Exploring the Interconnectedness between Work hours, Income Inadequacy, Time Adequacy, Leisure Time and Wellbeing within the Context of the Canadian Index of Wellbeing: A Case study of Victoria, British Columbia

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

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Abstract

Sustainability has consistently been linked to the wellbeing of the economy, society, and the environment. It has been viewed as a framework, which focuses on the interconnectedness of different systems, and activities that influence each other with the aim of enhancing wellbeing. These interdependencies of systems and activities are crucial for human wellbeing as they act as an impetus that strengthens and enhances wellbeing, and reflects the multiple factors that increase or diminishes wellbeing as well. In the light of this, this research aims to examine how the relationship between work hours, income inadequacy, time adequacy and leisure time influences wellbeing. It relied on archived data surveyed from Victoria, British Columbia by the Canadian Index of wellbeing (CIW). To establish a quantitative correlation between these factors of wellbeing, a subsample of 952 people who work for pay was drawn from the CIW dataset.

The data were analyzed with SPSS statistical tool using Pearson and Spearman correlation tests. The results showed a statistically significant association between work hours and time adequacy ($r = -.183$, p<.001); time adequacy and mental/physical wellbeing ($r= .429$, $r= .321$, p<.001); satisfaction with leisure time and mental/physical wellbeing ($r= .466$, $r= .503$, p<.001). These results indicate that as the participants' work hours increased, they had less than adequate time for other important activities e.g. time to sleep, socialize and to maintain physical fitness. Further, their state of mental and physical wellbeing increased as their time adequacy and satisfaction with leisure time increased and vice-versa. Other indicators influenced by time adequacy are sleep hours, physical activities, unpaid care to dependants, and vacation days were found to be statistically significant with weekly work hours. The overall outcome of the results

indicates health and wellbeing are closely related positively or negatively with human activities and lifestyle such as time adequacy for other activities outside of work, time devoted to sleep, physical activities and leisure activities.

This research contributes to the body of knowledge of the Canadian Index of Wellbeing (CIW) by underlining the interconnections that exist between the indicators and domains of the CIW selected for this study. In addition, this research would help influence policies and decisions, as policy makers would identify the factors driving wellbeing within the context of this research, and tailor interventions to minimize the pressures emanating from the factors driving wellbeing. In addition, this research stresses the importance of the sustainability of capital assets in achieving wellbeing.

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Chapter 1

Introduction

1.1 Sustainable Development and Wellbeing

With the rising prominence given to wellbeing and sustainable development in recent academic and policy discussions, linkages have been established between human wellbeing and sustainable development. These two concepts have received attention from researchers in the various fields of works, and it has been identified in literatures that both concepts rely on each other for their functioning, survival and existence; and improvement of human welfare (Matson et al., 2016; Dodds, 1997; Rogers et al., 2012; Sengupta & Dasgupta 2002).

As asserted by Cantor (2011), the Brundtland report definition of sustainable development that refers to "social, economic, and environmental development that meets the needs of current society without compromising or limiting future development and growth" (p.6) place emphasis on the relevance of both the natural environment and wellbeing in sustaining the needs of generations yet to come. As posited by Matson et al. (2016), "development is sustainable if inclusive social wellbeing does not decline over multiple generations" (p.14); therefore, it is crucial to recognize the role of the natural environment while placing value on the quality of human life to get a holistic measure of wellbeing (Sengupta & Dasgupta, 2002).

Dasgupta (2001) conceptual framework on sustainable development that covers the evaluation of quality of human life, measurement of social wellbeing and assessment of policies

for sustainable development expands the notion that the source of human wellbeing is not only derived from human capital, but from other capital assets (natural capital, manufactured capital and social capital) given that the quality of life of a society depends on how these "capital assets" are managed.

In their book, Matson et al. (2016) stressed on the relevance of these capital assets — natural, human, manufactured, knowledge and social in attaining sustainable development. The natural capital refers to resources that provide the basic needs of people; manufactured capital relates to human-made products; human capital captures people knowledge, skills and experience in a given society; social capital involves laws, norms and institutions that influence people's interaction; and knowledge capital– conceptual and practical knowledge that enhances a society's wellbeing. The authors believed that the degradation of these capital assets over time would not only cause a decline in social wellbeing, but also would result in unsustainable development. As illustrated in the below figure (Fig 1-1), the capital assets constitute the utmost determinants of wellbeing. All together, these assets drive the development the society needs to create its wellbeing (material needs, health and education, opportunity, community and security). Further, the social-environmental systems in which wellbeing is attained are complex and dynamic given they involve the production and consumption of goods and services that use capital assets to achieve sustainable development. The production and consumption processes are often viewed as a sustainability problem since consumption demands increases production levels and as a result put pressures on crucial assets such as fuel, water, soil and minerals. However, they proposed that more attention should be given to the conservation of resources and their

effects on the environment by making changes to how goods and services are produced with technological advancements and policies that lessen the negative impacts of production processes. As asserted by Matson et al. (2016), one identified key challenge is finding a balance between the consumption of goods and services that enhance human wellbeing and the production process required to provide them while the negative impacts on the social and economic system decline.

Figure 1-1: Interplay between Sustainable development and wellbeing

Constituents of wellbeing
Material needs
Health and education
Opportunity
Community
Security

Goals:
Inclusive wellbeing

Consumption processes

Goods and services

Production processes

Social-environmental system dynamics

Capital assets

Determinants of wellbeing
Human capital
Natural capital
Manufactured capital
Social capital

Actors /agents of action

Source: Matson et al. (2016, p.16)
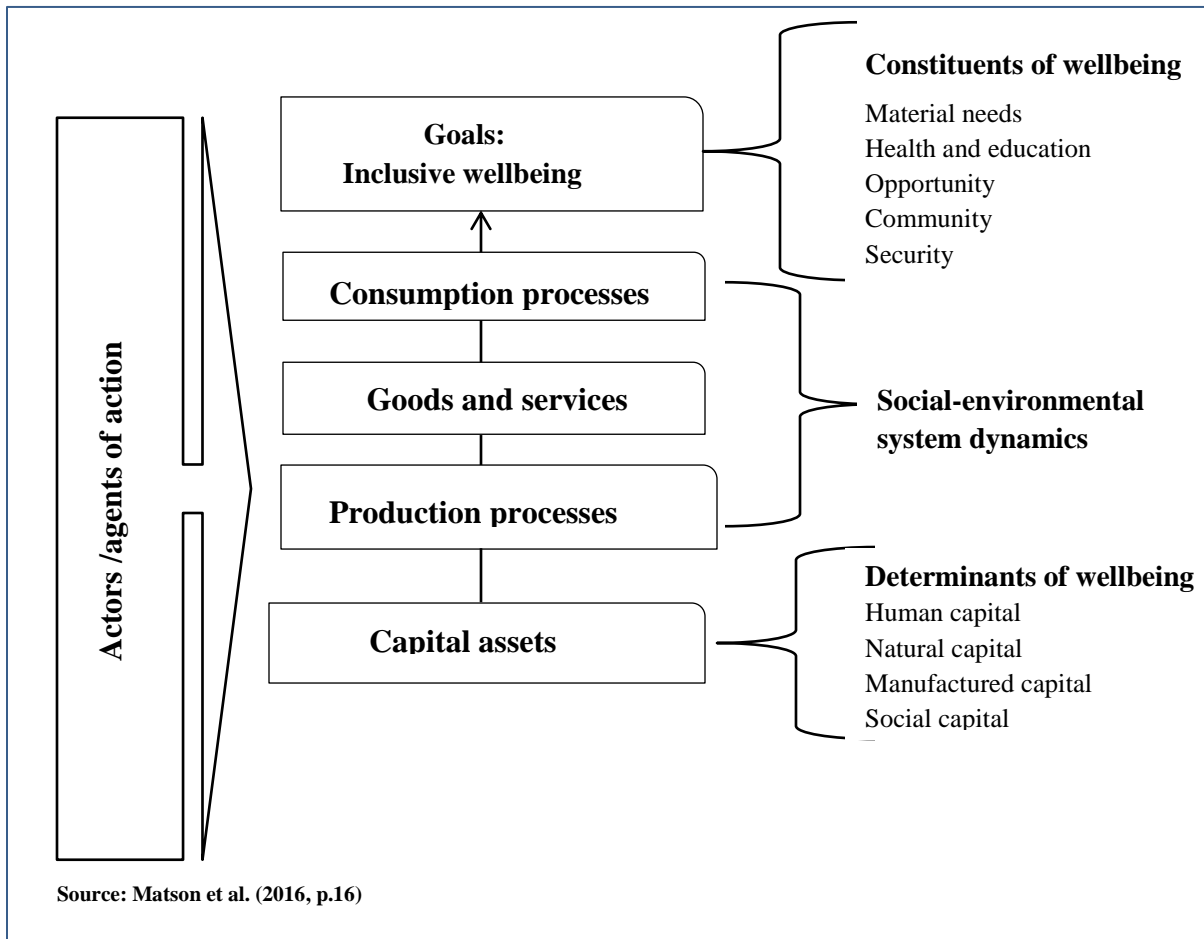
Furthermore, the Millennium Ecosystem Assessment (MEA) (2005) conceptual framework stresses the dynamic connection that exists between ecosystems and human wellbeing. It was reported that changes in human activities and living conditions drive the state of ecosystems and subsequently influence the state of human wellbeing. The ecosystem provides services that are beneficial to meet the basic needs of life, and these services encompass provisioning services such as food, water, timber, and fiber; regulating services that impact climate, wastes, floods, disease, and water quality; cultural services that offer aesthetic, recreational, and spiritual gains; and supporting services such as soil formation, photosynthesis, and nutrient cycling. The conceptual framework for the MEA postulates a dynamic relationship exists between humans and the ecosystem as changes in human conditions drive the changes in the ecosystem, thus influencing human wellbeing (Millennium Ecosystem Assessment, 2005).

According to Haines-Young & Potschin (2009), the findings from the Millennium Ecosystem Assessment (2005) report are of great concern as 60% of the assessed ecosystem services were reported as either degraded or used unsustainably. The outcome of these findings has strong repercussions for development and poverty alleviation given those mostly affected by the environment degradation are the vulnerable and poor (Díaz et al., 2006). Hence, the state of the ecosystem services strongly determines the wellbeing and sustainable development of the present and the future generation. As argued by Haines-Young & Potschin (2009), "No matter who we are, or where we live, our wellbeing depends on the way ecosystems work" (p.1). To better understand wellbeing and its relation to sustainable development, it is important for

countries to develop wellbeing indexes that incorporates the three pillars of sustainability that measures economic progress, quality of life and environment sustainability in a holistic way.

Different countries have developed their own measure of wellbeing based on what matters to them in recognition of the three pillars of sustainability. Wellbeing has been used interchangeably with single constructs such as happiness, quality of life and life satisfaction (Forgeard et al, 2011; Dodge et al 2012). While these single constructs omit important aspects of wellbeing, the multidimensional constructs holistically capture the essential components that constitute wellbeing. For instance, the OECD (Organization for Economic Co-operation and Development) assesses its member countries performance with 11 dimensions of wellbeing (OECD, 2011). In Australia, the proposed Australian National Development Index (ANDI) seeks to measure wellbeing by giving attention to the values and priorities of Australians while addressing social, economic and environment concerns with 17 key indicators. In Canada, the Canadian Index of Wellbeing (CIW) measures the wellbeing of Canadian's with eight critical domains and 64 indicators. As pointed out by Durand & Scott (2016), the multidimensionality of wellbeing is crucial as the idea of sustainable development is multidimensional in nature; hence assessing the progress of sustainable development requires measures of multidimensional wellbeing.

In the past, GDP has been used as a yardstick to measure a nation's wellbeing. It is believed that as GDP per capita rises, the standard of living of the population of a country increases, as well as the quality of life of individuals (Costanza et al., 2009). However, the inadequacies of GDP and its inherent limitations as a measure of quality of life have been

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identified and duly acknowledged (Stiglitz et al., 2010; Conceição & Bandura, 2008; Wilkinson & Pickett, 2009).

In 2008, the French president Nicolas Sarkozy, together with Nobel Prize-winning economists Stiglitz and Sen, and French economist Fitoussi created a Commission to assess the relevance of the GDP in measuring economic and social progress. Stiglitz et al. (2010) proposed that GDP should be adjusted to correct its deficiencies; and the measures of quality of life, sustainable development and environment be included in evaluating GDP (Stiglitz et al., 2010). As asserted by Nicolas Sarkozy:

… if we remain locked into an index of economic progress that includes only what is created and not what is destroyed; if we look only at gross domestic production, which rises when there has been an earthquake, a fire or an environmental disaster; … how can we expect to realize what we are really doing and face up to our responsibilities?

In Canada, GDP grew by 38% between 1994 and 2014 whereas wellbeing saw slow improvement – the CIW report indicates a 9.9% increase in wellbeing. While economic growth is increasing, the quality of life of Canadians has not seen much advancement (CIW report, 2016). This is evident as the living standards of Canadians dropped by 11% after the 2008 recession; leisure and culture of Canadians declined by 9% between 1994 and 2014; Canadians are dealing more with time crunch; the rating of overall health is not as positive as before; and the environment domain declined by 2.9% between 1994 and 2014 (CIW report, 2016). Given these issues threatening the quality of life of Canadians, it became important to have an appropriate measure of wellbeing– the Canadian Index of wellbeing to assess and monitor the wellbeing of Canadians (CIW National Report, 2016).

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1.2 Rationale of Study and Contribution

In Canada, the Canadian Index of Wellbeing (CIW) has been developed as a measure of wellbeing that drives evidence based decision making for effective social, economic, and environmental policy development (CIW, 2016). The CIW established eight key domains: Community Vitality, Democratic Engagement, Environment, Education, Healthy Populations, Leisure and Culture, Living Standards, and Time Use as parameters for assessing the quality of life and wellbeing in Canada. Within these domains, 64 indicators have already been developed. This research therefore aims to explore five selected domains of the CIW and their corresponding indicators of measure. One of the key goals of the CIW is to identify and understand the interconnections among the many factors influencing wellbeing by understanding how different factors relate and interact (Michalos et al. 2011). As suggested by Michalos et al (2011), there is need to explore relationships between indicators, domains, subpopulations and demographics within the CIW to better understand the interactional relationship that exists amongst them. Hence, this thesis contributes to the knowledge by providing evidence on the interconnections that exists among the selected five domains for this study.

The CIW has been extended to different provinces and municipalities within Canada for the purpose of developing a community plan that aims to advance wellbeing and sustainable development through wellbeing surveys that draw information from the residents on the eight domains of the CIW that are crucial to their wellbeing (Hilbrecht et al., 2013; Phillips et al., 2014; CIW, 2016). These wellbeing surveys have been deployed to communities in Ontario

(Guelph, Kingston, Oxford County and Waterloo Region), Alberta (Wood Buffalo) and British Columbia (Victoria).

This research adopted the Victoria Community Wellbeing Survey (CWS) as the primary source of data for this study and was hinged on the conceptual framework of the CIW. The survey was launched on May 5, 2014 with the goal of collecting information from residents of Victoria region on the eight domains of the CIW that are essential to their wellbeing. The survey depicts the CIW's expansive vision to conduct research to promote wellbeing in Canada (Phillips et al., 2014; Hilbrecht et al., 2013)

The primary purpose of this research is to investigate the relationships among work hours, income inadequacy, time adequacy, leisure time, and wellbeing in Victoria Capital District BC, Canada. With the use of a correlational research design, this research seeks to provide more insights on the multiple factors influencing and contributing to overall wellbeing by providing evidence with the outcome of the correlation results. The findings from this study provide understanding and awareness of how work hours, income inadequacy, time adequacy, leisure time are associated with wellbeing.

Given the relevance of wellbeing, the overarching goal of the Sustainable Development Goals (SDG's) is to ensure individual's quality of life globally. Quality of life involves people having access to essential resources that are needed to live a satisfied life. These needs are not limited to basic human needs such as food, shelter and clothing, but encompass how people spend their time as it relate to work and its impacts on their overall wellbeing. As established by Man & Lin (2014), longer work hours do not necessarily amount to productivity, thus time could

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be allocated to other activities that advance personal wellbeing and community growth. In the view of this, a balance between work and life activities would offer people more personal time to engage in leisure and other activities that contribute to their health and wellbeing. In addition, a work-life balance would provide opportunities for individuals to give attention to other crucial aspects of their lives such as spending quality time with family, building healthy relationships, volunteering, and providing unpaid care to dependents thereby contributing to their community's wellbeing.

One of the major social policy goals of national governance is to ensure and improve the quality of life of its populace. This research would be relevant in influencing policies at local and national levels as policy makers can make decisions based on the driving forces, pressures and responses of long work hours as they relate to human wellbeing. It aims to contribute the body of knowledge of wellbeing by creating awareness on human activities, behaviour and lifestyle that are beneficial and detrimental to health, overall wellbeing and the environment. The findings would further help policy makers, practitioners; organizations and the government to make better policies that relate to work hours in ensuring people have a balanced life between work and other aspects of their lives. Hence, it is important for policy makers to enact policies for improvement in these identified areas. In addition, this research contributes to literature on work hours, income inadequacy, time adequacy and leisure. Lastly, this study aims to offer empirical and theoretical contribution to the growing body of knowledge on wellbeing and sustainable development.

1.3 Research Question

In order to achieve the purpose of this study, this research is driven to provide answers to following key questions:

- How are work hours, income inadequacy, time adequacy, and leisure time associated to wellbeing?

- Is there an association between household income level and people's perceptions of their local environment in the context of wellbeing?

Chapter 2

Literature Review

2.1   The Concept of Wellbeing

For over 50 years, wellbeing has been likened to the material wealth of a country usually measured by its Gross Domestic Product (GDP). It has been the most widely accepted measurement of economic progress around the world (Conceição & Bandura, 2008; Costanza et al, 2009). However, increasing attention has been given to the inherent interrelationship between economic progress and wellbeing. Critics have recognized that GDP does not account for all the aspects of human life (Conceição & Bandura, 2008) as it fails to increase personal and social wellbeing through uneven income distribution (Wilkinson & Pickett, 2009). The use of GDP as a measure of economic performance, which traditionally indicates progress towards human wellbeing, is indeed problematic given that GDP accounts for all economic activities not minding if they contribute negatively to the welfare of the society. For instance, GDP measures economic activities that deplete natural capital and decrease ecosystem services which the society depends on for continual existence (Costanza et al., 2009; Max-Neef 1995). Moreover, non-monetary activities such as childcare and volunteerism, which play vital roles in societal wellbeing, are not captured by GDP (Cobb et al., 1995; Kubiszewski et al., 2013). Although it has been established that human wellbeing tends to rise as GDP increases, however continuous GDP growth does not necessarily translate to continuous improvement in quality of life (Max-Neef 1995; Cobb et al., 2007).

In the light this, the concept of wellbeing plays a vital role for the measurement of national success and environmental sustainability around the world. Recent studies show that the positive outcomes of wellbeing in areas such as health, work and productivity, prosocial behaviour and volunteering lead to other outcomes for a strong society and economy (Quick & Abdallah, 2012; Iwasaki & Mannell, 2000; Moen, 2010; Sparks et al., 1997; Lazarus & Folkman 1984; DeLongis et al., 1988). Even though there is no single definition of wellbeing, it has been agreed that wellbeing embraces the presence of positive emotions and moods, the absence of negative emotions, life satisfaction and fulfillment, and positive functioning (Frey & Stutzer, 2010; Andrews & Withey, 1976; Ryff & Keyes, 1995). Researchers from different fields have studied different aspect of wellbeing such as physical wellbeing, economic wellbeing, social wellbeing, emotional wellbeing, psychological wellbeing, life satisfaction and domain specific satisfaction (Keyes, 2002; Ryan & Deci, 2001; Diener, 2000; Chickzentmihalyi, 1990; Kaplan et al., 1993).

Extensive research on human wellbeing has shown relationships exist between work hours and people's subjective wellbeing, quality of life and environment sustainability (Kallis et al., 2013; Nørgård, 2013; Rogers et al., 2012; Jackson 2009). Work hours has been recognized as a determining factor that defines and allocate the time people devote to sleep (Patel et al., 2006), leisure activities (Iwasaki & Mannell, 2000), spending quality time with family, providing care for children and other dependants and engagement in volunteer and community service (Moen et al., 2008; Hill, et al., 2013; Moen et al., 2008). Further studies have found associations between work hours and physical wellbeing (Shields, 2000; Sparks et al., 1997), psychological wellbeing

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(Moen et al, 2013; Lazarus & Folkman., 1984; DeLongis et al., 1988) and life satisfaction (Collewet & Loog., 2014).

Also, from an environmental sustainability perspective, works hours has been identified as a pressure that encourages the incessant production and consumption of goods that requires more utilization of natural capital which contests with the sustainable development of the present and future generation (Kallis et al., 2013; Odum and Odum., 2001; O'Neill et al., 2012). It is in this regard that concepts like degrowth emerged. Degrowth seeks to address this sustainability problem by proposing shorter work hours that would cut down production and consumption level of environmentally harmful goods and services, and significantly improve quality of life and wellbeing of the society given that more jobs would be available for the unemployed, more time would be available for people to engage in leisure activities, spend quality time with their families and nurture relationships in their community (Kallis et al., 2013; Schor, 2008; Latouche, 2011; Jackson 2009)

As it has been over-emphasized that GDP is not a good measure of wellbeing, human and societal wellbeing still remains a pressing concern for societies even for the most developed economies with high level of income (GDP per capita) (Conceição & Bandura, 2008). This argument stresses that more income does not necessarily assure good quality of life and life satisfaction which are fundamental and significant to wellbeing. In realization of this, it is imperative to have better and holistic measures that truly reflect individual and societal values and priorities in the journey of attaining wellbeing.

2.2 Defining & Measuring Wellbeing

In recent decades, research in wellbeing has been growing interest in academic fields. The extensive research in wellbeing has raised these questions: "what is wellbeing?", "how did wellbeing emerge?"

In the fourth century B.C, the historical perspective of wellbeing emerged from the hedonic school of thoughts (McAllister, 2005). This perception equates wellbeing with feelings of happiness and pleasure, and views wellbeing as the approach for attaining pleasure and avoiding pain (Ryan & Deci, 2001; McAllister, 2005). The hedonic approach as it relates to happiness has been explored by different bodies of research to offer a holistic view of the notion (Bentham, 1972; Ryan & Deci, 2001; Kubovy, 1999; Kahneman et al., 1999). The utilitarian philosophers argue that a strong society is developed through individual's attempts to maximize pleasure (Bentham, 1972), while psychologists view the hedonic approach as a broad concept that does not only involve the pleasures of the mind but also considers that of the body – pleasures that occurs overtime, and relief pleasures– that occurs only briefly (Kubovy, 1999). Most importantly, the hedonic psychologists views wellbeing as subjective happiness and experience of pleasure (Diener et al.,1998; Ryan & Deci, 2001) as against displeasure experiences that involves all judgments on the good and bad aspect of life (Ryan & Deci, 2001, p.144). Hence, most hedonic psychology research assess subjective wellbeing as the existence of life satisfaction, presence of positive mood and the absence of negative mood– all are often termed as happiness (Diener & Lucas, 1999).

Despite the views of the hedonic approach, opposition from different researchers and bodies of knowledge have vilified happiness as a main determinant of wellbeing (e.g. Aristotle; Nagel, 1972; Fromm, 1981; Waterman, 1993; Ryff & Singer, 1998, 2000; Ryff & Keyes, 1995). In the view of this, Aristotle posited that hedonic happiness is an unrefined approach to wellbeing, as it does not express virtue "in doing what is worth doing" (Ryan & Deci, 2001, p.145). By taking knowledge from Aristotle, Fromm (1981) further claims it is important to differentiate between needs perceived subjectively with temporary pleasure and those "needs that are rooted in human nature whose realization is conducive to human growth for producing eudaimonia", which is wellbeing (p. xxvi). Therefore, the term eudaimonia refers to wellbeing and so differs from happiness (Fromm, 1981; Ryan & Deci, 2001).

While happiness takes a hedonic approach, eudaimonic approach states that not all human feelings or desires even the pleasure generating ones will promote wellbeing as some of these desires are not positive in attaining wellness (Waterman, 1993). Moreover, as highlighted by Ryff et al. (1998), the construct of human development and psychological wellbeing emerged from the eudaimonic approach.

As philosophical arguments about equating hedonic pleasure (happiness) with wellbeing has been debated, there has also been substantial discussion on the extent which subjective wellbeing adequately defines and measures psychological wellness (Waterman, 1993; Ryff & Keyes, 1995; Fromm, 1981). As noted by Ryff & Keyes (1995), psychological wellbeing differs from subjective wellbeing as it offers a multi-dimensional approach in measuring wellbeing in respect to six dimension of human actualization namely: personal growth, life purpose,

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autonomy, self-acceptance, mastery, and positive relatedness. The dimensions all define psychological wellbeing from a theoretically and operational approach, and identify the essential needs to improve emotional and physical health (Ryff & Singer 1998).

Furthermore, based on evidence from research, it has been concluded that wellbeing should be considered as a multidimensional phenomenon that embraces both hedonic and eudaimonic concept of wellbeing as these researchers (Compton et al., 1996; King & Napa1998; McGregor & Little, 1998) found some associations between the indicators of the hedonic and eudaimonic approach in their respective studies. As recognized by Ryan et al, (2001), these findings did not only highlight the convergence factors but stress the divergence factors that led to the development of indicators of hedonic and eudaimonic wellbeing.

Given the ambiguity and malleability of the wellbeing concept itself, various theoretical and operational definitions have emerged. As rightly noted by Forgeard et al. (2011), the question of how wellbeing should be defined has remained largely unanswered which has led to the rise of unclear and various definitions (Smith et al., 2001; Forgeard et al., 2011; Dodge et al., 2012). McGillivray (2007) further argues that wellbeing is often faced with different, competing meanings and understandings hence it lacks a collectively acceptable definition (Conceição & Bandura, 2008). Because of this, several variety of definitions do exist (Gasper, 2010), and most researchers have agreed with the multifaceted and complexity of the wellbeing construct (Diener, 2009; Michaelson et al., 2009; Stiglitz, et al., 2009). While most wellbeing researchers agree that wellbeing be defined and measured as a multidimensional concept (Ryff & Keyes, 1995; Ivković et al., 2014; Michaelson et al., 2009), some other researchers have ignored the multifaceted

approach to wellbeing and have equated wellbeing to a one-dimensional construct thereby resulting to the exclusion of some important aspect of wellbeing**.** For instance, wellbeing has been used interchangeably with single constructs such as happiness, quality of life and life satisfaction (Forgeard et al., 2011; Dodge et al., 2012). In the light of this, Stiglitz et al. (2009) defines wellbeing as a multi-dimensional construct that encompasses material living standards (income, consumption), health, education, personal activities such as work, political voice and governance, social connections and relationships, environment (present and future conditions) and uncertainty (economic and physical nature) (as cited in Ivković et al., 2014, p. 223).

Given the increasing growth in academic literature on how wellbeing should be measured, it has become imperative to have a broader and inclusive approach to measure wellbeing (Eger & Maridal, 2015); hence two approaches have been identified in measuring the multidimensional aspect of wellbeing– the objective and subjective approach (Conceição & Bandura, 2008).

The objective approach of wellbeing capture people's material and social situation to decipher the aspect of their lives that increase or detract their wellbeing (Conceição & Bandura 2008; McAllister, 2005). The objective indicators assess wellbeing with important and visible facts that involves economic, social and environmental data, which evaluate wellbeing using cardinal measures indirectly (McGillivray & Clarke, 2006; van Hoorn, 2007). The subjective approach measures people's wellbeing by asking them to rate the level of their happiness, quality of life and life satisfaction (Conceição & Bandura 2008). With the use of ordinal measures, subjective indicators of wellbeing directly measures people's real life situation and state of mind

by evaluating their cognitive judgements of life, affective moods and emotions (McGillivray & Clarke, 2006; van Hoorn, 2007; Diener et al., 1999).

Further, Ivković et al. (2014) defines wellbeing as gains attained by people in a society through attainment of high economic development which is the objective dimension of wellbeing that results in positive perception of quality of life in the society (the subjective dimension of wellbeing) (Michaelson et al., 2009; Ivković et al., 2014). Hence, this definition suggests that the objective dimensions of wellbeing are critical for achieving the subjective dimensions of wellbeing (McAllister, 2005). As indicated in the OECD report (2013), macroeconomic and objective indicators do not provide policy-makers with a sufficiently detailed and clear picture of the actual living conditions of ordinary people. In addition, they do not provide any coherent reason for trends in wellbeing, as the increase in economic growth does not correspond with life satisfaction reports (Michaelson et al., 2009; Ivković et al., 2014). However, the subjective indicators of wellbeing tend to provide critical information about people's lives; they offer insights and evaluate the experience of individual's living conditions as well (OECD, 2013; McGillivray & Clarke, 2006; van Hoorn, 2007). In other words, the wellbeing of a society can be understood by the actual living conditions perceived by individuals in the observed society, and the effects of these conditions on the individuals depend on their personal perception of their living conditions (Böhnke, 2005; Ivković et al., 2014). As posited by Hicks et al. (2016), wellbeing applies differently across context, thus measuring quality of life requires the assessment of economic and non-economic, subjective and objective measures of wellbeing across population groups (McGregor, et al., 2015; Ivković et al., 2014). It is imperative to

incorporate both objective and subjective measure of wellbeing when evaluating the wellbeing of a society as they provide a more holistic and richer measure of people's quality of life (Allardt, 1993; Ivković et al., 2014).

In order to illustrate a conceptual framework for the measurement of wellbeing for this study, figure (2-1) below was adopted.

Figure 2-1: Measures of wellbeing

Source: Ivković et al. 2014 (p.3)
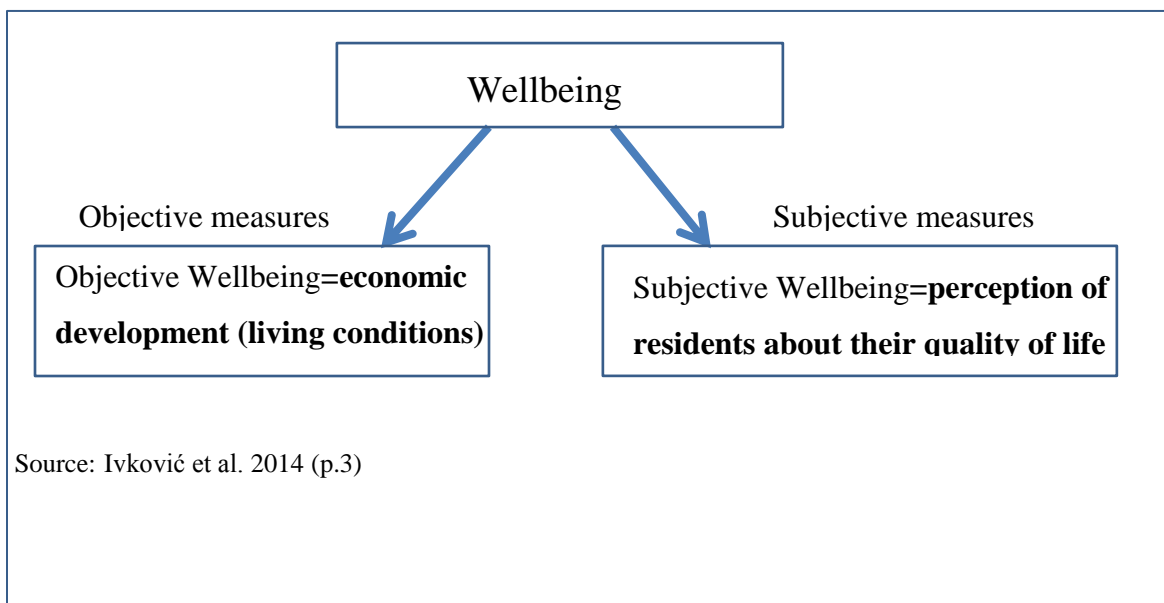
Figure 2-1 illustrates a holistic/combined approach to wellbeing upon which this thesis is based. As underscored by Felce & Perry (1995), an overall measure of wellbeing should embrace both objective descriptors and subjective evaluations of physical, material, social, and mental wellbeing. Blunden (1988) asserts that physical wellbeing is centered on the state of individual's health, fitness and physical safety and on their overall satisfaction with their physical health (Blunden, 1988; Muldoon et al., 1998). Further, Sherbourne et al. (1992) categorized physical

wellbeing measures as subjective measures that uses self-report of physical symptoms for health assessments. A good evaluation of an individual's mental wellbeing is understood as the absence of psychological distress - anxiety, depression, anger; and the presence of emotional ties and social support (Muldoon et al., 1998). Similarly, Diener et al. (1999) further classified mental/psychological wellbeing into four specific resources that embrace and evaluate people's perception of pleasant affect or positive wellbeing –joy, elation, happiness, mental health; unpleasant affect or psychological distress–guilt, shame, sadness, anxiety, worry, anger, stress, depression; life satisfaction–a global evaluation of one's life; domain or situation satisfaction – work, family, leisure and finances (McKee-Ryan et al.,2005, p.54).

Furthermore, Ryff and Singer (1998) argue that good or positive health is more than the absence of illness; it is a state of wellbeing rather than a state of illness. According to the World Health Organization (WHO, 1948), health is defined as "state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity" (p. 28). Therefore, human wellbeing involves the wellness of the mind and body and their interconnections. Hence, both components of mental and physical health should be considered when assessing people's health (Ryff and Singer, 1998). Ryff and Singer (1998) recognized that resources such as quality connections to others, spending quality time with family and loved ones and social relationships positively contribute to mental and physical health. Further, Dodge et al. (2012) draws attention to a different aspect of wellbeing wherein wellbeing is seen as a point of balance between fluctuating resources and challenges (p.230). In other words, wellbeing becomes stable when individuals have the sufficient resources (e.g. social relationships, work-life balance) they need

to meet a specific need or challenge of their physical and mental health (Brickman and Campbell, 1971; Headey & Wearing 1989, 1991, 1992). Hence, as individual's physical and mental wellbeing resources increase, the mental and physical challenges they encounter lessens. However, when individuals have more challenges than resources, the see-saw in Fig 2-2 slopes along their wellbeing and vice-versa (Dodge et al., 2012 p.230).

In illustrating the relationship between physical/mental health and wellbeing resources and physical/mental challenges with wellbeing as the point of balance, the below figure was adapted.

Figure 2-2: Dimension of wellbeing

Source: Dodge et al. 2012 (p.230)
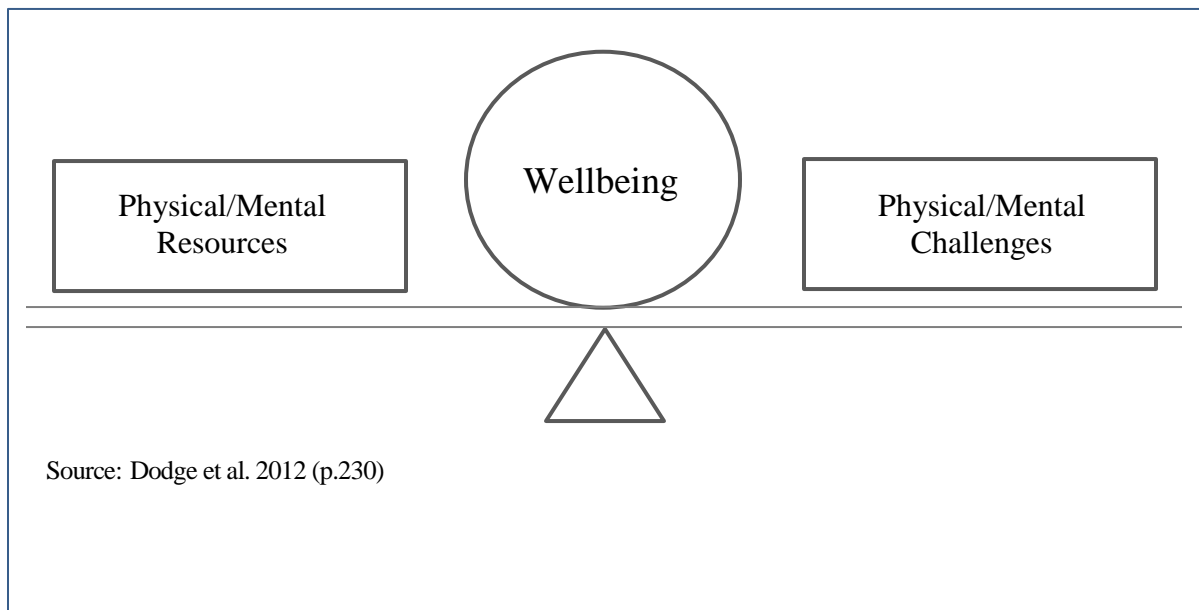
Furthermore, a variety of methods, metrics has been adopted to evaluate wellbeing. As pointed out by Larsen & Eid (2008), wellbeing is often assessed with self-report because of its

subjectivity. Self-reported wellbeing can be measured in different ways, however, the selection of a specific instrument depends on the expected outcome for measuring wellbeing in the first place (e.g. clinical outcome, assessment of a population health and wellbeing) (Eid, 2008; Larsen & Eid 2008)

2.3 Global Wellbeing Indices

As discussed earlier, several studies have identified the GDP inadequacy to holistically measure all aspect of economic, social and environmental sustainability that are relevant human wellbeing (Max-Neef 1995; Cobb et al. 2007). This has given rise to the proposal and development of several indexes to address the flaws that challenge the quality of life of the present and future generations. In reiterating Conceição & Bandura (2008) point on the two ways of measuring wellbeing, wellbeing indicators are developed to be measured subjectively and objectively. For instance, the OECD Better Life Index and Bhutan's Gross National Happiness Index (GNH) were created with self-reported data, while the Human Development Index (HDI) and the Genuine Progress Indicator (GPI) both that measure societal progress were developed with concrete data e.g. the HDI is the geometric mean of indices for each of its three dimensions – healthy life, education and living standards (UNDP, 2013); the GPI is measured with the same personal consumption data as the GDP but makes adjustments from the account (Talberth et al., 2006). The HDI and GPI are progress indicators that assesses and monitor economic and social progress and the development of a society (Asheim, 2000; UNDP, 2013). In wellbeing literatures, both the HDI and GPI are referred as not only progress indicators but are considered

as wellbeing indicators e.g. (Sagar & Najam, 1998; Talberth et al., 2006; Anielski, 2001). While measures of wellbeing come as single and multidimensional constructs, the OECD Index, Bhutan's GNH Index, the HDI are multidimensional in nature whereas the GPI is a single construct. These indices– the OECD Index, Bhutan's GNH Index, the HDI and GPI are distinct in wellbeing literature as they seek to measure wellbeing and progress directly and make improvements to GDP (Conceição & Bandura, 2008). These four indices –OECD Index, GNH Index, HDI and GPI are further explained in the next sub- sections.

2.3.1 OECD Better Life Index

In 2011, the Organization for Economic Co-operation and Development (OECD) proposed the Better Life Index, which focuses not only on the functioning of the economic system but also on people's experiences and on living conditions (OECD, 2011).

The OECD index identifies and translates wellbeing through three pillars– material living conditions, quality of life and sustainability. It evaluates the wellbeing of 34 member countries with the aim to provide information on the present and future wellbeing through 11 dimensions: housing, income, jobs, community, education, environment, governance, health, life satisfaction, safety and work-life balance (OECD, 2011). Also, its wellbeing framework focuses on people (individuals and households), wellbeing outcomes, distribution of wellbeing in the society, and evaluates both objective and subjective aspects of wellbeing with the aim of continuously driving wellbeing (Durand, 2015). The index has been criticized for its composition of only developed countries. However, its interactive tool allows other developing countries to create their own

Better Life Index and rank wellbeing issues in their countries (OECD, 2011). One of the key priorities of the index is to measure wellbeing and progress through on-going research to enhance its wellbeing measure and link the existing gap between wellbeing and policy intervention (OECD, 2011).

2.3.2 Human Development Index

The Human Development Index (HDI) is one of the well-known indices for measuring human progress globally. In 1990, the first Human Development Report was published with the vision of expanding people's choices and experiences towards achieving economic and social progress (UNDP, 2013). The HDI focuses on the richness of human lives rather than the wealth of an economy, and stress that people's needs and experiences are fundamental in evaluating the development of a country (UNDP, 2013). The index is an important substitute to GDP for measuring development as its framework for measuring human development is built on three key dimensions; a healthy life, education and living standards (UNDP, 2013); these three dimensions are also reflected as domains of the CIW. The HDI is calculated as the mean of these three dimensions. The health dimension is measured by life expectancy at birth, the education dimension measures both the average schooling years of adults aged 25 years and older and the expected years of schooling for children of school entering age. The living standard dimension is measured by gross national income per capita (UNDP, 2013).

Overtime, the HDI has been used to query national policy outcomes such as how countries with equal level of Gross National Income (GNI) per capita can have different human

development results. These contrasts identified by the HDI have stirred up debates on government policy priorities (UNDP, 2015). Conversely, the index has been criticized for not capturing environmental issues (Sagar & Najam, 1998). However, the HDI reports emphasize the importance of sustainable work for human development while ensuring a sustainable future.

Another criticism is it focuses mainly on a country's performance and ranking and gives less attention to human development issues from a global perspective (Sagar & Najam, 1998, p.249). In addressing this gap, the Human Development Report Office (HDRO) has provided other composite indices on some of the key global issues of human development such as human poverty, inequality and gender disparity. According to the HDI originators, people's access to basic amenities is required for the change that would promote human development globally.

2.3.3 The Genuine Progress Indicator

In 1995, the Genuine Progress Indicator (GPI) was created as a substitute to GDP to evaluate the effect of sustainable welfare on a growing economy by ensuring policymakers at all levels measure people's welfare in social, economic and environmental terms. The GPI aims to reflect the physical and monetary values; social and natural capital of a country thus depicts a broader perspective of the actual state of its wellbeing (Anielski, 2001). Originally referred as the Index of Sustainable Economic Welfare (ISEW), the index is well known for distinguishing between economic progress that weakens and strengthens environmental sustainability. Its goal

is not to only to measure economic activity but economic wellbeing (Talberth et al., 2006) since it adopts the same personal consumption account with GDP.

The GPI assesses the welfare of a society, its economy, and natural capital holistically by deducting values from the consumption account to reflect income inequality, environmental depletion, costs of crime, and loss of leisure not captured by the GDP (Talberth et al., 2006). The GPI account monitors the physical, qualitative and monetary costs and benefits of the human, social, natural and human-made capital in its wellbeing accounting framework (Anielski, 2001); and identifies factors that increase or decrease economic welfare (Kubiszewski et al., 2013). The GPI attempts to measure the "green GDP account" to reflect sustainable income, welfare equivalent income, and net social profit (Asheim, 2000). This measurement is achieved by segregating the personal consumption expenditures, and by adding or subtracting values to reflect positive or negative externalities from consumption activities. For instance, the GPI adjusts for income inequality, net capital formation and foreign borrowing, and integrates benefits such as the value of housework, service from household infrastructure, parenting and volunteer work amongst others to the account. On the other hand, it subtracts costs such as the value of time including the cost of loss leisure time, commute time and underemployment, cost of crime and long-term environmental degradation from the account (Anielski, 1999; Asheim, 2000).

Furthermore, the index tracks progress through its social, economic and environmental domains built on the "meta-principle" that social, economic and environmental needs should harmonize to achieve sustainable outcomes (Talberth et al., 2006). The GPI has received

criticism regarding its method of calculation and theoretical underpinnings. Also, it is grounded on weak sustainability since it measures natural and human-built capital differently. The cost of natural capital depletion is easily replaced with human-built capital, which is of higher value (Talberth et al., 2006 p.4). However, it provides further insights for sustainable policies that can increase the performance of a country in attaining sustainable development. In the long run, it can influence the execution of more anti-growth policies (Clark & Lawn, 2008).

2.3.4 Gross National Happiness Index

In the 1970s, His Majesty Fourth King of Bhutan, Jigme Singye Wangchuck developed the term "Gross National Happiness" (GNH). The GNH fundamental goal of development is rooted on happiness and wellbeing of a society. The index was created to improve the lives of the "not-yet-happy people" (Ura et al., 2012) by assigning more value to the non-economic aspects of wellbeing. The GNH concept believes that a holistic approach should be adopted to achieve progress and sustainable development (Gross National Happiness, 2010). According to Ura et al. (2012), the GNH index is a multi-dimensional construct that is built on data from periodic survey that represents different districts, gender, age groups and income levels in the country. The GNH index is multidimensional being that its indicators aims to reflect human wellbeing holistically than traditional measures of economic development and social progress (Ura et al., 2012).

The GNH index was created using the Alkire-Foster method, and was built on four main pillars: good governance, sustainable socio-economic development, cultural preservation, and environmental conservation. The index was further expanded into 9 domains and 33 indicators

that capture psychological wellbeing, health, education, time use, cultural diversity and resilience, good governance, community vitality, ecological diversity and resilience, and living standards of the Bhutan society (Gross National Happiness, 2010). These indicators guide and track the activities of the public sector in developing wellbeing policies for the Bhutan people and are relevant for measuring progress overtime. The 33 indicators are further composed of 124 variables all together. Some of the indicators are life satisfaction, healthy days, working hours, literacy, sleeping hours, sociocultural participation, household income and environmental responsibility amongst others.

The GNH index has been criticized for its unlikelihood of reflecting and measuring the diversity and significance of the GNH. However, it is a useful tool for tracking national progress of Bhutanese. Its framework is similar to the Canadian Index of wellbeing which is also dynamic and specific to the needs of Canadians. Just like the GNH index, the CIW seeks to measure the crucial dimension of life that is critical to the wellbeing of Canadians with eight key domains and 64 indicators.

2.4 The Canadian Index of Wellbeing

In 1999, the need to develop a single index to measure the welfare of Canadians was recognized by the Atkinson Foundation, after several engagements and consultations with key stakeholders and experts in relevant fields, they then agreed on "what matters most to Canadians". Before then, Canada like other developed countries relied mostly on the GDP for measuring economic progress. Canada had no high-level national instrument that observes and

gives report on the status of its wellbeing (CIW, 2012). The Canadian Index of Wellbeing was developed to measure and track the wellbeing of Canadians overtime and other crucial aspects of life not reflected by the GDP (CIW, 2012). The CIW defines wellbeing as "The presence of the highest possible quality of life in its full breadth of expression focused on but not necessarily exclusive to: good living standards, robust health, a sustainable environment, vital communities, an educated populace, balanced time use, high levels of democratic participation, and access to and participation in leisure and culture".

As stated in the "Technical paper: Canadian Index of Wellbeing 1.0", the development of the CIW eight indicators were based on a bi-directional approach which has been described as a pragmatic framework hinged on the use of empirical and theoretical evidence (Michalos et al., 2011). This is in recognition of the fact that most of the phenomena relevant to human wellbeing from which the established eight key CIW domains were derived from are dynamic. The CIW framework is bi-directional in that it further explores available data that could be added to the framework Hence the authentication and improvement of the CIW framework remains a continuous process (Michalos et al., 2011).

According to Michalos et al (2011), the indicators were selected based on the validity, reliability, quality and feasibility of their association with wellbeing (Smale & Hilbrecht, 2014). The CIW Technical report (2011) adopted "the Mandala of wellbeing" to explain the relationship among the domains and wellbeing. The personal resources in the first circle are healthy populations, education, and time use that represents the essential needs requires for wellbeing. The public resources are living standards, community vitality, leisure and culture, and

democratic engagement that a society draws from the public domain. The ecosystem resources however influence all other domains and circles. Further, the CIW used a compensatory scale to ensure the deterioration of some indicators is compensated by improvement in other indicators (Michalos et al., 2011 p.28). The Principle of Nonsufficient Reason was used to assign equal weight to the indicators in each domain. The principle suggest there should be sufficient reasons for assigning more weights to any indicator as the greater variety of weight assigned to the CIW indicators, the less useful the index would be acknowledged as an accepted measure of wellbeing (Michalos et al., 2011).

Booysen (2002) criticized the use of a composite index like the CIW for measuring wellbeing. He believed that double counting of redundant variables is most likely to occur in the development of the indicators; changes in component variables might not be reflected in the composite figures. The values of domains, variables, and indexes changes over time and the selection of the indicators maybe biased and politically motivated. On the other hand, as asserted by Michalos et al (2011), composite indexes like the CIW offer easy understanding to multiplex and multi-dimensional phenomena. It allows for comparison of different phenomena and assessment of their significance. Hence, it minimizes the chance of public programs to be wrongly influenced by various interest persons or groups (p.14).

Aside being a measure of wellbeing, one of the objectives of the CIW is to discover interconnections among the many factors that influence wellbeing especially the wellbeing of Canadians. The CIW seeks to expand wellbeing as a multidimensional construct with the awareness that policy decisions and programs can impact experiences, perceptions, and

opportunities; hence it can cause a ripple effect on wellbeing outcomes (Smale & Hilbrecht., 2014, p.493). Further, it is essential for the CIW to discover the interactions between indicators and domains, subpopulations, demographics and geography (Michalos et al., 2011). According to Michalos (1978), "explorations of these sorts of phenomena are essential for adequate sustainability assessments because human motives, preferences, needs, perceptions, evaluations and so on can be our greatest resources and/or constraints" (p.71)

2.5 Description/Relationship between Key Variables of Study

According to the CIW report (2016), "wellbeing is a system of interconnected systems" (p.67). The Canadian Index of Wellbeing stresses the importance of exploring the interconnection among indicators and domains in discovering the factors influencing wellbeing. As noted by Michalos et al. (2011), the purpose and structure of relationships need to be ascertained in order to recognize important trends and gaps.

This thesis section seeks to explore the relationship among some factors that influence wellbeing within the context of the CIW. These key factors are work hours, income inadequacy, time adequacy and leisure time. The detailed discussions of the key indicators are presented below, followed by literatures that address the associations between these factors.

2.5.1 *Weekly working hours*

According to a Eurostat publication (2013), measurement of the impact of paid employment on wellbeing is complex. Much attention has been given to the quantity and quality of paid work as paid employment demands a substantial amount of people's time and can positively or negatively affect quality of life (Abdallah et al., 2013; Meager et al, 2003). As argued by Abdallah et al., (2013), the number of people's weekly work hours affects their work-life balance that eventually affects their subjective wellbeing. Subjective wellbeing tends to decline after work hours exceed 48 hours per week, after job satisfaction and overall fulfilment with job diminishes (Abdallah et al., 2013). However, some researchers identified work hours does not diminish people's wellbeing but the variance in people's preference of work hours does (Bryan & Nandi., 2015; Wooden et al. 2009; Wunder and Heineck, 2013). This suggests that work-life balance can be achieved when people get to choose their preferred work hours hence their level of wellbeing level improves.

The OECD framework recognizes the significance of work-life balance to attain good quality of life. In its framework, the first indicator of work-life balance domain measures the percentage of workers who work over 50 hours for pay in the OECD countries (OECD, 2011). The OECD stresses the importance of people having a good balance between work obligations and their personal life. Although working less could reduce the income a person earns but on the other hand, working more hours can negatively affect people's health and wellbeing, and other important activities such as childcare and leisure activities (OECD, 2011). Similarly, the CIW time subdomain measures the proportion of Canadians that work more than 50 hours per week.

Long work hours involve high health risks for employees both at work and outside of work. It could strain personal relationships, increase fatigue and affect the worker's mental health (CIW, 2016). Meanwhile, this thesis adopts a similar indicator that seeks to measure the weekly work hours of respondents to understand how their work hours influences their work-life balance and other aspects of life.

Statistics Canada (2010) defines work hours as the number of hours usually worked in a typical week regardless of whether a monetary value involved e.g. household work, childcare and volunteer work. According to White & Beswick, 2003, long paid work hours implies working more than 48 hours a week. In Canada, employees are required to work a maximum of 48 hours per week. The recent results for average weekly work hours showed Canadians working population worked an average of 30.5 hours weekly (Statistics Canada, 2015). Furthermore, the results from the General Social Survey (GSS, 2010) showed that Canadians spent on average 8 hours 12 minutes on paid work and related activities, of which 7 hours 38 minutes were spent on paid work and the rest (1 hour 5 minutes) on commuting to and from work. In the light of this, it has been proposed that commute time and business travel time to be integrated when calculating work hours or time (White & Beswick, 2003).

In their book, Messenger et al. (2007) stated the average weekly working hours in most countries are usually between 35 and 45 hours per week. However, majority of developing countries have longer weekly working hours that exceeds 48 hours (e.g. Thailand, Costa Rica, Peru, Philippines, El Salvador, and Turkey). On the other hand, developed countries work shorter

hours with the exclusion of some Asian countries such as Japan, Republic of Korea and the Singapore that work more than 48 hours weekly.

2.5.2 *Income Inadequacy*

According to OECD Better Life Initiative report (2013), income plays a vital role in the different aspects of individual and societal wellbeing. Income has the capacity to increase people's consumption options and acts as a means to satisfy financial needs (Kuhn & Lozano, 2005; Kaya, 2014). Aside from providing people with their needs, income offers non-economic benefits in terms of improved life satisfaction, education and better health status and the opportunity of residing in a safe and clean environment (OECD, 2013; Boushey & Gundersen 2001). Household disposable income is usually comprised of earnings from paid employment, social benefits in cash, and rent paid to home owners amongst others. This indicator offers a good assessment of how income contributes to wellbeing (OECD, 2013).

It is important to note that the concept of income inadequacy is generally perceived as inexplicit as it does not seem to have a direct definition (Kaya, 2014). Income inadequacy has been applied to different context and differs among countries. It is perceived as a "monetary rationale" and "subjective perception" (Kaya, 2014 p.637)**.** Also, it is used interchangeably with financial inadequacy. According to Kaya (2014), perceived income inadequacy is the difficulty faced by households to make ends meet and the incapability to be financially stable. Further, it is considered as the incapacity to meet financial obligations, the incapability to save money and the likelihood of having no money before the next salary (Kaya, 2014; Boushey & Gundersen, 2001;

Fursman 2008). Boushey & Gundersen (2001) further describes income inadequacy as the extent to which households are unable meet their basic needs. It refers to when families lack basic amenities, financial incapacity to sustain a healthy home and environment. Other indicators of income inadequacy are inability to pay housing bills and food insecurity (Boushey & Gundersen., 2001).

According to Litwin & Sapir (2009), perceived income inadequacy is regarded as a significant indicator that determines non-economic wellbeing. It has been observed in relation to self-rated health (Cairney, 2000), life satisfaction (Coke, 1992), depressive symptoms (St. John, Blandford, & Strain, 2006). Income adequacy is not only impacted by objective economic measures, it is also influenced by other subjective factors such as people evaluating their future needs and comparing their income level with others (Litwin & Sapir., 2009). As pointed out by Kaya (2014), income surveys are good source for getting data on the subjective perception of household's income inadequacy. Usually, respondents are asked questions that relates to their capacity to make ends meet.

According to Williams et al. (2011), the number of people sustained by a particular income (e.g. family size) influences the people perception of income inadequacy. Often, income adequacy is assessed by asking people questions on how their financial needs were met in the previous year. It can be measured by calculating the mean of the responses to three circumstances– 'I could not pay my bills on time', 'I ate less because there was not enough food or money for food', and 'I did not have enough money to buy the things I needed' (Hilbrecht et al, .2015).

According to the European Commission's EuroBarometer (2010) report, one-sixth of participants indicated to have financial difficulties to pay their bills or to purchase food items in the previous year (Kaya, 2014). In Canada, income is significant determinant of food insecurity (Tarasuk 2010, Chen & Chen 2001, McIntyre et al, 2002). As stated by Power (2005), income influences healthy diet and indirectly mediates with people's social class status. The Canadian Community Health Survey (2000) which indicates 14.7% of Canadian households are food insecure and low-income Canadians are most likely to be nutritionally vulnerable supports this claim.

Boushey & Gundersen (2001) acknowledge the challenge of confirming if responses from income inadequacy surveys are honest as some people respond based on their household preference and taste. Therefore, the style and method of asking such questions are crucial to get accurate answers. As recommended by Beverly (2001), the assessment of income inadequacy should reflect the inability to access basic amenities. Objective and direct indicators should be adopted to assess the extent of the inadequacy in order to identify households that are genuine about their difficult financial situation Beverly (2001).

2.5.3 *Time Adequacy*

Past research has shown the importance of employees attaining a balance between work and life activities outside work. As noted by Karasek & Theorell's (1990), the quality of experience employees derive from their work determines the state of their health and wellbeing. The authors established a framework that associates employees work conditions to their health.

The framework reflects time strain, time demands and time control as important indicators that impacts employee's health and wellbeing. Therefore, time adequacy is necessary to balance work with activities and responsibilities outside work effectively (Lott, 2014).

According to Lott (2014) time adequacy "is the fit between working time and all other time demands and can be achieved through working time flexibility and autonomy"(p.1). Similarly, (Moen, 2010) describes time adequacy as the balance between the time spent at work and time outside the workplace. At times, time adequacy is perceived as employees not having enough time to spend with their families due to work responsibilities (Hill et al. 2013). According to Daly (2001), time is a psychological asset that is experienced and perceived differently among employees. For instance, employee's attributes (age, gender, number and age of children and partner employment status) and performance demands at work influence their perception of time adequacy (Lee et al., 2015).

The CIW measures time use with the Social Theory of Time[1] framework to get a perception of how Canadians spend their time by segregating the time use domain into different indicators that measures weekly work hours, commute time, daily sleep hours, time spent with friends, and reported levels of time pressure that influences overall wellbeing (CIW, Time use Domain). Also, the OECD has similar indicator in its framework that measures direct and

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[1] A time use framework that conceptualizes time as a multifactorial phenomenon with four sub- components (time, timing, tempo, and temporality). The time subcomponent involves indicators that capture the amount of time spent on specific activities; timing focuses on when activities occur during the day; tempo involves on how time is experienced in terms of pace; and temporality refers to the natural rhythms associated with daily, weekly, or annual routines that are largely dependent on biological or seasonal changes (See Time Use domain of the Canadian Index of Wellbeing -https://uwaterloo.ca/canadian-index-wellbeing/what-we-do/domains-and-indicators)

indirect effect of time spent on non-work activities that contributes to the wellbeing of employees and their family (OECD, 2011).

According to Moen et al. (2008), the time adequacy scale measures the adequacy of employees' evaluation of their time in relation to their obligations at work and home; and how they spend their leisure time. The time adequacy scale inquires if people have enough time to sleep/rest, socialize, keep in shape, prepare or eat healthy meals, participate in or be active in the community, nurture their spiritual and/or creative side, to complete housework or chores, to be with the children they live with, and to be with your partner or spouse. The time adequacy scale (Moen et al., 2008) also mediates the relationship between employee's personal wellbeing and the wellbeing of their family.

2.5.4 *Leisure Time*

Overtime, the significance of time spent on leisure activities for societal wellbeing has been recognized in wellbeing literatures. According to Chapple & Ladaique (2009), the quantity and quality of time spent on leisure activities plays a vital role for societal wellbeing. Leisure has been identified as an essential need that contributes positively to people's physical and mental health (Iso-Ahola & Mannell 2004; Haworth & Lewis 2005; Iwasaki, Zuzanek, & Mannell, 2001). Leisure does not only improve the wellbeing of the person that is involved or engaged in the leisure activities, it as well contributes to the wellbeing of others as the benefits from leisure activities are transferrable to people (OECD, 2009). This is evident through enhanced personal and family relationships (OECD, 2009)

Leisure can be viewed as the time spent free of duties and responsibilities (OECD, 2009). According to Burda et al (2006), the quantity of leisure is defined as "all activities that we cannot pay somebody else to do for us" (p. 1). Chapple & Ladaique (2009) argues that this definition does not reflect the types of activities that are considered as leisure. Alternatively, Pávková et al. (2008) defined leisure time as "the opposite of obligatory work and duties" (p.224). It is seen as the time people choose activities they engage in voluntarily to increase their satisfaction (Pávková et al. 2008). As noted by Sevilla et al, (2012), leisure activities involve non-work activities which people receive direct satisfaction from and cannot be transferred to another person. Such activities include sports activities, watching television, and socializing.

The OECD wellbeing framework assesses the leisure time and activities within its work-life balance domain. The leisure indicator measures data using national time use surveys to assess hours allocated to leisure activities daily for the populace within ages 25-64 years. The indicator measures leisure activities that include sports activities, participating/attending events, visiting or entertaining friends and engagement in hobbies. Further, the quality of life index developed by Natural Resources Canada evaluates leisure and recreational activities in different geographical locations in Canada. The index stresses leisure and recreational activities influences overall wellbeing and could direct the state of our health. It assesses leisure and recreational activities with two main indicators: the number of leisure-related commercial activities per thousand people e.g. attending musical concerts and festivals, art galleries and museums; and the number of libraries per thousand people (Atlas of Canada, 1999-2009). Furthermore, the CIW leisure and culture domain measures Canadians involvement with the arts, cultural, and

recreational activities. The domain covers four dimensions: participation, perceptions, experiences and opportunities. People's mental, physical health and overall wellbeing could be improved when they engage in leisure activities. In addition, these leisure activities create the avenue to relax, socialize and learn new things (CIW, 2016).

Dridea & Sztruten (2010) points out there are three main determinants of leisure time. The personal factor involves an individual's abilities, attitude and personality. It relates to an individual behaviour, needs and desires to be involved in the leisure activities. Income is another determinant for choosing a leisure activity, as individuals with higher income tend to have more varieties in leisure activities. Lastly, the opportunity to access the leisure facilities, the location of the leisure are important factors people consider before engaging in leisure activities (Dridea & Sztruten, 2010).

2.6 Relationships between Indicators/Variables of Study

2.6.1 Relationship between Work hours, Income and Income inadequacy

For more than two decades, the relationship between income and work hours has received a fair amount of attention (Borjas, 1980; Kuhn & Lozano, 2005; Litwin & Sapir 2009; Williams et al., 2011). There has been a shift in shorter to longer work hours during these decades. In the United States, before 1970, work hours were shorter for most workers (Costa 2000; Aguiar & Hurst 2007). However, the number of workers who worked 50 hours and more increased from 14.7% in 1980 to 18.5% in 2001 (Kuhn & Lozano, 2005). By 2002, it became evident that those

who worked longer hours were the highly paid workers while low-income earners worked shorter hours (Kuhn & Lozano, 2005; Costa 2000; Aguiar & Hurst 2007). Kuhn & Lozano concluded that some of the reasons for the increase in work hours were attributed to marginal incentives such as rise in income and opportunity for promotion amongst others. In view of this, some studies have recently established some association between work hours and income and income inadequacy.

Mehdikarimi et al. (2015) conducted a study to establish the relationship between work hours and income with data from the United States Census Bureau's American Community Survey. The identified variables that could determine the effect of income on work hours were usual hours worked per week and adjusted personal income in the past year. They conducted a regression analysis and found that for every 1% increase in adjusted personal income, hours worked per week went up by 0.06804. Hence, a 10% increase in income is forecasted to increase work time by 40.8 minutes per week. Therefore, this result demonstrates income has an effect on work hours.

According to Fursman (2008), reports from the 2006 Census in New Zealand showed some associations between working hours and income among the workforce. It was discovered that about 22.68% of the workforce worked more than 50 hours per week. Further, Fursman (2008) interviewed about 17 different families who were working over 50 hours weekly and income was identified as the determining factor that resulted in long work hours since their work hours increased as income increased. Although high income earners are more likely to work

more hours (Kuhn & Lozano, 2005), the New Zealand 2006 Census data pointed out that workers with no qualification, and low income earners worked longer hours (Fursman, 2008).

In the attempt to show that a relationship does exist between work hours, income and income inadequacy, Boushey & Gundersen (2001) conducted a study to examine the extent families encounter hardships as they transition from welfare to work status. The term "hardship" was used in place of income inadequacy in the study, and it involved food insecurity, inability to pay housing bills, inaccessibility to clothing and consumer durables, housing utilities amongst others. The results from the study showed that families who had recently moved from the welfare program still faced significant hardships in meeting their financial needs especially those who worked shorter hours. The outcome of analysis revealed that about 24.1% of part-time workers and 14% of full-time workers skipped meals; 39.8% of part-time workers and 21.1% of full-time workers could not afford the food they liked to eat, and 42.7% of part-time workers and 30.4% of full-time workers had difficulty paying rent and mortgages. This study indicates that those who work shorter hours are more likely to be challenged with income inadequacy and food insecurity. These results confirm that work hours increase as income level increases while income inadequacies decline. Similarly, associations were also found between income inadequacy and food insecurity from the results of National Children's Nutrition Survey in New Zealand. Food insecurity was highly reported among the low-income households in Māori and Pacific as children from these households were the highest reported without school lunch provisions.

In addition, Coşkuner (2016) conducted a regression analysis to determine the impact of household income on their financial situation. The results of the analysis showed income was the

most influential factor that forecasted people's financial satisfaction as one unit in household income increased financial satisfaction by 57.3%.

2.6.2 Relationship between Work hours, Time adequacy and Wellbeing

According to CIW report on time use, the way and manner people use and experience, time has a significant impact on their present and future physical and mental wellbeing; and on their individual and family and community wellbeing. Several factors influence the level of individual's time pressure and these factors have significant impact on people's overall wellbeing (Zuzanek, 2004; Shields 2000; Sparks et al., 1997; Moen et al 2013).

The menace of longer work hours have been supported with ample evidence through research. As pointed out by Sparks et al (1997), long work hours can increase the stress levels on people mental and physical health. Long work hours, together with continuous stress from work can definitely influence individual's state of health negatively (Sparks et al., 1997). Among the studies on work hours, a study was conducted in the United States in 2004. The researchers found that 69% of the participants reported they were highly overworked on their job, while 78% reported high work overload, as they were involved in too many tasks at the same time (Galinsky et al., 2005). Further, a report by Economic and Social Research Council of Great Britain established associations between long work hours and negative health consequences such as increase in stress levels. It was also noted that long work hours resulted in a decline in physical exercise activities (Sease & Scales, 1988).

Furthermore, Moen et al (2013) provided more evidence that higher demands on work-hours and lower levels of time control are related to poorer health outcomes in their study. Using data collected from 550 employees in a white-collar organization in the United States, they tested the relationship between time strain and seven self-reported health outcomes. Time strain was measured with average hours worked per week and psychological time demands scale. The results of the correlations between variables showed a positive correlation between psychological time demands and work hours (r = .52); a negative correlation between time adequacy and psychological time demands (r = −.50). These results indicate that as work hours increase, psychological demands from work increase. On the other hand, time adequacy increases as psychological demands from work decrease. The statistical results from the study suggest that the decrease in psychological demands from work and increase in time adequacy has positive effect on energy, psychological wellbeing and self-assessed health whereas negative consequences were experienced vice-versa (Moen, Kelly & Lam 2013).

In addition, Uehata (1991) conducted a survey of 203 workers who suffered cardiovascular attacks in Japan. The socio-medical background of the participants revealed that two-thirds of the workers worked over 60 regular hours per week and 50 overtime hours per month. Also, they spent more than half of their fixed holidays on work. These long work hours were also complemented with other stressful work issues such as career problems, excessive business trips. The study revealed 88 of the workers experienced emotional anxiety and work overload within 24 hours prior their health attack occurred. The outcome of the study concluded

that Karoshi- "fatal attack from work overload" was one of the work-related health issues caused by working long hours.

In establishing the relationship between work hours and stress, Paykel (2001) argued that stressful life situation often occurs before anxiety disorders. Shift work and long work hours have been identified as potential indicators of anxiety and depression that could have negative effect on mental health (Harrington, 2001). Further, Lazarus & Folkman (1984) amassed evidence from their study indicate that individuals living stressful lives are more likely to be unhealthy and are also prone to psychological issues than those living less stressful lives. Similarly, DeLongis et al (1988) found that the increase in daily hassles could result in a decline in health and mood. In addition, Kirkaldy et al (1997) examine the stress level on 2,500 medical professionals in Germany. The outcome of the results indicates that those physicians that worked over 48 hours weekly reported significantly higher levels of stress from their job than those that worked less than 48 hours per week.

According to Harrington (2001), there is consensus in literatures on the fact long hours from both regular and shift work has detrimental effect on sleep. Studies that examine the relationship between sleep and health have revealed sleep constraint can result in extreme daytime sleepiness and can reduce an individual's neurocognitive function as well (Ayas et al., 2003; Kahneman et al. 2004). Ayas et al, (2003) confirmed sleep loss may have long-term health consequences and could lead to several health issues ranging from mood swings, high blood pressure, weight gain, premature death, cardiovascular disease to the development of diabetes. In view of this, Kato et al. (2000) conducted a study with 8 healthy persons who had one night of

normal sleep and one night of total sleep deprivation. The outcome of the study showed the subjects who were totally deprived of sleep had significantly higher blood pressure compared to those who had normal sleep. Further, Kahneman et al. (2004) examined the impact of sleep on wellbeing using day reconstruction method (DRM) data. They found individuals that were sleep restricted had more emotions that are negative. Further study conducted by the British Household Panel Survey (BHPS) found associations between sleep constraints and lower life satisfaction (Ferrer-i-Carbonell & Gowdy, 2005).

Moving beyond this, physiologic studies put forward that sleep constraint has metabolic effects that influence weight gain (Patel et al 2006; Ayas et al 2003; Spaeth et al, 2013). Patel et al (2006) provided evidence by examining the association between self-reported sleep duration and subsequent weight gain in women that applied for the Nurses' Health Study in the United States over the course of 16 years. The results of the regression analysis showed that women sleeping 5 hours or less gained 1.14 kg more than did those sleeping 7 hours; women sleeping 6 hours gained 0.71 kg. The results therefore suggest that short sleep duration is associated with a slight increase in future weight gain and could possibly lead to the occurrence of obesity (Patel et al, 2006). The researchers noted that the associations between sleep deprivation and weight gain were still significant even after including some key covariates such as the participants smoking status. However, the results were not adjusted for dietary consumption and physical activity. In conclusion, they propose further research is conducted to investigate the mechanisms by which sleep duration may affect weight.

2.6.3 Relationship between Commute time and Wellbeing

According to Falcocchio et al (2015), traffic congestion is an increasing problem of long commutes to work mostly faced by those who reside in large urban areas. Excessive exposure to traffic congestion affects commuter's state of mental health, as the displeasure with the daily commute is associated with adverse psychological and physiological responses (Novaco, Stokols, & Milanesi., 1990). These responses include high blood pressure, high negative mood states and low tolerance for frustration (Falcocchio et al. 2015; Novaco et al., 1990).

Stutzer & Frey (2008) established people with longer commute times to and from work reported lower subjective wellbeing levels by using data from Germany Socio-economic Panel. The reasons highlighted for low subjective wellbeing were attributed to the mental and physical burden experienced in their commute time. Similarly, Hilbrecht et al. (2014) examined the relationship between commute time and wellbeing using cross-sectional data from the 2010 Canadian General Social Survey. The outcome of their research showed long commutes were associated with increased perception of stressful time pressure and lower levels of life satisfaction. Also, the results revealed that leisure time for physical and social activities was highly influenced by commute time. Therefore, it was concluded longer commute may results to reduced leisure time (Hilbrecht et al., 2014).

Furthermore, Olsson et al, (2013) conducted research in the urban cities of Sweden to examine the relationship between work commute and overall happiness. The outcome of the study showed that the commuters had positive and neutral feelings towards their commute time. This interesting and unexpected result was credited to the experience that people enjoy from

walking and biking to work. Olsson et al. also found social and entertainment activities increased positive feelings and reduced stress and boredom for longer commuters. The finding from this study reveals the experiences derived during commute time can influence one's state of happiness positively when coping strategies like stress management and social relations are observed especially during long commute (Lyubomirsky, 2008).

2.6.4 Relationship between Work hours, Leisure and Wellbeing

Previous wellbeing research has highlighted the importance of work and leisure to wellbeing (e.g. Bryce & Haworth, 2002, 2003; Haworth, 1997; Delle Fave & Massimini, 2003; Iso-Ahola & Mannell, 2004). These researchers are of the opinion that satisfaction derived from leisure activities and work is important for wellbeing.

Iso-Ahola & Mannell (2004) conducted a study to examine the relationship between leisure and health. They found that some of the reasons people were stressed was due to their difficult financial situation and the dominance of work over other aspects of their lives. They recognized that people use leisure activities as a means to get over these stressful situations. However, Iso-Ahola & Mannell argued that this approach to leisure is passive and reactive to personal health compared to proactive approach like engagement in active leisure activities that are vital for health and wellbeing (Haworth, 2011). Veal (1987) supported this argument by claiming that "the amount of a person's total waking life-time spent in non-work activities is greater than the amount spent in paid work," (p. 16). Therefore, time for leisure should be given

more priority and not be underestimated by paid employment but rather, more attention should be allocated to leisure at different stages of life.

In their study, Takeuchi et al. (2014) examined the effects working hours, income, and leisure time on suicide rates of men in all 47 regions of Japan. Negative and significant correlations were established between income and time for leisure of self-education activities ($r=-0.447$, p=0.0016) and hobbies ($r=-0.511$, p=0.0002). Regression analysis showed time for leisure social activities were a determining factor in suicide rates. This result implies work hours increased with rise in income and the rate of suicide was positively associated with working hours. The outcome of the results also indicates high or increasing proactive leisure activities could reduce or prevent suicide rate among men in Japan.

According to Haworth & Lewis (2005), it has been recognized that engagement in both physical and non-physical leisure activities reduce people's depression and anxiety. It yields positive moods and boosts individual's self-esteem and self-concept and promote social interaction. Leisure activities tend to increase overall psychological wellbeing and life satisfaction. Furthermore, Iwasaki, Zuzanek, & Mannell (2001) established that physical leisure activities not only reduces levels of mental health, but also contributes to physical health and wellbeing. Similarly, Taylor et al (1985) found regular physical activities tend to abate symptoms of mild depression and anxiety. Physical leisure activities advance cognitive functions, self-image, social skills and mental health.

Moving beyond this, Spurgeon et al. (1997) argue that long work hours act as direct and indirect stressors on employees especially from the effects of overtime work. However, Han &

Patterson (2007) points out employee's engagement in variety of leisure coping strategies can help suppress and reduce stress, and increase positive moods. These stress-coping strategies found to help people handle stress were identified as leisure companionship, leisure palliative, and leisure mood enhancement (Iwasaki & Mannell, 2000). These strategies control the impact of stress on physical health and improves positive mood when people engage in leisure activities.

Furthermore, research conducted by Iwasaki et al. (2001) showed that physically active leisure activities such as running contributed directly to physical health and wellbeing, and reduced mental health issues among Canadians. It was concluded that physically active leisure can contribute to improved health and is equally a vital activity for coping with stress (Iwasaki et al. 2001).

It is noteworthy to mention that some researchers found the experiences from leisure activities have resulted in psychological, physical, social, and spiritual benefits (Caldwell & Smith, 1988; Iso-Ahola, 1994; Long, 1990; Veal, 2001; Wankel, 1994; Coleman, 1997). For instance, Coleman (1997) found people's engagement in physical activities such as walking; jogging and aerobics contribute directly to their short and long-term health. Coleman & Iso-Ahola (1993) argued leisure activities contribute positively to the state of one's health by reducing and minimizing stress that would usually stimulate physical and mental illnesses. Folkman & Moskowitz (2000) supports these arguments by stressing that positive experiences gained through leisure experiences may prevent clinical depression and may eliminate the detrimental physical effects of chronic stress.

In the psychological research, leisure experiences were also found to be one of the main determinants of positive mood states (Parkinson et al., 1996; Stone, 1987). The involvements of family members in leisure activities were significantly associated with positive and good moods (Stone, 1987). Similarly, strong association were established between positive moods and leisure activities such as: going to movies or concerts as well as being an active participant in activities such as skiing, biking, mountain climbing, sightseeing, travel, and shopping (Clark & Watson, 1988). However, it was noted by Knopf (1991) that the psychological outcomes from outdoor leisure experiences were seen and felt to be more enjoyable and pleasurable to people (Knopf, 1991).

2.7 Degrowth, Wellbeing and the Environment

In the late 1980's, sustainable development arose to offer a framework to ensure economic growth, social wellbeing and environmental sustainability are well attuned (Flipo & Schneider, 2008; Asara et al., 2015; Martínez-Alier et al., 2010; Kallis et al. 2014; Schneider et al. 2010; Kothari et al. 2015; Dale et al. 2015). However, given the state of environmental issues after more than 30 years, the discussions of the sustainable development of the Brundtland Report seem to be transient and unattainable (Martínez-Alier et al., 2010). These discussions has been ineffective to develop policies that embrace all desired activities and needs at individual and collective levels (Martínez-Alier et al., 2010; Schneider et al. 2010).

Over the years, key debates have emerged on how sustainable development can be attained. The discourse has led to development of different thematic areas/concepts such as green

economy, decoupling, resilience and degrowth (UNEP, 2011; Fischer-Kowalski, & Swilling, 2011; Heinberg, 2007; Latouche, 2009; Schneider et al., 2010) .While much of these centers on the ecosystem and how resources can be used sustainably for environmental integrity, the concept of "degrowth" focuses not only on environmental sustainability but also on social sustainability towards improvement of social wellbeing for current and future generations (Dodds, 1997; Matson et al., 2016).

In the 1970's, the word décroissance (french for degrowth) materialized as a response to address the environmental, social and economic issues of the society (Flipo & Schneider, 2008). The English translation of décroissance – degrowth was later recognized and accepted at the first degrowth conference in Paris in 2008. Also, this conference marked the beginning of degrowth as an academic research area. The degrowth paradigm argues that for a sustainable future to be achieved, there is need to downscale the biophysical size of the global economy (Schneider et al. 2010; D'Alisa et al. 2014). Moreover, it emphasizes the problems and contradictions that exist between sustainability and economic growth (Kothari et al. 2015; Dale et al. 2015).

The social sustainability of degrowth stresses the importance of sustainable living for a society to flourish and prosper; for improvement of social capital and wellbeing (Rogers et al., 2012; Andreoni et al., 2013). Therefore, it seeks to avoid practices that could negatively impact individual health and welfare, and encourages social structures that enhance family and societal values in contribution to the welfare growth and societal wellbeing (Rogers et al., 2012). The degrowth concept is disparate from sustainable development which is driven by growth, rather it emphasizes a deliberate process that ensures a "prosperous way down" not focused on increasing

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economic growth but through credible economic, social and environmental policies that guarantee improvements in human welfare and equitable income distribution (Schneider et al.,2010; Odum and Odum., 2001). Further, Schneider et al. (2010) defines degrowth "as an equitable downscaling of production and consumption that increases human wellbeing and enhances ecological conditions at the local and global level in the short and long term" (p.512) which place emphasis on the importance of degrowth for attaining wellbeing.

According to O'Neill et al. (2012), there is a linkage between economic growth, human wellbeing and the environment. O'Neill (2012) et al pointed out that all natural resources necessary for human needs, functioning and survival stem from the environment; while all waste products emanating from production and consumption activities in the economy are recycled to the environment. This argument suggests that as economic output increases, more waste products will be cycled back to the environment (O'Neill et al., 2012; Krausmann et al., 2009; Singh & Eisenmenger, 2011). In view of this, the concept of decoupling emerged to reduce the rate of resource use and maintain economic output while reducing the negative impact of economic output on the environment (Fischer-Kowalski & Swilling (2011). However, as stated by the UNEP 2011 report, the decoupling of resources is taking place at a rate that is inadequate to accommodate the needs of a sustainable society. While decoupling focuses on improving the efficiency of resources through technology advancement, it is however faced with the rebound effect (e.g. Jevons paradox) which asserts that increases in efficiency gains may result in further use of other resources and, consequently in more environmental degradation (Conrad & Cassar 2014; Huppes & Ishikawa, 2009; Giljum et al.,2008).

Furthermore, O'Neill et al (2012) maintain that an economy is in a "steady state" only when there is equal income distribution; increasing quality of life, resources are allocated efficiently, and "the size of the economy fits within the capacity of ecosystems to provide resources and absorb wastes" (p.11). They also stressed the importance of a quality life that gives attention to health and wellbeing, leisure time, strong communities and work-life balance (O'Neill et al., 2012).

In their seminal paper, Demailly et al. (2013) reviewed the interaction between growth, reduced income inequality, employment and self-reported wellbeing wherein the weak link between economic growth and prosperity was identified. They contend that in wealthy economies, there is no correlation between happiness and long-term growth as well as between employment and long-term growth (Demailly et al., 2013). While it is widely acknowledged that the standard of living of a society is almost dependent on the productivity of its labour force, (Krugman 1992; Harris 1999; Demailly et al., 2013; Backman & Gainsbrugh, 1949) however it has also been recognized that longer working hours does not necessarily engender labour productivity as pointed out by some authors (Meager et al., 2003; Pencavel, 2015; Demailly et al., 2013). As noted by Demailly et al. (2013), there are other factors that determine productivity such as the demographic of the populace, the labour force distribution, accessible technology, and a country's specific standard weekly work hours as well.

Further, it is important to note that current growth paradigm advances for longer working hours as a way to achieve long-term economic growth through high production levels, and maintain standard of living by increased income. This logic however ignores the basic economic

concept of "diminishing marginal utility of income and wealth" which propose that much less satisfaction and happiness is derived from a tenth unit of a good than the first unit (Easterlin 1974; Helliwell et al. 2012). Reiterating this point Max-Neef (1995) opined that increasing income does not guarantee happiness in long-term especially in wealthy countries. Besides, the reduction in long work hours offers a way to address unemployment and close income inequality gap (Victor, 2008; Bowles & Park, 2005; O'Neill et al., 2012).

In justifying the degrowth agenda, Peter Victor (2008) argues that the reduction in working hours is necessary to eradicate poverty, and to avoid high unemployment rate that may be triggered by the decline of economic growth. In his proposal, Victor (2008) stressed that shorter work hours would allow for distribution of work hours so that more people get employed in the society. Further, in degrowth research, correlation has been established between poverty and unemployment (Kallis et al., 2013; O'Neill et al., 2012; Victor, 2008). As pointed out by Victor (2008), poverty rate tends to reduce as unemployment rate decline, as income is redistributed among the unemployed. Hence, proposals made towards poverty reduction calls for the replacement of economic growth with programs and policies that aim to redistribute income equally and provide the basic amenities of the society (Knight et al., 2013; Jackson, 2009; Victor, 2008; Nierling, 2010).

In opposition to work hours reduction, Booth and Sciantarelli, (1987) claimed the reduction of work hours would affect businesses negatively as it would result to decline in production level. However, Boeri and Bruecker, (2011) asserts the importance of work hours reduction in achieving a "slow or zero" economic growth to lower unemployment rate as shorter

work hours contributed to the decline of job losses in the OECD countries during the Great Recession (Spencer, 2011; Boeri &Bruecker, 2011). In addition, Jackson (2009) advocates for an environmental tax reform that transfer's tax burden from the labour sector to unfriendly environmental activities that generate CO2 emissions. This shift tends to offer "double perks" that increases employment while aiming to reducing environmental pollution and degradation (Axelsson 1997; Jackson 2009).

Aside from key issues of work hours highlighted above, Schor (2008) asserts that increasing work hours has shrunk the time people have for leisure activities. Wellbeing benefits achieved from reduction of work hours would give people time to engage in leisure activities (e.g. engagement in physical activities) that advances wellbeing (Kallis et al., 2013; Nørgård, 2013; Rogers et al., 2012). In addition, increasing work hours have led to the redistribution of work from the unpaid to the paid sectors. This is evident as everyday life activities have been monetized (e.g. unpaid care to dependants, household work) hence leading to negative impacts on social cohesion and quality of life (Schor, 2008; Latouche, 2011). Therefore, activities from the unpaid and non- market sector need to be visible and commodified within the market economy to ensure a smooth transition to an economy that will prosper with the use of uncommodified resources. Also, the free time gained from the distribution of work hours from paid to unpaid sectors can be allotted to other activities with positive effects on wellbeing (Bauhardt, 2014; Jackson, 2009; Schor 2008). In addition, people will have more time to provide care for children/dependants, for social connections and relationships, personal and leisure

activities and to explore new creative skills and learning that increases experience of self-fulfillment and personal development (Nierling, 2010; Knight et al., 2013; Kallis et al., 2013).

While there is no evidence to ascertain work hours reduction effect on human wellbeing, it is right to say that benefits attained from work hours reduction such as work-life balance, more time for physical activities, more time to engage in leisure activities would positively impact health and wellbeing especially when people devote their non-work time to these activities (Kallis et al., 2013; Nierling, 2010; Coote et al, 2010).

As noted by Kallis et al. (2013), these reductions can be actualized by reducing weekly workdays from 5 to 4 days, by increasing the proportion of part-time jobs in the labor force (Huberman & Minns ,2007). Other policies for consideration are the option of taking longer vacation days, maternity and paternity leaves to ensure people take a break from their jobs (Kallis et al., 2013), although such policies are bound to be confronted with implementation problems and organizational costs (Fitzgerald et al., 1996). In addition, it is crucial for these work hours reduction policies are applied to all sectors and not just to the manufacturing and the public sector to ensure income equality among all sectors (Kallis et al., 2013). Underscoring this point, Nørgård (2013) advocates for the transfer of economic activities from high energy labour intensive economy to the service sector that is less energy intensive (e.g. educational sector). This shift would reduce labour productivity and resource use and hence increase life satisfaction and happiness through lowering either working time or work productivity and replacing some of the leisure time into voluntary activities (Nørgård, 2013).

2.8 Income Inequality, Perception of the Environment and Environment Degradation

An unexpected association has been found between income inequality and people's perception of the environment (Haupt & Lawrence, 2012; Coburn 2004). It is evident from previous studies that the level of one's income is associated with one's perception of the environment sustainability (Izazola et al., 1998). Further, Izazola et al. (1998) conducted a study to understand the environmental perceptions between the low-income group and the middle-income group by comparing the responses of middle-income and low-income households. The middle class group perceptions focused on the negative impacts of air pollution on household health and quality of life while the low income households perceptions were linked to their daily source of existence and survival e.g. land quality for agriculture. Hence this result indicates both group's perception are associated with the state of their environment.

Moving beyond this, analyses from previous studies have found negative correlations between income inequality and environmental sustainability (Andrich et al., 2010; Baland et al., 2007; Holland et al., 2009; Mikkelson et al., 2007). From a sustainability perspective, increasing income inequality has been found to negatively influence the health of societies (Wilkinson & Pickett, 2009; Sapolsky, 2005), the economy, and the natural environment (Torras & Boyce, 1998). These researchers found the higher the income inequality, the worse the environmental indicators such as waste production, biodiversity loss and ecological footprint. As asserted by Torras and Boyce (1998), income equality, education and power indicators are strongly associated with pollution levels and the higher inequality in the distribution of income and power leads to further pollution and hence affects the environment negatively. For instance, research

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conducted on community forestry in Mexico showed the correlation between inequality levels and power. The so-called "powerful people" manipulated and overexploited the industry for their own selfish interest hence resulting to environment degradation and biodiversity loss (Klooster, 2000) managed the forests.

In Australia, the performance of the economic systems of the rich state of Western Australia has seen improvements in the past 30 years, whereas the income level of the poorest 20% of the society have declined in social functionality and environmental systems (Andrich et al., 2010). Also, 20% of the world wealthiest earn about 83% of the global income, whereas the poorest 60% rely only on about 6% (United Nations Development Programme, 1992). As pointed out by Boyce (1994), environmental degradation is more likely to occur when the wealthy class have more power and wealth than the low-income class as inequality increases the value of benefits gained by rich compared to costs imposed on poor and less powerful class of the society.

Although extensive research has been conducted on the relationship between inequality and various social and environmental indicators, the underlying mechanisms linking this relationship are, yet to be established (Haupt & Lawrence, 2012). Coburn (2004) argues that income inequality is the consequence of social, political and economic features of a society. The material production and consumption patterns of the society, attitude towards lifestyle and work patterns influences the quality of the environment, likewise government policies affect both income distribution and environmental quality.

From a degrowth perspective, policies that encourage and support work sharing through reduction of work hours should be adopted to reduce the gap in income inequality. Reduction of work hours could ensure social justice and wellbeing for everyone, as paid work will be evenly distributed (Coote et al., 2010). In addition, the reduction of work hours could decrease economic output, income and consumption of resources and thereby lessen the pressures on the environment (Knight et al., 2013). Degrowth proposes for work sharing to ensure job are available for all with even distribution of wages to fill the gap created by income inequality. Through work-sharing, work hours would reduce and decrease economic output and consumption of resources thereby minimizing the pressures on the environment (Knight et al., 2013). Lastly, Michalos et al., (2011) argue that the quality of people's lives does not only depend on the objective conditions in which they live, but also how they how they perceive those conditions, the actions taken thereafter and the implication of the actions (p. 71).

Chapter 3

Methodology

3.1 Introduction

This chapter presents the methodology employed in carrying out this research. This study relied on secondary data obtained from a 2014 Community Wellbeing Survey (CWS) conducted by the CIW in partnership with the Victoria Foundation on the Capital Regional District, British Columbia. The objective of this study is to explore the interconnectedness between work hours, income inadequacy, time adequacy, and leisure time on wellbeing. In meeting this objective, a quantitative correlation research design was utilized to explore the relationships between the factors associated with wellbeing within the context of this research and the CIW framework that was discussed in Chapter 2 (Section 2.4). The research design, the criteria for selecting variables and data analysis are presented in the succeeding sections. Additionally, the procedures used in the Victoria CWS, which are of particular relevance to this study, are presented in this chapter. The procedures specifically covered sample population, sampling procedures and survey instrumentation respectively. This research is driven to provide answers to the following key research questions:

- How are work hours, income inadequacy, time adequacy, and leisure time associated with wellbeing?

- Is there an association between household income level and people's perceptions of their local environment in the context of wellbeing?

3.2 Overview of Study Area

The Capital District of Victoria located in the province of British Columbia, Canada was the selected study location for this research. According to the 2011 Census, the region comprises of thirteen municipalities and has a population of about 344,615 making it the 15th most populous urban region in Canada (Statcan, 2011). The region is well known for its mild weather with rainy winters and cool and sunny summers (Tourism Victoria, 2012). Due to its equable climate, the city takes pride in abundant flowers that flourish during the winter period (Tourism Victoria, 2012). The main industries that generate revenue for the region are technology, food products, tourism, education, federal and provincial government administration and services. However, the technology and tourism sectors are the largest contributors to the economy with about $ 4.03 billion and over $1 billion annually respectively (VIATEC 2014; Tourism Victoria, 2012). Because of its distinction in the technology sector, Macleans Magazine ranked the city Canada's Smartest City in 2010. In addition, Victoria's tourism sector welcomes about 3.5 million tourists every year (Tourism Victoria, 2012). The region is known as the Cycling Capital of Canada with hundreds of kilometers of bicycle paths, bike lanes and bike routes that encourages workers to commute to work with their bicycle.

3.3 Operationalization of Wellbeing for Study

In this study, wellbeing was conceptualized with the assessment of the physical and mental health of the respondents of the Victoria CWS. In assessing their mental and physical health, the participants were asked to rate their physical and mental health a scale of 1 to 5 coded

as "poor" and "excellent" respectively. This operationalized approach of wellbeing used in this study is similar to the approach used Kobau et al. (2013) that assesses wellbeing with participant's satisfaction with their physical and mental health. Although Kobau et al. considered the assessment of social wellbeing in their conceptualization; however, social wellbeing was not assessed for this study as the healthy population domain of the Victoria CWS, which provided the data for this research only captured the assessment of the respondent's physical and mental health. Hence, wellbeing was conceptualized within the context and scope of this study.

3.4 Research Design

According to Muijs (2005), quantitative research is the process of using numerical data to explain a problem or an occurrence to and across groups of people. By using a quantitative method, the researcher relies on post positivist claims to acquire knowledge and uses methods of enquiry that involves experiments and surveys for collecting data with instruments that provide statistical information (Creswell, 2003).

A non-experimental research method was selected for this study. The Pearson and Spearman correlational design were specifically selected because they measure and describe the magnitude of association between two or more variables (Creswell, 2012). In a correlational design, the researcher examines the strength and direction of association between two variables within a study and observes the extent to which the association between the variables relies on the validity of their calculations (Leedy & Ormrod, 2010). A correlation design was an effective quantitative research approach for this study as it provided an unobtrusive method that identified

significant relationships and established patterns between the studied variables. This method also produces an outcome usually referred to as "r" in Pearson correlation and "rho" in Spearman correlation (Creswell 2002; 2009). In addition, a correlation design identifies whether the relationship between two variables are worth exploring further; however, it does not determine causality between variables (Muijs, 2005; Dixon et al, 1969).

The Victoria Community Wellbeing Survey (CWS) questions were used to identify, explore, and critically analyze the relationship between the factors that influence work hours, income inadequacy, time adequacy and leisure time. The perceptions drawn from the participant's responses provided this study with statistical information that concretely showed the relationships between these factors associated with wellbeing. The use of a correlational design was a valid statistical test for exploring the relationship between the variables as it provided answers that addressed the research questions and objective of this study.

3.5 Victoria Survey Design and Instrumentation

The Victoria (CWS) survey, the main source of data and information for this study was built on the conceptual framework of the CIW with collaboration from different stakeholders in the field of academia, policy, including experts from the public. The survey was designed to collate information from residents of Victoria region regarding the eight domains identified by the CIW as being important to their wellbeing. It is worthy of mention that most research on wellbeing are limited to only one aspect of wellbeing and neglects the complex interactions these domains represent in the day-to-day lives of Canadians (Phillips et al., 2014, p.4). However, the

Victoria CWS considered the eight domains identified by the CIW as very crucial to wellbeing, as the CIW offers a comprehensive and detailed measure of wellbeing. As noted by Hilbrecht et al. (2013), the holistic perception of wellbeing from this framework is considered "valid, credible, and reliable" (p.11). The survey questions were selected to reflect the national indicators in each of the eight CIW domains at national and provincial levels where possible; whereas at the community level, the eight domain indicators were adapted in the survey to allow residents express their feelings about their wellbeing in relation to their community (Hilbrecht et al., 2013). The Victoria survey questions covered both objective and subjective measures of wellbeing. In this study, the objective measure of wellbeing are quantifiable (work hours, sleep hours) while the subjective aspect involves indicators that are based on people's perceptions (financial situation, self-reported health and wellbeing).

The Victoria survey questions were drawn from previous surveys carried out by Statistics Canada such as Canadian Community Health Survey and the several General Social Surveys. In addition, effective measures from previous research directly linked to wellbeing were integrated in the development of the survey. Based on academic findings and other wellbeing surveys, these measures were created both at national and local levels with sources varying from the Gross National Happiness Survey, Multidimensional Sense of Community Scale, Bhutan Gross National Happiness Survey, Leisure Satisfaction Scale, and Time Adequacy Scale (Hilbrecht, Smale, & Smith 2013).

3.6 Victoria Sample population

A self-administered questionnaire was used to gather data from residents of the communities in the Victoria area to monitor wellbeing among residents of the Capital Region of British Columbia. The data represented a sampling frame including four core geographic areas: Core (Esquimalt, Oak Bay, Saanich, Victoria, View Royal), Peninsula (Central Saanich, North Saanich, Sidney), West Shore (Colwood, Highlands, Langford, Metochosin, Sooke), and the Gulf Islands (Salt Spring Island, Southern Gulf Island).

The survey provided information on eight CIW domains of wellbeing namely: Community Vitality, Democratic Engagement, Environment, Education, Healthy Populations, Leisure and Culture, Living Standards, and Time Use (Phillips, Hilbrecht & Smale, 2014). However, after a careful review of the survey, data from Democratic Engagement, Community Vitality, and Education domains were not explored in this study. This is because the selected variables/indicators measured were not reflected in these three domains.

3.7 Sampling Procedures

Surveys invitations were mailed to randomly selected households in the Capital District Region that represented about 10% of all households in the region. The questionnaires filled online accounted for 90.6% (N= 2,040) of the total questionnaires submitted (2,253) while 9.4% (n = 213) were filled using the paper version. Residents that were 18 years or older filled the questionnaires (Phillips, Hilbrecht & Smale, 2014).

With the use of the 2011 Census profile (N = 277,604) of residents that were 18 years or older, the data were weighted by age, sex and geographic location to give a closer representation of the residents of the capital region. According to Phillips et al (2014), the weighted data "accurately reflect(ed) the responses of residents without over- or under-representing any groups based on sex, age, or where they live in the region" (p. 3). Of 2,253 respondents, 952 persons indicated they work for pay, and they represented the sample population used in this research. Their weighted data (N=165,413) were as well matched with the 2011 Census profile.

3.8 Objective and Subjective Measures

The objective indicators (weekly work hours, daily commute time, sleep hours etc.) employed for this research were sourced from CIW surveys to obtain objective perspectives of wellbeing from respondents. As noted by Ivković & Mijoč (2014), objective measures of wellbeing are necessary to provide understanding of various economic and non-economic indicators that portray the objective wellbeing of a society. Generally, objective indicators are good measures for identifying and assessing the wellbeing of a society that needs urgent attention (Ivković & Mijoč 2014; Osberg, 2004); however, these indicators usually do not track the subjective wellbeing of a society as they may wrongly portray people are satisfied with their living conditions (Smith & Clay P, 2010).

In defining subjective wellbeing, McGillivray & Clarke (2006) viewed subjective wellbeing as a "multidimensional evaluation of life, including cognitive judgments of life satisfaction and affective evaluations of emotions and moods" (p.4). In addition, some other

literatures on wellbeing views subjective wellbeing as means, which people experience life positively (Diener, 1984). The subjective measures for the Victoria survey were derived from wellbeing surveys globally and some measures were then modified by CIW to include more items that match up better with its domains of wellbeing (Phillips, Hilbrecht, & Smale 2014). Together, the items obtained from wellbeing global surveys, the modified CIW items covered measures of mental and physical wellbeing, mental and physical health, income inadequacy, time adequacy, leisure satisfaction, financial situation, and the environment explored in this study.

The Victoria survey was structured into 10 different sections; eight of the sections encompassed the eight domains of the CIW while the other two sections covered the respondents' personal characteristics and overall health and wellbeing. In the different sections of the Victoria survey, respondents indicated their agreement to closed-ended questions using a 7-10 point Likert-type scale where 1="very strongly disagree" to 7= "very strongly agree"), (1= "extremely dissatisfied" to 7= "extremely satisfied"), (1= "not at all enough" to 10= "almost always enough"). In addition, some questions were set on a multiple item scale (e.g. Time Adequacy scale, Income Adequacy scale and Leisure Satisfaction scale). The use of the multi-items scale provided the researcher the opportunity to examine multiple factors that could contribute to wellbeing and overall quality of life (Diener 1984). Also, as pointed out in Diener (1984), studies that employ multi-item scale to evaluate individual's wellbeing provides a holistic view on wellbeing as opposed to those that adopt a single-item measure.

The purpose of the survey was to get the residents to provide objective and subjective response on the aspects of their community that influences their quality of life positively or

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negatively. The information gathered from the survey acts as a helpful guide to address the community's areas of need and concerns to leaders and policy makers. This information would help policy makers propose and develop effective services and programs to support and enhance wellbeing among residents (Hilbrecht, Smale & Smith, 2013).

The Victoria survey adopted both subjective and objective measures of wellbeing to get a holistic perception of wellbeing from respondents. The specific objective and subjective measures used in this research are summarized in Figure 3.

Figure 3-1:Objective and Subjective measures

Objective Measures

- Household Income
- Weekly Work Hours
- Weekly Unpaid Care (Hours)
- Daily Sleep Hours
- Commute Times (Minutes)
- Vacation Days
- Monthly Physical activities

Subjective Measures

- Self-reported wellbeing and health
- Time Adequacy
- Income Adequacy
- Satisfaction from Leisure time
- Experience from Leisure time
- Satisfaction with Financial situation
- Perception of Environment

Source: Authors' Compilation using Victoria CWS data

3.9 Criteria for Selection of Variables

In the attempt to gain insights on the variables to be studied, the 10 sections of the questionnaire were carefully reviewed to identify trends and patterns that could provide answers to the research questions. The research questions were used as a basis to classify the constructs of work hours, time adequacy, income inadequacy; leisure time and wellbeing in identifying the strengths and limitations of the dataset.

In this study, instances were drawn from the Victoria survey where some variables such as "I got good quality exercise", "I regularly ate healthy meals" were identified as ambiguous for this research. These variables seemed not to be clearly defined and the respondents could perceive these specific questions differently. As pointed out by Cozby et al., (1989), it is imperative for the empirical variables for a study to be defined operationally. It could lead a researcher to recognize that the selected variables might be too ambiguous to study.

Due to the use of an existing instrument and data, some measures of interest could not be ascertained directly from the survey to assess the correlations among the variables of interest. However, data was available in the survey to construct suitable substitution of variables in assessing the relationship between time adequacy, work hours, leisure and wellbeing. The grouping of each construct and their respective CIW domains and survey questions used in this study are presented in Appendix A.

3.10 Description of Selected Variables

Household Income

In order to ascertain the financial situation of the respondents, they were asked to indicate their household income range on a scale of 1-10 with minimum income range as under $10,000 and maximum range as $150,000 and over. The minimum income level (under $10,000) was coded as 1 while the maximum income level ($150,000 and over) was coded as 10.

Income Inadequacy and Financial Satisfaction

The income adequacy scale measures people's perception of the balance between their income and their financial needs and wants (Moen et al, 2008). The income inadequacy scale adapted for this study measured the mean of three questions on how people's financial needs and wants were met in the previous year. The first three questions of 'I could not pay my bills on time', 'I ate less because there was not enough food or money for food', 'I did not have enough money to buy the things I wanted' were sourced from the Happiness Initiative Survey. The questions of 'I could not pay my mortgage or rent on time' and 'I did not have enough money to buy the things I needed' were sourced from the CIW (Hilbrecht et al., 2015). Participants provided responses on a range of 1 to 5 with 1 coded as 'Never' and 5 coded as 'At least once a month'. The items were coded reversely, and a higher mean score indicate a stronger income adequacy ($\alpha = .78$) (Hilbrecht et al, 2015). In addition, the respondents were asked questions regarding their level of satisfaction with their financial situation and they indicated their level of

satisfaction with their financial level on a minimum and maximum range of 1 and 7 with 1 coded as "extremely dissatisfied" and 7 as "extremely satisfied" respectively.

Time Adequacy

The time adequacy scale is a dimension of work-life fit that assess employee's perception of having adequate time for 12 items on a measurement scale subjectively (Moen et al. 2008). The scale was initially developed by Van Horn et al. (2001) but was modified by Moen et al. (2008). The time adequacy questions are asked on a range of 1-10 with 1 coded as 'Not at all enough' and 10 as 'Almost always enough'. Out of the 12 items on the time adequacy scale, only 10 items were considered as the other two items 'enough time to be with your spouse/partner', and 'enough time for you to be with kids' did not apply to all the 952 respondents (N=952) in the Victoria survey. The results of the internal consistency indicate a very strong Cronbachs alpha at $\alpha= 0.94$ indicating that the components of the scale are sufficiently intercorrelated and the grouped items measure the same construct (Tavakol & Dennick, 2011).

Leisure Satisfaction Scale

This 12 scale-item measures the extent to which people feel their needs are being met and satisfied through leisure. It measures six aspects of perceived leisure satisfaction: psychological, social, physical, educational, relaxation, and aesthetic (Ragheb et al, 1980). However, only four components – educational, social, relaxation and physiological were adopted in the development of the survey. This research used this scale to get the respondents' perception on their

satisfaction and experience derived from their leisure on a 7 point-scale with 1 representing 'very strongly disagree' and 7 as 'very strongly agree'. The outcome of the internal consistency results shows a strong Cronbachs alpha (α=0.87).

Work hours, Monthly Physical Activities, Vacation Days and Hours of Unpaid care

The participants were asked to report their weekly work hours. This was to obtain their perception on how their financial situation influences their work hours. Also they answered questions relating to number of hours they spend on sleep/nap daily, the number of times they participate in vigorous exercise monthly, the number of days they were away on holiday in the previous year, and the number of hours they provide unpaid care for dependants weekly.

Mental and Physical wellbeing and health

In assessing the mental and physical health of the respondents, questions were asked on a scale of 1 to 5 and coded as "poor" and "excellent" respectively. Similarly, they also indicated their level of satisfaction with their mental and physical wellbeing on a scale of 1 to 7 with 1 coded as "extremely dissatisfied" and 7 coded as "extremely satisfied".

Perception of the Environment

Respondents reported the extent to which they personally agree with the quality of the natural environment in their city/town, the air/water quality of their community and their personal responsibility to help protect the natural environment. The minimum and maximum scores were code as 1= "very strongly disagree", and 7= "very strongly agree" for the three questions.

3.11 Data Analysis

The Victoria dataset was downloaded from CIW data repository, and the analysis of the data was processed using SPSS (version 23). Descriptive statistics were used to measure and analyze the frequency distributions and the central tendencies. Demographic characteristics of respondents and missing data analysis were also analyzed using descriptive statistics. Descriptive analysis was then followed with correlation analysis to address research questions.

Due to the nature of the data, both Spearman's rank and Pearson's correlation were used to analyze the correlation among the variables. The Spearman's rank was specifically used to test the strength of associations between two ranked variables to see if an increase in one variable would lead to the increase or decrease in another variable (McDonald, 2009). On the other hand, the Pearson correlation was used to measure the association between two interval or ratio level variables (Colwell & Carter, 2012). The level of significance of the correlation coefficients was

also conducted to indicate the likelihood of a given relationship between two variables is valid even if relationship between the two variables is either strong or weak (Colwell & Carter, 2012).

3.12 Validity and Reliability

In research, validity refers to the degree or how well a concept is measured accurately and precisely. In a quantitative study, an instrument is considered valid when it measures all the domain and content of a variable and construct effectually (Heale & Twycross, 2015). Hence, the validity of this research was grounded on how well the survey instrument measured the variables it was designed to measure effectively (Cozby, 2007). Also, this study is considered valid when the research design method addresses the research questions and objectives of the study without influencing the degree of relation between two variables (Cozby, 2007). On the other hand, reliability measures the precision of an instrument to confirm it measures the same construct or concept and provides the same outcomes if used again in the same situation. A reliable questionnaire should be designed to produce consistent level of response if used continually (Suskie, 1996).

For measuring the internal consistency of items on a multiple scale (time adequacy scale, income adequacy scale and leisure experience scale), the Cronbach's alpha reliability test was conducted. According to Tavakol & Dennick (2011), the internal consistency refers to how well multiple items on a scale measure the same construct. Therefore, the construct is associated to the "inter-relatedness of the items within the test" (p.53). Generally, the value of the items tested

is set between 0 and 1. The results of internal consistency test conducted on time adequacy, leisure satisfaction, and income inadequacy are displayed in the table below.

Table 3-1
Cronbachs Alpha Coefficient

Scale	Alpha Coefficient	Mean	SD	Error variance	Items
Time Adequacy	0.94	68	448.7	0.12	10
Leisure Satisfaction	0.87	60.1	64.53	0.24	12
Income Inadequacy	0.78	5.67	8.96	0.39	4

The Cronbach's alpha indicates a strong internal reliability for time adequacy (α=0.94), leisure satisfaction (α=0.87) and income inadequacy (α=0.78). The closer the Cronbachs alpha coefficient is to 1, the greater the internal consistency of the items in the scale and the acceptable value of alpha ranges from 0.70 to 0.95 (Tavakol & Dennick, 2011). As noted by Tavakol & Dennick, the interpretation of the reliability "is the correlation of the test with itself by squaring the correlation and subtracting it from 1.00 to produces the index of measurement error" (2011, p.53). For instance, the reliability for the time adequacy is 0.94, therefore there is a 0.12 error variance (random error) in its scores ($0.94^2 = 0.88$; $1.00 - 0.88 = 0.12$). Hence, the reliability score increases as the fraction of the test score ascribed to error decreases.

Chapter 4

Results

This chapter provides an overview and outcome of the analyses conducted. It begins with a descriptive analysis of variables for the study, followed by correlational analyses to address and provide insights on how work hours, income inadequacy, time adequacy, and leisure time interact to influence wellbeing. The studied sample is characterized by sex, age, marital status, household income level.

4.1 Demographic Statistics of the Sample Population

The sample population for this research was the participants who worked for pay. Of the respondents who worked for pay, the unweighted data was N=952 and weighted data was N= 165,414 and 51.2% were male and 48.8% were female with the average age of 44.4 years. The most prevalent portion of the participants involved in the survey ranged between the ages of 35 – 54 years. The largest group for marital status were those identified as married (61.2%), followed by those who were single and never married (17.3%). Also, the household annual income was further characterized into three categories; low income earners who earn less than $40,000 (16.2%), middle income earners who makes between $40,000 to $99,999 for (46.5%) and $100,000 or more for high income earners (34.3%). The description of the characteristics of the sample population with information on the number and percentage of the observations are presented in Table 4-1 below.

Table 4-1
Demographic Statistics

Characteristics	N	Pct
Gender		
Male	84,667	51.2
Female	80,747	48.8
Age Group		
18-34	48,011	29
35-54	82,655	50
55-64	28,462	17.2
65-85	6,286	3.8
Marital Status		
Single, never married	28,612	17.3
Married	101,217	61.2
Living common-law	17,873	10.8
Separated	3,999	2.4
Divorced	11,241	6.8
Widowed	1,763	1.1
Missing values	708	0.4
Household Income Level		
Less than $40000	26,719	16.2
$40,000 to $99,999	76,918	46.5
$100,000 or more	56,721	34.3
Missing values	5,056	3.1

N=165,414

4.2 Missing Data Analysis

Data for some key variables were missing for the sample population that work for pay (N=165,414). Unpaid care for children and dependent adults were reported to have the highest count of 149,353 and 134,996 missing data with a percentage score of 90.5 % and 81.8 % respectively. The high count indicates the questions for unpaid care (children and dependants) did not apply to all respondents. Hence, only those who indicated they provide care for their children and dependants answered the questions. Significant missing data were also recorded for the vacation days with a missing count of 102,556 and percentage score of 62%. This suggests that 62% of the participants either skipped the questions or did not go on vacation the previous year. The below table gives a breakdown of the missing data for all variables for this study with the counts and percentage of the missing data

Table 4-2
Missing Data Analysis

Variables	Count	%
Leisure Experience	169	0.1
Income Inadequacy (Needs)	1946	1.2
Time Adequacy	500	0.3
Household Income	5041	3.1
Satisfaction with Financial situation(Means)	264	0.2
Satisfaction with Leisure time	907	0.5
Physical wellbeing	143	0.1
Mental wellbeing	240	0.1
Daily Sleep hours	194	0.1

Variables	Count	%
Hours of Unpaid care for dependent adults	149353	90.5
Hours of Unpaid care for children	134996	81.8
Vacation days	102556	62
Income Inadequacy (Wants)	4464	2.7
Daily Commute time	2075	1.3
Weekly work hours	1099	0.7
Monthly physical activity	380	0.2
Air Quality	1459	0.9
Personal Responsibility to the Environment	730	0.4
Quality of Natural Environment(city/town)	1756	0.1
Mental health	131	0.5
Physical health	757	0.1

4.3 Results of Descriptive Statistics

The below table displays the groupings of the variables and the descriptive analysis of the variables selected for this research.

Table 4-3
Descriptive Statistics

Variable(s)	N	Mean	Std. Dev.	Min	Max
Household Income	160358	6.54	2.28	1	10
Financial satisfaction(means)	165147	4.36	1.75	1	7
Income inadequacy (needs)	163462	1.37	0.75	1	5
Income inadequacy(wants)	160936	2.56	1.64	1	5
Weekly work hours	164309	33.11	13.32	1	90
Time Adequacy	164910	6.99	2.16	1	10

Variable(s)	N	Mean	Std. Dev.	Min	Max
Daily sleep time (hours)	165217	7.04	1.02	2	12
Vacation Days	70684	4.93	11.01	0	120
Monthly Physical Activity	165032	5.68	7.74	0	48
Hours of Unpaid Care to Children (weekly)	30114	33.19	33.39	1	168
Hours of Unpaid Care to Adult (weekly)	15742	11.52	22.08	1	168
Satisfaction with Leisure time	164501	4.67	1.45	1	7
Leisure Experience	165244	5.03	0.69	3	7
Daily Commute time	163329	18.43	21.06	0	270
Physical health	165324	3.58	0.90	1	5
Mental health	164655	3.76	0.93	1	5
Mental wellbeing	165171	5.19	1.46	1	7
Physical wellbeing	165268	4.60	1.52	1	7
Quality of Natural Environment	165282	5.57	0.97	3	7
Air Quality	163950	5.48	1.10	1	7
Personal Responsibility to the Environment	164680	5.87	1.03	1	7

The forces driving the research problem for this study were identified as household income, financial satisfaction and income inadequacy (needs and wants). The average level of income indicated by participants was 6.54 (SD=2.28) which roughly correspond to an annual income of $70,000 based on the value assigned to household income in the survey. Overall, the average response for their satisfaction with financial situation was (M=4.36 SD=1.75), income inadequacy needs (M=1.37 SD=0.75) and wants M=2.56 (SD=1.64)

The outcome of the weekly work hours indicates that respondents work an average of 33 hours per week (SD=13.32). Also, they reported minimum and maximum weekly work hours of 1 hour and 90 hours respectively. In accordance to the British Columbia Employment Standard

Acts, the maximum weekly hour of work before overtime is 40 hours. Employees worked an average of 29.5 hours weekly inclusive of overtime time work in BC in 2015 and 29.3 in 2016 (Statistics Canada). These findings suggests that the respondents work less than the maximum work hours of 40 hours but worked 4 hours more than the previous average work hours reported for the province of BC in 2015 and 2016.

As mentioned earlier in Chapter 3 (Section 3.9), the time adequacy scale is a composite of the average of the 10 items. The outcome of the descriptive results for the time adequacy scale gave a mean score of 6.99 (SD=2.16). In addition, respondents answered questions relating to number of hours they spend on sleep/nap daily, the number of times they participate in vigorous exercise monthly, the number of days they were away on holiday in the previous year, and the number of hours they provide unpaid care for dependants weekly.

The results suggests that the respondents slept an average of 7 hours daily (SD= 1 hour), with a minimum and maximum sleep of 2 hours and 12 hours daily respectively. They participated in physical activity on an average of 6 times per month (SD= 8 times), with a minimum score of 0 hours and maximum score of 48 times indicating some respondents did not participate in vigorous exercise monthly. In addition, the average days for vacation reported was 5 days with minimum and maximum days as 0 and 120 days respectively signifying that some respondents did not go on holidays in the previous year. Lastly, the weekly average hours of unpaid care to children was 45 hours (SD=44 hours) with minimum and maximum weekly hours of 1 and 168 hours respectively. The weekly average hours of unpaid care to dependent adults was 12 hours (SD=25 hours), with minimum and maximum weekly hours of 1 and 168 hours

respectively. As previously stated in Chapter 4 (Section 4.2), the questions for unpaid care applied only to those who indicated they have responsibilities of providing care to their children and older dependents. Also, the findings of their commute time to work showed an average travel time of 18 minutes (SD= 21 minutes) with a minimum and maximum travel time of 0 and 270 minutes daily.

The respondents satisfaction with their leisure time and the experience derived from leisure activities were considered for this study. The mean scores point out they had an average satisfaction with leisure time 4.67 (SD=1.45), and 5.03 (SD=0.69) for the experience derived from their leisure activities. As stated earlier in Chapter 3, the leisure experience scale comprises of the mean of 12 items. Furthermore, the mental and physical health of the respondents was assessed. They were asked to rate their health and satisfaction with their wellbeing. The outcome of the statistics results showed the average levels of their physical and mental wellbeing were 4.6 (SD=1.52) and 5.19 (SD=1.46) respectively. Mean scores for their physical and mental health were reported as 3.58 (SD=0.90) and 3.76 (SD=0.93).

Lastly, they reported the extent to which they personally agree with the quality of the natural environment in their city/town, the air quality of their community and their personal responsibility to help protect the natural environment. The outcome of central tendency indicates their average level of personal responsibility to help protect the natural environment with a mean score of 5.87 (SD=1.03), the air quality of their community with mean score 5.48 (SD=1.10) and the quality of the natural environment in their city/town with an average score of 5.57 (SD=0.97).

4.4 Correlation of Variables

In this section, the research question(s) were addressed with both of Pearson and Spearman correlation statistics by reporting the strength of relationship. The findings and the statistically significance results are presented between the variables and highlighting the statistically significant results.

Table 4-4

Correlation between Weekly work hours and Household Income, Sleep hours and Commute time (N=164,515)

Variable(s)	Weekly work hours
Household Income	.275***
Daily Sleep hours	-.243***
Vacation Days	-.172***
Monthly physical activities	.039***
Daily Commute time	.049***

*** Correlation is significant at $p \leq .001$ (2-tailed)

A Pearson's correlation was conducted to examine the strength of relationship between weekly work hours with household income, daily sleep hours, and daily commute time. The results showed a positive and statistical significant relationship exists between weekly work hours and household income with $r = .275$ (p<.001). A negative and statistical significant

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relationship was found between work hours and sleep hours with $r = -.243$ (p< .001) while a very

weak but statistical significant relationship were established between work hours and commute

time at $r=.049$ (p< .001); work hours and monthly physical activity $r=.039$ (p< .001). Lastly, the

result indicates a negative and statistical significant correlation between work hours and vacation

days with $r = -.172$ (p<.001). These results suggest that high income is associated with longer

work hours and decrease in sleep time, that is, as income increases; work hours tend to increase

while sleep time reduces. In addition, there is an indication that vacation days reduce as their

work hours increases.

Table 4-5
Correlation between Household income, Financial means and
Income inadequacy (N=164,515)

Variable(s)	Income
Satisfaction with financial situation	.465***
Income inadequacy(Needs)	-.394***
Income inadequacy(Wants)	-.401***

*** Correlation is significant at $p \leq .001$ (2-tailed)

Using a Spearman's correlation, the relationship between income, satisfaction with

financial situation, and income inadequacy (financial needs and wants) were examined. The

outcome of the results showed a moderate, positive and statistical significant relationship

between income and financial satisfaction with $r_s = .465$ (p<.001). Also, a moderate, negative

and statistical significant association was established between income and financial needs and

financial wants at r_s = -.394 (p<.001) and r_s =- .401 (p<.001) respectively. The findings suggest high income is associated with the level of satisfaction with financial situation and income inadequacy for needs and wants. Therefore, as income increases, the level of satisfaction with financial situation increases, whereas, as income increases, inadequacies to meet financial needs and wants decreases.

Table 4-6
Correlation between Time adequacy, Work hours, Satisfaction with leisure time and Unpaid care (N=164,515)

Variable(s)	Time Adequacy
Weekly work hours	-.183***
Satisfaction with Leisure time	.630***
Unpaid child care	-.260***
Unpaid adult care	-.116***

*** Correlation is significant at p ≤ .001 (2-tailed)

Spearman correlation conducted showed a negative and statistical significant relationship between work hours and time adequacy with r_s = -.183 (p<.001), time adequacy and hours of unpaid child and dependants adults care at r_s = -.260 (p<.001) and r_s = -.116 (p<.001) respectively. On the other hand, the results displayed a strong, positive and statistical association between time adequacy and satisfaction with leisure time at r_s =.630 (p<.001).

The findings denotes longer work hours are associated with inadequate time, and higher time allocated to unpaid care is associated with lower time adequacy as well. Therefore, as hours of work increase, time adequacy for care of dependants tends to decrease. Conversely,

high satisfaction derived from leisure is associated with high time adequacy, that is, as time adequacy increases, satisfaction with leisure increases.

Table 4-7
Correlation between Work hours, Satisfaction with leisure time and Experience from leisure (N=164,515)

Variable(s)	Satisfaction with Leisure time
Experience from Leisure	.177***
Weekly work hour	-.110***

*** Correlation is significant at $p \leq .001$ (2-tailed)

The association between satisfaction with leisure time with work hours and experience from leisure was conducted with Spearman's correlation. The result shows there is a positive and statistical significant relationship between satisfaction with leisure time and the experience derived from leisure with a weak $r_s =.177$ (p<.001), and negative, weak but statistical significant association exists between work hours and satisfaction with leisure time at $r_s = -.110$ (p<.001).

The outcome of the results implies that high leisure experience is associated with high satisfaction with leisure time. This could imply that the amount of time allocated to leisure activities influence the experience individuals get from those activities or vice-versa. In addition, longer work hours are associated with decline in satisfaction with leisure time, that is, work hours influences the available time and satisfaction derived from leisure activities.

Table 4-8
Correlation between Vacation days and wellbeing
(N=164,515)

Variables	Vacation days

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Mental wellbeing	.164***
Physical wellbeing	.158 ***

*** Correlation is significant at p ≤ .001 (2-tailed)

The association between vacation days and mental/physical wellbeing indicates a weak correlation but a statistical and significant relationship between these variables. The result suggests that, as vacation days increases, people are more relaxed and their state of mental and physical wellbeing tend to increase and improve.

Table 4-9
Correlation between Time adequacy and wellbeing
(N=164,515)

Variables	Time Adequacy
Mental wellbeing	.429***
Physical wellbeing	.321***
Physical health	.193***
Mental health	.260***

*** Correlation is significant at p< .001 level (2-tailed)

With Spearman's correlation, the association between time adequacy and wellbeing were examined. The result showed positive and statistical relationships between time adequacy, mental/physical wellbeing with r_s = .429 (p< .001) and r_s =.321 (p< .001); mental/physical health r_s =.193 (p<.001) and r_s =.260 (p<.001) respectively. This finding is particularly noteworthy as it appears to provide evidence that having adequate time to sleep, to engage in physical activities, to socialize, and to sustain meaningful relationship has a strong influence on both physical and

mental wellbeing. Therefore, spending adequate time on activities outside work would improve people's health and wellbeing.

Table 4-10

Correlation between Satisfaction with leisure time, Leisure experience, health and wellbeing (N=165,414)

| Variable(s)	Satisfaction with Leisure time	Leisure Experience
Physical wellbeing	.466***	.364***
Mental wellbeing	.503***	.222***
Mental health	.225***	.185***
Physical health	.151***	.315***

*** Correlation is significant at $p \leq .001$ (2-tailed)

Relationships were examined between satisfaction with leisure time, leisure experience with subjective physical and wellbeing, self-reported physical and mental health using Spearman's correlation. The findings showed positive and statistical significant relationship exists between the variables of satisfaction with leisure time, and mental/physical wellbeing at r_s = .503 (p <.001), and r_s = .466 (p <.001); mental/physical health with r_s = .225 (p <.001), and r_s = .151 (p <.001) respectively. Findings also indicates positive and statistical significant relationship between the experience derived from leisure and mental and physical wellbeing with r_s = .222 (p <.001), r_s = .364 (p < .001); and mental and physical health with r_s = .185 (<.001), r_s = .315 (p <.001). This result indicates that both leisure concepts are meaningfully associated with subjective wellbeing and self-reported health as the increase in both satisfaction with leisure and experience derived from leisure influences wellbeing and health positively.

4.5 Relationship between Income level and Perception of the Environment

In order to identify the relationship between income levels and the respondent's perception of their environment, responses on the quality of the natural environment of their city/town, quality of air and water in their community and their personal responsibility to protect the environment were matched with their income level. The figures below shows the percentage of the respondent's level of agreement based on their income levels.

Figure 4-1:Percentage of residents who agree that they have a personal responsibility to protect the environment by income level
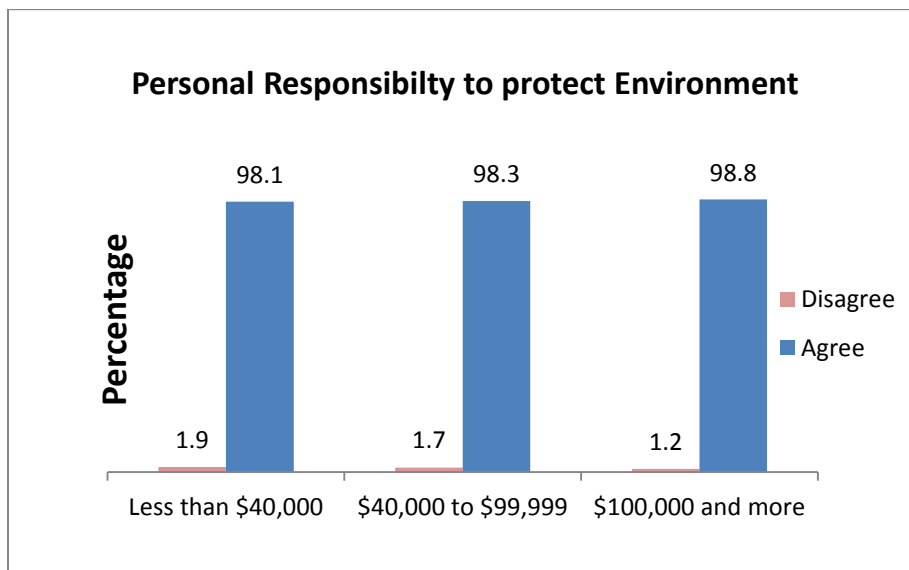

The above chart showed the three household income groups (less than $40,000, $40,000 to $90,000, and $100,000 and more) had a high level agreement to have a personal responsibility to protect their environment, although, the level of agreement of high income (98.8%) and middle- income group (98.3%) were slightly higher than the low- income group (98.1%). Hence,

only 1.9% of the low-income group disagreed that they had a personal responsibility to protect the environment.

Further, a test of significance (ANOVA) was conducted to determine the effect of household income on the respondent's personal responsibility to the environment. The outcome of the test of significance (ANOVA) showed a significant effect of household income on the respondent's personal responsibility to the environment at [F (2, 253803) = 190.09, p= <.001 (See Appendix B). This result suggests that household income is associated with people's responsibility to protect their environment. Since there was a statistically significant difference between the household income and personal responsibility to the environment, a post hoc test using the Tukey HSD test was conducted to determine where the differences between groups were significant. The results of the test showed that there were significant differences between all three groups of income at p=< .001.

Figure 4-2: Percentage of residents who agree that air quality in the community is very good by income level
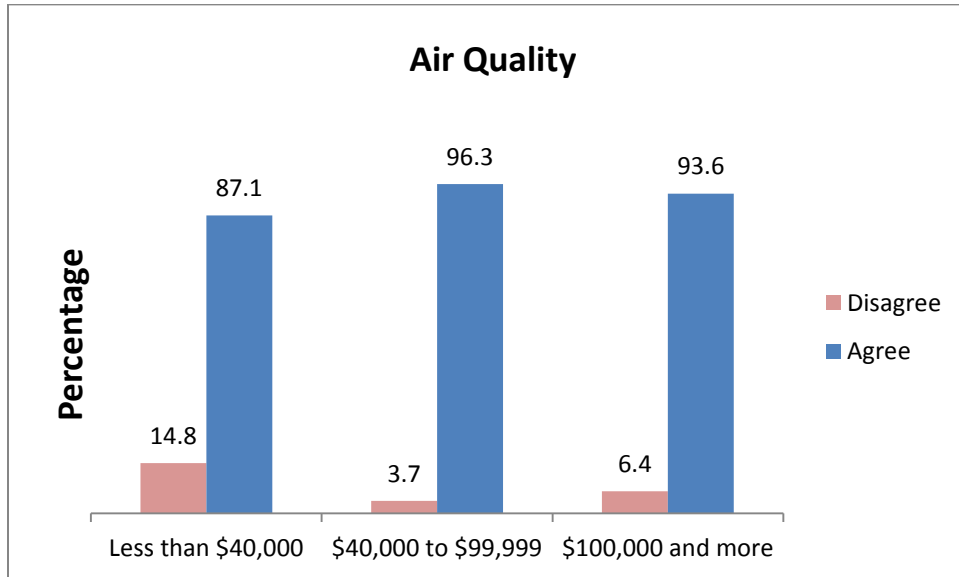
The results from Fig 4-2 highlights the significant difference between the people who earned more than $100,000 (93.6%), and those who earned less than $40,000 (87.1%) based on the quality of air in their environment. A higher percentage of low-income earners (14.8%) and high income earners (6.4%) disagreed that the air quality in their environment was very good while the middle income earners had the highest level of agreement (96.3%) with the quality of the air in their environment. This result suggests that most middle and high-income earners are likely to agree with the quality of air in their environment to be very good. The results of the test of significance (ANOVA) conducted to determine the effect of household income on the respondent's perception of air quality was reported at [$F_{(2, 253066)} = 4679.23$, $p = <.001$]. The outcome of the result suggests that household income affects people's perception of air quality in

their environment. Also, the results of the post hoc test showed that there were significant differences between all three groups of income with level of significance reported as p=< .001.
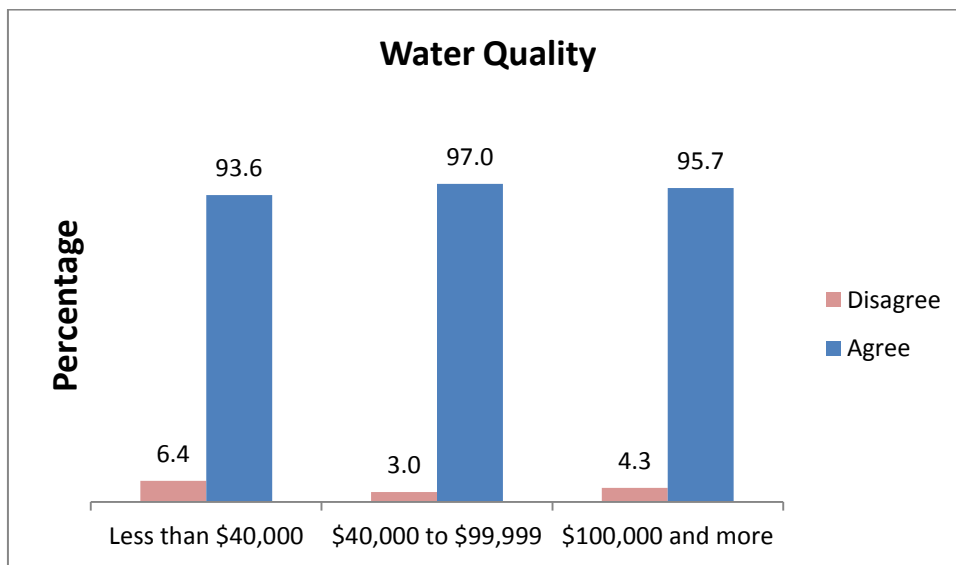
Figure 4-3: Percentage of residents who agree that water quality in the community is very good by income level

The results from Figure 4-3 show that the middle-income class (97%) and the high-income earners (95.7%) had the highest level of agreement with the quality of water in their community to be good while the low-income class (6.4%) had the highest level of disagreement. These results suggest that the middle and high-income classes are more likely to agree that the quality of water in their environment is very good. The findings of the test of significance (ANOVA) conducted to determine the effect of household income on the respondent's perception of water quality was reported at [F (2, 253722) = 3822.34, p=<.001]. The ANOVA result suggests that household income relates with people's perception of water quality in their

environment. Further post-hoc test conducted shows there was statistically difference between the low-income group and high-income group (p=<.001), as well between low-income group and middle income earners (p=<.001). However, there were no differences between the middle and high-income level group (p=0.118) (See Appendix C).

Figure 4-4: Percentage of residents who agree that the quality of natural environment in their city/town is very good by income level
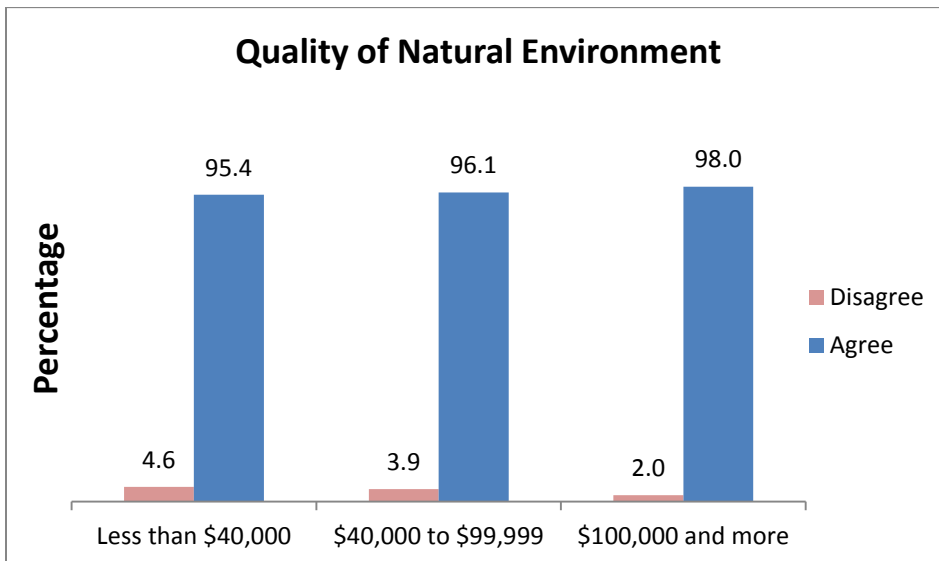
Most of the respondents in the three-income level agree that the quality of the natural environment in their town was very good. However, the chart shows the low-income earners had the highest disagreement with the statement (4.6 %) compared to the other income level groups. The high-income earners (3.9%) and middle-income class (2%) disagreed with the statement. The results of the test of significance (ANOVA) between household income and the respondent's perception of the quality of their natural environment was reported at [F (2, 254828) = 4505.83,

p=<.001]. The outcome of the result suggests that household income relates with people's perception of the quality of their natural environment. Similarly, the results of the post hoc test showed that there were significant differences between all three groups of income with level of significance reported as p=< .001.

Chapter 5

Discussion and Conclusion

This thesis presents a study to explore the interconnectedness between work hours, income inadequacy, time adequacy, leisure time and wellbeing in Victoria BC Canada with data surveyed by the Canadian Index of Wellbeing (CIW). A quantitative correlation study was conducted to investigate how the relationship between work hours, income inadequacy, time adequacy, and leisure influence societal wellbeing. The outcome of the findings addressed the research questions:

- How do work hours, income inadequacy, time adequacy, and leisure time interact to influence wellbeing?

- Is there an association between household income level and people's perceptions of their local environment in the context of wellbeing?

This chapter provides answers to the research questions, discussions of findings, the study limitations. In addition, recommendation for future research and contribution to the CIW and general wellbeing are discussed.

5.1 Relationships between Variables

The first research question for this study aims to examine how interactions between work hours, income inadequacy, time adequacy, and leisure time influence wellbeing. The Pearson's

and Spearman's correlation was used to ascertain the relationship between the variables, and provided concrete answers to the first research question. Other variables such as sleep hours, unpaid care for dependants, vacation days and engagement in physical activities were underlying factors that influenced wellbeing for this study. The findings and discussions emanating from Research Question 1 are discussed in sub-sections 5.1.1 and 5.1.2 and 5.1.3.

5.1.1 Work hours, Income and Income inadequacy

The correlation results between work hours, income and income inadequacy revealed long work hours were associated with increase in income; decrease in income inadequacies of people meeting their basic needs such as food, rent or mortgage payment, bill payments (water, hydro, phone, credit card). The outcome of these results was anticipated as previous studies found significant relationship among work hours, income and income inadequacies (Mehdikarimi et al., 2015; Fursman, 2008). Mehdikarimi et al. (2015) conducted a regression analysis to examine how income influences people's work hours with data from the United States Census Bureau's American Community Survey. The findings from their analysis showed that as income increased by 1%, work hours increased by 0.06804 hours per week. Hence, a 20% increase in income would result to about 81.6 minutes more spent weekly at work. Similarly, Fursman (2008) conducted a qualitative study by interviewing about 17 different families who worked over 50 hours weekly and it was revealed income was the key determinant for working extra hours. Other identified reasons for longer work hours were the workers ability to meet the workload requirements of their job, pressures from workplace and the work culture of specific

industries e.g. agriculture, construction and hospitality; however the need for higher income was a major driver (Fursman, 2008). The findings also indicate that when sufficient financial resources are available, work hours are more likely to lessen whereas low- income earning households are more likely to have little or no flexibility with their working hours.

Furthermore, in assessing the relationship between work hours, income and income inadequacy, Boushey & Gundersen (2001) analyzed data from the Survey of Income and Program Participation (SIPP) and the National Survey of American Families (NSAF). The surveys asked the respondent's questions to determine whether they encountered food insecurity and financial difficulty in the past year. The analysis of the data showed the families that transitioned from the welfare program to work status had difficulty in meeting their financial needs especially those who worked shorter hours. Some of the part-time workers, about 24.1% skipped meals, 39.8% could not afford the meal they wanted, and 42.7% had difficulties paying their rent and mortgages. These results indicate those who work shorter work hours encounter more financial challenges compared to those who work longer hours since income decreases as work hours decline and vice-versa.

In overall, these findings validate the outcome of correlation results that found positive and significant relationship between work hours and income; negative and significant relationship between income and income inadequacies. The respondent's income increased as their work hours increased and their income inadequacies such as food insecurities, difficulty in paying rent and mortgages reduced as their income increased.

5.1.2 Income and Financial Satisfaction

The results for the analysis between income and financial satisfaction from this study indicate people became more satisfied with their financial situation with increasing income. This result supports prior research that suggests that household income has a direct effect on financial satisfaction (Coşkuner, 2016). With data collected from a population of academic and administrative staff in Ankara, Turkey, Coşkuner (2016) conducted a regression analysis to determine how income contributes to financial satisfaction amongst other variables such as financial knowledge and financial behaviour. The findings of the analysis showed income was the most influential factor predicting financial satisfaction as one unit in household income increased financial satisfaction by 57.3%. As pointed out by Vera-Toscano et al., (2006) people evaluate their financial situation by considering not only their level of income, but simultaneously assessing how adequate and stable that income can satisfy their needs, the adequacy of income with respect to their expenditure. Hence, people with higher financial needs are unlikely satisfied with their level of income. Also, previous studies that found strong positive relationship between household income and satisfaction suggests that high-income earners are more satisfied with their financial situation however, at higher income level, the effect on financial satisfaction diminishes for additional units of income earned (Newman et al. 2008; Ferrer-i-Carbonell, 2005; Van Praag et al. 2003)

Furthermore, Newman et al. (2008) investigated the extent which household income influences financial satisfaction by conducting a panel analysis of 1,998 individuals in Irish households between 1994-2001. The outcome of the analysis showed a positive and significant

relationship between household income and financial situation, that is, the participants were more satisfied with their financial situation as their household income increased. However, the effect of financial satisfaction declined for additional units of income at higher income levels.

Overall, income was identified as an important factor driving work hours, income inadequacy and financial satisfaction evident from the correlation results of this study and from the findings on previous studies e.g. Coşkuner (2016) and Newman et al. (2008).

5.1.3 Work hours, Time adequacy, Satisfaction with leisure time and Wellbeing

As seen in the results section, work hours were statistically associated with time adequacy. The results show increasing work hours relate negatively with time adequacy. Long work hours were associated with time for other life activities such as sleep time, time for leisure activities, physical activities, vacation days, daily commute to work and time to provide care for dependants. Even though long work hours were negatively associated with the time people had for other activities outside of work, some employees still allocated their non-work time for physical activities. Hence, this result suggests people are more likely to devote their non-work time to activities based on their priorities and preference. The results further showed that time adequacy for some these essential and crucial aspects of life correlated positively with the participant's state of health and wellbeing.

Furthermore, the results showed time adequacy positively relates to people's engagement in physical activities, hours of sleep, leisure activities but interestingly relates negatively with unpaid care for children or dependants. Although, the expected result was that time for unpaid

care would increase as time adequacy increases; however, this surprising result suggests people might have insufficient time on their hands for other activities when they provide care to their children and other dependants. However, it may be possible for some employees that earn hourly wages to increase their work hours in order to help pay for expenses related to caring for children and dependent adults. This particular result therefore reveals the essence of reducing weekly work hours proposed in the degrowth discussion of the literature review.

Further, the results indicate time adequacy was positively related with the satisfaction people derived from their leisure time; hence, the more time spent on leisure activities, the higher the satisfaction and experience received and felt from those activities. The experience derived from leisure activities contributes positively to physical and mental health by reducing and minimizing stress that would usually trigger physical and mental illnesses (Coleman & Iso-Ahola, 1993; Iso-Ahola & Mannell, 2004), increase psychological outcomes (Knopf, 1991), and as well prevent clinical depression (Folkman & Moskowitz ,2000). As pointed out by Mannell (2007), vacations have been seen a form of leisure that encourages positive outcome such as tension release, personal improvement and many opportunities to engage in activities that enhance life satisfaction. This is supported with evidence from the results section of this thesis that showed vacation days declined with increasing work hours and wellbeing increased as vacation days increased.

In assessing how work hours may influence health conditions, Spark et al. (1997) carried out meta-analyses of 21 study samples within 1965-1996 to determine the effect of work hours on health. The health issues covered in these studies were not limited to myocardial infarction,

exhaustion, mental stress, anxiety, poor sleep. By calculating the weighted average of the observed correlation, the results indicated a small but positive and significant relationship between overall health symptoms, physiological and psychological health symptoms, and hours of work. In addition, the qualitative analysis of 12 studies confirmed the positive relationship between work hours and health issues. These results indicate health symptoms increases with increasing work hours thereby suggesting long work hours can be detrimental to health.

Furthermore, the finding in the result section suggests weekly work hours were indirectly associated with wellbeing whereas time adequacy was directly associated with wellbeing directly. This is obvious from the correlation established between commute time, sleep hours, engagement in physical activities and weekly work hours. The correlation between weekly work hours and commute time was positive and statistically significant, which suggest that daily commute time to work increases as weekly work hours increases even though the result of correlation was very weak. The results further showed weekly hours were negatively and statistically associated with sleep hours; and positively correlated with physical activities. This result indicates that increase in work hours were associated with decline in sleep hours suggesting people have insufficient sleep when they work longer hours. However, employees who engage in shift work especially night shift jobs are more likely to be sleep derived as their sleep pattern changes, and they could experience difficulties sleeping during daytime. Further correlation results showed physical activities increased with increasing work hours indicating some people still allocated time for physical activities even after a long day at work. The outcome of this result could suggest that some employees were more conscious of their physical

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health and wellbeing by engaging in physical activities such as jogging and aerobics. In addition, there is a possibility that some employees could afford a gym membership because of the increment of their income. Previous studies have shown the direct impact of sleep and physical activities on health and wellbeing. Shorter sleep has been found to be associated with lower positive emotion and more negative emotion (Kahneman et al., 2004), lower life satisfaction (Ferrer-i-Carbonell & Gowdy, 2005) and weight gain (Patel et al., 2006). Participation in physical activities reduces depression and anxiety, increases general psychological wellbeing and life satisfaction (Haworth & Lewis, 2005), reduces levels of mental ill-health and contributes to higher levels of physical health and wellbeing (Iwasaki et al., 2001).

5.2 Income Level, Perception of the Environment and Wellbeing

In answering the second research question, this thesis explored the relationship between the respondent's income level and perception of their personal responsibility to protect the eenvironment; the quality of the air and water in their community; and the quality of their natural environment. The income level was categorized into three groups namely: low-income class (those who earned less than $40,000), middle-income earners ($40,000-$99,999) and lastly high-income class ($100,000 or more).

The assessment of the respondent's personal responsibility to protect their environment showed most income earners agreed they had a personal responsibility to keep their environment safe, although a higher percentage of high-income earners (98.8%) and middle-income earners

(98.3%) agreed more than the low-income group (98.1%). This result suggests only a few households (1.9%) within the income bracket of less than $40,000 disagreed to have a personal responsibility to protect their environment. This result supports a study conducted by Hilbrecht and Smale (2016) for Oxford County, Ontario that found most of the residents within the three income brackets agreed they had a personal responsibility to protect their environment, however high and middle-income households had a higher level of agreement than low-income households did. As posited by Hilbrecht & Smale (2016), the high percentage of agreement from the three income groups indicate people place value on the environment in their community, and feel responsible to conserve the physical assets in the environment e.g. air, green space, water and all living things. This indicator is associated with the 15th Sustainable development goal that promotes the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services. Furthermore, as stated Eden (1993), people can be responsible to the environment by promoting public environmentalism through green consumerism, passive membership of environmental groups, and domestic recycling.

Furthermore, the findings from the respondent's perception on the quality of the natural environment showed those who earned more than $100,000 or more in previous year had a highest level of agreement than the other two income groups, although there was only a slight difference among the three groups. Still, the result indicates high-income earners are more likely to assess the quality of their natural environment as very good when compared to either the lower or the middle-income households. Further results from the analysis showed income was associated with people's perception of water and air in their community. The middle-income

earners had a higher level of agreement than the higher and low-income individuals did. However, those that earned less than $40,000 in previous year had a higher level of disagreement on the quality of air and water in their environment. This result corroborates with Hilbrecht and Smale (2016) study that found that middle-income earners were more likely to assess the quality of the air and water in their community as very good when compared with the low and high-income group. According to Hilbrecht & Smale (2016), clean air and water do not only enhance health and wellbeing, but also create a desirable community for people to live, work and play. Good air and water quality could also be an attraction for tourist to visit the community (Hilbrecht & Smale, 2016). In addition, these indicators of air and water quality relates to the sixth Sustainable Development Goals (SDG's) that ensures access to clean water and sanitation.

Furthermore, studies have revealed associations between people's perception of their environment and their wellbeing. As posited by Russell et al., (2013), people's perceptions of their local environment are associated with their physical health. This is evident from a clinical study where participants were exposed to either a window with a natural scene, plasma TV screen with an image of the same natural scene, and a brick wall. It was revealed that those exposed to the natural scene through the window had rapid recovery of heart rates after being exposure to low-level stress than the other groups (Russell et al., 2013); hence suggesting a relationship between the participant's perception of their environment and physical health. Also, studies have established the relationship between physical health and people living in predominately natural environments as residents who live in more green space tend to have better self-reported health (Maas et al., 2006). The findings of this study collaborate with

Mitchell & Popham (2008) which found that health inequalities associated with income deprivation are lower in greenest neighborhoods compared to those who have no or less exposure to green space. Hence, the differences in morbidity rates are highly associated with socioeconomic factors such as household income; however, the closeness of homes to green space may reduce health inequalities through the benefits of physical activities, as physical environs that encourage good health might play a vital role in reducing socioeconomic health inequalities (Mitchell & Popham, 2008). This suggests that access to good natural/physical environments is strongly associated with the socioeconomic position of individuals (Mitchell & Popham, 2008). For instance, high-income earners are more likely to afford to live in a good ambient and environment, while low-income earners could be exposed to air pollution due to the state of environment they reside (WHO, 2010).

More studies have shown that people's interaction (by either presence or visual) with their local environment has psychologically and physiologically restorative effects on their health through reducing blood pressure and stress levels (Russell et al., 2013; Mitchell & Popham, 2008). Also, individual's perception and direct interaction/experience of environmental degradation and loss could lead to concern, anxiety, guilt, anger, helplessness, dread, and pessimism that could negatively influence their mental health and wellbeing (Bohm, 2003). Other studies have shown that the natural environment improves health and promote healthy behavior. As posited by De Vries et al. (2003), those who reside in a good natural environment are unlikely to be exposed to air pollution, and are more likely to engage in outdoor physical activities; and are healthy for being exposed to natural elements. Further, the study conducted by

De Vries et al. (2003) showed that the benefits of a greener environment had more significant beneficial effects on individuals within a lower income bracket indicating they are more sensitive to their local natural/physical environment. Such non-material connections with the environment have been known to play vital in improving mental health as noted by Russell et al. (2013). However, the contribution of perception and experience with their natural environment is quite complex, and sometimes difficult to measure, therefore this research does not conclusively say that high-income level necessarily results in the positive perception of their environment and overall wellbeing. Notwithstanding, as recommended in the European Environment Agency outlook report (2015), a better understanding of changes in the social distribution of environmental quality can be helpful for policy especially for those within some particular groups e.g. low incomes households, children, and the elderly who are more likely to be more vulnerable as a result of their economic, health, and educational status, access to health care, and lifestyle factors that influence their coping capabilities and adaptation. For instance, policies that ensure the level of pollution does not have a harmful impact on human health and environment should be implemented.

5.3 Study Limitation

This research adopted only a correlational test to examine the relationship between the variables. While it suggested the relationship between two variables, it could not prove that one variable causes a change in another variable, as there is a possibility a third variable caused the

observed variables to be correlated (Stangor, 2011). This however limited the richness of results captured from the data for this study.

Secondly, the data for this study was self-reported and was subject to self-presentation biases that may alter the outcome of the results. In addition, as mentioned earlier in the methods section, this study was limited by the use of existing instrument, data as some measures of interest were included in the survey, and this restricted the exploration of variables for this research. For example, this survey did not provide data that could ascertain the correlation between work hours and its consequence on the environment.

5.4 Future Research and Recommendation for Policy

In the future, regression analysis may be conducted to determine the contribution of each key variable (time adequacy, satisfaction with leisure time, and experience from leisure) to explain their variations on wellbeing. Future studies should also consider exploring the indirect effects, that is, the mediating effects of the predicting variables of this study on wellbeing. Previous mediation study conducted by Hilbrecht et al. (2015) indicates this method allows the researcher to assess the degree or extent that the mediators contribute to the relationship between the predictor and outcome variables.

While this research explored the relationship among general work hours, time adequacy and wellbeing, future research should focus on the how shift work hours and interacts with time adequacy and wellbeing. Literature reveals those who engage in shift related jobs; especially night shifts are more affected with physiological problems as their eating and sleeping pattern

changes (Harrington, 2001). In addition, they experience more disruption of family and social activities, family and marital responsibilities (childcare and house chores) (Harrington, 2001).

To ensure employees have a balance between work hours and time adequacy for other important aspects of life, Kallis et al. (2013) proposed for reduction of weekly workdays from 5 days to 4 days; decrease of daily work hours e.g. 8 hours to 5 hours; and the increase in the proportion of part-time jobs in the labor force so that employees could work fewer hours in a year. According to the Kallis et al, these work hours reduction policies would give employees the opportunity to work less, and provide more leisure time to travel, learn, read, spend quality time with their families and nurture social relationships. Such work hours policies was implemented by the government of France in year 2000 to reduce unemployment, and offer workers more balance between work and life to enhance the quality of life (Kallis et al., 2013). Further important benefits can be attained with the reduction of work hours as employees could have more time to engage in physical activities and have less work-related stress; they may also have more time dedicated to parenting and off-the-job personal development; personal activities and leisure activities (Kallis et al., 2013). However, there is no assurance that employees will allocate their non-work time to these activities but there is a higher chance of them having more personal time for non-work activities. A key issue identified with work hours reduction policies is whether the policy would materialize with or without a change in wages.

As recommended by the OECD Employment outlook report (2016), policies that encourage flexibility autonomy of work hours should be considered and adopted by organization and businesses. More organization and businesses should consider policies that give employee's

flexibility and autonomy of their work time e.g. the option of working from home. Studies show there is a high possibility that employees would have higher time adequacy with flexible and autonomous working time than with fixed schedules. For instance, Lott (2014) found that work time flexibility and autonomy are positively related to employees' time adequacy while low time adequacy was found to be correlated with fixed work schedules. As indicated in the results section of this thesis, the increase in time adequacy contributed to both physical and mental wellbeing positively.

In addition, policies that ensure employees use their full paid vacation days should be put in place and adhered to by both employers and employees. Hilbrecht & Smale (2016) discovered positive associations between vacations and better mental health and quality of life. In their study on the contribution of paid vacation time to wellbeing, the outcome of their results indicated a significant positive relationship between the paid vacation time and life satisfaction; and self-assessed health by mediating feelings of greater satisfaction with work–life balance, decreased time pressure and better mental health. Furthermore, the outcome of their results showed that longer vacation days contributed to wellbeing as it was directly linked to greater satisfaction with work–life balance, better mental health and reduced time pressure.

5.5 Concluding Thoughts

Given the importance of wellbeing, the principal goal of Sustainable development is to ensure the needs of the present and future generations are met by ensuring both generations have accessibility to the essential resources to live a quality life. This thesis highlights the

interplay between sustainable development and wellbeing and stresses on the importance of capital assets (natural capital, human capital, manufactured capital, knowledge capital and social capital) in attaining wellbeing. In view of this, the framework of sustainability is hinged on the interconnections of different activities that affect each other to increase wellbeing. This interconnectedness is critical in achieving human wellbeing as it captures several factors that tend to increase and decrease wellbeing.

This thesis explored the interconnectedness of work hours, income inadequacy, time adequacy and leisure time in influencing wellbeing. As one of the key goals of government is to ensure and enhance the wellbeing of individuals in the society, this research would assist policymakers recognize the needs of the Victoria BC populace and influence policies at local and national levels. The results obtained from this research would support policy makers to enact better policies that recognize the effect of long work hours as they relate to human wellbeing. These policies should ensure people enjoy a work-life balance, and influence important outcomes that may enhance health, quality of life and wellbeing of the community. Furthermore, these findings would not only create awareness for the government but also for the populace on how certain, behaviour and lifestyle contributes or undermines their health, wellbeing and environment.

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Appendix A

Selected Variables for Study

Variables	CIW Domains	Survey Question(s)
Household Income	Living Standards	What was your total household income from all sources last year?
Weekly Work Hours	Living Standards	How many hours per week do you usually spend working at your main job?
Weekly Unpaid Care for dependants (Hours)	Time Use	How many hours in a typical week of unpaid cares do you usually provide?
Daily Sleep Hours	Time Use	How many hours of sleep/naps do you usually get per day?
Commute Times (Minutes)	Time Use	How long does it take (in minutes) to get from your residence to your place of work for your main job?
Vacation Days	Leisure and Culture	How many days in total were you away on holiday in the past year?
Monthly Physical Activities	Leisure and Culture	What's the total number of times you participated in vigorous exercise in a typical month?
Time Adequacy Scale	Time Use	To what extent is there enough time for you:

Variables	CIW Domains	Survey Question(s)
		to get enough sleep/rest?
		to be yourself?
		to socialize?
		to keep in shape?
		to prepare or eat healthy meals?
		to participate in or be active in the community?
		to nurture your spiritual and/or creative side?
		to complete chores or errands?
		and your family to be together?
		to form and sustain serious relationships?
Leisure Satisfaction Scale	Leisure and Culture	My leisure provides opportunities to try new things
		My leisure provides me with opportunities for social interaction with others
		My leisure helps me to relax
		I participate in leisure that develops my physical fitness
		My leisure helps me to learn about myself
		My leisure has helped me to develop close relationships with others
		My leisure helps relieve stress
		I participate in leisure that restores me physically
		My leisure helps me to learn about other people
		My leisure is most enjoyable when I can

Variables	CIW Domains	Survey Question(s)
		connect with others
		My leisure contributes to my emotional wellbeing
		My leisure helps me to stay healthy
Satisfaction with Financial situation	Overall Health and Wellbeing	How satisfied are you with your financial situation?
Satisfaction with Leisure time	Overall Health and Wellbeing	How satisfied are you with your leisure time?
Income Inadequacy(Needs)	Living Standards	I could not pay my bills on time (e.g., water, hydro, phone, credit card)
		I could not pay my mortgage or rent on time
		I ate less because there was not enough food or money for food
		I did not have enough money to buy the things I needed
Income Inadequacy(Wants)		I did not have enough money to buy the things I wanted
Self-reported wellbeing and health	Overall Health and Wellbeing	How satisfied are you with your mental wellbeing?
		How satisfied are you with your physical wellbeing?
	Healthy	How would you rate your physical

Variables	CIW Domains	Survey Question(s)
	Populations	health?
		How would you rate your mental health?
Perception of the Environment	Environment	The quality of the natural environment in my town/city is very high
		The air quality in our community is very good
		I feel I have a personal responsibility to help protect the natural environment

Appendix B
One-way Anova Test

	Sum of Squares	df	Mean Square	F	Sig
The quality of the natural environment in my city/town is very high					
Between Groups	8620.14	2	4310.07	4505.83	0.000
Within Groups	243756.67	254828	0.96		
The air quality in our community is very good					
Between Groups	12076.31	2	6038.16	4679.23	0.000
Within Groups	326560.52	253066	1.29		
The water quality in our community is very good					
Between Groups	8858.44	2	4429.22	3822.34	
Within Groups	294006.00	253722	1.16		
I have a personal responsibility to help protect the natural environment					
Between Groups	402.54	2	201.27	190.09	0.000
Within Groups	268730.90	253803	1.06		

Post Hoc Tests (Tukey HSD) - Multiple Comparisons

Dependent Variable			Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
The quality of the natural environment in my city/town is very high	Less than 40000	40000 to 99999	-.329[*]	0.005	0.000	-0.34	-0.32
		100000 and more	-.504[*]	0.005	0.000	-0.52	-0.49
	40000 to 99999	Less than 40000	.329[*]	0.005	0.000	0.32	0.34
		100000 and more	-.175[*]	0.005	0.000	-0.19	-0.16
	100000 and more	Less than 40000	.504[*]	0.005	0.000	0.49	0.52
		40000 to 99999	.175[*]	0.005	0.000	0.16	0.19
The air quality in our community is very good	Less than 40000	40000 to 99999	-.485[*]	0.006	0.000	-0.50	-0.47
		100000 and more	-.549[*]	0.006	0.000	-0.56	-0.53
	40000 to 99999	Less than 40000	.485[*]	0.006	0.000	0.47	0.50
		100000 and more	-.064[*]	0.005	0.000	-0.08	-0.05
	100000 and more	Less than 40000	.549[*]	0.006	0.000	0.53	0.56
		40000 to 99999	.064[*]	0.005	0.000	0.05	0.08
The water quality in our community is very good	Less than 40000	40000 to 99999	-.436[*]	0.005	0.000	-0.45	-0.42
		100000 and more	-.446[*]	0.006	0.000	-0.46	-0.43
	40000 to 99999	Less than 40000	.436[*]	0.005	0.000	0.42	0.45
		100000 and more	-0.010	0.005	0.118	-0.02	0.00
	100000 and more	Less than 40000	.446[*]	0.006	0.000	0.43	0.46

Dependent Variable			Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
		40000 to 99999	0.010	0.005	0.118	0.00	0.02
I have a personal responsibility to help protect the natural environment	Less than 40000	40000 to 99999	.020*	0.005	0.000	0.01	0.03
		100000 and more	-.073*	0.006	0.000	-0.09	-0.06
	40000 to 99999	Less than 40000	-.020*	0.005	0.000	-0.03	-0.01
		100000 and more	-.093*	0.005	0.000	-0.10	-0.08
	100000 and more	Less than 40000	.073*	0.006	0.000	0.06	0.09
		40000 to 99999	.093*	0.005	0.000	0.08	0.10

*. The mean difference is significant at the 0.05 level.