face of stressors which are briefly discussed below. Only the major stressors are discussed. The order of the headings does not imply the order of importance. Neither is the listing exhaustive; only the major stressors are discussed briefly focusing on themes and trends that serve the purpose of this research. The stressors discussion is followed by a discussion of the protection mechanisms.

3.4.6.1 - Major land stressors

Urban and suburban sprawl on productive agricultural lands

In Niagara, like in the rest of Canada, good agricultural lands were lost to urban uses over the years. In Ontario, urban centres grew from agricultural trading centres and part of their growth is owed to their proximity to the productive agricultural lands as the source of their trade (Hofmann, 2005; Krushelnicki & Bell, 1989). Over the years the small trading centres expanded by engulfing the surrounding agricultural areas. The result is that “between 1951 and 2001, the

supply for dependable agricultural land in Ontario declined by 4 percent, while the demand for cultivated land increased by 20 percent” (Hofmann, 2005, p.1). Urban sprawl continues to be a major land stressor. The fight over urban boundaries in Niagara Region is described in subsection 3.4.3 above. Local groups of concerned citizens such as PALS and NLT continue their efforts for preservation of agricultural lands and natural heritage sites.

Infrastructure

Another non-agricultural land use is the building of major infrastructure including highways for transporting goods and people. A recent proposal is a new highway called the Mid-Peninsula Corridor; it is to be on the less productive farming land south of the escarpment, but is still met by resistance. Proponents of the new corridor argue that the alternative, future widening of Queen Elizabeth Way (QEW), would have a more negative impact on the Greenbelt lands (Van Dongen, 2010) which include the unique fruitbelt lands. The arguments over this new proposed highway continue. The writer of this research attended a board meeting of the Preservation of Agricultural Lands Society (PALS) where reference was made to the opposition stance of the organization Shift Ontario as anchored in the development of alternative transport before, not after, the highway gets approved. Shift Ontario is an alliance of organizations, including PALS, working to influence provincial transport planners against building new highways including this one referred to as GTA West Corridor (Shift Ontario, 2011). Upon contacting the Ontario Ministry of Energy and Infrastructure enquiring about the status of the project, I received a letter dated June 21, 2010 informing me about Public Information Centres held from June 17 to June 23, 2010 to incorporate input from the public and stakeholders in the revision and finalization of the ministry’s transportation development strategy. A follow-up call to the project team and a visit to the web site yielded the information on the status being a rethinking of alternatives in

optimizing the existing transportation network, providing new non-road infrastructure, and widening sections of existing highways. The above are to set a strategy (March 2011) to guide the future environmental assessment processes (Ontario Ministry of Energy and Infrastructure, 2011). Further public consultations will be held late in the Fall 2012.

Landfills

Landfills occupy large areas of rural lands. The expansion of landfills defies the more sustainable practice of recycling, and some landfills exhibited negative environmental effects. In Niagara Region, landfills come under the responsibility of the Policy and Planning Section of the Regional Public Works Department (Regional Municipality of Niagara, 2007). However, approvals are administered by the province and public consultations are often sought. Landfills introduce to the land a concentrated mix of biodegradable and non-biodegradable products that can restrict future use of the land parcel. Rural areas are usually targeted for landfill sites. McKechnie, Simpson-Lewis & Neimanis (1983, p. 36) explain, “because of the low intensity of rural land use and the small population directly affected, landfills in such locations are often perceived as more compatible.” Intuitively, landfills need to be in non-productive lands in rural areas, but economic imperatives dictate shortening the distance of transportation from the garbage generating centres. Hence, a balancing of contradictory factors is often involved. Innovatively, landfills’ expansions can be stopped through recycling waste with solutions like generating biogas (to be discussed further in subsequent sections), the multiple box garbage, and, most importantly public education to reduce, reuse, and recycle.

An example of landfill problems is a site opposite Brock University on Glenridge Avenue, St. Catharines. The site was first used as a quarry. The pit left from quarry operations

was then approved for use as a landfill site despite citizen and expert opposition pointing to the likelihood of contaminants escaping through the fractured rock. The fractured ground caused leaching of foul-smelling gases into four manholes of the main effluent sewer. In 1996, after years of citizens' complaints, the City of St. Catharines had to install a gas collection system connecting the four leachate-collection manholes with nineteen landfill gas wells (Integrated Gas Recovery Services, 2011) to use the gas for heating purposes in a nearby hospital. Solving the problems of the landfill demanded a lot of active citizens' engagement. In 2001, the landfill was closed and natural succession was allowed to turn it into a naturalization area with hiking trails connecting with the Bruce Trail (Regional Municipality of Niagara, 2011a). The restoration of the quarry site into a naturalization site provided a recreation park and a refuge for bees whose vital role in pollination is crucial in a farming area (Brock University, 2010). Professor Miriam Richards of Brock University identified the return of 125 species of bees to the area (Brock University, 2010). The above is an example of policies' effects on mitigating the negative impact of land use.

Quarries

Aggregate and stone quarries impose land stress by the permanent loss of topsoil and often, alteration of ground water regimes if no rehabilitation arrangements are tied to the quarry license. By virtue of the limestone and sandstone formations of the Niagara Escarpment and the proximity to urban areas, aggregate quarries constitute a significant economic activity and land use in rural Niagara. There are 15 active sites in Niagara Region at present mostly along the Niagara Escarpment and the Onondaga Escarpment along Lake Erie shores. Fonthill, in the middle of Niagara, stands on a kame of sand and gravel left by the last glacial retreat. In view of the short supply of sand and gravel (Forgeron, 2011) the pit of Fonthill, operated by Lafrage

Canada Inc., is the only significant one. The Niagara Escarpment Plan, now forming an integral part of the Greenbelt Plan, identifies mineral resource extraction area as one of its seven area designations allowing operations licensed under the Aggregate Resources Act in the escarpment rural area designation (Niagara Escarpment Commission, 2010)

The current Ontario Provincial Policy Statement, published 2005 and reviewed in 2010, has provisions on Mineral Aggregate Resources (s.2.5) requiring that, “progressive and final rehabilitation ... to accommodate subsequent land uses” (Ontario Ministry of Municipal Affairs and Housing, 2005b, p. 20), but does not mention rehabilitating to the level of the original land use before extraction. Clause 2.5.4 on Extraction in Prime Agricultural Areas states that, “[R]ehabilitation of the site will be carried out so that substantially the same areas and same average soil quality for agriculture are restored” (Ontario Ministry of Municipal Affairs and Housing, 2005b p. 20). However, the sub clause continues to enumerate instances where complete agricultural rehabilitation is not required including the instance where restoration is not feasible. This leaves a loophole that may result in the loss of prime agricultural lands. A. G. McLellan (1983) points to the need for improving the utilization of subsurface resources and a subsequent restoration of the land resource including retention of the topsoil. The quarry operation license is granted by the Ontario Ministry of the Environment in accordance with the Aggregate Resource Act. However, the operations are supervised by the Ontario Ministry of Natural Resources where rehabilitation standards mention that its requirements may vary according to site-specifics (Ontario Ministry of Natural Resources, 2011). The planning process is led by the Region and the concerned local municipality and requires compliance with section seven of the Regional Policy Plan clause 7.B.1.32 which prohibits mineral aggregate operations in sensitive areas, clause 7.B.1.33 which specifies the conditions for operations in the Unique

Agricultural areas, and clause 7.B.1.34 which specifies the rehabilitation conditions for operations in the Greenbelt Natural Heritage System. The multiplicity of agencies connected to quarries provides a multilayered control.

The trend in Niagara is for the observance of the rehabilitation conditions specified in each licence. Some are required to rehabilitate to the original agricultural use. So, they keep the top soil and subsoil along the edges of the site to be put back. In Font Hill, two closed operations were successfully rehabilitated to agricultural use. In Vineland Quarries, parts are already restored to vines growing along the slopes (Forgeron, 2011). Other licences specify leaving a hole in the ground to be filled with water for recreational uses as a pond.

With regard to stewardship governance, the Niagara Region Council has an advisory body called the Public Liaison Committee (PLC) which addresses issues in public works and gives recommendation to the Council in the light of the input from public consultations. An example is the January 11, 2011 recommendation concerning Queenston Quarry in Niagara-On-The-Lake where the PLC recommended amendments to the Regional Policy Plan and the concerned municipality Official Plan to alter the Urban Area Boundary to facilitate the redevelopment of a former Queenston quarry into a mix of uses (Regional Municipality of Niagara, 2011b). However, regional planners opposed the Urban Area Boundary expansion because it will require unanticipated expansion of services to residential development (Van Dongen, 2011). The above are just examples of the practices in Niagara influencing land use for quarry operations to shed light on the sustainability and resilience concerns.

Forestry practice

Southern Ontario, including Niagara, was heavily settled since the beginning of European settlement. This meant clearing forests for agriculture and development. Deforestation could have resulted in the creation of permanent semi-desert wastelands if it was not for efforts by visionaries like Edmund Zavitz who, more than a century ago, started reforestation as the Chief Provincial Forester (Bacher, 2011). Such insight regarding the importance of a green cover inspired conservation, primarily in southern Ontario.

The Regional Municipality of Niagara by-law No. 30-2008 is now in force under the title, “A by-law to prohibit or regulate the harvesting, destruction or injuring of trees in woodlands in the Regional Municipality of Niagara”. One of the purposes of the by-law is to promote, “Good Forestry Practices that sustain healthy woodlands-related natural habitats and environments” (Regional Municipality of Niagara, 2008, p.1). This by-law aims at protecting the fragmented forest remnants of the past when the whole peninsula was under forest cover. Michael R. Moss describes a survey conducted in 1817 by Robert Gourlay and published in 1822 as Gourlay’s Statistical Account of Upper Canada (Moss, 1994). Gourlay described Niagara Peninsula as follows, “In 1784, the whole country was one continued forest. Some plains on the borders of Lake Erie, at the head of Lake Ontario, and in a few other places, were thinly wooded, but, in general, the land in its natural state was heavily loaded with trees” (Moss, 1994, p. 144). Forest clearing for agriculture and logging mark livelihood features which seem destined to continue. Logging under the prevailing regulations is meant to serve sustainable uses. Regional Tree and Forest Conservation By-law No. 30-2008 to regulate harvesting, destruction or injuring of trees in woodlands states in its preamble one of its purposes as, “helping to achieve 30% forest cover in Niagara Region” (Regional Municipality of Niagara, 2008c, p.1). However, no target date for

achieving the 30% forest cover has been set. In the past, unregulated logging caused erosion of the soil, disrupted water flows and harmed fish populations in rivers and streams (Weetman, 1983). At present, forests are regenerating in some parts of Niagara where the area required for farming is reduced leaving the abandoned land to revert to a semi-natural state of secondary succession (Moss, 1994). The Niagara Escarpment scarp face is fully forested and where the escarpment is cut by re-entrant valleys, the diversity of the flora manifests the richness of the ecosystem. It is such rich biodiversity that needs to be protected by plans and policies under the lens of sustainability and resilience.

Intensive agriculture

Using the land resource for agricultural purposes entails management of the soil, including tillage, fertilization, drainage, and fallowing. Over time, negative effects are manifested if the farmer does not adopt intercropping, minimum or no-tillage, and natural revitalization of the soil's fertility (Coote, 1983). Intensive monoculture farming often results in depleting soil fertility, heavy inputs of nitrogen fertilizers results in soil acidity, and pesticide use results in soil contamination. Moreover, the driving of heavy machinery over the soil results in soil compaction which reduces the soil's ability to capture rainfall and leads to more rapid runoff. In Niagara Region, tender fruit and grapes farming are types of farming which require relatively small farm areas (Regional Municipality of Niagara, 2003); this is not typical of monoculture requiring large parcels of land. Intensive farming may be typical of livestock operations; the region has seventy four dairy operations, one hundred and nineteen operations raising cattle, thirty hog operations and twenty eight livestock combinations according to 2006 census (Regional Municipality of Niagara, 2010d). Such operations are more likely to use monoculture practices.

In Niagara, the number of farms is declining. Between 1971 and 2001, the number of farms decreased by 49% with a corresponding decrease in acreage of only 7.8% indicating clearly the trend of more land area in fewer large farms run by fewer companies (Regional Municipality of Niagara, 2003, p.4.6). The region's Agricultural Economic Impact Study conducted in 2003 expressed a concern for the decline in the number of farms in Niagara as being higher than the provincial and southern Ontario rates. The study explains, "[T]he elevated level of loss is consistent with trends in other areas where pressure for urban growth is more intense" (Regional Municipality of Niagara, 2003, p. 4.6). The 2003 study was updated in 2010 and found that over the period from 2001 to 2006, number of farms in Niagara declined by 1.3% and the area of farmland also declined by 1.3% (Regional Municipality of Niagara, 2010, p.1). This indicates a stabilisation of the trend of enlarged farm sizes.

3.4.6.2 - Land protection mechanisms

The major land protection mechanisms active in Niagara are briefly discussed below. The order of the listing does not imply the order of importance for they are all important; neither is the list exhaustive for limitations of time and space for this research.

The Greenbelt Act and the associated Greenbelt Plan

The Greenbelt Plan is a major provincial initiative to preserve farmlands and a large area of Niagara lies within the Greenbelt (Ontario Ministry of Housing and Municipal Affairs, 2005). The Greenbelt Foundation is an agency established to support desirable activities in the Greenbelt. Part of the vision for 'Friends of the Greenbelt Foundation' states, "Our vision is a vibrant and healthy Greenbelt with a protected and restored rural environment, a strong and successful rural countryside, a robust agricultural sector and a pattern of urban settlement that

supports the Greenbelt” (Friends of the Greenbelt Foundation, 2011, p. 1). An example of the Foundation’s activities in Niagara Region is Niagara Trail Culinary Transition Funding which secures long-term support of culinary activities in the region. Another example is the 2007 seven grants for various Niagara organizations. In summary, Friends of the Greenbelt Foundation is exerting efforts to illustrate the positive contribution of the Greenbelt to the region’s advancement including the economic viability of agriculture and related activities in order to counter the controversy against the Greenbelt legislation led by some landowners.

The Niagara Escarpment Planning and Development Act and associated plan

In 1990, the Niagara Escarpment Planning and Development Act was passed establishing the Niagara Escarpment Commission with a mandate to draw up a plan to serve as a framework of objectives and policies combining means of livelihoods, preservation of natural areas, and public access for recreational purposes (Niagara Escarpment Commission, 2010). Roughly around sixty kilometers of the 725 km. stretch of the escarpment is within Niagara, but this UNESCO Biosphere Reserve remains the most prominent physical feature in the region and an example of how to manage for sustainability in livelihoods and stewardship. Since 2005, the Niagara Escarpment Plan became part of the Greenbelt Plan, together with the Oak Ridges Moraine Conservation Plan (Ontario ministry of Municipal Affairs and Housing, 2005a). However, the Niagara Escarpment Commission continues to manage escarpment daily affairs issuing permits for the allowable types of activities in the escarpment area according to the Niagara Escarpment Plan. In summary, the Commission administers allowable activities such as gravel and stone quarries, recreational uses and other activities in its area which includes the parts lying in Niagara Region.

The Niagara Peninsula Conservation Authority

The Niagara Peninsula Conservation Authority (NPCA) works in partnership with the Niagara Region to preserve the natural capital. NPCA covers the whole of Niagara Region together with 21% of the City of Hamilton and 24% of the Haldimand County as one watershed (Niagara Peninsula Conservation Authority, 2011, p. 1). The major activities of the NPCA include water management and safeguards against flood events, acquisition of sensitive conservation lands, and protection of valleys and wetlands (Niagara Peninsula Conservation Authority, 2011).

In the nineteenth century, forest clearing for agriculture and for building towns created wastelands in Southern Ontario. Early twentieth century visionaries like Edmund Zavitz, with his work in reforestation, inspired other conservation efforts. Inspired by Zavitz, Mel Swart, a key founder of the Preservation of Agricultural Lands Society (PALS) struggled to achieve forest-protection by-laws and ultimately the establishment of NPCA in 1959 (Bacher, 2011). It was realized that the loss of forest cover was related to flooding events. Hence, one of NPCA's duties is to monitor conditions of its watershed to prevent flooding and the associated soil erosion (Niagara Peninsula Conservation Authority, 2011).

NPCA started issuing Report Cards for the state of nature's preservation since 2005. The report card covers six indicators that include agriculture (Regional Municipality of Niagara, 2011). The Niagara Peninsula Conservation Authority's most recent Report Cards are 2005, 2006, and 2007. In comparing the indicators for the natural environment category, the Protected Natural Areas, scores for the years 2005, 2006, and 2007 respectively indicated an improvement in 2007 (from C to B). However, Species Abundance declined during the same period. Stream quality remained at D which signifies needing significant improvement. The NPCA plays a vital

role in monitoring environmental indicators in the region as it points to areas needing special attention.

Land trusts

Some land in Niagara Region is designated as park land or, in some other way, protected for ecological purposes. Among the available land protection mechanisms is the Niagara Land Trust, which was registered in 2008 (Niagara Land Trust, 2010). Land trusts are associated with natural heritage protection as well as preserving lands for agricultural purposes (Roach, 2007), or encourage farms easement arrangements, but the easement initiative has yet to emerge in the Niagara Region (Bacher, 2010).

Ontario Land Trust Alliance (OLTA) and Niagara Land Trust (NLT) are not active in Niagara region agricultural easements (Bacher, 2010), but they are active in easements for natural heritage areas. The OLTA runs programs with the support of Ontario Heritage Foundation and Ontario Ministry of Natural Resources (Hilts, 2002). Private stewardship, encouraged and supported by NGOs, is destined to play the major role in affecting conservation goals in coordination with all stakeholders. As Yvon Mercier explains, "... it is important to address the concerns of all resource users. This ensures that private stewardship programs receive maximum support from landowners, environmental groups, the general public and politicians" (Mercier, 2002, p.2). Examples of environmental NGOs are: the Nature Conservancy of Canada and the Natural Heritage League; the later is a coalition of Ontario non-government organisations (NGOs) and government agencies devoted to the preservation of natural areas (Hilts, 2002). These organizations have particularly important roles in encouraging ecological stewardship outside of formally protected areas. The Ontario Natural Heritage League (ONHL),

for example, has adopted a personal approach in stewardship advocacy by contacting landowners in high priority natural areas and entering into a voluntary handshake verbal agreement to conserve the land; the commitment later gets recognised by a Stewardship Award given to the participating landowners (Hilts, 2002). Stewart Hilts of Guelph University adds, "...The macro-economic context of agricultural and land use planning policies must be re-examined since it has a major influence on the decision of landowners" (Hilts, 2002, p.2). This is recognition of many farming landowners' financial difficulties. While a verbal agreement can be a good starting point of raising awareness, a more formal easement arrangement between a Land Trust and a landowner puts high priority lands under protection for perpetuity. The Preservation of Agricultural Lands Society (PALS) has recently forwarded a letter to the Minister of Agriculture, Food and Rural Affairs. Hon. Carol Mitchell, describing the society's vision regarding permanent protection of the fruit lands stating, "We envision a voluntary program using restrictive covenants (easements) placed on the farm title to protect the land in perpetuity much like the 1994 Tender Fruit Land Program which was cancelled by the in-coming Harris government in 1995" (Preservation of Agricultural lands Society, 2011, p.1). In summary, land trusts can play a bigger role than they presently do to include the protection of prime agricultural lands in perpetuity.

Environmental Farm Plan

Farmers, as the main rural residents in Niagara, play a pioneering role in natural heritage stewardship. One Ontario initiative in this regard is The Canada-Ontario Environmental Farm Plan. This is a voluntary assessment prepared by the farmers with guidance from the program's workshops on 23 different areas of the farm practice which amount to mitigating the negative influences of farming on the environment (Ontario Ministry of Agriculture, Food, and Rural

Affairs, 2010). Environmental Farm Plan programs include cost-share funding. The Greenbelt Foundation is one of the supporters which donate funds to the EFP projects (Greenbelt Foundation, 2010). For the NPCA report card item on the Environmental Farm Plan (EFP), participation scored a B grade in 2005 with 260 projects implemented rising to 268 in 2006 and 343 in 2007. The EFP projects are administered by the Ontario Soil and Crop Association (Ontario Soil and Crop Improvement Association, 2006). In summary, the Environmental Farm Plan, being a voluntary initiative, disseminates information that can improve the farmers' image and strengthen the relationship between farmers, environmentalists, and ordinary citizens.

In stewardship, where little is known about the impact of human activity on the environment, the sustainability imperatives serve Precaution and adaptation (S7 in appendix C) in adopting the precautionary principle for poorly understood risks, and Socio-ecological system integrity (S1 in appendix C) calling for the protection of the life support natural functions. Another sustainability imperative is the Resource Maintenance and Efficiency calling for the reduction of extractive damage and avoiding waste (S5 in appendix C), and the long-term integration of all sustainability principles to seek mutually supportive benefits (S8 in appendix C). The most relevant resilience imperatives are Ecological Variability (R2 in appendix D) which calls for working with ecological variability rather than attempting to control it, acknowledging slow variable that may tip the system into an unfavourable state (R5 in appendix D) and the valuation of Ecosystem Services (R9 in appendix D).

Criterion for evaluation

By combining and adapting the works of Gibson et al. (2005) and Walker & Salt (2006) merged with the rural Niagara specifics as indicated above, I deduce that stewardship objectives can be specified for Niagara Region as the following criterion for plans evaluation:

Plans and policies should allot specific clauses to alleviate land stressors through institutionalized adoption of the precautionary principle, socio-ecological system integrity and the application of all sustainability imperatives besides adapting to ecological variability while rewarding voluntary stewardship roles of farmers and land owners to preserve ecosystem services.

The following requirements are positive characteristics to be sought in evaluation of the plans and policies:

1. Requiring environmental impact assessments of all major projects and responding to the input from public consultations
2. Emphasize the expansion of recycling to reduce dependence on landfills
3. Subjecting quarry activities to more stringent regulations in rehabilitating the land after using it
4. Subjecting logging activities on private land to strict reforestation regulations.
5. Raising awareness about intensive farming's long-term degrading effects
6. Enhancement of the role of land trusts to protect natural as well as agricultural heritage

3.4.7 – Multi-functionality of Agriculture

Background

Agriculture was introduced to the Niagara Region by First Nations and was equally significant in the European settlement ventures, in part because the area is easily accessible by water. Before European settlement, the region was mostly covered by deciduous forests (Moss, 1994; Carolinian Canada Coalition, 2004). Today's agricultural activity and urbanisation changed the forested landscape to fragmented wooded landscape.

In regards to soil quality, the Canada Land Inventory (CLI) identifies prime agricultural lands as categories 1, 2 & 3 and these top categories are in high proportion in the Niagara Region facilitating farming activities (Regional Municipality of Niagara, 2003). In Niagara Region, agriculture has been important in the past and still plays an important role in the Region's economy. The 2010 update of the Agricultural Economic Impact Study highlights a comparison of census figures between 2001 and 2006 indicating an increase in gross farm receipts from \$511 million to \$671 million, with an average per acre Gross Farm Receipts of \$2899, the highest in Ontario (Regional Municipality of Niagara, 2010d, p. 1).

Agriculture in Niagara involves multiple products as a result of climate and soil. The above mentioned update of the Economic Impact Study groups the thirty one farming products into twelve categories where greenhouse-based production constitutes 43% of total gross farm receipts and has grown at the rate of 33% over the period from 2001 to 2006. Poultry and egg comes second in gross farm receipts, followed by grapes and tender fruit. However, all the four major products are surpassed in rates of growth over the same period by the minor activities in "horse & pony", "nursery" and "cash crop" (Regional Municipality of Niagara, 2010d). This

indicates that diversification of production is a continuing trend. Diversification is one of the factors of multi-functionality as it allows for positive biophysical interaction (Wilson, 2008). For example, a combination of crops and dairy operations can facilitate the production of biogas for energy while using the biogas generation by-product, sludge, as a fertilizer.

Agriculture in Niagara plays multiple roles in the sense that its immediate marketable outputs, especially grapes, create the thriving wine industry and the associated wine tourism. Fruits used to supply canning operations before the unfortunate closures. The closures of the canning operations reflect the multi scalar nature of farming activities as global factors influence local decisions. However, it is the non-marketable outputs that give agriculture its multi-functionality in land management for biodiversity, and recreation, and in water management. Multi-functionality is partly about benefits of agriculture that go unrewarded in the marketplace and which can vary according to farming practices such as tillage, chemical inputs, preserving wetlands, and protecting the sides of rivers and creeks. Moreover, rural areas are increasingly becoming consumption areas in outdoor activities with agriculture adding to the aesthetic amenity of rural areas (Barbieri & Valdivia, 2010). Some writers refer to yet another facet of agricultural multi-functionality, that of public goods such as food security and landscape preservation meriting support for their costs (Bruntstad, Gaasland & Vardal, 2005; Barbieri & Valdivia, 2010; Wilson, 2008). In Niagara Region the landscape preservation role is recognized by the participation in initiatives such as the Environmental Farm Plan and land trusts activities discussed in subsection 3.4.6 above; this covers the landscape preservation role. Food security role is recognized by the provision of daily consumption products which otherwise, would have been imported with all the risks and uncertainty accompanying the importation of daily needs. Geoff A. Wilson (2008) argues that the policy environment is a key driver for multi-functionality

if it adopts a holistic outlook that incorporates the social side with the environmental and economic aspects.

In order to uncover issues and trends, the influence of Niagara Region's policies linked with multi-functionality will be reviewed under the subheadings of "socio-ecological system integrity" and "value-added activities". This will be followed by a discussion of biogas production as a promising facet of multi-functionality.

Socio-ecological system integrity

Multi-functionality in agricultural activities provides the harmony needed in the rural landscape between production and stewardship working towards sustainability and the preservation of nature's goods and services vital for functioning systems (Zasada, 2011; Atwell, Schulte & Westphal, 2010; Hajkowicz, 2009). Vineyards in Niagara are associated with wineries and wine tourism. Farming in general provides an aesthetic addition to the quality of life in the region and gives the region its identifiable character which is closely associated with rural tourism and ecotourism. The above are all factors of agricultural multi-functionality, which serve an integration of the social and the ecological systems (Wilson, 2008). Geoff A. Wilson links trends in multi-functionality with productivist and non-productivist regimes as referred to in chapter two on generic areas of consideration. Wilson further explains, "Actors in the strongly multi-functional agricultural regime show strong tendencies for local and regional embeddedness (strong governance structures), characterized by activities that will help provide new income and employment opportunities" (Wilson, 2008, p. 368). Niagara Region's agricultural policies indicate trends of multi-functionality; one such policy is the fostering of on-farm and off-farm value-added activities.

Value-added activities

One of the region's initiatives to boost economic activity in the rural areas is the proposal of encouraging value-added activities in farms (Regional Municipality of Niagara, 2009c; Robson, 2010). The Region considers this initiative an innovative means of improving farm viability. In the proposed Regional Plan Policy Amendment 6 – 2009, the Region allows on-farm and off-farm locations not necessarily operated by the farmer, but strictly servicing the agricultural economy. Activities have to be in line with the Provincial Policy Statement in which section 2.3.3 regulates uses permitted in Prime Agricultural Areas restricting them to agricultural uses, secondary uses, and agricultural related uses, as a framework (Regional Municipality of Niagara, 2009c). An ongoing activity that adds value to the agricultural product is the Niagara thriving wine industry and its associated nature tourism. Other activities include farm gate marketing and biogas production.

A study by Planscape was reviewed by the Region staff and a final report entitled "Review of land Use Policy and Related Implementation Methods Regarding Agricultural Value-Added Activities" was approved by the Region. The report identifies activities ranging from simple "washing and sorting" to "processing". It describes value added as income added. In the wine industry the present value added activities in Niagara include tours and wine tasting, gift boutiques, and bed and breakfast hospitality. The report articulates the approach as, "a perceived need to develop a broader definition of agriculture and agricultural activities that goes beyond the traditional restrictions to recognize innovative means of improving farm viability" (Regional Municipality of Niagara, 2009c, p.2). Such broadening of defining agriculture is identified as a tendency towards multi-functionality. Combined operations of dairy and crops open the possibility for biogas production as an additional farm activity. Biogas in Niagara

Region is discussed in the following subsection. Exploring venues for ensuring a viable industry drives the Region's interest in value-added activities and savings in energy costs can be one venue served by biogas production.

Biogas production

Among the possibilities open to the contributions of agriculture towards a sustainable and resilient farming multi-functionality in rural Niagara, is biogas production. Biogas production, which has already begun on a small scale in the region, is not only a way to improve farms' profitability, but also a way to develop a culture of minimising waste by making use of human and animal wastes together with the remains of plants after harvest. Biogas production facilities in the region already started with humble beginnings that can be expanded. Clare Riempa consultants worked with PlanET Biogas Solutions Inc. to build a 250 KW biogas plant in Jordan Station, Lincoln to produce electricity and heat to supply a greenhouse with its energy requirements and sell the surplus to the grid. Another plant was built in the region using the leftover when grapes are crushed for wine (Riempa Consultants, 2010).

In summary, biogas production in Niagara Region is still in its initial stages and is, therefore, a promising area for expansion. Plans and policies can be effective tools in speeding up progress in such a win-win solution for farm wastes.

The sustainability imperatives linked with agricultural multi-functionality as a means to boost income and reduce costs are Socio-ecological system integrity that calls for building human-ecological relations (S1 in appendix C), Livelihood Sufficiency and Opportunity (S2 in appendix C) which calls for providing opportunities to seek improvements, and Resource Maintenance and Efficiency (S5 in appendix C) which calls for avoiding waste and cutting

material and energy use, Immediate and Long-term Integration of all sustainability imperatives (S8 in appendix C), Precaution and Adaptation (S7 in appendix C) by guarding against uncertainty through diversification (R1 in appendix D). Other resilience imperatives of relevance are: Modularity (R3 in appendix D) calling for self-contained modular components utilizing waste, and Innovation (R7 in appendix D) emphasizing experimentation, locally developed rules and embracing change to acknowledge slow variables (R4 in appendix D) and monitor feedbacks (R5 in appendix D).

Criterion for evaluation

By combining and adapting the works of Gibson et al. (2005) and Walker & Salt (2006) merged with the rural Niagara specifics, as indicated above, I deduce that agricultural multi-functionality objectives can be specified for Niagara Region as the following criterion for evaluation:

Plans and policies should acknowledge and foster multi-functionality in agriculture as one of the means to foster farming viability and livelihoods, socio-ecological system integrity, sustainable use of resources through the adoption of precaution and adaptation and the integration of all sustainability imperatives. Multi-functionality entails fostering diversification, the building of a regional modular character while acknowledging slow variables and system feedbacks through innovative local solutions

The following requirements are positive characteristics to be sought in evaluation of the plans and policies:

1. Recognition of agricultural multi-functionality
2. Support for local food processing plants

3. Use of fiscal tools to enhance value-added activities linked with farming
4. Incorporation of incentives and structural arrangements to support biogas production to recycle waste and reduce dependence on fossil fuels.

3.4.8 – Preparedness for the future

Can the vagaries of the free market push Niagara out of being competitive in agricultural productivity? Can climate changes alter the pattern of feasible farming products? Is the rural socio-ecological system suffering irreversible degradation? These are plausible questions for an age of surprises and uncertainty. So, how is Niagara getting prepared for the unexpected?

Background

Niagara Growth Management Strategy, a growth plan for the period 2008-2031, was developed through community surveys, workshops and focus group discussions (Regional Municipality of Niagara, 2006). In 2006, the Region prepared a report entitled Niagara's Growth Management Strategy: Backgrounder, Charting our Shared Future, which stressed Niagara's position between the Greater Toronto Area (GTA) and the U.S. This report was the preparatory stage for the Region's Growth Management Strategy of 2008 to ensure a Growth Strategy responding to the Region's aspirations while being in harmony with the provincial Growth Plan requirements including intensification indices. This background report is significant in setting a Grow South strategy. The actual Growth Management Strategy, which was produced two years later, did not adopt the Grow South trend, but rather a combination of Grow South and other options. The preferred growth option reflected stakeholders' contribution described by the plan as, "Accordingly, the municipal allocations in the Preferred Option are not solely dictated by anticipated market forces ... other considerations, such as potential ecological impacts,

infrastructure costs and economic policy objectives could be addressed” (Regional Municipality of Niagara, 2008, p. iii). The Preferred Option provides for growth in all communities and eliminates the need for immediate urban boundary expansions (Bacher, 2010). The deviation from original evaluation is also indicative of the changing economic drivers putting less emphasis on trade exchanges south of the border. The experience with the medium term planning shed light on the continually changing drivers and the complexity and uncertainty that need to be accommodated.

The long term plan

Niagara Region produced a discussion paper for a long term planning under the title, “Sustainable Niagara 2060” (Regional Municipality of Niagara, 2010a) to imagine Niagara in 2060 and apply back-casting to work towards the imagined goals. The project is still at the initial stage of stakeholders and citizens input; the writer of this research actively participates in such workshops, an ongoing process during 2011 and continuing in 2012. Sustainable Niagara vision has eight focus areas with their goals: 1) Infrastructure systems, 2) Culture, learning and social development, 3) Health and security, 4) Ecosystems and natural areas, 5) Built environments, 6) Governance, 7) Economy, and 8) Agriculture and food

The Sustainable Niagara vision for agriculture, a major activity in rural Niagara, is focused around, “The need for a national food policy . . . More local food policies and strategies are also being developed to boost consumer knowledge of what foods are available and the benefits of local products; connect food back to the land and the farmer who grows it” (Regional Municipality of Niagara, 2010a). This is a significant inclination towards establishing links

between consumption and the resource, land. It is indicative of embeddedness and modularity, fostering tight feedbacks and social capital, all are imperatives of resilience.

For the purpose of this evaluative research, the Region's preparedness for the future will be examined through the 'Sustainable Niagara 2060' long-term plan's goals and its resilience implications. The plan is in its preparation final stages, but its goals are already identified.

On ecological resilience, the indicators that will be monitored for achieving a healthy, well maintained and resilient natural system include: percentage coverage by the natural heritage system, indicator species abundance, and stream erosion (Regional Municipality of Niagara, 2010e). For agriculture and food, the indicators that will be monitored for achieving abundance of agricultural lands that produce quality products and foster a unique sense of identity include net revenue per acre, capacity of producer-based crops, value-added operations and economic contribution by agriculture (Regional Municipality of Niagara, 2010e).

On building social resilience, the indicators to be monitored for achieving the goal of an inclusive engaged community that values culture, learning and social development are: Educational attainment of the working population, public funding towards poverty, and economic footprint of the cultural sector (Regional Municipality of Niagara, 2010e).

On the economic resilience, the indicators that will be monitored to achieve an innovative and diverse business and high quality life are: median income levels, employment rates, and changes in cost of agricultural production/ selling price of product (Regional Municipality of Niagara, 2010e). Building a learning economy is one way to counter uncertainty by creating an ongoing process of adaptability to changes through learning from experience. Another vision in economic resilience is the benchmarking of regional competitiveness as a response to globalised

challenges. Niagara Region or any other region has distinct characteristics which distinguish it from other regions. It is the fostering of such local characteristics that identify a path for regional competitiveness by selling a regional brand (Eaton, 2008).

The vision and goals of the remaining six areas in “Sustainable Niagara” are all about building resilience within a distinct Niagara character.

In summary, preparedness to face uncertainty in Niagara revolves around the 2060 plan goals and visions, including the promoting of a unique Niagara character. However, since all plans and policies have some urban bias (Summer, 2005b), the criterion on preparedness for the future should emphasise shielding the rural milieu from neo-liberal and neo-Darwinian allusions that “if rural areas do not adapt to the inevitability of the global economy, they are not fit to survive” (Summer, 2005b, p. 304). The political history of Ontario, of which Niagara is part, witnessed experimenting with neo-communitarianism during the Bob Rae NDP government (1990-1995), followed by neo liberalism during the Mike Harris, PC government (Eaton, 2008). The effect of such shift on Niagara forced NGOs working on sustainable food projects linked with community economic development to shift to market-led elitist forms of agri-tourism in response to the shift to neo liberalism (Eaton, 2008). Adaptive management of all projects should characterise rural Niagara’s buffering against sudden shifts in government policies by promoting Niagara’s unique character or what Eaton (2008) calls selling the locale.

The sustainability imperative of close relevance are Precaution & Adaptation (S7 in appendix C), and Immediate and Long-term Integration (S8 in appendix C) which calls for applying all the sustainability principles at once to target mutually supportive benefits. As for the resilience imperatives, all nine are applicable as the preparedness for the future is basically about

being ready to absorb shocks without shifting to an undesired state. Here, resilience is defined as ecological resilience, “resilience is measured by the magnitude of disturbance that can be absorbed before the system redefines its structure by changing the variables and processes that control behavior (Gunderson, 2000, p. 426). The term ecological resilience is used in the sense of distinguishing it from engineering resilience (Gunderson, 2000). Lance Gunderson (2000) suggests three strategies for adding resilience to managed systems: increasing the system’s buffering capacity, managing for processes at multiple scales, and nurturing sources of renewal. Such strategies are included in the following merging of local characteristics with the imperatives of sustainability and resilience.

Criterion for evaluation

By combining and adapting the works of Gibson et al. (2005), Walker & Salt (2006) and other writers merged with the rural Niagara specifics, as indicated above, I deduce that the objectives of preparedness for the future can be specified for rural Niagara as the following criterion for evaluation:

Plans and policies should institutionalize the adoption of precaution and adaptation as one of the means to prepare for uncertainty and applying all sustainability imperatives to seek mutually supportive benefits while nurturing a resilient Niagara character through all resilience imperatives.

The following requirements are positive characteristics to be sought in evaluation of the plans and policies:

1. Fostering ecological resilience through stopping and reversing degradation of the natural system

2. Fostering social resilience through building the capacity the human capital in the rural Niagara milieu
3. Fostering economic resilience through diversifying economic activities and encouraging in-built adaptability to global changes
4. Building a distinct Niagara character as a driver for competitiveness

**3.5 – The generic Categories of Consideration of section 2.4 specified as
evaluation Criteria for the Niagara context**

In the above description of the Rural Niagara system, the qualitative method of a single case study was used to arrive at a tentative Niagara-context listing of criteria drawn from the eight broad areas of consideration (chapter two) reflecting generic categories in rural areas close to urban centres. The importance of uncovering generic categories of consideration lay in the creation of a conceptual framework guided by the imperatives of sustainability and resilience. Applying the generic categories to the rural Niagara context led to the creation of the above criteria to evaluate plans and policies pertaining to land use. The criteria are summarized in the following table 3.1.

Column two of table 3.1 below refers to the sustainability and resilience imperatives linked with each category. This highlights interdependencies between the categories.

The eight sustainability imperatives (Gibson et. al, 2005) are described briefly as S1 (Socio-ecological system integrity), S2 (Livelihood sufficiency & opportunity), S3 (Intragenerational equity), S4 (Intergenerational equity), S5 (Resource maintenance &

efficiency), S6 (Socio-ecological civility & democratic governance), S7 (Precaution & adaptation), S8 (Immediate & long-term integration).

The nine resilience imperatives (Walker & Salt, 2006), are described briefly as: R1 (Diversity), R2 (Ecological variability), R3 (Modularity), R4 (Acknowledging slow variables), R5 (Tight feedbacks), R6 (Social capital), R7 (Innovation), R8 (Overlap in governance), R9 (Ecosystem services).

Table 3.1, Eight Major Criteria of Evaluation in the rural Niagara context:

Major Criteria for Evaluation in the context of rural Niagara	The relevant sustainability and resilience imperatives
<p>1 – Plans and policies should provide for building communities’ capacity in participative and collaborative governance including overlap in governance, and more devolved responsibilities.</p> <p>Examples:</p> <p>Institutionalizing public deliberations in drafting plans as in Sustainable Niagara 2060; Coordinating municipal Official Plans with the Regional Policy Plan through dual representation in the Regional and municipal councils (overlap in governance)</p>	<p>S6</p> <p>R8</p>
<p>2 – Plans and policies should provide means for reconciling different interests in a way that celebrates diversity and ensures</p>	<p>S2, S3, S6</p> <p>R1, R4, R5, R6</p>

<p>sufficiency and opportunity for all towards intragenerational equity and democratic governance while supporting community solidarity and social capital to acknowledge slow variables and feedback signals.</p> <p>Example: Encourage Community Supported Agriculture</p>	
<p>3 – Besides protecting farmlands, plans and policies should provide for the support of viable farming by fostering livelihood sufficiency and preserving resources for future generations within a modular regional character.</p> <p>Examples: Resisting the rezoning of agricultural lands to urban uses;</p> <p>Supporting local food marketing</p>	<p>S2, S4, S5</p> <p>R3</p>
<p>4 – Plans and policies should provide for strengthening the socio-economic base integrity in ways that also maintain/ rehabilitate the socio-ecological base reducing threats to its long-term integrity while encouraging diversity and innovation.</p> <p>Examples: Revitalizing the rural milieu through expanding ecotourism and wine tourism; encouraging innovative solutions and green industry in the rural milieu</p>	<p>S1, S5</p> <p>R1, R7</p>

<p>5 – Plans and policies are to be used as a tool to reduce intragenerational and intergenerational inequities in livelihood sufficiency and opportunity through collective responsibility, building trust, and innovative solutions to the local poverty problems.</p> <p>Examples: The introduction of programs to help new immigrants; improve public services in rural areas</p>	<p>S2, S3, S4, S6</p> <p>R6, R7</p>
<p>6 - Plans and policies should allot specific clauses to alleviate land stressors through institutionalized adoption of the precautionary principle, socio-ecological system integrity and the application of all sustainability imperatives besides adapting to ecological variability while rewarding voluntary stewardship roles of farmers and land owners to preserve ecosystem services.</p> <p>Examples: Adopting the precautionary principle in environmental impact studies; valuing nature’s services; empowerment of local advocacy groups’ efforts to protect natural heritage</p>	<p>S1, S5, S7, S8</p> <p>R2, R5, R9</p>
<p>7 – Plans and policies should acknowledge and foster multi-functionality in agriculture as one of the means to foster livelihoods, socio-ecological system integrity, sustainable use of resources through the adoption of precaution and adaptation and</p>	<p>S1, S2, S5, S7, S8</p> <p>R1, R3, R4, R5, R7</p>

<p>the integration of all sustainability imperatives. Multi-functionality entails fostering diversification, the building of a regional modular brand while acknowledging slow variables and system feedbacks through innovative local solutions</p> <p>Examples: Rewarding the role of farmers as stewards; supporting value-added activities and biogas production</p>	
<p>8 – Plans and policies should institutionalize the adoption of precaution and adaptation as one of the means to prepare for uncertainty and applying all sustainability imperatives to seek mutually supportive benefits while nurturing a resilient Niagara character through all resilience imperatives.</p> <p>Examples: Building a Niagara brand competitive character</p>	<p>S7, S8</p> <p>R1 to R9</p>

Conclusions

The theoretical contribution of arriving at the above contextualized criteria is the merging of sustainability and resilience imperatives within a conceptual framework of generic categories of consideration. This merging highlights the links between the different criteria.

The practical contribution is to provide criteria guided by the sustainability and resilience imperatives to be used by stakeholders to meaningful critique the plans and policies pertaining to land use for their effects on rural Niagara’s livelihoods and stewardship.

Chapter 4 – Checking the eight categories of consideration by triangulation

4.1 – Introduction: the chapter agenda

This chapter serves the purpose of checking the eight categories of consideration listed at the end of chapter two on table 2.1 above through triangulation using two additional methods besides the case study, namely documents analysis and local press content analysis to check if the eight categories are present. It also serves the purpose of answering the last part of the research questions of chapter one, namely the prioritization of the categories. The triangulation exercise does not change the criteria of evaluation pertaining to Niagara context of table 3.1. I simply check the presence of the broad categories of consideration and their prioritization order. The broad categories as merged with sustainability and resilience imperatives are reiterated here:

1. Democratic governance and overlap in governance that foster participatory governance and includes redundancy structure
2. Social relations in the rural milieu that foster intragenerational equity, socio-ecological civility and build social capital within modularity
3. Viable farming and its links to the preservation of socio-ecological system integrity, livelihood sufficiency, preserving and maintaining the land resource for future generations and acknowledging slow system variables, modularity and ecosystem services
4. Building a strong socio-economic base benefiting from urban migrants while maintaining/ rehabilitating the ecological base to cater for livelihood sufficiency and

intragenerational equity through diversity and innovation while acknowledging slow variables

5. Equity in the rural milieu through livelihood sufficiency and intragenerational equal opportunity guided by democratic governance that builds social capital
6. Stewardship in the rural system to reverse environmental degradation through socio-ecological system integrity, resource maintenance, the adoption of the precautionary principle and adaptive management that respects ecological variability and ecosystem services in a modular approach to acknowledge slow system variables and feedback signals
7. Embracing agricultural multi-functionality that targets socio-ecological system integrity and protects ecosystem services while seeking livelihood sufficiency and intragenerational equity through the adoption of diverse activities to cater for slow variables and tight feedbacks
8. Preparedness for the future through achieving socio-ecological system integrity, respecting ecological variability to acknowledge slow variables and system feedback by building ecological, social, and economic resilience and seeking mutually supportive benefits of applying all sustainability principles

4.2 – Method

To check the validity of the evaluation criteria of table 3.1 arrived at using the single case method, the second step is to conduct a documents analysis to check the presence of the broad categories; this was done through analyzing a representative sample of regional governmental

and non-governmental documents to identify the mention of each category and to what degree of emphasis and prioritization. The third step is to consult public archives represented by the local press and conduct a standard content analysis to check how the eight categories are presented. Thus, the listing of relevant categories of consideration was examined from three different angles:

- Specifying the literature review identification of major categories of consideration to the Niagara context through the case study.
- Sifting through the Region's governmental and non-governmental documents. This is to examine how the same categories are emphasized or downplayed in order to present them in the order of prioritization. Also to investigate if there are recurring additional categories.
- Deciphering the contents of the local press to feel the public pulse, listen to the words of the texts in manifest and latent content analysis, and measure the order of priority attached to each category.

A summary of prioritized categories is tabulated in section 4.4 as table 4.4 to constitute the prioritized criteria for the plans' evaluation.

4.3 – Examining Niagara's categories of consideration from different perspectives

4.3.1– Key categories of consideration in the Niagara rural context

The categories identified are drawn from generic areas of consideration (table 2.1) which are common to rural areas close to urban centres in developed countries and projected on Niagara Region. This exercise resulted in criteria for evaluation for rural Niagara; these are summarized

in table 3.1 of section 3.5 of chapter three above as criteria for evaluating plans and policies related to land use.

4.3.2 –Categories of consideration as reflected in document analysis

In this subsection, I examine the contents of documents for how each of the eight categories identified in chapter two, is presented and the emphasis attached to its mention. The units of analysis are therefore documents. The sample is a purposive selection of documents most closely related to the research focus. I adopted a combination of sources that included examining official documents, literature of public (example the Ontario Trillium Foundation) and private (example PALS and OLA) organizations to achieve a comprehensive unbiased coverage. The data sets take the form of summations and the analysis is cross-sectional although some Regional documents address the same issues repeatedly over a lapse of time (Example: Regional Policy Plan Review of 1990, the Economic Impact Study of 2003 and the Growth Management Strategy of 2008), thus adding a longitudinal dimension.

The governmental documents examined were:

1. 1989 Policy Plan Review under the title of *Farming in the Niagara Region: Structure, Trends and Land Use Policies*.
2. The Region's initiative on consulting a wide spectrum of stakeholders in discussing where new development should be located. The document produced in 1990 is entitled: *Responses to "Where Next? A Look to the Future*
3. A brief to Canada's governments describing what measures are needed from the four levels of government, federal, provincial, regional, and municipal. The

document produced in 1990 is entitled: *Preserving Niagara's Agricultural Industry: Initiatives by All Four Levels of Government for Today's Farmers*

4. The study conducted by Planscape for the Region under the title: *Regional Agricultural Economic Impact Study*
5. *Securing a Legacy for Niagara's Agricultural lands: A Vision from One Voice.*
This is a document by the Niagara Region Agricultural Task Force endorsed by the Region in May 2004
6. *Energizing Niagara's Wine Country Communities.* A document produced for the Region by a private consultant in 2007.
7. A document of the Niagara Peninsula Conservation Authority (NPCA) on the watershed.
8. A document of the Niagara Parks Commission (NPC).

The non-governmental documents are:

1. A document by The "Preservation of Agricultural Lands Society"
2. A document by "Friends of the Greenbelt Foundation"
3. A document by "Ontario Landowners Association" (OLA)
4. A document by "Citizens Coalition of Greater Fort Erie"
5. A document by "Niagara Land Trust"

An annotated bibliography of the above thirteen documents is in Appendix E. While realizing that there are other initiatives and studies, the above Regional documents are chosen based on several visits to the region and posing queries to Mr. Patrick Robson, the Commissioner, Integrated Community Planning in the Region (Robson, 2010b). The non-

governmental documents were chosen as a purposive sample through the literature review exercise.

4.3.2.1 – Method

In choosing between the different methods for the above documents' analysis, I employ what Berg (2009) calls Directed Content Analysis described as, "Directed content analysis involves the use of more analytic codes and categories derived from existing theories and explanations relevant to the research focus. In this case, the researcher will get immersed in the raw data, using these themes and those that may emerge from the data itself" (Berg, 2009, p. 341).

Through a coding protocol focusing on rural livelihoods and stewardship, the analysis leads to confirming the criteria emerging from each category within the Niagara context identified in table 3.1 above. The coding protocol is to examine each document for the eight categories transformed into concepts in the original table 2.1 as identified by the indicators listed in table 4.1 below, record the manifest and latent mention of the concept, and code its response (N for an alarming issue, P for an issue needing to be addressed) as indicated in Appendix F and summarized in table 4.2 below.

The concept was used as a "descriptive inference" (Adcock & Collier, 2001) to facilitate operationalizing the concept. Adcock & Collier (2001) observe four levels between concept and observation: starting with a background concept, a researcher moves to the second level of a systemized concept which is a specific formulation subject to an explicit definition (In my case a merging of the background concept with sustainability and resilience imperatives). The third level involves the indicators which, in qualitative research, serve the classification procedure. In the final fourth level are the scores or the conclusions of qualitative coding. Validity is judged by

how the codes capture the ideas in the systemized concept. Reliability is judged by avoiding what Adcock & Collier (2001) call random error, which may be introduced by classifications that may vary between two researchers. For example, I started by complementing the basic classification of direction with a classification of the intensity of a document's response to a concept as High, Medium, or Low. Upon a repetition of the classification to check consistency, random error was noticed and the intensity classification was dropped in the summary tables. Adcock & Collier (2001) posit that random error may result in a correct classification "on average", but they also point to the basic consideration of preserving reliability. Towards the goal of achieving higher reliability, random error was avoided in the summary tables by confining classification to the direction only.

The concepts extracted from generic categories were systemized by merging them with sustainability and resilience imperatives (table 2.1). By sifting through the documents, the presence of the concepts was captured through the associated indicators specified in the following subsections. Thus, the indicators provide the transfer from a conceptual definition to an empirically measurable term.

Miles & Huberman (1994, p. 11) suggest that an initial step in analyzing qualitative data is to reduce it. "Qualitative data can be reduced and transformed in many ways: through selection, through summary or paraphrase, through being subsumed in a larger pattern, and so on". In this research, the examined documents were reduced to only what is pertaining to rural livelihoods and stewardship and to the concepts being analysed as a theoretical proposition.

On maintaining consistency, Berg (2009) quote Strauss (1987, p.30) as suggesting guidelines for open coding (that which opens inquiry); most important is to ask the data specific

and consistent set of questions. In this research, each category of consideration was examined in the documents with the same set of appropriate questions as indicated below. The sample of documents chosen was a purposive sample based on the relevance to the research question. The short list of the Region's documents was checked for close relevance by a visit to the Region.

The main questions for analyzing the documents are:

- 1 How is the concept of the major category represented in the document?
- 2 How is the concept related to the other seven concepts?
- 3 What are the implications of the case study thick description on the concept as presented in the document?

Responses to each concept in answer to question one were judged on how the concept is portrayed by using indicators to identify the concept. The indicators are decided upon intuitive logic and guided by the indicators used by the Niagara 2060 study (Regional Municipality of Niagara, 2010e). Responses were coded with a Nominal Measure as follows:

An alarming issue (N)

An issue needing to be addressed (P)

The frequency of mentioning a concept together with its indicator's letter (see Appendix F) is recorded to facilitate the identification of the importance attached to a concept. In deciding the frequency, an additional count is considered for a new theme in order not to repeat a count for the same theme in the same section.

The Intensity was initially evaluated as:

L (Low) if a category is simply mentioned

M (Medium) if a category is mentioned highlighting its importance

H (High) if a category is mentioned indicating the negative effects of losing it

Each document is analyzed for all concepts, but then the Appendix F is filled for each concept separately (F1 – F8 present concepts 1 to 8) in order to facilitate answering questions two and three above for each concept under its corresponding appendix.

Table 4.1. The indicators for the eight concepts:

<p>G1- Governance Embracing S3, S6 R1, R4, R5, R6</p>	<p>a) responding to public consultations outcome, b) involvement of NGOs, c) encouraging volunteerism, d) reforming the decision making process</p>
<p>G2- Positive Social Relations Embracing S2, S3, S6 R1, R5, R6</p>	<p>a) subscribing to “Community Supported Agriculture”, b) resolving conflicts over land use, c) supporting farmers markets, d) fostering participation in community activities</p>
<p>G3- Viable Farming Embracing S1, S2, S4, S5 R1, R3, R4, R5, R9</p>	<p>a) trends in rented farms, b) inclinations to sell or stop farming, c) reduction in farmed acreage, d) gross farm receipts changes, e) marketing of local products, f) right to farm protection, g) preservation of agricultural lands, h) supporting the agricultural industry</p>
<p>G4- Socio-economic</p>	<p>a) tourism, including wine tourism, b) rural job markets, c)</p>

<p>Base</p> <p>Embracing S1, S2, S3, S5</p> <p>R1, R2, R4, R7, R9</p>	<p>economic diversification, d) exports of agricultural produce, e) changes in cost of agricultural production/ selling price of product, f) intensification of urban residential development.</p>
<p>G5- Equity</p> <p>Embracing S2, S3, S4, S6</p> <p>R2, R6</p>	<p>a) disproportionate poverty levels, b) rural service provision, c) agricultural workers' limited rights, d) living wage raise, e) access to nutritious food, f) fostering multiculturalism</p>
<p>G6- Stewardship</p> <p>Embracing S1, S5, S7, S8</p> <p>R2, R5, R9</p>	<p>a) environmental protection, b) land trusts activities, c) supporting the Environmental Farm Plan program, d) indicator species abundance</p>
<p>G7- Multi-functionality in agriculture</p> <p>Embracing S1, S2, S5, S7, S8</p> <p>R1, R3, R4, R5, R7</p>	<p>a) wineries' trends, b) fostering farm gate marketing, c) value added activities, d) conservation of cultural heritage, e) on-farm energy production</p>
<p>G8- Preparedness for the Future</p> <p>Embracing S1, S2, S3, S8</p> <p>R1 to R9</p>	<p>a) use of backcasting, b) applying the Precautionary Principle, c) presence of alternative plans, d) recognizing uncertainty</p>

4.3.2.2 - Results

The summary of the findings is reflected in table 4.2 below. Intensity was omitted as it was not consistent when the evaluation was repeated to test coding consistency. Direction was consistent when tested by repeating the evaluation.

Table 4.2 – Results of Document Analysis: Summary of the findings of Appendix F on the count of the frequency of mention of the eight categories and any emerging categories

<u>Category/ Indicator</u>	<u>Number of mentions</u>	<u>Direction</u>
1a- Governance/ Responding to public consultations outcome	11 1	P N
1b- Governance/ Involvement of NGOs	1	P
1c- Governance/ Encouraging volunteerism	1 1	N P
1d- Governance/ Reforming the decision making process	3 2	P N
2a- Positive Social Relations/ Subscribing to “Community Supported Agriculture”		
2b- Positive Social Relations/ Resolving conflicts over land use	4 1	N P
2c- Positive Social Relations/ Supporting farmers markets	3 1	P N
2d- Positive Social Relations/ Fostering participation in	3	P

community activities		
3a- Viable Farming/ Trends in rented farms	2	N
	3	P
3b- Viable Farming/ Inclinations to sell or stop farming	12	N
3c- Viable Farming/ Reduction in farmed acreage	14	N
	3	P
3d- Viable Farming/ Gross farm receipts changes	7	N
	6	P
3e- Viable Farming/ Marketing of local products	6	N
	9	P
3f- Viable Farming/ Right to farm protection	5	N
	4	P
3g- Viable Farming/ Preservation of agricultural lands	16	N
	2	P
3h- Viable Farming/ Supporting the agricultural industry	4	N
	11	P
4a- Socio-economic Base/ Tourism including wine tourism	3	N
	15	P
4b- Socio-economic Base/ Rural job markets	6	N
	3	P
4c- Socio-economic Base/ Economic diversification	2	P
4d- Socio-economic Base/ Exports of agricultural produce	2	P
4e- Socio-economic Base/ Changes in cost of agricultural	2	N

production	4	P
4f- Socio-economic Base/ Intensification of urban residential development	5 8	N P
5a- Equity/ Disproportionate poverty levels	2	P
5b- Equity/ Rural service provision	2 4	N P
5c- Equity/ Agricultural workers limited rights		
5d- Equity/ Living wage raise		
5e- Equity/ Access to nutritious food		
5f- Equity/ Fostering multiculturalism	2	P
6a- Stewardship/ Environmental protection	13 25	N P
6b- Stewardship/ Land conservation	11 8	N P
6c- Stewardship/ Supporting the Environmental Farm Program	5	P
6d- Stewardship/ Indicator species abundance	6 2	N P
7a- Multifunctionality in Agriculture/ Wineries trends	1	P
7b- Multifunctionality in Agriculture/ Fostering farm gate marketing	1 3	N P
7c- Multifunctionality in Agriculture/ Value-added activities	3 5	N P

7d- Multifunctionality in Agriculture/ Conservation of cultural heritage	1 7	N P
7e- Multi-functionality in Agriculture/ On-farm energy production	1	P
8a- Preparedness for the Future/ Use of backcasting		
8b- Preparedness for the Future/ Applying the precautionary principle	5 1	N P
8c- Preparedness for the Future/ Presence of alternative plans	2 1	N P
8d- Preparedness for the Future/ Recognizing uncertainty	5 4	N P

4.3.2.3 – Analysis

The summary table above indicates the relative importance attached to each category and answers the first question in analyzing the documents: How is the concept of the major category represented in the documents? As for the second and third questions, on how each category relates to the other seven and how is it presented in the case study thick description, these are discussed in the following analysis.

In the above, the highest level of mention is the level (16) of N, an alarming issue. This was for the category of Viable Farming, for the indicator, “Preservation of agricultural lands”. The second highest N (15) is within the same category of Viable Farming for the indicator

“Reduction in farmed acreage”. Outside the category of Viable Farming, the high levels of mention are for the category of Stewardship, for the indicator “Environmental protection” (25), followed by the category of Socio-economic Base, for the indicator “Tourism including wine tourism” (15), both as a P, an issue needing to be addressed.

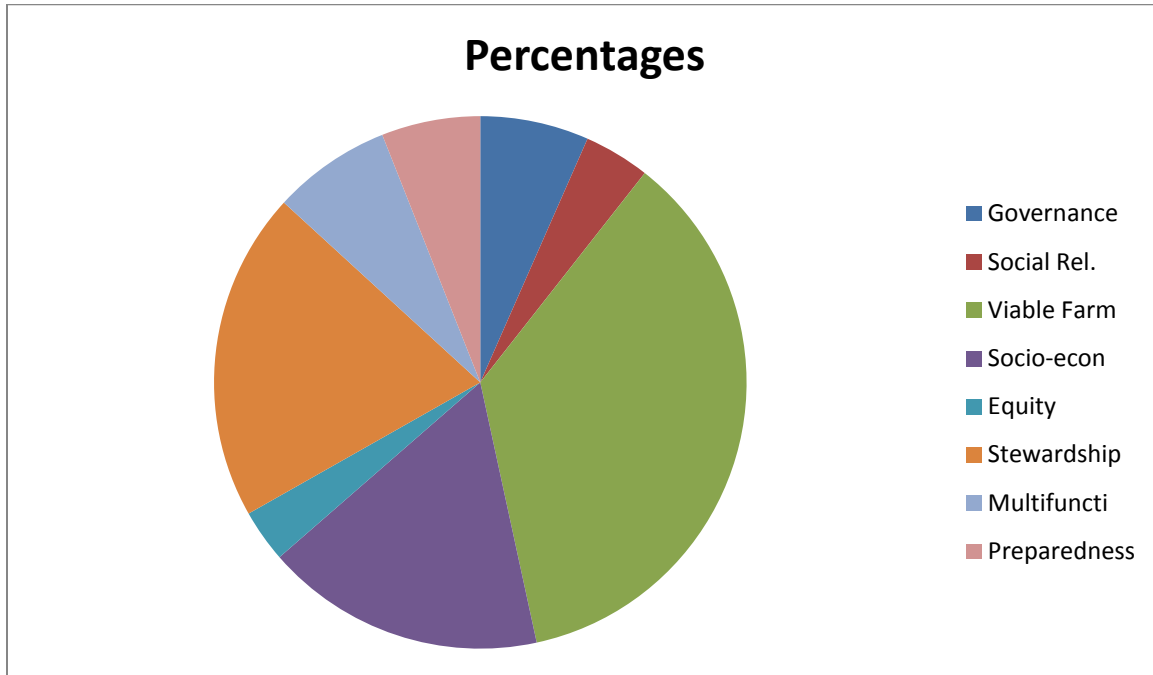
In order to compare the relative weight and importance attached to the categories above by the reviewed documents, the following table and pie diagram are analyzed:

Table 4.2.1- Document Analysis: Total frequencies of mention for all indicators per category and percentage weighing

Category	Total number of mentions	Percentage of the category's frequency of mention compared to the total mentions
G1- Governance	20	6.6%
G2- Positive Social Relations	12	4%
G3- Viable Farming	107	36%
G4- Socio-economic Base	50	17%
G5- Equity	10	3.2%
G6- Stewardship	60	20%
G7- Multi-functionality in Agriculture	22	7.2%
G8- preparedness for the Future	18	6%

The above table is illustrated in the pie diagram below:

The number of mentions of each category as a percentage of the total mentions



The following quotations from the reviewed documents highlight the relative importance attached to the above categories and introduce emerging issues.

Document number one of the governmental documents is part of the Niagara Region Policy Plan Review in 1989 entitled "Farming in the Niagara Region". One of the recommendations is, "[t]hat the Region in its agricultural land use policies, support options for on-farm integration, and on-farm income diversification" (Regional Municipality of Niagara, 1989, p. xi). The above points to the category of Multi-functionality in Agriculture, a concept that is well developed in the literature from Europe as a way out to help struggling farms.

A common feature in many governmental and non-governmental documents is the notion to protect prime agricultural lands as a valuable resource. This is articulated in the second governmental document as follows:

“Several individuals and groups argue that the lands are simply too valuable to be developed and that they will be valued by future generations. They also question the wisdom of using the best lands for development when this contributes to increasing our national dependence on imports. These imports may be cheap today but may be expensive tomorrow” (Regional Municipality of Niagara, 1990, p. 2).

Along the same lines, the Economic Impact Study postulates, “Once taken out of production, the agricultural land of Niagara cannot be replaced. It is among the best of limited supply” (Regional Municipality of Niagara, 2003, p. 2.7). On the other extreme is the following statement from the submission of Economic Developers Committee,

“Higher value-added per employee should be the goal in Niagara with agriculture being treated as any other industry ... Governments should distinguish between marginal and competitive sectors ... too much emphasis have been placed on the preservation of agricultural lands.” (Regional Municipality of Niagara, 1990, p. 8).

The above quote reflects the outlook at the resource “Prime Agricultural land” as a market commodity that needs to be subject to the market forces of supply and demand. If such a philosophical approach is accepted, then other resources, like fresh water, clean air and biodiversity, may be treated in the same manner, a trend that may spell unsustainable progress. While the governmental documents are generally characterized by reserved and politically correct language, the non-governmental documents uncover deep rifts in outlook between the parties which advocate resource conservation and the public good, on the one hand, and those which defend the property rights and the freedom to take steps that aim at self-interest unless the regime of land protection is extended to protect the land owners. The PALS document (Dated 1988, before the era of protection) postulated that the trend of selling farming lands to developers, “was not for lack of an alternative vision. Agriculturalists proposed that land be purchased by the government and leased back by the farmers” (Preservation of Agricultural Lands Society, 1988, p. 4).

The document by the Ontario Landowners Association (OLA) seeks to protect the interests of farmers. The document finds the solution to the farming problem in restoring what it calls the principles of a free marketplace; the abrogation of such principles, in their opinion, has caused the decline of farming and “places Canada’s sovereignty in jeopardy through food dependence on others” (Ontario Landowners Association, 2008, p.2). As in the PALS document above, the OLA document’s coding contains many alarming issues (N) with a high tone (H) which indicates the negative effects without reservations. It has a bitter critique for the governance practice of having one government bureaucracy creating the regulations while a different government bureaucracy enforces them. The document ends with a strong language stating, “Democracy and sovereignty are being traded away for the profitability of a monopoly. Canadian farms and rural communities are being denied the ability to prosper and left to debt, apathy and the loss of their heritage to feed the cannibals appetite” (Ontario Landowners Association, 2008, p. 8).

The above quotes focus on the third category of Viable Farming which garnered 36% of its indicators mention. Second to Viable Farming, is the category of “Stewardship” with 20% of frequency in its indicators mention, followed closely by the category Socio-economic Base at 17%. The document of the Niagara Land Trust (NLT) focuses on stewardship only. It highlights the fact that Niagara lies within the Carolinian Life Zone characterized by a rich biodiversity and many threatened species together with a high population density, articulated in a quote as,

“NLT has a special responsibility as our mandate includes one of the most diverse and endangered ecosystems in the country, the Carolinian life zone. This unique landscape ... contains 25% of Canada’s population but less than one percent of its land area ... the Carolinian life zone has the greatest number and concentration of species at risk in Canada” (Niagara Land Trust, 2011, p.1)

Concerns over Stewardship are echoed in other documents. The document of the Citizens Coalition of Greater Fort Erie (CCGFE) articulates the resistance to the construction of a car racing track as driven by the fear that it would encourage urban sprawl over wetlands and forested areas. An alarming quote from the 2007 report card from the document of the Niagara Peninsula Conservation Authority is, “In 2007, the indicator ‘species abundance’ score was 3.7, a score of poor. In comparison, an excellent score would be between 9 and 12”. Such threats to biodiversity have prompted the action by groups of concerned citizens to resist projects which may bring short-term benefits of jobs and taxes, but inflict long-term harm on the environment, especially along the Niagara River which suffered from pollution by chemical industries on both sides of the US-Canada border. On the category of the Socio-economic Base, the Region’s loss in the auto industry shifted attention towards tourism and agriculture as economic drivers. The realization of the links between the two economic drivers is manifested in the governmental document entitled “*Energizing Niagara’s Wine Country*”. An alarming statement from the report is, “Wine and culinary tourism is a specialized market which, while growing, is still relatively small” (Niagara Economic Development Corporation, 2007, p. 14). This is labeled as 7d (N) indicating it as an alarming issue within the category of Multi-functionality in Agriculture in view of the fact that, with the decline in manufacturing, the Region’s economy depends on agriculture and tourism. The linkage between these two pillars, wine tourism, is vital for the health of both. Struggling farming families seeking off-farm income depend on the vitality of tourism activities linked with agriculture.

It is interesting to note that the least mentioned categories were Multi-functionality in Agriculture, Governance, and Preparedness for the Future, Social Positive Relation, and Equity

in descending order. This puts such categories in low priority while the pressing issues lie within Viable Farming, Stewardship, and the Socio-economic Base.

The literature review of Chapter Two indicates that Multi-functionality in Agriculture is being stressed in Europe as a means of realizing a sustainable farming industry by encouraging value-added activities on-farm and off-farm. In Niagara, this is reflected as the Region's initiative of the Policy Plan amendment 6-2009 regarding Agricultural Value Added Activities Policies which cleared an OMB appeal in May 02, 2011 and became in full force.

The most evident emerging issue from the documents is the need for Public Transit in the rural areas. However, the Public Transit issue was partly resolved in 2011 when the Region introduced a region-wide bus service connecting the major cities; this made some rural areas more accessible but not all rural Niagara. The most related category for this issue is Category 5 - Equity, as the provision of regional transit makes accessibility easier for the low-income residents seeking jobs outside their residing areas.

The emerging issue is to be compared with the emerging issues from the press articles' analysis that follows.

4.3.3 –Categories of consideration in the local press.

First, three local papers were chosen for their high circulation and easy access online. These are: St. Catharines Standard, Niagara This Week, and Niagara Falls Review. Initial search indicated a repetition of the same issues. Hence, it was decided to limit the content analysis exercise to the St. Catharines Standard, the oldest and most widely circulated paper.

4.3.3.1 - Method

The approach used in this part is different from the above one on documents analysis. The criteria of selection of relevant material are based on the main research theme's words: Rural, Livelihoods, Stewardship, Greenbelt, and Farming. Manifest analysis was conducted by examining the relevant articles for the frequency of the word's mention, and the tone. Latent analysis followed by extending the exploration to data interpretation. Bruce Berg (2009) refers to Bogdan and Biklen (2006) explaining data interpretation as that, "which involves developing ideas about the information found in the various categories, patterns that are emerging, and meanings that seem to be conveyed. In turn, this analysis should be related to the literature and broader concerns and to the original research questions." (Berg, 2009, p. 343). In this research, the content analysis of the local press is used as a check for the presence of similar categories of consideration as the ones that emerged from the case study and confirmed by document analysis. Appendix G indicates details of the content analysis and the table 4.2 summarizes the findings.

The technique of Content Analysis is used to see if the same eight categories of criteria of chapter two are found in the local press and to reveal the underlying implicit connotations attached to each category. This serves the purpose of uncovering public perceptions of the eight recognized categories and the priority ordering attached to the categories.

The population of articles is decided from the daily paper's relevant articles published from December 01, 1996 till December 31, 2011. This was dictated by the St. Catharines Public Library archives facility; further examination revealed that even the year 1996 was too far in the past for the research topic. The first search string was: rural OR livelihoods OR stewardship OR greenbelt OR Niagara Region's policy. The search returned 6959 results (some had more than

one article). An initial scanning of the articles revealed many articles to be of low relevance resulting from the word “rural” which returned articles on general rurality. So, the search was repeated using the following search string: Rural Niagara, AND livelihoods OR stewardship OR greenbelt OR Niagara Region’s policy. This search returned 1469 results from oldest to newest. This time the relevance of results was higher. However, with a quick scanning of the articles, it was decided to conduct a sampling technique combining a purposive with a random approach in order to keep the sample to a manageable size while capturing the important periods of the topic’s debate. Judging the prevalence of the topic, the early articles were sampled at a random interval of 50 till the end of the year 2003. From 2004, the random interval was narrowed to 10 as the topic became a matter of hot debate. The heat of the debate intensified starting 2005 when the interval was expanded to 30 to limit the sample size to a reasonable one, thus every thirtieth article was sampled till December 2011. The resulting sample size was 50 articles. Considering the fact that this content analysis complements the more detailed documents analysis, and the fact that the initial scanning of articles was meticulous enough to end up with a satisfactory and manageable sample, this sample size was adopted.

The technique of ‘Content Analysis’ was used as a structured observation to identify four characteristics: frequency, direction, intensity, and space (Neuman & Robson, 2007). An article was carefully read to judge its relevance to a category by using the category’s indicators of table 4.1 or several of the eight categories. However, more important was to uncover the emergence of additional categories or issues.

Each article’s text was copied to a Word document to use the Find facility. The frequency of a category’s indicator mention had to be judged as explicit or implicit mention. For example,

the word Governance may not be mentioned but implied. The tone of description (direction), and the strength of the message (intensity), are then judged and entered in the appendix G.

In observing consistency with the documents analysis above, the same protocol of evaluation was followed, copied here from subsection 4.3.2:

Responses were coded with a Nominal Measure as follows:

An alarming issue (N)

An issue needing to be addressed (P)

The frequency of mentioning a concept together with its indicator's letter (see Appendix G) is recorded to facilitate the identification of the importance attached to a concept. In deciding the frequency, an additional count is considered for a new theme in order not to repeat a count for the same theme in the same section.

The Intensity measure was dropped later, but it was initially evaluated as:

L (Low) if a category is simply mentioned

M (Medium) if a category is mentioned highlighting its importance

H (High) if a category is mentioned indicating the negative effects of losing it

Three articles were found of little or no relevance and were omitted.

Detailed findings of the Content Analysis are presented in Appendix G. A summary of the results is presented in table 4.3. The eight categories are reiterated as: (1) Democratic Governance, (2) Community Solidarity, (3) Viable Farming, (4) Socio-economic Base, (5)

Addressing Inequity, (6) Fostering and Rewarding Stewardship, (7) Acknowledging Multifunctional Agriculture, (8) Preparedness for the Future by Resilience Building. The indicators for each category are in table 4.1 above. New issues that emerge from the content analysis are indicated in bold in the appendix G and indicated separately in the table 4.3. The intensity (H, M, L) was omitted like in the documents analysis for the same reason of non consistency upon repeating the coding.

4.3.3.2 - Results

Table 4.3 – Results of local press content analysis: Summary of the findings of Appendix G on the count of the frequency of mention of the eight categories and any emerging categories

<u>Category/ indicator</u>	<u>number of mentions</u>	<u>Direction</u>
1/ a Governance/ responding to public consultation outcomes	2 5	P N
1/ d Governance/ reforming the decision making process	9 4	P N
2/ b Positive Social Relations/ resolving conflicts over land use	2 1	P N
2/ d Positive Social Relations/ fostering participation in community activities	5 2	P N

<u>3/ b</u> Viable Farming/ inclination to sell or stop farming	2	N
<u>3/ c</u> Viable Farming/ reduction in farmed acreage	4	N
<u>3/ d</u> Viable Farming/ gross farm receipts changes	1	N
<u>3/ e</u> Viable farming/ marketing of local products	3	P
	1	N
<u>3/ f</u> Viable farming/ right to farm protection	2	P
	2	N
<u>3/ g</u> Viable farming/ preservation of agricultural lands	8	P
	2	N
<u>3/ h</u> Viable farming/ supporting the agricultural industry	5	P
	10	N
<u>4/ c</u> Socio-economic Base/ economic diversification	2	P
	2	N
<u>4/ f</u> Socio-economic Base/ intensification of urban residential development	6	P
	2	N

5/ a Equity/ poverty levels	3	P
	3	N
5/ b Equity/ rural service provision	1	P
	2	N
5/ d Equity/ living wage raise	2	P
5/ e Equity/ access to nutritious food	2	P
5/ f Equity/ fostering multiculturalism	1	N
6/ a Stewardship/ environmental protection	21	P
	2	N
6/ b Stewardship/ land conservation	2	N
7/ a - Multifunctionality in agriculture/ wineries trends	1	P
7/ c Multifunctionality in agriculture/ value-added activities	1	P
7/ d Multifunctionality in agriculture/ conservation of cultural heritage	2	N
	1	P
8/ b Preparedness for the future/ applying the precautionary	2	P

principle		
<u>8/ c</u> Preparedness for the future/ presence of alternative plans	1	P
	1	N
<u>8/ d</u> - Preparedness for the future/ recognizing uncertainty		
<u>Emerging issue:</u>		
Need for regional public transit	<u>6</u>	<u>P</u>
<u>Emerging issue:</u>		
Critique of the property tax assessment	<u>5</u>	<u>P</u>

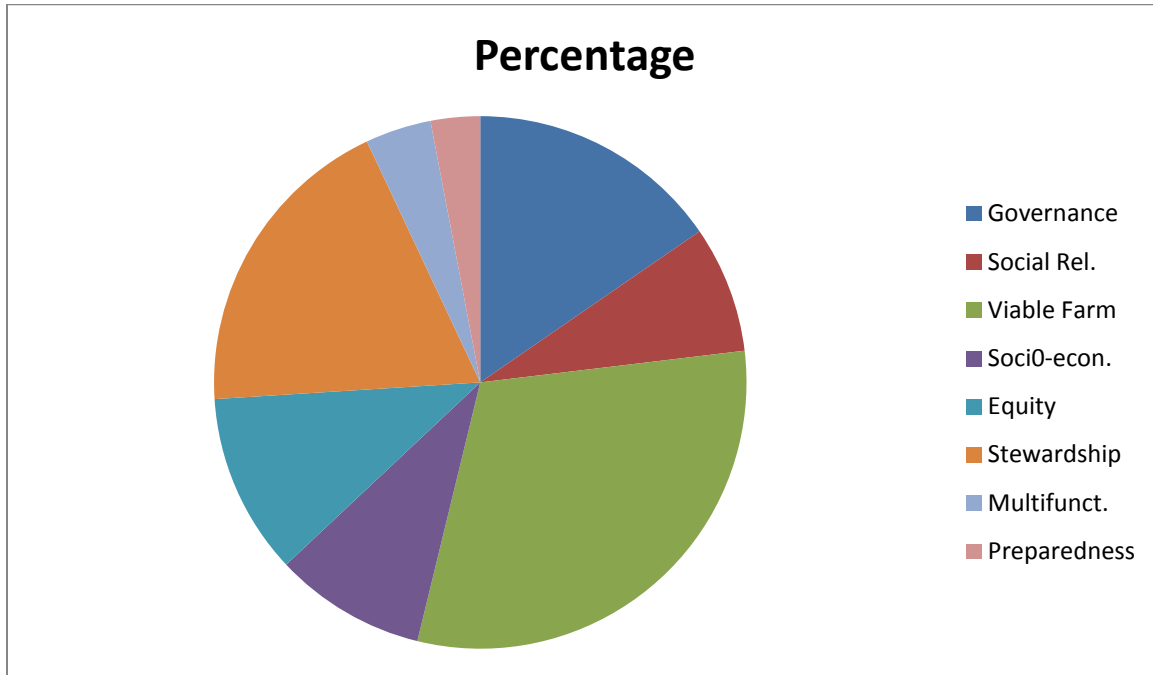
4.3.3.3 - Analysis

Only the emerging issues that were repeatedly mentioned have been added above. Other emerging issues which appeared once and not repeated were considered as transient issues, not persisting issues. The following table and pie diagram indicate the relative importance of the total frequency of mention of each category as a percentage.

Table 4.3.1- Local press Content Analysis: Total frequencies of mention for all indicators per category and percentage weighing

Category	Total number of mentions	Percentage of the category's frequency of mention compared to total mentions
G1- Governance	20	15.4%
G2- Positive Social Relations	10	7.7%
G3- Viable Farming	40	30.7%
G4- Socio-economic Base	12	9.2%
G5- Equity	14	11%
G6- Stewardship	25	19%
G7- Multifunctionality in Agriculture	5	4%
G8- preparedness for the Future	4	3%

The number of mentions of each category as a percentage of the total mentions



In comparing the above pie diagram with the pie diagram for the Document Analysis results, it is fascinating to note that most dominant category is still Viable Farming followed again by Stewardship at almost the same percentages. However, the category of Equity which was a marginal 3.2% in the findings from Documents Analysis, has gained relative importance in the Local Press Analysis to 11% at the expense of lower relative importance for all the remaining categories apart from Viable Farming and Stewardship. In referring to the case study rich description, several characteristics are recognized as unique to Niagara Region; one is the influx of refugees entering through Peace Bridge and settling in the region. The other characteristic is the low wages offered by the portion of the agricultural industry that resorts to migrant seasonal workers from Central America.

A general observation in comparing local press and the documents is that the local press uses blunt and direct language, unlike the politically correct reserved language generally used by the documents.

An interesting quotation is hereby taken from the article of April, 02, 2004 as follows:

“The mandate of the Greenbelt Task Force is narrow: to determine what agricultural lands and what land restrictions should be implemented within this ‘protective greenbelt’. The mandate does not include considering the economic viability of farms within the greenbelt. This means if the pressure is not there, farmers could be severely affected” (Kirby, 2004, p. A6).

An article in the March 01, 2005 issue under the title “Farmers protest the greenbelt legislation” pointed to the meeting when the greenbelt legislation was announced in a rural art gallery. Ontario Premier Dalton McGuinty is quoted to say:

“It is no secret that some people are opposed to the greenbelt ...The most important thing that we can do for the future of farming is to make sure we’ve got farmland” (Bonnell, 2005, p. A2). On the other hand, a protesting farmer said, “The restrictions placed on greenbelt properties rob farmers of the ability to ply their trade” (Bonnell, 2005, p. A2). The above reflect part of the controversy surrounding the greenbelt. Besides struggling to find profit, farmers and rural areas, in general, suffer from substandard public services in rural Niagara. On the inferior standards of rural services in the Township of Wainfleet, an interesting quote is taken from the issue of May, 15, 2006 as follows:

“Responsibility for inspecting septic systems used to be shared with the Ministry of the Environment, said Gord Miller, Ontario’s Environment Commissioner. But under the previous Conservative government, septic system rules moved under the Ministry of Municipal Affairs and Housing. That ministry regulates, but does not monitor or enforce, said Miller. ‘It is a serious gap in policy,’ Miller said. Failing septic systems are a growing threat to the province’s groundwater, he added (Von Dongen & Mayer, 2006, p. A2)

The article of October 29, 2004 indicates contents on the category of Viable Farming, indicator h (supporting the agricultural industry) as comments against the official policy. Quoting from the article the CEO of Grape Growers of Ontario and later on, a Regional Councilor articulated the problem as, “the plan limits the size of buildings for value-added agricultural development to 144 square meters ... that wouldn’t help a chicken farmer or a beef operation” (Currie, 2004, p. A2).

The above situation of 2004 was rectified in 2009 by the Regional Policy Plan Amendment 6-2009 Agricultural Value-Added Activities Policies (Regional Municipality of Niagara, 2009c). However, the Region’s problems necessitate innovative solutions in advocating local food, in invigorating wine tourism and in encouraging the growth of nature and ecotourism. By deviating from general rules, a made-in-Niagara solution may prove feasible. A viewpoint by a farmer concerning local wine marketing, for example, is expressed in the issue of April 17, 2007 as follows:

“After expropriating billions of dollars of land value through the greenbelt without any compensation, perhaps the redistribution of wine store outlets could be the first step to right many past wrongs” (Krocsis, 2007, p. A6).

An emerging issue is that of the need for regional transit. It is repeated in several articles from 2004 to 2009. In September 2011, the Region introduced an initial step for regional transit connecting the local transit systems for the municipalities of the region’s five cities, St. Catharines, Thorold, Welland, Port Colborne, Niagara Falls, and the town of Fort Erie. This is a step in the right direction within the category of Equity as it makes jobs more accessible, but it leaves most of the rural areas out of public transit reach. This calls for more innovative solutions like agricultural cooperatives to fill this gap to attract more local labour to the farming jobs now being filled by overseas seasonal workers.

The second emerging issue is: “Critique of the property tax assessment”. St. Catharines Standard of July 14, 2005 is quoted as, “Ontario’s property tax system is seemingly under continual fire from Niagara’s politicians ... there have been concerns with the way properties are assessed by the Municipal Property Assessment Corporation ... ‘the problems with property taxes are exacerbated by the province not funding social services the way they should be’ said Lincoln Regional Councilor Jill Hildreth” (Reid, Kalvin, 2005, p. A5). Another article points to the same point as, “Among the litany of complaints is a flawed method of assessing properties” (Reid, Kalvin, 2004, p. A6). The above reflect concerns about assessment practices in Ontario, a point which is addressed by the literature. Since 1791 when Upper Canada, the subsequent Ontario, was established and through various reforms of which 1998 was the latest, Property Tax has been criticized (Slack, Tassonyi & Bird, 2007). The tax has been described as, “unfair because it is unrelated to ability to pay and unrelated to benefits received, unsuitable because it supports services unrelated to property, and inadequate because it does not generate sufficient municipal revenues” (Slack, Tassonyi & Bird, 2007, p. 4). However, since this issue is not shared with the document analysis and not identified in the case study, it is dropped from the summary table 4.4

4.4 – Summary of criteria and priority order

The criteria for evaluating plans are the ones recognized in chapter three, section 3.4. Document analysis and local press analysis were used to confirm the presence of the same categories by triangulation. It also revealed the relative importance attached to each category by calculating the percentage value for the frequency of mention. The following table 4.4 reiterates the categories from section 3.4 and indicates the order of relative importance in both the document and press analysis.

**Table 4.4 – Summary of identified categories of consideration from the three perspectives
(The table reiterates the contents of table 3.1 and adds the priority order)**

Criteria for evaluation in the rural Niagara context (from table 3.1)	Priority position in Region’s documents	Priority position in Local press
<p>1 – Plans and policies should provide for building communities’ capacity in participative and collaborative governance including overlap in governance, and more devolved responsibilities.</p> <p>This addresses the sustainability imperative S6 (appendix C) and the resilience imperative R8 (appendix D)</p> <p>Example: Institutionalizing public deliberations in drafting plans as in Sustainable Niagara 2060; Coordinating municipal Official Plans with the Regional Policy Plan through dual representation in the Regional and municipal councils (overlap in governance)</p>	<p>5th. (6.6%)</p>	<p>6th. (5.4%)</p>

<p>2 – Plans and policies should provide means for reconciling different interests in a way that celebrates diversity and ensures sufficiency and opportunity for all towards intragenerational equity and democratic governance while supporting community solidarity and social capital to acknowledge slow variables and feedback signals.</p> <p>This addresses the sustainability imperatives S2, S3, S6 (appendix C), and the resilience imperatives R1, R4, R5, R6 (appendix D)</p> <p>Example: Encourage Community Supported Agriculture</p>	<p>7th. (4%)</p>	<p>5th. (7.7%)</p>
<p>3 – Besides protecting farmlands, plans and policies should provide for the support of viable farming by fostering livelihood sufficiency and preserving resources for future generations within a modular regional look</p> <p>This addresses the sustainability imperatives S2, S4, S5 (appendix C), and the resilience imperative R3 (appendix D)</p>	<p>1st. (36%)</p>	<p>1st. (30.7%)</p>

<p>Example: Resisting the rezoning of agricultural lands to urban uses; supporting local food marketing</p>		
<p>4 – Plans and policies should provide for strengthening the socio-economic base integrity in ways that also maintain/ rehabilitate the socio-ecological base reducing threats to its long-term integrity while encouraging diversity and innovation.</p> <p>This addresses the sustainability imperatives S1, S5 (appendix C), and the resilience imperatives R1, R7 (appendix D)</p> <p>Example: Revitalizing the rural milieu through expanding ecotourism and wine tourism; encouraging innovative solutions and green industry in the rural milieu</p>	<p>3rd (12%)</p>	<p>4th. (9.2%)</p>
<p>5 – Plans and policies are to be used as a tool to reduce intragenerational and intergenerational inequities in livelihood sufficiency and opportunity through collective responsibility, building trust, and innovative solutions to the local poverty problems.</p> <p>This addresses the sustainability imperatives S2, S3,</p>	<p>8th. (3.2%)</p>	<p>3rd. (11%)</p>

<p>S4, S6 (appendix C), and the resilience imperatives R6, R7 (appendix D).</p> <p>Examples: The introduction of programs to help new immigrants, and improve public services in rural areas</p>		
<p>6 – Plans and policies should allot specific clauses to alleviate land stressors through institutionalized adoption of the precautionary principle, socio-ecological system integrity and the application of all sustainability imperatives besides adapting to ecological variability while rewarding voluntary stewardship roles of farmers and land owners to preserve ecosystem services.</p> <p>This addresses the sustainability imperatives S1, S5, S7, S8 (appendix C), and the resilience imperatives R2, R5, R9 (appendix D).</p> <p>Examples: Adopting the precautionary principle in environmental impact studies; valuing nature’s services; empowerment of local advocacy groups’ efforts to protect natural heritage</p>	<p>2nd. (20%)</p>	<p>2nd. (19%)</p>
<p>7 – Plans and policies should acknowledge and foster</p>	<p>4th. (7.2%)</p>	<p>7th. (4%)</p>

<p>multi-functionality in agriculture as one of the means to foster livelihoods, socio-ecological system integrity, sustainable use of resources through the adoption of precaution and adaptation and the integration of all sustainability imperatives. Multi-functionality entails fostering diversification, the building of a regional modular brand while acknowledging slow variables and system feedbacks through innovative local solutions</p> <p>This addresses the sustainability imperatives S1, S2, S5, S7, S8 (appendix C), and the resilience imperatives R1, R3, R4, R5, R7 (appendix D)</p> <p>Examples: Rewarding the role of farmers as stewards; supporting value-added activities and biogas production</p>		
<p>8 – Plans and policies should institutionalize the adoption of precaution and adaptation as one of the means to prepare for uncertainty and applying all sustainability imperatives to seek mutually supportive benefits while nurturing a resilient Niagara character through all resilience imperatives.</p> <p>This addresses the sustainability imperatives S7, S8</p>	6 th . (6%)	8 th . (3%)

(appendix C), and the resilience imperatives R1 to R9		
Examples: Building a Niagara brand competitive character		
9- Emerging issue: The need for Regional transit (This can positively address category 5 on Equity)		

Conclusion

This exercise of confirming the presence of the categories and further establishing the priority order for the categories of consideration is important for plans and policies evaluation in the sense that, when all aspirations cannot be met, the top priority categories take precedence.

From the above, it may be concluded that the categories identified through the case study were also identified in two other methods: document analysis and local press content analysis. On relative importance or prioritisation, both the analysis methods place Viable Farming as top priority, followed by Stewardship. The lowest priority is given to Multi-functionality in Agriculture and Preparedness for the Future. This signifies a consistency in recognizing pressing considerations between the documents (governmental and non-governmental) and the press (non-governmental). Such agreement adds to the reliability of the methods.

Chapter 5 – Conclusions and reflections

In rural Niagara, agriculture is still a major activity. Agricultural lands continue being exposed to development pressures; this constitutes a major challenge for the viability of rural Niagara. Productive agricultural lands and prime development lands share many common characteristics such as minimal vegetation cover, good drainage, easy access and large parcels (Sullivan, 1990). High prices offered for development render farming less attractive financially. Other challenges are uncovered through an investigation of the sustainability and resilience criteria for evaluating land use plans and policies.

The findings answer the research question: What are the criteria to facilitate the evaluation of the provincial and regional land use planning initiatives for strengthening rural sustainability and resilience, especially rural community and the working farm viability, and land stewardship in Niagara Region? It answers the question by identifying such criteria. This was done through the following steps: First, the generic sustainability and resilience imperatives were identified. This was followed by identifying the specific areas of consideration related to land use in rural socio-ecological systems close to urban areas in developed countries. By projecting such areas of consideration on a case study of rural Niagara, the case-specific criteria for plans evaluation were developed (refer to table 3.1). Triangulation was achieved by examining the eight categories of consideration leading to the criteria through the adoption of two other research methods, document analysis and local press content analysis. The examination through document analysis and local press content analysis confirmed the presence of the categories and added the identification of the order of emphasis reflecting an order of prioritization for the categories (refer to table 4.4). The order of prioritization revealed similarities within the document analysis and the local press content analysis as the two methods agreed on attaching

the highest priority to ‘Viable Farming’ followed by ‘Stewardship’ and in placing ‘Preparedness for the Future’ at a low priority. While this ordering can guide the evaluation exercise in recognizing what is considered as more pressing, it also points to the need of raising awareness on Preparedness for the Future as an area not to be overlooked in a world full of surprises.

Criteria are needed to guide the evaluation of plans and policies by stakeholders. The criteria arrived at in this thesis are based on categories of consideration merged with sustainability and resilience imperatives; this adds the utility of providing means of critique under the lens of sustainability and resilience, the goal of healthy progress.

The criteria are reiterated below in the order of averaging the percentages of the priority positions in the documents and in the press contents as shown in table 4.4 to reflect the order of priority:

- 1. Besides protecting farmlands, plans and policies should provide for the support of viable farming by fostering livelihood sufficiency and preserving resources for future generations within a modular regional character**
- 2. Plans and policies should allot specific clauses to alleviate land stressors through institutionalized adoption of the precautionary principle, socio-ecological system integrity and the application of all sustainability imperatives besides adapting to ecological variability while rewarding voluntary stewardship roles of farmers and land owners to preserve ecosystem services.**
- 3. Plans and policies should provide for strengthening the socio-economic base integrity in ways that also maintain/ rehabilitate the socio-ecological base**

reducing threats to its long-term integrity while encouraging diversity and innovation.

- 4. Plans and policies are to be used as a tool to reduce intragenerational and intergenerational inequities in livelihood sufficiency and opportunity through collective responsibility, building trust, and innovative solutions to the local poverty problems.**
- 5. Plans and policies should provide for building communities' capacity in participative and collaborative governance including overlap in governance, and more devolved responsibilities.**
- 6. Plans and policies should provide means for reconciling different interests in a way that celebrates diversity and ensures sufficiency and opportunity for all towards intragenerational equity and democratic governance while supporting community solidarity and social capital to acknowledge slow variables and feedback signals.**
- 7. Plans and policies should acknowledge and foster multi-functionality in agriculture as one of the means to foster livelihoods, socio-ecological system integrity, sustainable use of resources through the adoption of precaution and adaptation and the integration of all sustainability imperatives. Multi-functionality entails fostering diversification, the building of a regional modular brand while acknowledging slow variables and system feedbacks through innovative local solutions**

- 8. Plans and policies should institutionalize the adoption of precaution and adaptation as one of the means to prepare for uncertainty and applying all sustainability imperatives to seek mutually supportive benefits while nurturing a resilient Niagara character through all resilience imperatives.**

5.1 – The research implications for rural Niagara

The criteria for evaluating plans and policies arrived at in this research can be applied to the various Regional initiatives' reviews including the Agricultural Action Plan, 2006, the Agricultural Value Added Activities Policies, 2009, the Regional Policy Plan, 2007, and the Growth Management Strategy, 2008. Regional initiatives are subjected to public consultations and the identified criteria can be used as yard sticks to critique plans and policies under the lens of sustainability and resilience imperatives, albeit for rural areas.

Promoting daily livelihoods and stewardship in Niagara Region

One of the findings of this research is that biogas production is at an early stage with very humble beginnings in some agricultural enterprises. Biogas production can be a win-win solution to the financial issues faced by family farms: this is so because it provides a source of energy from waste. Thus, the problem of waste disposal is solved while providing free gas for generating electricity or for heating purposes. What remains after the production of gas is an organic fertiliser (Electrigaz, 2012); this is the third win. Measures that can offset financial costs for farmers are related to energy savings by mandating the production of biogas in industrial livestock enterprises, for example. The conversion of animal manure into fuels and clean fertilisers – unlike biosolids by-products of sewage treatment - will serve to achieve multi-purpose benefits of recycling waste, alleviating water pollution, enriching the soil with nutrients,

and reducing energy costs by producing energy on site. Clare Reimpa consultants worked with PlanET Biogas Solutions Inc. to implement a 250 KW biogas plant in Jordan Station, Lincoln in 2007 to produce electricity and heat to meet the needs of a greenhouse and sell the surplus to the grid. Outside Niagara, a more recent biogas plant was commissioned in 2011 in Ridgetown College of Guelph University as part of the college Centre for Agricultural Renewable Energy and Sustainability. It is an anaerobic digester that uses dairy manure, beef manure, corn silage, and fats (PlanET, 2012). Biogas production is an approach that seeks multiple gains by developing a culture of minimizing waste, solving the problem of waste disposal, and providing a free energy source.

Biogas production, the encouragement of value-added activities, wine tourism and nature tourism constitute components of a multi-functional agricultural system which can be more sustainable. Regional plans and policies can be designed in such a manner as to support multi-functionality in agriculture, but the support of higher levels in government is needed. It is a question of orchestrated official policies and coordination between various ministries at the federal, provincial and regional levels that will achieve rural viability, a goal which is closely linked with social resilience and food security at the regional, provincial and national levels.

5.2 – The research implications for similar areas in the GGH

Within the caveat of observing regional specifics, the findings of this research can be applied to the evaluation of the provincial land use initiatives, notably the Greenbelt Plan, the Growth Plan and the parts pertaining to land use policies in the Provincial Plan Statement. Since the Greenbelt Plan review is due in the year 2015, the criteria arrived at in this thesis and listed above, can be applied to the review in the form of a concerned citizen contribution.

5.3 – Implications of the research findings on the research approach

Reflecting in retrospect upon the research approach, I find that the qualitative method revealed subtle factors influencing trends in the Region. If I adopted the quantitative method of gathering and analyzing statistical data, the factors driving trends would have remained unknown. The qualitative method uncovered the links between, for example, stewardship and multi-functional farming, between poverty and immigrants/ refugees influx, and between cultural heritage and economic diversity, to quote a few. An area for future research is to find to what extent such links are cause-effect relations and whether/ what significant other factors are involved.

I decided from the beginning not to use the interview method. I was driven by the precaution of missing the messages of the interviewees as a result of what Berg (2009) calls *dramaturgy* defined as, “the stream of symbolic interaction” (Berg, 2009, p. 102); my belonging to a minority culture could have acted as a filter between me and the mainstream culture messages. However, the case study, document analysis, and qualitative content analysis are also interpretations; what makes them preferable to interviewing or other obtrusive methods is that the researcher declares a clear stance. I declared my stance in the introduction chapter as that of an observer looking from within the system with the perspective that thriving rural livelihoods and stewardship are crucial for urban and rural integrated progress. The adoption of a clear stance created a wide, but clearly defined space for interpretation of data. The fact that the research findings answered the research question reinforces the suitability of the qualitative approach. However, interviews and focus group techniques can add strength to the suggested further research, especially with the cause/ effect approach.

5.4 – Areas for further research

Section 3.5 above enumerates eight major criteria for evaluating the plans and policies. Systems thinking literature (Checkland, 1999; Gunderson, Holling, Pritchard, & Peterson, 2002; Waltner-Toews & Lister, 2008) point to the fact that the way we present a system is influenced by our world view. A more complete way of presenting and analysing a system is to repeat the analysis exercise with as many different perspectives as practicable. This may be viewed as an area for further future research on the same topic but from a different perspective.

From the findings, two hypotheses emerge as possible areas of future investigation that may be approached from a different perspective. One is the hypothesis: Among categories of consideration in Niagara Region, the top priority is for addressing Viable Farming. This hypothesis can be investigated using interviews to support or refute it. The second hypothesis worthy of testing is: The governmental and non-governmental Niagara documents attach less importance to the issues of Equity in the Region in comparison with the importance attached by the local press. Such hypothesis can be approached using the comparative case study method to investigate Equity issues in rural and urban settings.

5.5 - Reflections

Modern civilisation is based largely on urbanisation, competitive markets, and minimally-controlled exploitation of natural endowments (Berkes, Folke, & Colding, 1998). History teaches us that civilisations succumb in their excesses. Therefore, reins need to be introduced to control free markets, sprawling urbanisation, and the unsustainable exploitation of natural endowments, including land, if this magnificent climax of human progress, our modern civilisation, is to continue. Constraints on urban sprawl are to be coupled with incentives. Such incentives are

expected to be channelled through official plans and policies. This research uncovered the key criteria for evaluating plans, including the investigation whether such incentives are present or not.

As for the competitive markets and minimally controlled exploitation of natural endowments, many writers agree that the way of doing things at present is unsustainable and cannot be allowed to continue unchecked (Gibson et al., 2005; Gertler & Baker, 1990; Summer, 2005; Willers, 1991). At the core of unsustainable practices in various facets of human activities is the conventional *laissez-faire* mentality of the free market (Fennell & Weaver, 2005). In judging activities' contribution to sustainability, one needs to look beyond reforms of the existing ethics, to a radical change. According to Summer (2005), life values link sustainability to the civil commons, which are defined by John McMurtry as, "any co-operative human construct that enables the access of all members of a community to life goods" (McMurtry in Summer, 2005). Civil commons are being destroyed by money values overriding life values (Summer, 2004). Corporations try to convince us that when natural capital is converted to monetary value, nothing is lost as we get the equivalent whether in liquid money or human-made assets like buildings. According to this logic, natural capital is viewed narrowly as resources. The question that begs attention here is: What about parts of nature that are not obvious resources? In the words of David Ehrenfeld, "Conservation is usually identified with the preservation of natural resources ... Resources can be defined narrowly as reserves of commodities that have an appreciable money value to people, either directly or indirectly." (Ehrenfeld, 1991, p.76). Parts of nature that are not recognized as exploitable do not have a money value, but they have an inherent value and a latent monetary value ignored by our deficient accounting systems. A good example is the services offered by wetlands. If artificial

flood mitigation measures and water filtering plants are built to substitute the free services of wetlands, then a wetland can be evaluated at millions or billions of dollars (Costanza et al., 1997). Capitalizing on such non monetary values of nature is one way to moderate our narrow perspective of nature as a reservoir of economically valuable resources.

There is evidence of a growing awareness among citizens aiming at being vigilant to practices that put money values ahead of life values. An example of citizens' awareness of the non-monetary values in Niagara Region is the ongoing fight around a proposed "Race Car Track" in Fort Erie creating a controversy. I attended a Council Meeting with a representative from PALS to put the case for protecting agricultural lands against a decision by the Municipal and Regional Governments to override the Official Policy by creating a "special policy area" (Citizens Coalition of Greater Fort Erie, 2011). Accommodating the race track of 821 acres over general agricultural lands and a provincially significant wetland (Bacher, 2010), may create some short-term gains in seasonal jobs, but it will cast the shadow of long-term losses of the services of the wetland, the fish habitat in Miller Creek and Frenchman Creek, and the agricultural lands. In view of the fact that south western Ontario wetlands declined from covering 28% of the landscape to 5% (Carolinian Canada Coalition, 2004), any wetland is to be considered a national treasure to be cherished and protected. The Race Track case was reviewed in the Ontario Municipal Board (OMB) which postponed its prehearing from April 8, 2011 to a later date to allow the project's proponents to prepare studies and environmental assessments. The OMB hearing was held for more than a week starting June 18, 2012 at Fort Erie City Hall; a ruling is to be issued within a few months. Stewardship in Niagara is a public concern. In 1991, when the Ontario Ministry of Natural Resources established the Short Hills Provincial Park, broad public consultation enriched the code of ethics to protect the natural heritage reconciling the

perspectives of keeping it as a wild natural area and the recreational uses (Stefanovic, 1997). The Short Hills experience of coordinated efforts by stakeholders can provide an inspiration for Fort Erie citizens to favour long-term socio-ecological system integrity over short-term gains.

Summarizing the above review, stewardship in Niagara Region is a public concern and farmers are expected to stand at the forefront for protecting the land resource in rural Niagara if they are to continue farming. It is no surprise that Viable Farming stands as a top priority as the findings of this research indicated.

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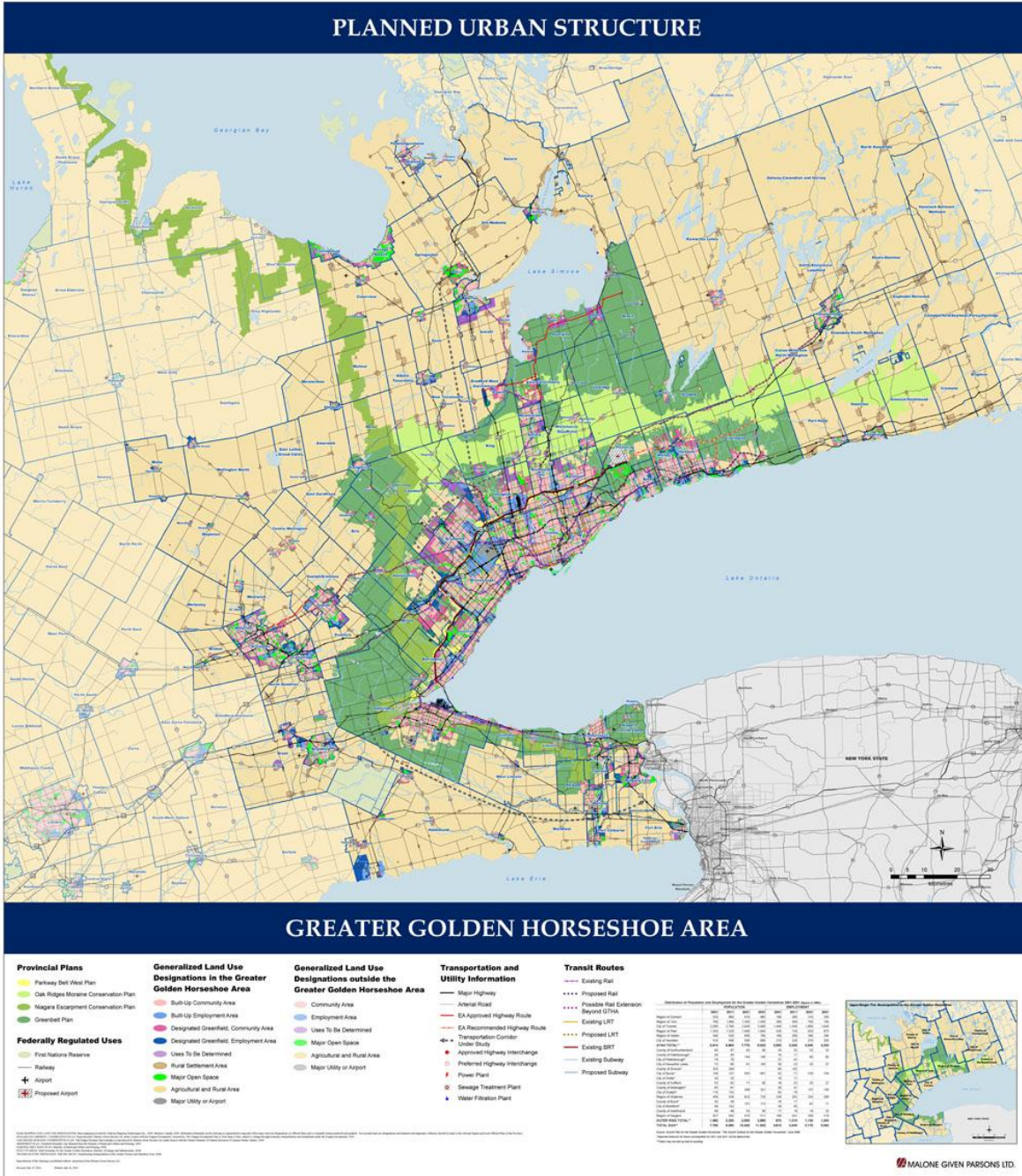
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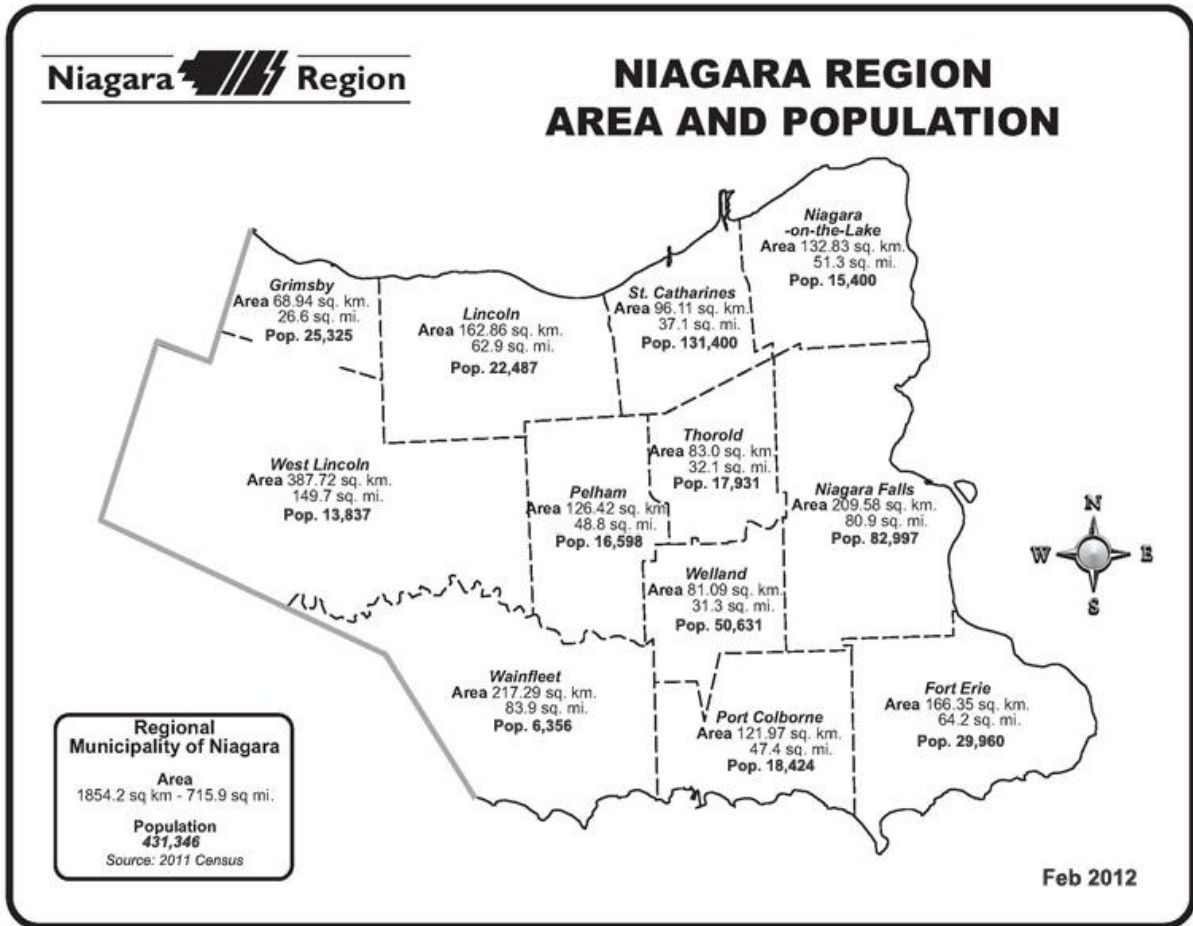
Appendix A: Map of the Greater Golden Horseshoe area and the Greenbelt



Source: www.mgp.ca/index.php/products-and-presentations/ggha

Appendix B: Map of Niagara Peninsula

12 municipalities with population



Source: www.niagararegion.ca/living/icp/images/Area-Pop-07-6.jpg

Appendix C: Gibson et al. eight points for sustainability requirements as decision criteria

1. **Socio-ecological integrity:** Build human-ecological relations to establish and maintain the long-term integrity of socio-biophysical systems and protect the irreplaceable life support functions upon which human as well as ecological well-being depends.
2. **Livelihood sufficiency and opportunity:** Ensure that everyone and every community has enough for a decent life and that everyone has opportunities to seek improvements in ways that do not compromise future generations' possibilities for sufficiency and opportunity.
3. **Intragenerational equity:** Ensure that sufficiency and effective choices for all are pursued in ways that reduce dangerous gaps in sufficiency and opportunity (and health, security, social recognition, political influence, etc.) between the rich and the poor.
4. **Intergenerational equity:** Favour present options and actions that are most likely to preserve or enhance the opportunities and capabilities of future generations to live sustainably.
5. **Resource maintenance and efficiency:** Provide a larger base for ensuring sustainable livelihoods for all while reducing threats to the long-term integrity of socio-ecological systems by reducing extracting damage, avoiding waste and cutting overall material and energy use per unit of benefit.
6. **Socio-ecological civility and democratic governance:** Build the capacity, motivation and habitual inclination of individuals, communities and other collective decision making bodies to apply sustainability requirements through more open and better informed deliberations, greater attention to fostering reciprocal awareness and collective responsibility, and more integrated use of administrative, market, customary and personal decision making practices.
7. **Precaution and adaptation:** Respect uncertainty, avoid even poorly understood risks of serious or irreversible damage to the foundations of sustainability, plan to learn, design for surprise and manage for adaptation.
8. **Immediate and long-term integration:** Apply all principles of sustainability at once, seeking mutually supportive benefits and multiple gains.

Source: Gibson, Robert B, Hassan, Selma, Holtz, Susan, Tansey, James & Whitelaw,

Graham. (2005). *Sustainability Assessment*. London: Earthscan. (pp. 116-118).

Appendix D: Brian Walker & David Salt nine point criteria for a resilient world

- 1. Diversity:** A resilient world would promote and sustain diversity in all forms (biological, landscape, social, and economic).
- 2. Ecological Variability:** A resilient world would embrace and work with ecological variability (rather than attempting to control and reduce it).
- 3. Modularity:** A resilient world would consist of modular components.
- 4. Acknowledging Slow Variables:** A resilient world would have a policy focus on “slow” controlling variables associated with thresholds.
- 5. Tight Feedbacks:** A resilient world would possess tight feedbacks (but not too tight).
- 6. Social Capital:** A resilient world would promote trust, well-developed social networks, and leadership (adaptability).
- 7. Innovation:** A resilient world would place an emphasis on learning, experimentation, locally developed rules, and embracing change.
- 8. Overlap in Governance:** A resilient world would have institutions that include “redundancy” in their governance structures and a mix of common and private property with overlapping access rights.
- 9. Ecosystem Services:** A resilient world would include all the unpriced ecosystem services in development proposals and assessments.

Source: Walker, Brian & Salt, David. (2006). *Resilience Thinking: Sustaining Ecosystems and People in a Changing World*. Washington, DC: Island press.

Appendix E: Annotated bibliography of major documents

used for document analysis

Governmental documents (Regional government), a purposive sample to represent studies, outlooks, and profiles from a governmental presentation

1)Regional Municipality of Niagara. (1989). *Farming in the Niagara Region:*

Structure, Trends and Land Use Policies. Brampton, Ontario: Info.

Results Consultants.

A study conducted by InfoResults for the Region as part of the Region's Policy Plan Review process. It reviews agricultural statistics as well as the Canada - US Free Trade agreement (CUSTA) and the General agreement on Tariffs and Trade (GATT). The major findings include uncertainty and apprehension about the future of agriculture among farmers. The Policy Plan Review created expectations about extending urban area boundaries and / or more flexibility regarding severance policies. Also, speculations accelerated land values to levels making farming unattractive. The study conducted more than 100 interviews with farmers and key respondents, but could not draw any generalisations from the interviews because the opinions expressed varied widely.

2)Regional Municipality of Niagara. (1990a). *Regional Niagara Policy Plan review:*

Resposes to "Where Next: A look to the Future". Thorold: Regional Niagara.

This report is produced by the Regional Planning and Development Department to document the responses from local municipalities, organizations, and individuals on the Region's four development options (pages i-15 summarise all the submissions); the report includes a survey and proceedings from public meetings. The four options are:

- Lake Erie shoreline urban expansion
- Central Niagara urban expansion
- Trends urban expansion
- Queen Elizabeth Way North urban expansion.

Views, especially among the local municipalities, varied, but overall, the Central Niagara option was apparently favoured as the most feasible “Go south” and as the option preserving the unique lands of the north. Pages 1- 15 are analysed and coded as they represent the summary of all submissions. From page 16 onward, the rest of the document contains appendices.

Significant quotes from this document represent extreme perspectives for and against development on agricultural lands.

First quote, from page 2 stressing the preservation of fruitlands, The second quote represent the views of “concerned fruit growers” as, “In the face of these economic difficulties, the farmers argue that if the industry is not made viable, the Region should open up the land for development” (Regional Municipality of Niagara, 1990, p. 7).

Professor Ralph Kruger of the University of Waterloo suggested, “that the Region should identify a southern option and then go after Federal and Provincial support for farmers” (Regional Municipality of Niagara, 1990, p.10)

3)Regional Planning and Development department. (1990). *Preserving Niagara’s Agricultural Industry: Initiatives by All Four Levels of Government for Today’s Farmers*. Thorold: Regional Municipality of Niagara.

This is publication #77 of the Regional Planning and Development Department and prepared by the Agricultural Sub-Committee targeting all four levels of government as recommendations for actions needed from each level.

On the federal level, the report recommends, among other things, amendments to the Canada-Ontario Crop Insurance Act. Another point raised is the widening gap in the difference in interest rates for farm loans between Canada and the US, rendering Canadian farmers at a competitiveness disadvantage besides the unequal subsidies. The report recommends long-term loans at a fixed rate.

On the provincial level, the major recommendations are for restoring farm property tax rebates for rented lands, to increase funding for the land stewardship program.

On the regional level the major recommendations are for increasing funding for the federations of agriculture, establish a policy for the purchase of locally-grown agricultural products, develop policies to enable the farmer to farm, increase productivity and reduce costs. On the local municipality level, the report recommends that Official Plans protect agricultural lands, protect farmers from by-laws and regulations which restrict normal operating practices, and upgrade roads in agricultural areas to facilitate marketing.

4)Regional Municipality of Niagara. (2003). *Regional Agricultural Economic Impact Study*. Bracebridge, Ontario: Planscape.

The study was conducted by Planscape for the Region. The study highlights the importance of farming in the Region's economy in direct and indirect. The study concludes that, overall, agriculture is successful, but there are issues surrounding the industry's future. Some of the issues concern cheap food policies, foreign subsidies for imported rival products, labour

shortages and land prices speculation. This is reflected in a slight decline in number of farms and total acreage under farming (approximately 1.3% from 2001 to 2006 census) together with the increasing proportion of rental farming indicating the industry's vulnerability. Quoting from the 2010 update, "The report confirms that in 2006, agriculture in Niagara continued to prosper. However, there are some trends which are of concern ... the production profile shifted slightly with a growth in cash crop production. This trend may have been in response to commodity prices but is of concern in an area with the unique ability to grow more specialized crops. The average age of farmers continues to creep up (Regional Municipality of Niagara, 2010, p.4). It is worth noting that the farmers' surveys formed the basis for the report's conclusions. One hundred farmers responded to the survey from all twelve municipalities; 34% of respondents were from the predominantly rural townships of West Lincoln and Wainfleet. This indicates the growing concern in rural areas about shaping the industry's future.

An interesting quotation from the "Economic Impact Study, 2003" (#4 governmental document) is: "Once the economic contribution is understood, the costs of losing the land (e.g., the added cost of imported fruits and vegetables, the dislocation of farmers and farming families, the loss of socio-economic spin-offs associated with agriculture etc.) can be compared with the benefits of conversion (e.g., property tax revenues, jobs, and spin-offs associated with the activity which replaces agriculture etc.) (Regional Municipality of Niagara, 2003, p. 5.1).

In the 2003 study conclusions, the report points to a problem which is rarely recognized and that is the negative effect of heavy traffic close to the farms as indicated in the following quote, "The increase in traffic on the roads in the tender fruit and grape areas has increased demand for maintenance and the associated use of salt. Salt adversely affects productivity in the short term and the land in the long term" (Regional Municipality of Niagara, 2003, p. 9.2).

Another quote from the conclusions sums up the importance of supporting agriculture in the region as, “The issues associated with preservation of the land go far beyond purely economic considerations and include food security, safety and national self sufficiency” (Regional Municipality of Niagara, 2003, p. 9.2).

5)Regional Municipality of Niagara Agricultural Task Force. (2004). *Securing a legacy for Niagara’s agricultural land: A vision from one voice*. (Discussion paper endorsed by the Regional Council in May 2004).

The paper produced by the Region’s Agricultural Task Force formed from one councilor, a representative from PALS and several representatives from the farming industry. The discussion paper is a product of discussions on the concept of an agricultural preserve at the 2nd. Annual Smarter Growth Niagara Summit of 2002. The Task force is to represent all sectors of the industry with One Voice. One of the study’s recommendations is to include complimentary value added activities linked with farming as a measure to enhance viability. Also, the Task Force is to work with the major commodity groups to identify their specific requirements. Another recommendation is to encourage Niagara-specific research. The report sets a future strategy outlined as, “This strategy is a ‘made in Niagara’ solution to support agriculture ... Effective implementation of the strategy will require collaboration with the federal, provincial, regional and local governments” (Regional Municipality of Niagara, 2004, p. 3).

6)Niagara Economic Development Corporation. (2007). *Energizing Niagara’s wine country*. Thorold, Niagara: Regional Municipality of Niagara.

The study was funded by the Niagara Economic Development Corporation among other funders. The study envisions Niagara as a world class destination for visitors for cultural, heritage and educational opportunities on wine and wineries. The study aims at enhancing tourism and

revitalising wine country communities by encouraging investments including private and public sectors partnerships. The study's recommendations resulted in amendment 3-2009 to the Regional Plan to accommodate wine country policies under the plan's section four, 'Economic Development and Tourism'. The first part of the report was analysed for the issues that need to be addressed or alarming issues. The second part of the report deals with details of tourist services, gateways identification, and the needed coordination of presenting attractions (cultural, historic and natural).

Representative sample documents from other government agencies based on purposive sampling driven by the close relevance to the research question

7)Niagara Peninsula Conservation Authority. (2010). *Conservation Areas*.

Retrieved on October 10, 2010 from

www.npca.ca/conservation-areas/default.htm.

The documents were downloaded from the NPCA web site and the Niagara Region web site. The first document is entitled 'Niagara Peninsula Conservation Authority: Regulation of Development, Interference with Wetlands and Alterations to Shorelands and Watercourses'. The document is covered by the Ontario Regulation 155/06 made under the Conservation Authorities Act. The second set of documents was the Report Cards for the Peninsula Watershed for the years 2005, 2006, and 2007. No updated later report cards were found on the web sites. The documents were chosen for their representation of the Authority's directions and the region's watershed concerns.

8)Niagara Parks Commission. (2011). *Environmental Protection*. Retrieved on

November 24, 2011 from www.niagaraparks.com.

The Niagara parks Commission plans and implements various activities in the upkeep of parks and tourist attractions along the Niagara River corridor. The above document was selected as the most closely related to the research being on environmental protection side of the Commission's activities. The document boasts an enviable record on land stewardship focused on the preservation and enhancement of the natural beauty of the Niagara Falls and the Niagara River corridor. The document enumerates projects on green initiatives, environmental protection and restoration activities.

An interesting quote from the document concerns a native plant species being restored.

“The project helps to protect the last remaining strand of Chinquapin Oak Savannah that once was the dominant landscape over much of the area ... Efforts for revitalization of this rare species and related endangered plant species involved significant removal of invasive exotic species in 1999” (Niagara Parks Commission, 2011, p. 4).

Non-governmental documents based on purposive sampling driven by the close relevance to the research question

1) Preservation of Agricultural lands Society. (1988). *The Niagara Conservation*

Strategy: The preservation of Agricultural Lands Society Conservation

Project. St Catharines: PALS.

The Preservation of Agricultural Lands society (PALS) received a grant from 'Employment & Immigration Canada' to conduct a research study on a conservation strategy. The document is written in strong language; many of the points are labeled as alarming issues (N) than in the government documents which are written in softer diplomatic language. Many of the categories raised were in high tone (H) indicating the negative repercussion without reservations.

The document presents a historical record of the evolution of the concept of land conservation in Niagara. It comes ten years after the establishing of the Society in 1976 and,

therefore, records the Society's struggle to raise awareness and resist what they call 'urban-driven planning' which resulted in development onto unique tender fruit farmlands instead of being diverted onto poorer lands. In the early efforts to save a precious non-renewable resource, prime agricultural lands, the document is quoted, "This unfortunate trend was not for lack of an alternative vision. Agriculturalists proposed that the land be purchased by the government and leased back by farmers ... this would have given the farmers immediate cash and the promise of lower land and interest costs" (Preservation of Agricultural Lands Society, 1988, p. 4). This concept is not too detached from the concept of reintroducing easements for which PALS still fights to guarantee conservation in perpetuity.

The document refers explicitly to resilience concepts through a review of wrong practices like the extension of Welland Canal to Port Colborne reducing the natural source of water to Lyons Creek describing it as, "This was typical of the many hardships caused by working against nature instead of developing our economic activity in harmony with natural systems" (Preservation of Agricultural Lands society, 1988, p. 9).

On the combined economic and stewardship arenas, the document presents the bitter reality faced by farmers as,

"The resulting competition for land and high land prices limits the farmer in the expansion of the farm. In turn, this leads to intensified farm practices which can deplete the soil. Finally, the loss of our agricultural resource base due to urbanization, and greater reliance on imported food leads to subsequent loss of jobs in agriculture and in related industries. This was most evident in the decline of the canning industry when foreign owned canneries shut down and then sold the land for development, causing a collapse of the industry, the loss of many related jobs, and our canning self-sufficiency" (Preservation of Agricultural Lands Society, 1988, p. 11).

There are many admirable quotes which expose the problems on the farmers' financial struggles, fragmentation of farming lands, severances and other problems. The document, written back in 1988, called very strongly for the need for a provincial legislation to protect agricultural lands; this became a reality through the Greenbelt Act and Plan in 2005. As the farmland is protected, the farmer's continuation in farming now needs to be protected.

2) Friends of the Greenbelt Foundation. (2011b). Niagara culinary trail. Retrieved on August 01, 2011 from www.greenbelt.ca/node/1762.

The online document describes the Foundation as charitable foundation which began its work in 2005 with a mandate to fund organizations promoting farming, the environment and rural communities located in Ontario's Greenbelt. The document points to the federal/ provinces Agricultural Policy Framework (APF) of 2008 – 2013 as a collaborator in providing programs to promote and fund farming stewardship. "Friends of the Greenbelt Foundation" provides additional funding support for such programs which are based on farm environmentally sound practices.

The above focuses on the Environmental Farm Program, a cornerstone in the stewardship role played by farmers and for which they deserve financial support. Agricultural support for the programs is led by the Ontario Farm Environmental Coalition while local delivery is carried out by the Ontario Soil and Crop Improvement Association.

It was expected to find some mention of the "Multifunctionality in agriculture" as one way the Foundation can help in what they call "support activities that preserve and enhance the Greenbelt 's agricultural, rural and ecological integrity and viability" (Friends of the Greenbelt Foundation, 2011a, p. 1)

3)Ontario Landowners Association. (2006). *Finding Profit on Canadian Farms*.

Retrieved March 25, 2009, from www.ruralrevolution.com.

The document has special importance for being one of opposition to the planning regime status quo. Although it is about Ontario in general, its position concerning Niagara region is part of the general Ontario position. The document is written in a strong language advocating free market economy, less government regulations and more support for small family operations. It gives anecdotal examples from cheese, beef, tobacco, and chicken operations to illustrate how government regulations and quotas harm the small operator and serve the big corporation monopolies.

4)Citizens Coalition of Greater Fort Erie. (2011, April 4). *Fort Erie speedway fight*

attracts national attention from environmental watchdogs. Retrieved April 29, 2011 from www.niagaraatlarge.com/2011/04/05/fort-erie's-speedway.

This online document introduces the CCGFE as a grassroots community group incorporated in 2010 to “support responsible development that will enhance and protect the cultural and ecological assets of Greater Fort Erie and Regional Niagara” (Citizens Coalition of Greater Fort Erie, 2011, p. 1).

The document presents the support the CCGFE garnered from reputable Canadian environmental watchdogs like David Suzuki Foundation and the Preservation of Agricultural Lands Society (PALS) for their cause of resisting the motor speedway racing track on rural lands. Both the Town of Fort Erie and the Region agreed to override the Official Policy and create a ‘special policy area’ for this project. The CCGFE argues that the project will encourage urban sprawl over agricultural lands, wetlands and forested areas. The document points to the

Carolinian Canada Coalition ‘Conservation Action Plan for Niagara’ emphasizing the importance of the Niagara River corridor as the most biologically diverse natural area in the Golden Horseshoe. The speedway project will compromise several of the Action Plan’s eleven goals, one of which (#7) is “To direct incompatible development and land uses away from natural areas” (Carolinian Canada Coalition, 2010, p. i).

The CCGFE document and David Suzuki Foundation document highlight various aspects of the categories of consideration, some with a strong language and others with moderate language.

5)Niagara Land Trust. (2011). Your legacy: Niagara’s Future. Retrieved on January 30, 2012 from www.niagaralandtrust.com.

The Niagara Land Trust is relatively recent and, since its establishment in 2008, was active in protecting natural areas, not agricultural lands (Bacher, 2011). The online documents are limited. The organization’s web site describes it as incorporated in 2008 with a geographic area of focus being the Niagara Peninsula and its contingent watersheds. The objectives are described as, “to protect lands and waters of ecological, agricultural, cultural values through a variety of mechanisms. These include – but not restricted to – land acquisition, conservation agreements, landscape restoration and education” (Niagara Land Trust, 2011, p. 1).

With Niagara Land trust being part of Ontario Land Trust Alliance (OLTA), the NLT documents were read with the Ontario Land trust documents to see if any of the categories recognized in the other documents are addressed. This proved to be very limited as the land trusts documents focus narrowly on their stewardship missions.

Because of the documents' narrow focus on category 6, 'Stewardship', counting the coded categories was considered unnecessary.

Appendix F1 – F8

**Appendices F1 to F8 below refer to the concept indicators of table 4.1 displayed below for
easy reference**

Reiterating table 4.1, The indicators for the concepts:

G1- Governance	a) responding to public consultations outcome, b) involvement of NGOs, c) encouraging volunteerism, d) reforming the decision making process
G2- Positive Social Relations	a) subscribing to “Community Supported Agriculture”, b) resolving conflicts over land use, c) supporting farmers markets, d) fostering participation in community activities
G3- Viable Farming	a) trends in rented farms, b) inclinations to sell or stop farming, c) reduction in farmed acreage, d) gross farm receipts changes, e) marketing of local products, f) right to farm protection, g) preservation of agricultural lands, h) supporting the agricultural industry
G4- Socio-economic Base	a) tourism, including wine tourism, b) rural job markets, c) economic diversification, d) exports of agricultural produce, e) changes in cost of agricultural production/ selling price of product, f) intensification of urban residential development.
G5- Equity	a) disproportionate poverty levels, b) rural service provision, c) agricultural workers’ limited rights, d) living wage

	raise, e) access to nutritious food, f) fostering multiculturalism
G6- Stewardship	a) environmental protection, b) land conservation, c) supporting the Environmental Farm Plan program, d) indicator species abundance
G7- Multifunctionality In agriculture	a) wineries' trends, b) fostering farm gate marketing, c) value added activities, d) conservation of cultural heritage, e) on-farm energy production
G8- Preparedness for the Future	a) use of backcasting, b) applying the Precautionary Principle, c) presence of alternative plans, d) recognizing uncertainty

Appendix F1

Documents analysis for the category, Governance.

Responses to the question of how the category is represented are coded as indicated in

section 4.3.2 by identifying the indicator and the direction as:

An alarming issue (N), an issue that needs addressing (P) with the frequency of mention

(within brackets)

Intensity: H (High), M (Medium), L (low)

Document # Year –Title (The analysed parts)	<u>Category/ Indicator and frequency</u>	<u>Direction</u>	<u>Intensity</u>
1 1989 –Farming Trends study (Major findings and interviews with farmers. Pages ii-ix & 29-36)	1 d- (2)	P	M
2 1990 –Responses to “Where Next”? A Vision to the Future (From page i to page15)	1 a- P (4)	P	M
3 1990- Preserving Niagara’s Agricultural			

Industry: Initiatives by All Four Levels of Government (From page 1 to page 20)			
4	1a – (1)	P	H
2003- Regional Agricultural Economic Impact Study, including 2 surveys and analysis based on the surveys	1a – (2)	P	M
	1d – (1)	P	M
5	1a – (2)	P	M
2004 – Securing a legacy for Niagara’s agricultural land: A vision from one voice & the Agricultural Action Plan	1d – (1)	P	M
6			
2007 – Energizing Niagara’s wine Country Communities			
7	1c – (1)	N	H
2006/ 2007 - Niagara Peninsula Conservation Authority Act under Ontario Regulation 155/06 & The Peninsula Watershed Report Cards			
8	1c – (1)	P	M
2011 – Niagara Parks Commission. Report on environmental protection			
9	1a – (1)	P	M
1988 – The Niagara Conservation Strategy/ Preservation of Agricultural Lands Society			

10 2011– Friends of the Greenbelt Foundation	1b – (1)	P	M
11 2008 – Ontario Landowners Association. “Finding profits on Canadian farms”	1a – (1) 1d – (2)	N N	H H
12 2011 – Citizens Coalition of Greater Fort Erie: Fort Erie Speedway Fight Attracts National Attention from Environmental Watchdogs			

Appendix F 2

Documents analysis for the category, Positive Social Relations

Documents analysis for the category, Governance.

Responses to the question of how the category is represented are coded as indicated in

section 4.3.2 by identifying the indicator and the direction as:

An alarming issue (N), an issue that needs addressing (P) with the frequency of mention

(within brackets)

Intensity: H (High), M (Medium), L (low)

<u>Document #</u> <u>Year –Title</u> <u>(The analysed parts)</u>	<u>Category/</u> <u>indicator and</u> <u>(frequency</u>	<u>Direction</u>	<u>Intensity</u>
1 1989 –Farming Trends study (Major findings and interviews with farmers. Pages ii-ix & 29-36)	2b- N (2)	N	M
2 1990 –Responses to “Where Next”? A Vision to the Future (From page i to page 15)			
3			

1990- Preserving Niagara's Agricultural Industry: Initiatives by All Four Levels of Government (From page 1 to page 20)			
4	2c – (1)	P	L
2003- Regional Agricultural Economic Impact Study, including 2 surveys and analysis based on the surveys	2c – (1)	P	H
	2d – (1)	P	H
5			
2004 – Securing a legacy for Niagara's agricultural land: A vision from one voice			
6	2c – (1)	P	M
2007 – Energizing Niagara's wine Country Communities			
7	2d – (1)	P	M
2006/ 2007 - Niagara Peninsula Conservation Authority Act under Ontario Regulation 155/06 & The Peninsula Watershed Report Cards			
8			
2011 – Niagara Parks Commission. Report on environmental protection			
9	2b – (2)	N	H
1988 – The Niagara Conservation Strategy/ Preservation of Agricultural Lands Society			

<p>10</p> <p>2011– Friends of the Greenbelt Foundation</p>	<p>2b – (1)</p>	<p>P</p>	<p>M</p>
<p>11</p> <p>2008 – Ontario Landowners Association. “Finding profits on Canadian farms”</p>	<p>2c – (1)</p>	<p>N</p>	<p>H</p>
<p>12</p> <p>2010 – Citizens Coalition of Greater Fort Erie: Fort Erie Speedway Fight Attracts National Attention from Environmental Watchdogs</p>	<p>2d – (1)</p>	<p>P</p>	<p>M</p>

Appendix F 3

Documents analysis for the category, Viable Farming.

Documents analysis for the category, Governance.

Responses to the question of how the category is represented are coded as indicated in

section 4.3.2 by identifying the indicator and the direction as:

An alarming issue (N), an issue that needs addressing (P) with the frequency of mention

(within brackets)

Intensity: H (High), M (Medium), L (low)

<u>Document #</u> <u>Year –Title</u> <u>(The analysed parts)</u>	<u>Category/</u> <u>Indicator and</u> <u>(frequency)</u>	<u>Direction</u>	<u>Intensity</u>
1 1989 –Farming Trends study (Major findings and interviews with farmers. Pages ii-ix & 29-47	3a- (1) 3a (1) 3b (3) 3c (5) 3d (3) 3e (2) 3f (3)	N P N N N N P	

	3h (1)	P	
2	3a (1)	P	
1990 –Responses to “Where Next”? A	3b (5)	N	
Vision to the Future (From page i to page	3c- (3)	N	
15)	3c (3)	P	
	3d (4)	N	
	3d (1)	P	
3	3c- (2)	N	
1990- Preserving Niagara’s Agricultural	3e (2)	P	
Industry: Initiatives by All Four Levels of	3g (2)	N	
Government (From page 1 to page 20)	3h (8)	P	
4	3a – (1)	N	H
2003- Regional Agricultural Economic	3b – (2)	N	H
Impact Study, including 2 surveys and	3c – (2)	N	M
analysis based on the surveys	3d – (2)	P	M
	3e - (2)	P	M
	3e (1)	N	H
	3g (2)	N	M
	3g (3)	N	H
	3h – (1)	N	H
5	3a – (1)	P	M
2004 – Securing a legacy for Niagara’s	3d – (2)	P	M
agricultural land: A vision from one voice	3e – (1)	N	H

	3e – (2)	P	M
	3f – (1)	N	H
	3g – (2)	N	H
	3h – (1)	P	M
6 2007 – Energizing Niagara’s wine Country Communities			
7 2006/ 2007 - Niagara Peninsula Conservation Authority Act under Ontario Regulation 155/ 06 & The Peninsula Watershed Report Cards	3h – (1)	P	M
8 2011 – Niagara Parks Commission. Report on environmental protection			
9 1988 – The Niagara Conservation Strategy/ Preservation of Agricultural Lands Society	3b – (1)	N	H
	3e (1)	N	H
	3f (3)	N	H
	3g – (6)	N	H
	3h – (1)	N	H
10 2011– Friends of the Greenbelt Foundation	3e – (2)	P	M
11	3b – (1)	N	H

<p>2008 – Ontario Landowners Association.</p> <p>“Finding profits on Canadian farms”</p>	<p>3c – (1)</p> <p>3d(1)</p> <p>3e – (1)</p> <p>3e - (1)</p> <p>3f – (1)</p> <p>3f – (1)</p> <p>3h (2)</p>	<p>N</p> <p>P</p> <p>P</p> <p>N</p> <p>P</p> <p>N</p> <p>N</p>	<p>H</p> <p>M</p> <p>M</p> <p>H</p> <p>M</p> <p>H</p> <p>H</p>
<p>12</p> <p>2010 – Citizens Coalition of Greater Fort Erie: Fort Erie Speedway Fight Attracts National Attention from Environmental Watchdogs</p>	<p>3c – (1)</p> <p>3g – (1)</p> <p>3g – (1)</p> <p>3g – (1)</p>	<p>N</p> <p>P</p> <p>P</p> <p>N</p>	<p>M</p> <p>L</p> <p>M</p> <p>H</p>

Appendix F 4

Documents analysis for the category, Socio-economic Base.

Documents analysis for the category, Governance.

Responses to the question of how the category is represented are coded as indicated in

section 4.3.2 by identifying the indicator and the direction as:

An alarming issue (N), an issue that needs addressing (P) with the frequency of mention

(within brackets)

Intensity: H (High), M (Medium), L (low)

Document # Year –Title (The analysed parts)	Category/ Indicator and (frequency)	<u>Direction</u>	<u>Intensity</u>
1 1989 –Farming Trends study (Major findings and interviews with farmers. Pages ii-ix & 29-36)	4b- (1) 4e- (1) 4e- (2)	N P N	
2 1990 –Responses to “Where Next”? A Vision to the Future (From page i to page 15)	4 a (3) 4 d (2)	N P	

3	4e (1)	P	
1990- Preserving Niagara's Agricultural Industry: Initiatives by All Four Levels of Government (From page 1 to page 20)	4f (3)	P	
4	4a – (5)	P	M
2003- Regional Agricultural Economic Impact Study, including 2 surveys and analysis based on the surveys	4a – (1)	P	H
	4a – (1)	P	L
5	4c – (1)	P	M
2004 – Securing a legacy for Niagara's agricultural land: A vision from one voice	4f – (2)	N	H
6	4a – (4)	P	M
2007 – Energizing Niagara's wine Country Communities	4b – (1)	P	M
	4c – (1)	P	M
7	4a – (2)	P	M
2006/ 2007 - Niagara Peninsula Conservation Authority Act under Ontario Regulation 155/ 06 & The Peninsula Watershed Report Cards	4f – (1)	P	M
8	4a – (1)	P	M
2011 – Niagara Parks Commission. Report on environmental protection			
9	4a – (1)	P	M

1988 – The Niagara Conservation Strategy/ Preservation of Agricultural Lands Society	4b – (3) 4f (1)	N N	H H
10 2011– Friends of the Greenbelt Foundation			
11 2008 – Ontario Landowners Association. “Finding profits on Canadian farms”			
12 2010 – Citizens Coalition of Greater Fort Erie: Fort Erie Speedway Fight Attracts National Attention from Environmental Watchdogs	4f – (3) 4f – (1) 4f (1) 4f – (1)	P N N P	M M H

Appendix F 5

Documents analysis for the category, Equity.

Documents analysis for the category, Governance.

Responses to the question of how the category is represented are coded as indicated in

section 4.3.2 by identifying the indicator and the direction as:

An alarming issue (N), an issue that needs addressing (P) with the frequency of mention

(within brackets)

Intensity: H (High), M (Medium), L (low)

Document # Year –Title (The analysed parts)	Category/ Indicator and (frequency)	<u>Direction</u>	<u>Intensity</u>
1 1989 –Farming Trends study (Major findings and interviews with farmers. Pages ii-ix & 29-36)	5b (1) 5f (2)	P P	
2 1990 –Responses to “Where Next”? A Vision to the Future (From page i to page 15)	5 b (1)	N	

3			
1990- Preserving Niagara's Agricultural Industry: Initiatives by All Four Levels of Government (From page 1 to page 20)			
4	5b – (1)	P	H
2003- Regional Agricultural Economic Impact Study, including 2 surveys and analysis based on the surveys	5b – (2)	N	H
	5e – (1)	P	H
	5e – (1)	P	M
5	5b (2)	P	M
2004 – Securing a legacy for Niagara's agricultural land: A vision from one voice			
6	5b – (1)	P	M
2007 – Energizing Niagara's wine Country Communities			
7			
2006/ 2007 - Niagara Peninsula Conservation Authority Act under Ontario Regulation 155/ 06 & The Peninsula Watershed Report Cards			
8			
2011 – Niagara Parks Commission. Report on environmental protection			
9	5b – (1)	N	H

1988 – The Niagara Conservation Strategy/ Preservation of Agricultural Lands Society			
10 2011– Friends of the Greenbelt Foundation			
11 2008 – Ontario Landowners Association. “Finding profits on Canadian farms”			
12 2010 – Citizens Coalition of Greater Fort Erie: Fort Erie Speedway Fight Attracts National Attention from Environmental Watchdogs	5a – (1) 5a – (1)	P P	M H

Appendix F 6

Documents analysis for the category, Stewardship.

Documents analysis for the category, Governance.

Responses to the question of how the category is represented are coded as indicated in

section 4.3.2 by identifying the indicator and the direction as:

An alarming issue (N), an issue that needs addressing (P) with the frequency of mention

(within brackets)

Intensity: H (High), M (Medium), L (low)

<u>Document #</u> <u>Year –Title</u> <u>(The analysed parts)</u>	<u>Category/</u> <u>Indicator and</u> <u>(frequency)</u>	<u>Direction</u>	<u>Intensity</u>
1 1989 –Farming Trends study (Major findings and interviews with farmers. Pages ii-ix & 29-36)			
2 1990 –Responses to “Where Next”? A Vision to the Future (From page i to page15)	6a – (5) 6a – (5)	P N	
3	6a – (1)	P	

1990- Preserving Niagara's Agricultural Industry: Initiatives by All Four Levels of Government (From page 1 to page 20)			
4	6a – (3)	P	M
2003- Regional Agricultural Economic Impact Study, including 2 surveys and analysis based on the surveys	6b – (2)	P	H
	6b – (2)	N	H
	6c – (1)	P	H
	6d – (1)	P	M
	6d – (1)	N	H
5	6b (1)	P	M
2004 – Securing a legacy for Niagara's agricultural land: A vision from one voice			
6	6a – (1)	P	M
2007 – Energizing Niagara's wine Country Communities			
7	6a – (5)	P	M
2006/ 2007 - Niagara Peninsula Conservation Authority Act under Ontario Regulation 155/06 & The Peninsula Watershed Report Cards	6a – (3)	N	H
	6c – (3)	P	M
	6d - (2)	N	H
8	6a – (4)	P	M
2011 – Niagara Parks Commission. Report on environmental protection	6a – (1)	N	H
	6d – (1)	P	M
	6d – (1)	N	M

9	6a – (3)	N	H
1988 – The Niagara Conservation Strategy/ Preservation of Agricultural Lands Society	6b - (3)	P	M
	6b – (8)	N	H
	6d – (1)	N	H
10	6a – (3)	P	M
2011– Friends of the Greenbelt Foundation	6b – (1)	P	M
	6c (1)	P	M
11			
2008 – Ontario Landowners Association. “Finding profits on Canadian farms”			
12	6a – (2)	P	M
2010 – Citizens Coalition of Greater Fort Erie: Fort Erie Speedway Fight Attracts National Attention from Environmental Watchdogs	6a – (1)	P	H
	6a – (1)	N	H
	6b – (1)	P	M
	6b – (1)	N	H
	6d – (1)	N	H

Appendix F 7

Documents analysis for the category, Agricultural Multi-functionality.

Documents analysis for the category, Governance.

Responses to the question of how the category is represented are coded as indicated in

section 4.3.2 by identifying the indicator and the direction as:

An alarming issue (N), an issue that needs addressing (P) with the frequency of mention

(within brackets)

Intensity: H (High), M (Medium), L (low)

Document # Year –Title (The analysed parts)	Category/ Indicator and (frequency)	<u>Direction</u>	<u>Intensity</u>
1 1989 –Farming Trends study (Major findings and interviews with farmers. Pages ii-ix & 29-36)	7b- (1) 7c- (1) 7c- (1)	P P N	
2 1990 –Responses to “Where Next”? A Vision to the Future (From page i to page 15)			

3			
1990- Preserving Niagara's Agricultural Industry: Initiatives by All Four Levels of Government (From page 1 to page 20)			
4	7b (2)	P	M
2003- Regional Agricultural Economic Impact Study, including 2 surveys and analysis based on the surveys	7c – (1)	P	M
	7c – (1)	P	H
	7d – (2)	P	M
	7d – (2)	P	L
5	7c – (1)	P	M
2004 – Securing a legacy for Niagara's agricultural land: A vision from one voice	7d – (1)	P	M
	7e (1)	P	M
6	7a – (1)	P	H
2007 – Energizing Niagara's wine Country Communities	7d – (2)	P	M
	7d – (1)	N	M
7			
2006/ 2007 - Niagara Peninsula Conservation Authority Act under Ontario Regulation 155/ 06 & The Peninsula Watershed Report Cards			
8			
2011 – Niagara Parks Commission. Report			

on environmental protection			
9 1988 – The Niagara Conservation Strategy/ Preservation of Agricultural Lands Society			
10 2011– Friends of the Greenbelt Foundation			
11 2008 – Ontario Landowners Association. “Finding profits on Canadian farms”	7b – (1) 7c – (1) 7c - (2)	N P N	H M H
12 2010 – Citizens Coalition of Greater Fort Erie: Fort Erie Speedway Fight Attracts National Attention from Environmental Watchdogs			

Appendix F 8

Documents analysis for the category, Preparedness for the Future.

Documents analysis for the category, Governance.

Responses to the question of how the category is represented are coded as indicated in

section 4.3.2 by identifying the indicator and the direction as:

An alarming issue (N), an issue that needs addressing (P) with the frequency of mention

(within brackets)

Intensity: H (High), M (Medium), L (low)

<u>Document #</u> Year –Title (The analysed parts)	<u>Category/</u> <u>Indicator and</u> <u>(frequency)</u>	<u>Direction</u>	<u>Intensity</u>
1 1989 –Farming Trends Study (Major findings and interviews with farmers. Pages ii-ix & 29-36)	8c- (1) 8d- (3)	N N	
2 1990 –Responses to “Where Next”? A Vision to the Future (From page i to page15)	8 b- (1) 8 c- (2)	N P	

3	8d- (1)	N	
1990- Preserving Niagara's Agricultural Industry: Initiatives by All Four Levels of Government (From page 1 to page 20)			
4	8c – (1)	N	H
2003- Regional Agricultural Economic Impact Study, including 2 surveys and analysis based on the surveys	8d – (2)	P	M
	8d – (1)	N	M
	8d – (1)	P	H
5			
2004 – Securing a legacy for Niagara's agricultural land: A vision from one voice			
6			
2007 – Energizing Niagara's wine Country Communities			
7	8b – (1)	N	M
2006/ 2007 - Niagara Peninsula Conservation Authority Act under Ontario Regulation 155/ 06 & The Peninsula Watershed Report Cards			
8			
2011 – Niagara Parks Commission.			

Report on environmental protection			
9 1988 – The Niagara Conservation Strategy/ Preservation of Agricultural Lands Society	8b – (1)	N	H
10 2011– Friends of the Greenbelt Foundation	8d – (1)	P	L
11 2008 – Ontario Landowners Association. “Finding profits on Canadian farms”	8b – (1)	N	H
12 2010 – Citizens Coalition of Greater Fort Erie: Fort Erie Speedway Fight Attracts National Attention from Environmental Watchdogs	8b – (1) 8b – (1)	P N	H H

Emerging issues from the documents:

1 –An emerging issue shared with the Press Analysis concerns the **need for public transit in the rural areas**. Quoting from a Regional Municipality of Niagara report (2003, p.8.7), “Public transit outside urban centres is basically non-existent. This results in the unfortunate circumstance where the jobs exist, the workers are available but the two cannot

connect” (Regional Municipality of Niagara, 2003, p. 8.7). In 2011, the Region started a regional public transit service connecting the region’s cities and towns traversing some rural areas; this helps in alleviating Equity as non-car-owning job seekers from cities can gain better access jobs. However, the purpose is to connect urban centres and many farms remain out of bounds from the regional transit lines. Innovative solutions are needed like establishing a farmers’ coop to share the cost of transporting their labour force.

Appendix G

Results of a search in St. Catharines Standard daily paper according to section 4.3.3 by

identifying the direction as:

An alarming issue (N), an issue that needs addressing (P), with the frequency of mention and space in word count indicating the page number (pointing to relative importance).

Intensity: H (High), M (Medium), L (low)

<u>Article</u>	<u>Category covered/ indicator</u>	<u>Frequency</u>	<u>Direction</u>	<u>Intensity</u>	<u>Length</u>
<u>Dec</u> <u>08,1996</u>	1d-Governance/ reforming decision making (Implicit)	1	P	L	196 (A3)
<u>Nov. 11,</u> <u>2000</u>	6a- Stewardship/ environmental protection (Explicit)	2	P, P	M, M	599 (F6)
	2d- Pos. Social Relations/ participation in community activities (Implicit)	2	P, P	L, L	
	Environmental/ Spiritual Links (Explicit)	2	P, P	H, H	
<u>April 30,</u> <u>2002</u>	6a- Stewardship/ environmental protection (Implicit)	2	P	L	496(A1)
<u>Nov. 05,</u>	Emerging: Property tax	1	P	H	659

2003	assessment (exp)				(A7)
	3g- Viable Farming/ preservation of agricultural lands (Explicit)	2 1	P P	M L	
	4f- Socio-economic Base/ intensification of urban residential development				
January 06, 2004	1d-Governance/ reforming of decision making process (Implicit)	3	P, P, P	L, L, L	351 (A6)
January 22, 2004	5b- Equity/ service provision (Implicit)	1	P	L	637 (A5)
	2d- Social Relations/ fostering participation in community activities	1	P	L	
Feb. 17, 2004	3h- Viable Farming/ supporting the farming industry (Explicit)	1	P	M	571 (A3)
	3g- Viable Farming/ preservation of agricultural lands (exp)	2	P	M	
	2d- Social Relations/ fostering participation in community activities (imp)	1	P	L	
April 02, 2004	3h- Viable Farming/ supporting the agricultural industry (exp)	1	N	H	213 (A6)
	1a- Governance/ responding to	1	N	M	

	public consultations (exp)				
April 26, 2004	3g- Viable Farming/ preservation of agricultural lands (Implicit)	1	P	M	1112 (D2)
	1d- Governance/ reforming the decision making (Explicit)	1	P	L	
	4f- Socio-economic Base/ intensification of urban (imp) development (imp)	1	P	M	
May 07, 2004	Emerging: Critique of property tax assessment (exp)				
June 15, 2004	3h- Viable Farming/ supporting the agricultural industry (Explicit)	3	N, N, N	H, H, H	622 (A7)
	1a- Governance/ public meetings (Explicit)	1	P	L	
	8b- Preparedness for the Future/ Applying the Precautionary Principle (Implicit)	1	P	L	
	3g- Viable Farming/ preservation of agricultural lands (exp)	1	N	H	
	3e- Viable Farming/ marketing of	1	P	L	

	local products (imp)				
July 29, 2004	3g- Viable Farming/ preservation of agricultural lands (Implicit)	1	P	L	394 (A4)
August 21, 2004	5a- Equity/ Poverty levels (explicit)	2	N	H	2251 (A1)
	5d- Equity/ living wage raise (explicit)	2	P	M	
	5e- Equity/ access to nutritious food (explicit)	2	P	L	
	Emerging: The need for regional transit				
Oct. 01, 2004	Emerging: property Tax (exp)	1	P	M	415 (A6)
Oct 29, 2004	2b- Social relations/ conflict resolving over land use (implicit)	1	N	M	853 (A2)
	7c- Multifunctionality in agriculture/ value-added activities (explicit)	2	N, N	M, M	
	3h- Viable farming/ supporting the	2	N, N,	M, M	

	agricultural industry (implicit)	1	P	M	
	3e- Viable farming/ marketing of local produce (explicit)	1	P	M	
	Need for regional transit	1	N	M	
	4c- Socio-economic Base/ economic diversification (exp)				
Nov. 06, 2004	4f- Socio-economic Base (exp)	2	P	M	850
	3b- Viable Farming/ inclination to sell or stop farming	1	N	H	(A9)
	3h- Viable Farming/ supporting the agricultural industry (exp)	2, 2	N, P	H, M	
	8d- Preparedness for the Future/ Recognizing uncertainty	1	N	H	
	Emerging: Property tax assessment	1	P	M	
Nov. 15, 2004	3c- Viable farming/ reduction in farmed acreage (explicit)	2	N, N	H, H	442 (A1)
	6a- Stewardship/ environmental protection	1	N	H	
	6b- Stewardship/ land conservation	2	N	H	
Nov, 23 ,2004	3c- Viable farming/ reduction in farmed acreage (explicit)	2	N, N	H, H	291 (A4)

	Emerging: Critique of property tax assessment	1	P	L	
Dec. 07, 2004	1d- Governance/ reform of decision making process (explicit)	2	N, N	H, H	288 (A8)
Dec. 23, 2004	Bearing the cost of refugees influx into Niagara	1	N	M	836 (A3)
January 15, 2005	3b- Viable farming/ inclinations to sell or stop farming (explicit)	1	N	H	616 (A3)
	3d- Viable farming/ farm receipts (explicit)	1	N	H	
	3f- Viable farming/ right to farm (explicit)	2	N, N	M, H	
	3h- Viable farming/ supporting agriculture (explicit)	1	N	M	
		1	P	L	
	3e- Viable farming/ marketing local produce (implicit)				
March 01, 2005	3g- Viable farming/ preservation of agricultural lands (explicit)	1	P	M	480 (A2)
	3h- Viable farming/ supporting agriculture (explicit)	1	N	M	
	6a- Stewardship/ environmental protection (explicit)	1	P	M	
Mar 28,	3f- Viable farming/ right to farm	1	P	M	486

2005	protection (explicit)				(A1)
May 25, 2005	4f- Socio-economic Base/ intensification of urban development	1	P	M	653 (A1)
	4c- Socio-economic Base/ economic diversification	1	N	H	
July 14, 2005	Critique of property tax assessment	1	N	H	474 (A5)
Nov. 26, 2005	1a- Governance/ public meetings (explicit)	1	N	H	534 (A6)
	Critique of the property tax assessment	1	N	H	
	4f- Socio-economic Base/ intensification of urban development	1	P	M	
Feb. 23, 2006	2d- Social Relations/ participation in community activities (implicit)	2	N	H	758 (A8)
May 15, 2006	6a- Stewardship/ environmental protection (implicit)	1	P	H	845 (A2)
	5b- Equity/ rural service provision (explicit)	2 1	N, N P	H, H L	
	1d- Governance/ reform of decision making (explicit)	1	N	H	

	8b- Preparedness for the Future/ applying the precautionary principle (imp)				
Aug 03, 2006	6a- Stewardship/ environmental protection (explicit)	3	P, P, P	M, M, M	932 (B8)
Oct. 12, 2006	7e- Multifunctionality in agriculture/ on-farm energy production (explicit)	1	P	M	373 (A5)
	1a- Governance/ public meetings (implicit)	1	P	L	
Dec. 01, 2006	Need for regional public transit	1	P	L	557
	1d- Governance/ reform of decision making process (explicit)	1	P	L	(A14)
	2b- Social relations/ conflict resolving over land use (implicit)	1	P	L	
	6a- Stewardship/ environmental protection (implicit)	1	P	L	
Feb. 22, 2007	3h- Viable farming/ supporting the agricultural industry (implicit)	2	P	M	562 (A5)
April 17, 2007	3e- Viable farming/ marketing of local products (explicit)	1	N	M	382 (A6)

	7a- wineries trends (implicit)	1	P	L	
	7c- Multifunctionality in Agriculture/ value-added activities (imp)	1	P	M	
June 01, 2007	4c- Socio-economic base/ economic diversification (explicit)	1	P	H	292 (A4)
	Need for regional transit (explicit)	1	N	H	
Aug. 09, 2007	5f- Equity/ fostering multiculturalism (explicit)	1	N	H	382 (A10)
Oct. 06, 2007	Need for regional public transit	2	P	M	1523 (A1)
	6a- Stewardship/ environmental protection (explicit)	4, 1, 1	P, N, P	H, H, M	
	8c- Preparedness for the Future/ presence of alternative plans (explicit)	1	P	L	
	Need for more recycling and regulations on sludge	4	P	M	
Dec 04, 2007	3g- Viable Farming/ preservation of agricultural lands (explicit)	1	P	M	412 (D4)
	6a- Stewardship/ environmental	2	P	M	

	protection (explicit)				
Mar 01, 2008	6a- Stewardship/ environmental protection (implicit)	1	P	M	565 (E1)
	6a- Stewardship/ environmental protection (explicit)	1	P	M	
Sept 05, 2008	1d- Governance/ reform of decision making process (explicit)	2	N	H	573 (A5)
Dec. 01, 2008	4f- Socio-economic base/ intensification of urban development (explicit)	1	N	M	523 (A6)
	4f- Socio-economic base/ intensification of residential development (explicit)	1	N	H	
	3g- Viable farming/ preservation of agricultural lands (explicit)	1	N	L	
April 18, 2009	5a- Equity/ disproportionate poverty level	3	P	L	622 (D6)
Sept. 19, 2009	6a- Stewardship/ environmental protection (explicit)	2	P	M	991 (C4)
	6b- Stewardship/ land conservation (explicit)	2	P	M	
Feb. 06, 2010	4c- Socio-economic Base/ economic diversification (implicit)	1	P	M	709 (A3)

	Need for Regional transit (explicit)	1	P	L	
June 23, 2010	2b- Positive Social Relations/ resolving conflict over land use (implicit)	1	P	M	785 (A2)
	8b- Preparedness for the Future/ Applying the Precautionary Principle (explicit)	1	P	M	
Oct. 25, 2010	1d- Governance/ reforming the decision making process (on lobbying) (implicit)	2	P	M	647 (C7)
	6a- Stewardship/ environmental protection (explicit)	2	P	M	
Feb. 09, 2011	1a- Governance/ responding to public consultation outcomes (implicit)	1	N	M	733 (A1)
	5a- Equity/ disproportionate poverty levels (implicit)	1	N	H	
	1a- Governance/ responding to public consultation outcome (explicit)	2	N	M	
Aug.	2d- Positive Social Relations/	1	P	M	643

13, 2011	fostering participation in community activities (implicit) 3f- Viable Farming/ right to farm protection (implicit) 7d- Multifunctionality in agriculture/ conservation of cultural heritage (implicit)	1	P	M	(A8)
		1	P	M	