

Does GNH Determine Contextual QoL? A Case of Thimphu Urban*

*Gonpo Tenzin***

Abstract

The empirical assessment of happiness or life satisfaction is emerging as a key research area across the world. Studies in this area, however, are pursued mostly by determining generalized Quality of Life (QoL) and fails to reflect contextual and place-based QoL. This study aims to fill this gap by examining how place-based attributes could determine QoL by taking the case of Thimphu, the capital city of Bhutan. Subsuming the attributes of Gross National Happiness (GNH) the study determines QoL of Thimphu for the first time. The study applies empirical QoL model and employs both qualitative and quantitative approach, and it also considers wide range of literature reviews. The findings reveal that both GNH and most QoL cases are multidimensional in approach and bears high correlation between the attributes. There is inherent commonness and similar patterns between the two. Converging the findings from recent GNH survey 2015 and this QoL assessment, the analysis demonstrated that there is correlation close to $R^2 = 0.91$ and the line of best fit at $y=0.1236x+1.7333$. The significance of the findings confirm that the QoL mechanism would be efficient, effective and realistic if it is place-based and contextual in approach, but not undermining dynamism in change around. The findings of the

* The author remains indebted to all the unit conveners, particularly Dr. Hitomi Nakanishi, University of Canberra for her unwavering supervision, wisdom, knowledge and technical guidance to carrying out this study. The author also thanks Dasho Karma Ura, Mr. Karma Wangdi, Mr. Dendup Chopel and Mr. Jigme Phuntsho for extending data approval and support in carrying out this study. Lastly to all the respondents who arranged their time to discuss and respond to the questionnaires.

** Chief Planning Officer, Policy and Planning Division, National Land Commission Secretariat, Thimphu. Email: gtenzin@nlcs.gov.bt

QoL assessment also recommends set of significant propositions to address the dispossession of QoL. The policy review, program alignment and innovative infrastructural integration in education, psychology and community vitality domains of QoL are underscored as main recommendations from the study.

Keywords: Gross National Happiness, quality of life, indicators/attributes, satisfaction, domains/dimensions, place-based, subjective and objective wellbeing

1. Introduction

1.1. Background

Evaluating realistic QoL is an indispensable part of public decision making processes to generate purposive, timely and right policy interventions. However, the assessment of QoL is undeterminable in most cases. According to Brown et al. (2004) states there is no definite and widely accepted theory or empirical tools to determine QoL. It remains complex, nebulous and amorphous until it attains homeostasis state (Lawton, 1991). (Hagerty et al., 2001) reviewed 22 most commonly used QoL models around the world and found out that the use of tested conceptual model of QoL is lacking in most cases. As a result, there is high prevalence of inconsistencies in the application of QoL assessment and models around the world. However, what is commonly revealed is that the contextual place-based attributes are the most sensible and realistic to determine QoL.

It is significant to ascertain these findings by considering contextual place-based QoL mechanism in the study and assessing their relationship and resemblances. The study considers GNH as a place-based QoL mechanism in the context of Bhutan to test against QoL empirical model. The test uses common dataset of Thimphu urban, the capital city of Bhutan. While GNH is a development model that inherently determines QoL in Bhutan (Ura et al., 2012), it is an exemplary model with multidimensional approach like most existing QoL models

used around the world. GNH consist of 9 domains, 33 indicators and more than 124 variables to determine the holistic progress of the country and its people.

Attributes such as material and emotional wellbeing, social and community vitality and health and life satisfaction are wisely considered in constructing 15 QoL indicators in this study which inherently subsumes the 33 indicators of GNH.

1.2. The purpose of the study

The key purpose of the study is to find out the relationship between GNH and QoL assessments regardless of the different approaches and assessment models used, and also examine whether GNH determines contextual measure of QoL or not in Bhutan. After confirming the findings, an actionable, significant, measurable and simple QoL assessment for Bhutan will be proposed which would contribute towards timely and informed decision making processes of public policy. Though GNH is the guiding development philosophy of Bhutan, its actual operationalization with scientific measures is still evolving and require continuous review and construct to meet the cross-situational needs with changing times. Further, the constant evaluation of QoL with GNH would be time consuming, extensive and costly as it requires comprehensive responses for over 124 variables from an individual and household levels. This extensive assessment is also conducted after every five years and would create time gap and underprovide evidence of people's actual quality of life. This would consequently undermine timely and right intervention in the fast changing society vis-à-vis the needs.

1.3. Scope of the Study

The purpose of the study demands intensive background on GNH and its ability to determine contextual QoL, thus some comprehensive aspects of GNH is captured in the study including its attributes and strengths and weaknesses. The study also covers reasonable range of literature review to find the qualitative analysis, primarily encompassing diverse studies on such as, amorphous state of QoL, foundation and

attributes of QoL, QoL as contextual application and most essentially how GNH subsumes QoL as a contextual place-based model. As the study considers Thimphu urban as a case study, brief background on urban policy environment and planning is captured to provide some basic ideas. QoL for Thimphu urban is then assessed using appropriate methodology and QoL Model. The methodology discusses indicator construction and determinants using methods like interview, content judgment and description. The discussion on the study findings sketchily draws strength to support this report. Limitations and significance of the study are also highlighted before drawing the conclusion. Exclusively, the significance of the study underscores the potential set of recommendations for the future course of action.

2. Background of Gross National Happiness

History of Happiness and Public Value Management (PVM) in the country dates back to the time of Drukpa abbot Zhabdrung Ngawang Namgyel (1594–1651), who visited Bhutan in 1616 and shaped the country's history. He promulgated the first set of Bhutanese laws in 1651 within which ten pious acts, known as Lhachoe Gyewa Chu and the sixteen virtuous acts of social piety, referred as the Michoe Tsangma Chudrug was introduced (Whitecross, 2004; Royal Court of Justice, 2016). These are the basis of codification of law that states that if the government cannot create the Happiness (*dhe-ki*) for the people there is no reason to exist the government (Ura, et al., 2012; Ura 2011b).

The concept of GNH was promulgated by the fourth King of Bhutan, Jigme Singye Wangchuck. (Kyi, 2015) said that the King's reign was one of great changes shaped by a vision that was sensitive to the past legacies and needs of the future. The King said he was interested not only in Gross Domestic Product indicating the total income of the country, but riveted more in Gross National Happiness to represent the spiritual and emotional wellbeing of his subjects. This is a sensible development course chosen by the King in achieving steady

progress through the path of modernization without undue damage onto its beautiful endowments (Kyri, 2015).

The present King, Jigme Khesar Namgyel Wangchuck also reaffirmed the importance of happiness in his coronation speech in 2008 when he emphasized that the true essence of Gross National Happiness is 'Development with Values' that encompasses holistic, balanced, collective, sustainable and equitable development.

Technically, in operationalizing GNH in the overall development perspective, it is characterized through four strategic areas, which is also called as four pillars of GNH. The four pillars are i) Sustainable and equitable socio-economic development; ii) Environmental conservation; iii) Preservation and promotion of culture; and iv) Good governance. These four pillars then constitute 9 domains and 33 indicators. The 33 indicators are divided into over 124 variables to measure happiness through multidimensional approach. The nine domains were selected on normative grounds that particularly determine key areas of GNH. Conventionally, the three domains like health, education and living standard are the traditional public policy dimensions, ecological and good governance are noble areas becoming common across and the psychological wellbeing, time use, community vitality and cultural diversity are distinct and innovative attributes.

2.1. Attributes

The GNH Index is set in order to indicate the trend and measurement over time. According to Ura et al. (2012), the index is on single number composite ranging from zero to one with zero as least value and one as highest value. For example, as per GNH Survey 2015, the GNH Index value for 2015 is 0.756, which is fairly on higher side. In determining this value, people are categorized as happy when they meet sufficiency in six of the nine domains, or when they attain sufficiency in at least 66% of the 33 weighted indicators. Technically, GNH Index is equal to 1 minus the product of HA ($GNH=1-HA$), where H is the headcount representing percentage of people

who do not enjoy sufficiency in six or more domains and A is the average proportion of domains within which people those are not yet happy, still lack sufficiency (it indicates the breath of shortfalls).

2.2. Strengths

Recently weaknesses have been underpinned against New Public Management (NPM) due to deficiency of wellbeing constituents and manifesting self-interests groups among politicians or bureaucrats (O'Flynn 2007). In order to redress or search beyond NPM, Public Value Management (PVM) is considered as holistic conventional public policy paradigm, which derived prolific interest from both practitioners and academicians (O'Flynn, 2007). In Bhutan, GNH inherently takes care of PVM and assumes it is adopted way before the conception of PVM into public policy realm. There is hardly any tool to indicate and measure people's emotional state in governance because of which objective aspects and material development takes lead resulting in multiple complexities and issues. GNH determines not only objective aspects but also subjective wellbeing or the emotional state for inclusive and informed practical action (Ura et al., 2012). Besides, as GNH constitutes psychological wellbeing as one of nine domains, it integrally determines the quality of life, even more profound in comparison to most of the other conventional QoL approaches.

2.3. Weaknesses

The criticism is why Bhutan is not ranked on the top list of global happiness index today. As per the World Happiness Report (2016), Denmark is ranked first and Bhutan ranked 84th out of 150 countries, despite declaring that its development is driven by happiness model. Further, to empirically derive and define happiness itself is another perceived confrontation facing parallel to the pragmatic conventional economic models. The GNH index cannot include all round relevant aspects of GNH to sufficiently guide policy. It requires a finite and narrower analysis of policies and programmes, customised to local realities (Ura et al., 2012). GNH, as inherently inoculate social or individual contentment,

could be challenging to devise and address the diverse needs in the materialistic world. (Lepage, 2009) agrees that GNH would define quality of life but questions how it could take exhaustive structuration of quality of life description in conformation with other QoL index like Economic Intelligence Unit (EIU). One critical observation is that the GNH survey is carried out after every five years and it could create gap in making timely informed decision in first changing situation and need.

3. Literature Review

3.1. QoL as an amorphous state

Despite extensive researches on objective and subjective aspects so far, there has been no definite or widely accepted theory or empirical tools to determine QoL (Brown et al., 2004). (Awais, 2011) recounts Rosenberg (1992), Bowling (1995; 1996), and Bowling et al. (2001) that QoL generally defined at macro level considering the societal or objective aspects and micro level with individual or subjective aspects, in which the former constitutes employment, income, education, housing, other living and environmental circumstances, and latter constitutes the individual experiences and values related to well-being, happiness and life satisfaction. Further, when it comes to model, it differs and persists with lot of inconsistencies depending upon time and situation. (Brown et al., 2004) investigated a couple of researches ranging from the Maslow's hierarchy of human needs to classical analysis, such as psychological well-being, morale, happiness and life satisfaction conducted by Andrews et al. (1986; 1976), social expectations by Calman (1984) and unique perception of individuals by O'Boyle (1997) and it was found out that QoL is complex and nebulous. It remains in an amorphous state of interacting objective and subjective parameters until it attains a state of homeostasis by itself (Lawton, 1991). The essential mediator of adaptation process to attain homeostasis is called 'response shift', during which changing internal standards and values, the response or the perception to QoL does change concurrently (Sprangers et al., 1999). Similarly, Donoghue

(2004) termed it as ‘coping mechanism’ that cope up with deteriorating health or circumstances and leading optimistic perception of higher QoL.

3.2. Foundation and diverse attributes of QoL

QoL indicators is generally constructed towards determining happiness and life satisfaction but inherently it is grounded on Maslow’s hierarchy of needs pyramid. According to Calman (1984), QoL changes with time and under normal circumstance it is expressed in terms of satisfaction, happiness, contentment, fulfilment and ability to cope. Further the ‘Gap Theory’ according to Calman (1984) or the relative deprivation theory defines that the QoL is sum total of differences between expectation and present experience at given period of time (Bowling, 2001). The expectation is not confined to material wellbeing alone as Esterlin (1974; 1995; 2001) argues that income is not systematically accompanied by real essence of happiness. Awais (2011, p. 6-7) highlights GNH, Gross Domestic Product (GDP), Multidimensional Poverty Index (MPI), Human Development Index (HDI), Index of Sustainable Economic Welfare (ISEW) or Genuine Progress Indicator (GPI), Gini Coefficient, Wealth Estimates, Private Product Remaining, European Quality of Life Survey, Happy Planet Index as existing scientific approaches of measuring QoL today. These methods are embedded with tangible and intangible constituents, but largely predominant with material attributes. According to Aging and Mental Health (2003), QoL measures four ontologically grounded domains, such as control, autonomy, pleasure, and self-realization. While Economist Intelligence Unit (2005) defines through nine determinants, such as, material wellbeing, health, political stability and security, family life, community life, climate and geography, job security, political freedom and gender equality. (Kahneman et al., 2006) assess more from subjective point of view using U-Index (proportion of time individual spends on unpleasant or undesirable state). The U-index is computed for each individual and averaged over a sample of individuals to determine the net affect. (Nakanishi, 2015) determine QoL through set of indicators categorized under five domains, such as, community

safety and security, prosperity and diversity, culture and education, community wellbeing, quality environment and sustainability. (Higgins et al., 2012) accounts according to Evaluation body of England and Wales assessment themes, in which the dataset spans 10 distinct QoL themes, nine of which are numeric and analyzable. The themes are, community safety, health/social well-being, environment, economic well-being, community cohesion, housing, education/life-long learning, culture and leisure, transport, and people and place.

(Galloway, 2006) states that according to Taillefer et al. (2003, p. 299) identified three types of QoL models, such as conceptual model, conceptual framework and theoretical framework and he recounts the findings of Hagerty et al. (2001) that having reviewed 22 most commonly used QoL models around the world found that the use of tested conceptual model of QoL is deficient in all cases. However, reviewing and reading 9749 abstracts, 2455 articles and in-depth studies of 897 articles on QoL, Galloway (2006) uncovered the core domains and indicators (Appendix 6) for QoL commonly used and revolve around material and emotional wellbeing, community and social vitality and health and life satisfaction. Similarly, Brown et al. (2004) remarks poor health and social relationships, poor dwelling and neighborhood are persistent in most studies as deleterious that take quality away from lives.

3.3. QoL as contextual application

The Aga Khan Development Network (2013) carried out exploratory studies to comprehend people's culturally and socially embedded outlook for the 'good quality of life' and it was confirmed that the topics, domains and indicators for the assessments are highly place-based and need-based with time. For instance, in Britain the labour Government conducted monitoring of QoL using 15 indicators, while Mercer Human Resource Consulting (2003) used 39 indicators depending upon the place, region and contextual needs (Brown et al., 2004). The Australian Centre for Quality of Life (2013) describes over 1200 instruments which purport to determine QoL but is unsuitable to use for general population and regions

due to its idiosyncratic mixture of dependent variables with place. The literature on QoL during 1970s and 1980s account that the assessment of life satisfaction has been through work, health, community, family relationship, friends and standard of living, but overtime the determinants are changing, especially when safety and higher needs crucial reliant with place and situation (Brown et al., 2004).

(Mizobuchi, 2016) in the Journal of Happiness Studies espouses ‘happiness sensitivity’ is used to determine variance of subjective wellbeing from one country to another as it differs so much with differing socio-economic settings. While Galloway (2006) underlines that it is misleading to replicate or take a conception of QoL constructed in one country context to another or even from one geographic location, ethnic group, cultural and social setting to another. He recounts Keith (2001) stating that the dimensions or attributes of QoL largely differ from one culture to another and search for common and cross-jurisdictional definition would be misleading.

3.4. GNH measures QoL

Defining QoL has been abstruse for quite a while and various definitions are widespread from researchers to derive conceptual clarity. As per the typologies highlighted in Appendix 6.1, most commonly understood is that QoL usually incorporates the idea of determining ‘happiness and satisfaction’ (Galloway, 2006). (Brown, et al., 2004) infers that QoL is inclusive and must determine through multidimensional approach, in which measuring change in QoL must account several variables that comprises actual changes in circumstances and circumstances of interest. Further, Fernandez-Ballesteros (1998) and Galloway (2006), with extensive literature review, defines QoL as constructed on multidimensionality approach with multiple ingredients. (Ura, et at., 2012) explained that the operationalization of GNH deploys multidimensional approach and scientifically encompasses holistic measurement. While the assessment of QoL in most cases are lopsided, as Nakanishi (2015) underscored, the indicators in introducing QoL into policy

making has been placing greater importance on economic aspects without considering multidimensionality. (Awais, 2011) mentioned that it is of no use having indicators that increases but fail to increase the society. In fact, GNH is recommended as one of the outstanding methods to measure QoL (Awais, 2011). According to Lepage (2009), happiness is considered as synonymous to QoL or key attribute to QoL. He upholds GNH of Bhutan as definition of QoL in a holistic approach that consists agglomeration of multiple ingredients.

GNH for Bhutan determines 'happiness sensitivity' in its own way. In order to create the sensory line of happiness, according to Provisional Findings (2015, p. 133), sufficiency cutoff ($k = 66\%$) is set to draw sensitivity line and determines the people who attain 66% and above sufficiency are considered as happy. The robustness of this cutoff ($k=66\%$) is tested with analysis on range of plausible cutoffs (CBS, 2015).

4. Thimphu Urban

4.1. Urban policy environment

The Royal Government of Bhutan (RGoB) has assigned a lot of emphasis on enhancing adequate capacities and developing a strategy for national urban development (MoWHS, 2008). In 2008, RGoB launched Bhutan National Urbanization Strategy (BNUS) and Thimphu City Development Strategy (TCDS) simultaneously, in order to place strategic policy framework for the national urban development, particularly concerning built environment of the national capital city. Besides, RGoB has also worked on development of legal and institutional framework for the country to improve urban development. For instance, the National Housing Policy, 2002 was adopted, followed by the establishment of National Housing Development Corporation (NHDC) in 2003. In order to build individual financial capacity for urban residents to cope up with urban strategies, legal and financial framework of foreclosure to facilitate mortgage lending was developed as well.

4.2. Urban Planning

Since the establishment of Thimphu as capital city of Bhutan in 1955, development of modern amenities took place, predominantly driven by contemporary urbanization conceptions. The first town plan of the city was prepared in 1964 but remained unimplemented due to lack of capacity and resources (MoWHS, 2008). According to Thimphu City Development Strategy (2008), a structure plan that was prepared in 1986 guided Thimphu urban development through 1990s. Subsequently in 1998 another strategic plan was prepared to pursue the need of extending the municipal boundary and command over larger area. In the same year, Council of Ministers issued an executive order to further guide the urban development with the objective to convert Thimphu as a dream city of all Bhutanese which is culturally vibrant, environmentally sustainable and most importantly, people friendly. Over the years, developments both tangible and intangibles took place with diverse urban planning modalities but mostly in uncoordinated fashion. However, with the BNUS in place, planning in Thimphu urban has been more coordinated and strategized. According to MoWHS (2008), it is observed that there is skewed pattern of distribution of urban population in the nation and the relative concentration of the nation's urban population is in Thimphu urban, making it a primate city. At present, based on the published information of the Census 2005, Thimphu houses approximately 40% of the nation's urban population and over 70% of its district population. It is also projected that the city shall house approximately 88% of the nation's urban population by the year 2020 if the current growth rate continues. Considering this current situation and the projected urban resident population, the study of QoL under this specific capital city would exhibit the representative findings of Bhutan urban society.

5. Analyzing Thimphu urban quality of life

5.1. Methodology

The GNH indicators, beside serving as basis for shaping government policy, decision making process and review of its policy implication, it allows the public to evaluate changes and improvements of QoL (CBS, 2015). As GNH index and QoL are comparably founded on multidimensional approach considering both objective and subjective determinants as highlighted in literature review, there would exist inherent common features. Deriving indicators to determine the quality of Bhutanese life from GNH would not be grossly incorrect. GNH reflects normative values that are rooted into socio-cultural settings of the Bhutanese society, bears statistical properties and robustness, indicates happiness or the true subjective aspects overtime and are aligned and related to the public actions and policy formulations (Ura et al., 2012).

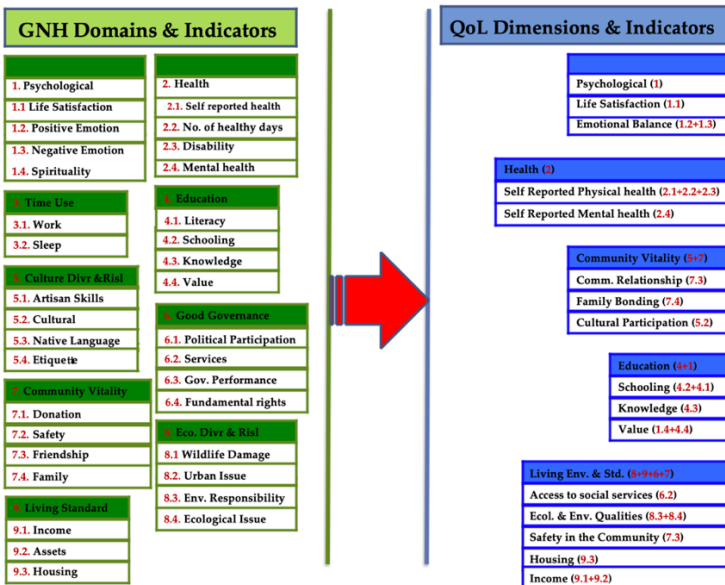


Figure 1. Shows derivation of QoL domains and indicators from GNH

The 5 dimensions with 15 indicators is derived from the 9 domains and 33 indicators of GNH as shown in Figure 1 to assess the quality of Bhutanese life, taking Thimphu urban as a case.

In order to derive 15 indicators for quality of life, an informal interview was conducted with randomly selected Bhutanese citizens, who are currently living in Canberra for one to two years. The respondents (n=10, 2016) were mostly Thimphu urban residents from diverse occupational backgrounds and diverse living standards. The responses with respect to relevancy of 33 GNH indicators to their individual QoL and living environment were captured in both structured and unstructured questionnaires. These responses were then processed in SPSS (Statistical Package for the Social Science) to get generic descriptive statistical understanding and basis. The SPSS output of 33 GNH indicators were then ranked according to their relevancy and top 15 were selected for QoL indicators (Appendix 1).

The following considerations were taken while selecting the indicators:

5.1.1. Interview Result

- The indicators that ranked 1 to 15 was selected out of 33, considering interview responses and also ensuring inherent constituent of the unselected ones are subsumed;
- Indicator 2 (positive emotion) and 11 (literacy) both ranked 3rd according to interview responses, while indicator 2 is subsumed under 'emotional balance' and 11 under 'schooling';
- Indicator 8 (mental health) and 10 (sleep) both ranked 12th, but both are subsumed under 'Health' dimension;

- Indicator 9 (work) and 29 (environment responsibility) both ranked 14th, but 9 is included under ‘community vitality’ and 29 under ‘living environment and standard’;
- The interview revealed that indicators like, fundamental rights, political participation, urban issue (from environment point of view), native language, artisan skills and etiquette are not much relevant to their individual QoL or living environment.

5.1.2. Subsumable in content

- Dimension 1 (Psychological Wellbeing) of QoL includes all indicators of GNH domain 1.
- Dimension 2 (Health) of QoL includes all intrinsic essence of four indicators of GNH domain 2, where ‘self reported physical health’ and ‘self reported mental health’ covers all aspects of subjective and objective aspect of individual health;
- Dimension 3 (Community Vitality) of QoL combines domain 5 of GNH at essence level by including ‘cultural participation’ indicator. The ‘community relationship’ and ‘family bonding’ inherently covers the essence of four indicators of GNH domain 3;
- Dimension 4 (Education) of QoL takes three of four indicators of GNH domain 4. The ‘schooling’ would take care of ‘literacy’ indicator and ‘value’ would take care of the ‘spirituality’ indicator;
- Dimension 5 (Living Environment & Standard) of QoL takes the essence of domains 6, 7, 8 and 9 of GNH. The ‘access to social service facilities’ would take the essence of GNH domain 6, ‘ecological and environmental qualities’ takes the essence of GNH domain 8, ‘safety in the community’ take the essence of GNH domain 7 and ‘income’ and ‘housing’ take essence of GNH domain 9 (as shown in the Figure 1).

5.1.3. Indicator Description

Dimension 1: Psychological Wellbeing

1.1. *Life Satisfaction*: Indicates through level of satisfaction from the standard of living with 4-point scale – from very satisfied to very dissatisfied levels. The EU (2015) recounts Pavot and Diener (2008) that the ‘life satisfaction’ is distinct construct representing a cognitive and global evaluation of the quality of life in total; and

1.2. *Emotional Balance*: The ability to enjoy normal day-to-day activities would indicate the emotional balance with 4-point scale – from more than usual to much less than unusual levels. (Diener et al., 2008) have underpinned that the experience of emotions relate to good life depends on the values that characterize one’s society.

Dimension 2: Health

2.1. *Self-Reported Physical Health*: Determined through the extend of physical ability with 4-point scale from excellent to poor levels. Bircher and Wehkamp (2011) defines health as a dynamic state of wellbeing, which is described by physical and mental potential, to satisfy the demands of life corresponding with age, culture, and personal duty; and

2.3. *Self-Reported Mental Health*: Assessed through the extend of mental extreme like thought of committing suicide and depression in last 12 months with 4-point scale – yes or no. Primarily, mental health or in psychiatric filed, the main focus of QoL assessment has been on the symptomatic of mentally ill persons suffering from long-term and disabling illnesses such as schizophrenia, chronic depression, manic-depressive illness, and severe personality disorders (Gigantesco et al., 2011).

Dimension 3: Community Vitality

3.1. Community Relationship: Assessed through helping each other in a neighbourhood with 4-point scale – always to never. The OECD (2011) recounts OECD (2001) that as an instinctive social creature, the quality of the relations in a community or society is crucial factor in determining the wellbeing or QoL;

3.2. Family Bonding: Assessed through the family members' care for each other with 4-point scale – disagree to agree. (Greenhaus et al., 2003) noted that the quality of life is unvaryingly highest for those who are more engaged or more satisfied in family than work, and vice versa; and

3.3. Cultural Participation: Assessed through the number of days one spend in the past 12 in cultural activities. The positive impact of participation in cultural activities are accepted for almost 40 years by a scientific measurement scale and concerns increased to gauge the quality of life (UNESCO, 2009).

Dimension 4: Education

4.1. Schooling: Directly indicated through formal and non-formal education levels 4-point scale – pre-primary to bachelors' degree levels. Schooling in life makes invariably high reason to influence on one's wellbeing, with the better educated individuals there is potentially higher wages and have higher probabilities of job and opportunities that contributes to one's quality of life (OECD, 2011);

4.2. Knowledge: Indicated through literacy in general with 4-point scale – literate or illiterate. According to Vision 2020 (1999) states that the importance of acquiring knowledge in its the rich folklore, legends and myths transmit values and instills foundation for awareness and indebtedness; and

4.3. *Value*: Indicated through belief in ‘karma’ in the course of daily life with 4-point scale – regularly to not at all. The values are fundamental that shapes people’s characters and choices one makes in life, which presumably determines the subjective aspects of QoL.

Dimension 5: Living Environment and Standard

5.1. *Access to Social Services*: Indicated through the performances of government in last 12 months in reducing gap between rich and poor with 5-point scale – very good to very poor. By ‘access’ means reasonable or fair share of resources and opportunities, cutting across essentially every sphere imaginable including social support system, adequate to respond to and meet the basic needs (Michalski, 2001);

5.2. *Ecological and Environment Qualities*: Indicated through the level of responsibilities in qualities of environment with 4-point scale – highly responsible to not at all responsible. The environment where people live incredibly matters the QoL, environmental pollution itself accounts $\frac{1}{4}$ of the global burden of diseases from the poor environment conditions (OECD, 2011);

5.3. *Safety in the Community*: Indicated through the contentment of victims of crimes and violence environment in a community with 4-point scale – very discontented to do not have complain. The OECD (2011) on safety or personal security highlights that it is core element for wellbeing of individual or society/community as a whole, for instance experiencing a crime is one key factor that shapes security;

5.4. *Housing*: Assessed through dwelling ownership with 3-point scale – rented to owned. The housing cost burden and also quality and environment are included

as one of the major issues affecting QoL by (Streimikiene, 2015); and

5.5. Income: Indicated through the level of income from all sources by 5 pointer scale – very high to very low. According to Kahneman & Deaton (2010) found that the life evaluation happens when plotted against log income rises steadily. While emotional wellbeing also rises with log income, but beyond an annual income of \$75,000 it has no further progress.

These indicators conceded in this paper comprehensively subsumes the 33 indicators of GNH and would determines contextual QoL. While Nakanishi (2015) applied top-down and bottom-up approach in selecting indicators for assessing QoL. Similar considerations have been in selecting indicators comprising individual views of the random selected residents (although not representative due to sample size) and already formulated set of GNH at policy level. These selected indicators are then reviewed exploring various studies carried out in the relevant field and then applied AIMS (Action focused, Important, Measurable and Simple)¹ criteria to pass the final selection. Further, the indicators were then categorized into five dimensions as shown in Figure 1 and under indicator description above.

5.1.4. QoL model

The QoL model as shown in Appendix 2 is applied as per Nakanishi (2015, pp.77) to carry out QoL computations for gender, age-cohorts and required variables considered under five dimensions and 15 indicators in the study. For an easier computations purpose, the QoL model is built in a excel functions as shown the steps (Appendix 5), that inherently gives individual's satisfaction score and influence of individual's value (weighting). The allocation of weighting differs as some apply experts' weighting and some self reported

¹ AIMS criteria according to Nakanishi (2015) based on Higginson et al (2003).

individual weighting. In this case, the weighting is allocated depending on contextual preferences as indicated in the functions applied.

5.2. Data

The latest decomposable data set of Thimphu urban of GNH Survey 2015 was obtained from the Centre for Bhutan studies (CBS) to conduct this analysis. The most relevant data and variables against the selected indicators were segregated from the whole and reviewed and validated before conducting arithmetical valuation with QoL model. As such the data set is from an extensive and recent survey which covers 865 residents out of 79,185 (2005) Thimphu urban population. The survey used multi-stage stratified random sampling methodology to ensure representative sample comprehensively (CBS, 2015). The data set constitutes demographic details and wide range of responses against more than 124 variables.

Out of 865 respondents, 591 were female (68%) and 274 males (32%), indicating double the respondents were female, by 36% higher than male. In breaking down to age cohorts, age 15-25 is (N=219) or 25.3% of total the respondents and likewise age 25-35 is (N=312, 36.1%), 35-45 (N=181, 20.9%), 45-55 (N=89, 10.3%), 55-65 (N=40, 4.6%), 65-75 (N=21, 2.4%) and 75-85 (N=3,0.3%).

5.3. QoL in Thimphu Urban

In carrying out the QoL assessment based on data set acquired from Centre for Bhutan Studies, the satisfaction levels/scores² were estimated for all indicators. The scoring of estimation levels was carried out using the scale of 0 – 100 as applied (steps shown in Appendix 5) in the assessment of QoL of Canberra, Australia (Nakanishi, 2015). The average satisfaction in the respective dimensions are presented in five age cohorts as shown in Figure 2. Except for the age between 75-85 years, it is revealed that the satisfaction of health

² Appendix 3 (table) consists satisfaction scores and estimated QoL

dimension is leading amongst other dimensions. Applying QoL model to the above satisfaction scores, health still leads in terms of QoL. In gender comparison, as shown in Figure 3, female has moderately higher QoL than male, but shows slightly lower in the overall QoL assessment.

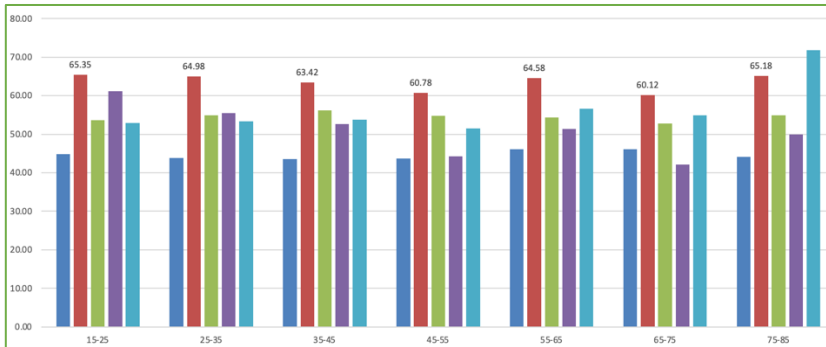


Figure 2. Satisfaction Scores by Age Cohorts

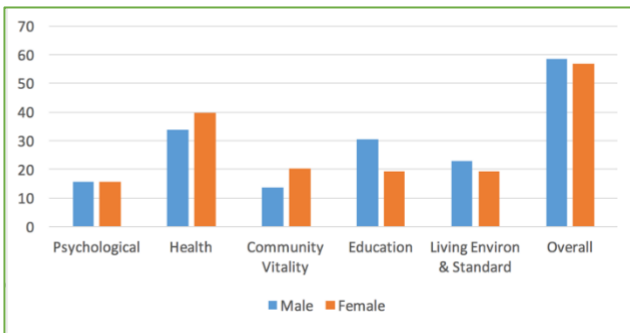


Figure 3. QoL by Gender

Considering the quality of education concern in Bhutan (Sherub, 2009, pp.11), it is also worthwhile to examine the relationship between quality of education and QoL. It is revealed, as indicated in Figure 4, that people with higher level of schooling have higher QoL in Thimphu urban, people with higher education have higher QoL. The analysis also demonstrated that there is high correlation between QoL and

overall education levels by $R^2 = 0.91223$ with the line of best fit at $y=0.1236x+1.7333$. Similarly, this correlation is almost same in case of GNH index as indicated in Figure 5.

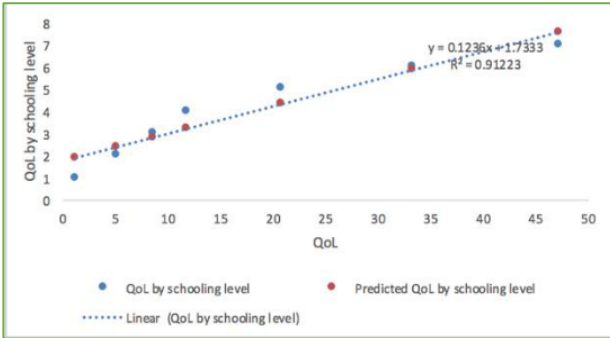


Figure 4. QoL line fit plot (reference to education)

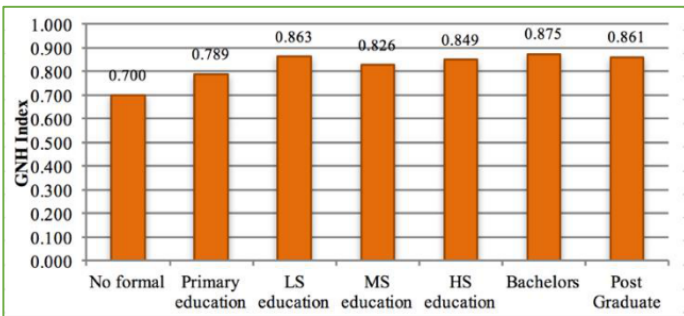


Figure 5. GNH Index by Education levels (CBS, 2015)

Comparing QoL between literate and illiterate categories, as indicated in Figure 6, the literate section of Thimphu urban has comparatively higher QoL than the illiterate ones. The study also exclusively assesses the variable of values contribution towards QoL considering it as one of the key inherent constitutes of both QoL and GNH. As indicated in the Figure 6, there is high QoL amongst Thimphu urban residents who practices values on regular basis than residents who do it occasional, rarely and not at all.

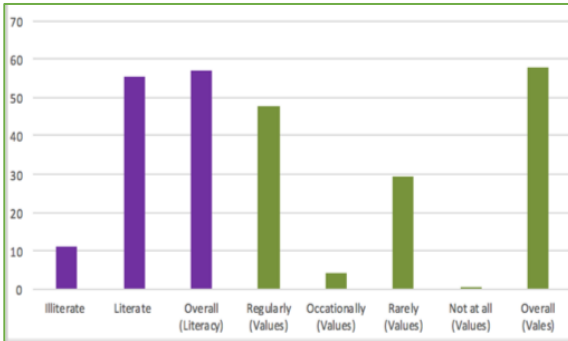


Figure 6. QoL in literature & values

6. Discussion

6.1. Conforming Relationship between GNH and QoL

As discussed under the literature review and methodology, it may be concluded that GNH can broadly function to determine the QoL in Bhutan context. However, assessing QoL exclusively from GNH need to ensure how QoL assessment proposed would inherently constitute GNH attributes. In order to confirm this, relationships between the two have to be validated. In doing so, it is reasonable to compare QoL assessment using QoL Model (Nakanishi, 2015) and the recent estimated GNH index of 2015. QoL assessment proposed in this study is based on the recent data collected through a survey conducted by the Centre for Bhutan Studies. It provides common data platform with that of GNH but involves different assessment models. This gives better way to test the relationship between GNH and QoL. The assessment using QoL Model as indicated under 'QoL in Thimphu Urban' hardly vary from the GNH index and the survey findings of 2015. Surprisingly, they exhibit almost similar correlation close to 1 (high). Taking gender, age groups and education into consideration, as highlighted earlier, it was found out that there is comparably the same configuration. The assessment of QoL in gender decomposition reveals that in both the cases overall male has higher QoL or the sufficiency attainment than

female. As indicated in Figure 3 the QoL assessment for male is higher, which is similar to that of sufficiency attainment of GNH as indicated in Figure 7.

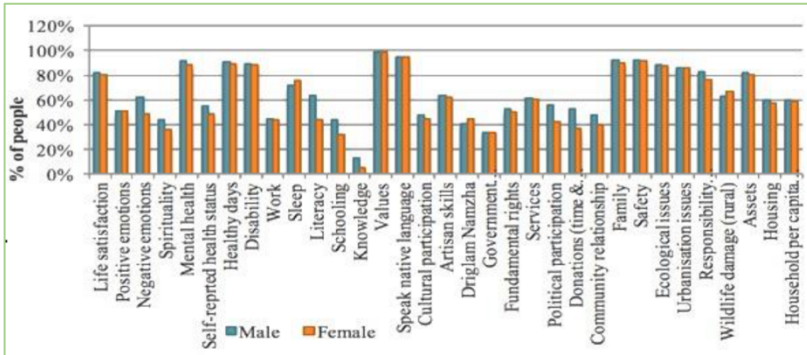


Figure 7. The % of people enjoying sufficiency by gender in Bhutan (CBS, 2015)

In the age categories, it is indicated that the highest GNH index value is between age 25-29 years as indicated in Figure 8 which is similar with that of QoL assessment and satisfaction scores of this study. In comparison, there is hardly huge differences as indicated through the QoL by age cohorts (Figure 9) and satisfaction score (Figure 2). Like wise, there is no huge variation between the domains/dimensions correspond to both the cases.

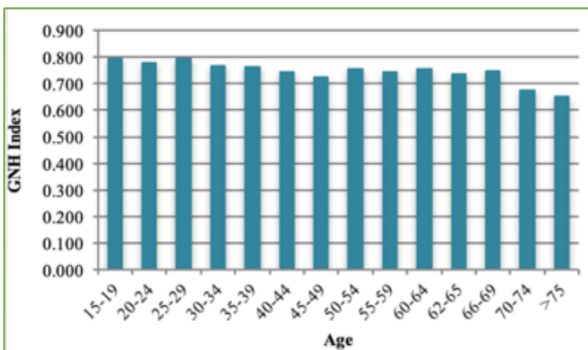


Figure 8. GNH Index by Age Cohorts (CBS, 2015)

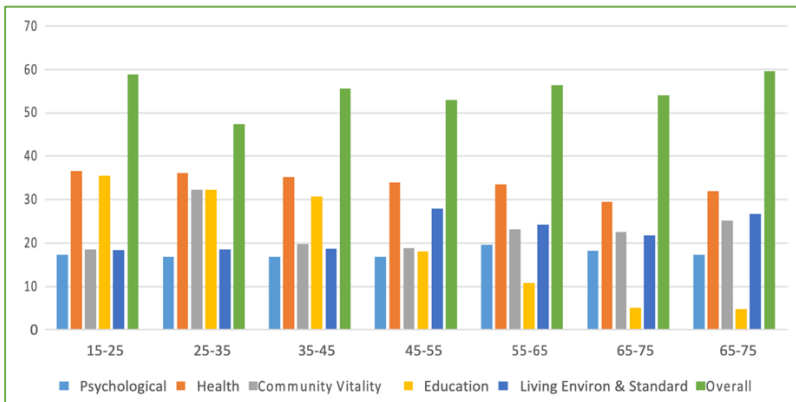


Figure 9. QoL by Age Cohorts

The following key points reaffirm how QoL assessment proposed in this study inherently considers GNH attributes:

- The literature review highlights both GNH and QoL is grounded on multidimensional approaches.
- The methodology underlines GNH in Bhutan context can broadly (not specific and timely) serve QoL assessment as it is place-based and constructed on required scientific approaches.
- The indicators or determinants under GNH domains and QoL dimensions show high correlation in most cases. For instance, in cases like schooling levels, literacy, values and the variables across age categories correspond high correlation and bears common findings.

6.2. Deprived of QoL

It is apparent through the analysis that the female in general has low QoL, induced by low QoL in education, living environment and psychology domains. Although there is higher QoL for female in terms of health and community vitality, there is still comparatively low in rest other three domains, indicating

there is prevalence of imbalances of interventions to ensure the QoL.

Further, QoL observation in different age cohorts revealed that there is fairly higher QoL in two extremes of the age groups (age between 15-25 and 75-85). It could be discernable that as the society is inherently bonded by the endemic 'reciprocity' of kindness and care values, the youth and senior sections of population who are out of labour participation age groups receive full support and care from the respective family members and the royal welfare schemes. This undeniably might have contributed in ensuring higher QoL in those age groups comparing with others. However, there is low QoL in the age groups of 45-55 and 65-75, which both falls under the adult labour force participation group. According to Rapten (2014), the adult Labour Force Participation Rate (LFPR) is noticeably high at 77% in 2012 comparing with other LFPR groups. Moreover, normatively age group between 45-55 is considered as the most responsible age group who makes higher socio-economic contributions in the society. It would be unmerited with the lower QoL for those who makes higher labour force participation. Another low QoL is the age group between 65-75, where people face lot of insecurities and uncertainties once it crosses active working age group.

Like wise, discerning in terms of literacy point of view, the illiterate sections of the population, exclusively the ones who do not practice values are highly deficient with the QoL.

6.3. Urban and Rural QoL

This study does not assess QoL in rural context but having lot of resemblance between the recent GNH findings and this QoL assessment, it is sensible to draw some rural and urban comparison to a broader discussion in this study. As per the Provisional Findings of 2015 Gross National Happiness Survey, health, cultural diversity and community vitality are the highest contributors to GNH in rural areas, and living standards and educations are the highest in urban areas. Certainly, with lot of service amenities and easy access to

physical comfort and opportunities, urban areas would definitely score higher on living standard in comparison to rural areas for both GNH and QoL assessment. As highlighted earlier, community vitality score is higher in the rural than urban areas mainly because rapid urbanization is accompanied by certain form of socio-cultural deterioration.

However, the contribution by ecological diversity and resilience appears almost equal in both rural and urban areas. Residents in rural areas experience higher sufficiency in community relationship, donations, ecological issues, safety and political participation compared to urban areas. While the urban counterparts have better quality housing, higher income, more assets, longer years of education, literacy and better access to services compared to rural areas (CBS 2015, p. 40). These attributes favoring urban areas would be relatedly applied to Thimphu urban to cover wider understanding of the situation in this QoL assessment.

7. Significance of the Study

Irrespective of size and extent of this assessment, QoL assessment approach is the first of its kind for Bhutan. This QoL assessment though confined to Thimphu urban fairly encompasses the understanding of QoL within the whole country in reference to GNH perspectives. In order to understand and communicate with emerging QoL language for the country, the study is carried out anticipating wider use in times to come for better policy formulation, harmonized with the dynamic model and robust indicators by future researchers. This would significantly indicate timely and valid QoL than GNH broadly does and dispense value addition towards the practicality of GNH framework.

However, the study proposes the following significances, accentuated from the overall findings:

- There is prevalence of some form of gender disparity in terms of intra-household investment, resource

allocation, property share, household duties and enrolment to education in Bhutan (Choden, 2014). However, amongst all, education could be viewed as one of the severe forms of gender disparity. This is further corroborated by this study exhibiting lower QoL in female than male with regard to education domain. In order to ensure the balanced QoL between female and male, it is highly significant to review and translate this into policy measures and interventions. There may also have other underlying causes of disparity in education in the country.

- The practice of values is one critical factor that enhances the perceived QoL as exhibited through this study. However, the existing education system has not been aligned with the determinable value promotion in the society. The risk is with the contemporary education modalities, it subtly diminishes the prevailing values and the community vitality. The inclusive educational intervention with quality relevancy and contextual approach is equally important to enhance the QoL, not off-putting the ubiquitous technological disruptions around.
- One buying point from this study is the adverse impact of the unconnected urbanization process. Taking Thimphu urban into account, there is indication of lowering psychology and community vitality in urbanization process. As indicated from the study, the QoL contribution from psychology domain is lowest out of five domains in the urban settlement. There may be a reasonable set of program interventions to promote community vitality and enhance psychology wellbeing. The culturally activated public spaces; friendly neighborhood parks and play; voluntary spiritual and community services; contextual/ relevant innovations/nudges and creative industries; investment ecosystem and benefit sharing; and revolutionary livability cities and transformative growth

may be recommended for the urban development policies.

- The university levels of education need to be enhanced with pragmatic skills orientation and contextual STEM promotions. The country still depends on rhetoric and uncertain abroad universities/institutions that barely has value addition in the transformative skills and knowledge requirements of the changing need and time. While, the study revealed that the QoL has very high correlation with the levels of education and need right and relevancy of quality of education system.
- The life security schemes including secured housing may be proposed with in-depth studies considering contemporary means-tested benefits, targeting population, particularly right after the active working age who are experiencing lowest QoL, as exhibited in the study.
- Finally, QoL mapping by deploying GIS (Global Information System) may be recommended to comprehensively relate with the existing spatial information and to meticulously assist the public policies and decision making processes of the country on a real time basis.

8. Limitations

The study assesses QoL of Thimphu urban with a resident population of 79,185 to derive empirical findings. The findings are then generalized to develop relationship between GNH and QoL without having undertaken nationwide QoL assessment. The study would then implicit certain limitation, as for a study that involves correlation and randomized experiment involve limitations with respects to generality of findings (Simon et al., 2013). The rural QoL is also not empirically assessed to make holistic comparison mainly because the study aims to select specific geographic location as scope of the study. Besides, the

study has also not considered exclusive assessment of QoL of residents under unhappy categories (56.6% of total population of Thimphu)³ to reveal explicit finding to make the case strong. However, as the study is based on responses of huge sample size of (N=865), it is assumed that assessment would have close representation. Nevertheless, Simon et al. (2013) stated that the 'case study' approach is a subjective but require additional research to verify, validate and test whether findings from one study would generalize elsewhere or not.

Moreover, within the scope of this study QoL-oriented policy evaluation is not undertaken, as one key important aspect of QoL assessment is to have QoL-oriented policy evaluation, in which the estimation of change in QoL level is used by setting scenarios in considering the policy measures to enhance the quality of life (Nakanishi, 2015).

9. Conclusion

The QoL may be understood as balanced and holistic satisfaction of life, viewed through different idiosyncratic composition of place, time and situation vis-à-vis the changing needs. GNH in a way is determining QoL in Bhutanese context, however, precise QoL mechanism is deficient to effect timely and accurate decision making process. Though GNH is grounded on multidimensional approach to determine QoL it perceived as extensive, vast and cost intensive to carryout reasonable frequency of assessments. Considering the relationship between GNH and QoL as conceded above, QoL assessment for Bhutan for the first time is hypothetically established with this study. The 15 indicators of QoL that subsumes 33 indicators of GNH explains QoL experienced by Thimphu urban residents which is almost observed identical across the dimensions, except with health which is relatively higher. In comparison with the findings from recent GNH survey 2015 and this QoL assessment, the assessment

³ Disaggregated unhappy % population of Thimphu Urban from unhappy (8.75%) and narrowly happy (47.87%) at national level.

demonstrated a correlation close to $R^2 = 0.91223$, meaning there is high correlation between the variables. The significance of the findings confirms that QoL mechanism would be efficient, effective and realistic if it is place-based and contextual in approach. The QoL assessment determined the section of population who are deprived with quality of life and recommends policy review, program interventions and infrastructural integration in three domains of QoL such as education, psychology and community vitality.

10. References

- AKDN. (2013). Quality of Life Development Program. Aga Khan Development Network, Geneva, Switzerland. http://www.akdn.org/quality_of_life/AKDN_QoL_brochure.pdf.
- Alkire, S. & Foster, J. (2011). Understanding and Misunderstandings of Multidimensional Poverty Measurement. Oxford Poverty & Human Development Initiative (OPHI), University of Oxford, United Kingdom.
- Australian Centre for Quality of Life. (2013) Personal Wellbeing Index – Adult. International Wellbeing Group, Deakin University, Melbourne, Australia.
- Awais, M.S. (2011). Quality of Life (QoL) in a Society: Theoretical Discussion and Recommendations. Lahore, Pakistan. http://www.piqc.edu.pk/casestudies/Prof_Dr_Syed_Muhammad_Awais_Quality_of_Life_TQM_Case_Study_PIQC.pdf.
- Bircher, J. & Wehkamp, K. (2011). Health care needs need to be focused on health. 5 Ed, Vol.3, No.6, pp. 378-382. dx.doi.org/10.4236/health.2011.36064.
- Bowling, A. (2001). Measuring Disease, 2 Ed. Open University Press, Buckingham, Philadelphia, USA. <https://www.mheducation.co.uk/openup/chapters/0335206417.pdf>.

- Brown, J., Bowling, A. & Flynn, T. (2004). Models of Quality of Life: A Taxonomy, Overview and Systematic Review of Literature Review. European Forum on Population Ageing Research, Kingston University, London. pp. 113
- Calman, K. C. (1984). Quality of life in cancer patients - an hypothesis. *Journal of medical ethics*. vol.10, pp. 124- 127
- CBS. (2015). Provisional Findings of 2015 Gross National Happiness Survey. Centre for Bhutan Studies & GNH Research, Bhutan.
- Chan, S. (2016). Denmark Ranks as Happiest Country; Burundi Not So Much. The Newyork Times, http://www.nytimes.com/2016/03/17/world/europe/denmark-world-happiness-report.html?_r=1
- Choden, P. (2012). Gender Gap in Household Investment: A Study on Bhutan. School of Economics and Finance School of Business. Queensland University of Technology, Australia.
- Constitution of the Kingdome of Bhutan. (2008). Thimphu, Bhutan.
- Diener, E. Realo, A. & Kuppens, P. (2008). The Role of Positive and Negative Emotions in Life Satisfaction Judgment Across Nations. *Journal of Personal and Psychology*, Vol. 95, No.1, pp. 66-75.
- Donoghue, K. J. (2004). Measuring Coping: Evaluating the Psychometric Properties of the COPE. Edith Cowan University, WA, Australia.
- Easterlin, R.A., & Angelescu, L. (2009). Happiness and Growth the World Over: Time Series Evidence on the Happiness-Income Paradox. Discussion Paper Series, No. 4060. <http://ftp.iza.org/dp4060.pdf>
- European Union. (2015). Quality of Life: facts and views. (2015). Luxembourg, Europe. pp.236. <http://ec.europa.eu/eurostat/documents/3217494/6856423/KS-05-14-073-EN-N/>

- Fernandez-Ballesteros, R. (1998). Quality of life: The differential conditions. *Psychology in Spain*, vol. 2, pp. 57-65.
- Galloway, S. (2006). Well-being and quality of life: Measuring the benefits of culture and sports: A literature review and think piece. *Social research*, pp. 4-97, Centre for Cultural Policy Research, University of Glasgow, Scotland.
- Gigantesco, A., & Guiliani, M. (2011). Quality of life in mental health services with a focus on psychiatric rehabilitation practice. *Animal-assisted interventions in mental health*, Vol. 47, No. 4, pp. 363-372.
- GNHC. (2013). Eleventh Five Year Plan – Vol 1: Main Document. Gross National Happiness Commission, Royal Government of Bhutan, Thimphu, Bhutan.
- Greenhaus, J. H., Collins, K.M., & Shaw J.D. (2003). The relation between work-family balance and quality of life. *Journal of Vocational Behaviour*, vol. 63, pp. 510-531.
- Helliwell, J., Layard, R., & Sachs, J. (2016). World Happiness Report 2016, Vol. 1, http://5c28efcb768db11c7204-4ffd2ff276d22135df4d1a53ae141422.r82.cf5.rackcdn.com/HR-V1_web.pdf.
- Higgins, P., Campanera, J., & Nobajas, A. (2012). Quality of life and spatial inequality in London. *European Urban and Regional studies*, SAGE. pp, 1-18.
- Kahneman, D., & Deaton, A. (2010). High income improves evaluation of life but not emotional well-being. Center for Health and Wellbeing, Princeton University, Princeton, NJ. https://www.princeton.edu/~deaton/downloads/deaton_kahneman_high_income_improves_evaluation_August2010.pdf.
- Kahneman, D., & Krueger, B.A., (2006). Development in the Measurement of Subjective Well-being. *Journal of Economic Perspective*, Vol.20, 1, pp. 3-24.
- Kyi, A.S.S. (2015). A Special Tribute from Myanmar to His Majesty the Fourth King.

- The Bhutanese, Bhutan,
<https://www.facebook.com/TheBhutaneseNewspaper/posts/743887229050543>
- Lepage, A. (2009). The Quality of Life model as attribute of the sustainability concept. *The TQM Journal*, Vol. 21, 2, pp. 105-115. University of Technology of Compiègne, France.
- Michalski, J, H. (2001). Asking citizens what matters for quality of life in Canada. CPRN, Canada.
<http://cprn.org/documents/ACF9yQBXd.PDF>.
- Mizobuchi, H. (2016). Measuring socio-economic factors and sensitivity of happiness. *Journal of Happiness Studies*. vol. 1, pp.1-42. Springer, Netherlands.
- MoWHS. (2008). Bhutan National Urbanization Strategy. Ministry of Works and Human Settlement, Royal Government of Bhutan, Thimphu, Bhutan.
- MoWHS. (2008). Thimphu City Development Strategy. Ministry of Works and Human Settlement, Royal Government of Bhutan, Thimphu, Bhutan.
- Nakanishi, H. (2015). How does urban policy influence quality of life? The case of Canberra, Australia. *Policy Studies*, 2015, Vol. 36, 1, pp. 72-91.
- Nakanishi, H., Sinclair, H., & Lintern, J. (2013). Measuring Quality of Life: An Integrated Evaluation of Built Environment. CUPUM conference papers, University of Canberra, Australia.
http://cupum2013.geo.uu.nl/download/usb/contents/pdf/shortpapers/70_Nakanishi.Pdf.
- NSB. (2005). Population and Housing Census 2005. Royal Government of Bhutan, Thimphu, Bhutan.
- NSB. (2012). Statistical Year Book. National Statistical Bureau, Thimphu, Bhutan.
- NSB., & ADB. (2013). Bhutan Living Standard Survey 2012 Report. National Statistical Bureau, Thimphu, Bhutan.
- NSB., & World Bank. (2014) Bhutan Poverty Assessment, National Statistical Bureau, Thimphu, Bhutan.

- O'Flynn, J. (2007). From New Public Management to Public Value: Paradigmatic Change and Managerial Implications. *Australian Journal of Public Administration*. Vol. 66, Issue 3, pp. 353–366.
- OECD. (2011). Quality of Life. Compendium of OECD Well-being Indicators. <http://www.oecd.org/std/47918063.pdf>.
- Rapten, P. (2014). Undertaking the Dynamics of Labour Market and Youth Unemployment in Bhutan – A Study for Policy and Strategic Responses. Institute of Development Economics, Japan External Trade Organization. *V.R.F Series*, No. 487.
- Reed, Mark. S., Evan D. G. Fraser., & Andrew, J. (2006). An Adaptive Learning Process for Developing and Applying Sustainability Indicators with Local Communities. *Ecological Economics*, 59: 406–418.
- Royal Court of Justice. (2016). Introduction to the Bhutanese Legal System. *Judiciary of Bhutan*. <http://www.judiciary.gov.bt/html/judiciary/legal.php>.
- Sherub, K. (2009). Bhutanese Teachers, Pedagogical Orientation in the Primary Classes (PP-V): A Factor on Quality of Education. Paro Collage of Education, Paro, Bhutan. <http://www.pce.edu.bt/sites/default/files/Quality%20of%20Education%20II.pdf>.
- Simon, M. K., & Goes, J. (2013). Scope, Limitations and Delimitations. Dissertation and Scholarly Research: Recipes for Success, Seattle, WA. <http://dissertationrecipes.com/wp-content/uploads/2011/04/limitationsscopedelimitation1.pdf>.
- Sprangers, M.A.G., & Schwartz, C.E. (1999). Integrating response shift into health-related model. *Social Science & Medicine*, vol. 48, pp. 1507-1515.
- Streimikiene, D. (2015). Quality of Life and Housing. *International Journal of Information and Education Technology*, Vol. 5. No. 2.

- UNESCO. (2009). Measuring Cultural Participation, Framework for cultural statistics handbook, No.2. Institute for Statistics.<http://www.uis.unesco.org/culture/Documents/fcs-handbook-2-cultural-participation-en.pdf>.
- Ura, K. (2011). The Bhutanese Development Story. The Centre for Bhutan Studies, Thimphu.<http://www.bhutanstudies.org.bt/publicationFiles/Monograph/mono-1en-bt-dev-stry.pdf>.
- Ura, K., Alkire, S., & Zangmo, T. (2012). GNH and GNH Index. Center for Bhutan Studies, Thimphu, Bhutan.
- Ura, K., Alkire, S., Zangmo, T. & Wangdi, K. (2012). A Short Guide to Gross National Happiness Index. Centre for Bhutan Studies, Thimphu, Bhutan.
- Ura, K., Alkire, S., Zangmo, T. & Wangdi, K. (2012). An Extensive Analysis of GNH Index. Centre for Bhutan Studies, Thimphu, Bhutan.
- Whitecorss, R. (2004). The Thrimzhung Chenmo and the Emergence of the Contemporary Bhutanese Legal System. Centre for Bhutan Studies & GNH Research, Thimphu, Bhutan.

11. Appendixes

Appendix 1. Ranking of GNH indicators with relevance to Quality of Life

Sl	Q a/b	Relationships	N	Mean	Mean a&b	Std. Dev	Std. Dev a&b	Ranking Indicators
1	a	Indicator1 (Life Satisfaction) of domain 1 (Psychological wellbeing) to QoL	10	4.70	4.30	0.483	0.3995	10
	b	Indicator1 (Life Satisfaction) of domain 1 (Psychological wellbeing) to living environment	10	3.90		0.316		
2	a	Indicator2 (Positive Emotion) of domain 1 (Psychological wellbeing) to QoL	10	4.70	4.65	0.675	0.687	3
	b	Indicator2 (Positive Emotion) of domain 1 (Psychological wellbeing) to living environment	10	4.60		0.699		
3	a	Indicator3 (Negative Emotion) of domain 1 (Psychological wellbeing) to QoL	10	1.70	2.05	0.483	0.779	23
	b	Indicator3 (Negative Emotion) of domain 1 (Psychological wellbeing) to living environment	10	2.40		1.075		
4	a	Indicator4 (Spirituality) of domain 1 (Psychological wellbeing) to QoL	10	3.90	3.75	0.876	0.8595	20
	b	Indicator4 (Spirituality) of domain 1 (Psychological wellbeing) to living environment	10	3.60		0.843		
5	a	Indicator 1 (self reported health) of domain 2 (Health) to QoL	10	4.60		0.516		

	b	Indicator1 (self reported health) of domain 2 (Health) to living environment	10	4.40	4.50	0.699	0.6075	6
6	a	Indicator2 (no. of healthy days) of domain 2 (Health) to QoL	10	4.40		0.699		
	b	Indicator2 (no. of healthy days) of domain 2 (Health) to living environment	10	4.10	4.25	0.568	0.6335	11
7	a	Indicator3 (disability) of domain 2 (Health) to QoL	10	4.20		0.919		
	b	Indicator3 (disability) of domain 2 (Health) to living environment	10	3.70	3.95	0.675	0.797	17
8	a	Indicator4 (mental health) of domain 2 (Health) to QoL	10	4.30		0.823		
	b	Indicator4 (mental health) of domain 2 (Health) to living environment	10	4.10	4.20	0.994	0.9085	12
9	a	Indicator1 (work) of domain 3 (Time use) to QoL	10	4.30		0.675		
	b	Indicator1 (work) of domain 3 (Time use) to living environment	10	3.90	4.10	0.568	0.6215	14
10	a	Indicator2 (sleep) of domain 3 (Time use) to QoL	10	4.40		0.699		
	b	Indicator2 (sleep) of domain 3 (Time use) to living environment	10	4.00	4.20	0.816	0.7575	12
11	a	Indicator1 (Literacy) of domain 4 (Education) to QoL	10	4.80		0.422		
					4.65	0.422	0.697	3

Does GNH Determine Contextual QoL?

	b	Indicator1 (Literacy) of domain 4 (Education) to living environment	10	4.50		0.972		
12	a	Indicator2 (Schooling) of domain 4 (Education) to QoL	10	4.50		0.527		
	b	Indicator2 (Schooling) of domain 4 (Education) to living environment	10	4.20	4.35	0.919	0.723	9
13	a	Indicator3 (Knowledge) of domain 4 (Education) to QoL	10	4.30		0.823		
	b	Indicator3 (Knowledge) of domain 4 (Education) to living environment	10	3.80	4.05	0.789	0.806	15
14	a	Indicator4 (Value) of domain 4 (Education) to QoL	10	4.80		0.422		
	b	Indicator4 (Value) of domain 4 (Education) to living environment	10	4.40	4.60	0.516	0.469	4
15	a	Indicator1 (Artisan skills) of domain 5 (Cultural Divr & Resil) to QoL	10	3.30		1.059		
	b	Indicator1 (Artisan skills) of domain 5 (Cultural Divr & Resil) to living environment	10	3.10	3.20	1.37	1.2145	22
16	a	Indicator2 (Cultural participation) of domain 5 (Cultural Divr & Resil) to QoL	10	3.80		0.789		
	b	Indicator2 (Cultural participation) of domain 5 (Cultural Divr & Resil) to living environment	10	3.70	3.75	1.337	1.063	20
17	a	Indicator3 (Speak native language) of domain 5 (Cultural Divr & Resil) to QoL	10	4.10	3.95	0.568	0.6785	17

	b	Indicator3 (Speak native language) of domain 5 (Cultural Divr & Resi) to living environment	10	3.80		0.789		
18	a	Indicator4 (Driglam Namzha) of domain 5 (Cultural Divr & Resil) to QoL	10	4.40		0.516		
	b	Indicator4 (Driglam Namzha) of domain 5 (Cultural Divr & Resi) to living environment	10	4.20	4.30	0.789	0.6525	10
19	a	Indicator1 (Political participation) of domain 6 (Good Governance) to QoL	10	3.60		0.516		
	b	Indicator1 (Political participation) of domain 6 (Good Governance) to living environment	10	3.40	3.50	1.265	0.8905	21
20	a	Indicator2 (Services) of domain 6 (Good Governance) to QoL	10	4.80		0.422		
	b	Indicator2 (Services) of domain 6 (Good Governance) to living environment	10	4.60	4.70	0.699	0.5605	2
21	a	Indicator3 (Governance performance) of domain 6 (Good Governance) to QoL	10	4.20		0.632		
	b	Indicator3 (Governance performance) of domain 6 (Good Governance) to living environment	10	4.10	4.15	0.738	0.685	13
22	a	Indicator4 (Fundamental rights) of domain 6 (Good Governance) to QoL	10	4.10		0.568		
	b	Indicator4 (Fundamental rights) of domain 6 (Good Governance) to living environment	10	3.90	4.00	0.876	0.722	16

Does GNH Determine Contextual QoL?

23	a	Indicator1 (donation time&money) of domain 7 (Community vitality) to QoL	10	3.90		0.568	0.8135	19
	b	Indicator1 (donation time&money) of domain 7 (Community vitality) to living environment	10	3.70	3.80	1.059		
24	a	Indicator2 (safety) of domain 7 (Community vitality) to QoL	10	4.50		0.527	0.613	7
	b	Indicator2 (safety) of domain 7 (Community vitality) to living environment	10	4.40	4.45	0.699		
25	a	Indicator3 (Community friendship) of domain 7 (Community vitality) to QoL	10	4.40		0.516	0.627	11
	b	Indicator3 (Community friendship) of domain 7 (Community vitality) to living environment	10	4.10	4.25	0.738		
26	a	Indicator4 (Family) of domain 7 (Community vitality) to QoL	10	5.00		0	0.211	1
	b	Indicator4 (Family) of domain 7 (Community vitality) to living environment	10	4.80	4.90	0.422		
27	a	Indicator1 (Wildlife damage) of domain 8 (Ecological Divr & Resil) to QoL	10	4.20	3.90	0.919	1.1745	18
	b	Indicator1 (Wildlife damage) of domain 8 (Ecological Divr & Resil) to living environment	10	3.60		1.43		
28	a	Indicator2 (Urban issue) of domain 8 (Ecological Divr & Resil) to QoL	10	4.10	3.95	0.568	0.8005	17

	b	Indicator2 (Urban issue) of domain 8 (Ecological Divr & Resil) to living environment	10	3.80		1.033		
29	a	Indicator3 (Env. responsibility) of domain 8 (Ecological Divr & Resil) to QoL	10	4.30	4.10	0.675	1.062	14
	b	Indicator3 (Env. responsibility) of domain 8 (Ecological Divr & Resil) to living environment	10	3.90		1.449		
30	a	Indicator4 (Ecological issue) of domain 8 (Ecological Divr & Resil) to QoL	10	4.20	4.10	0.789	0.9215	14
	b	Indicator4 (Ecological issue) of domain 8 (Ecological Divr & Resil) to living environment	10	4.00		1.054		
31	a	Indicator1 (Income) of domain 9 (Living Standard) to QoL	10	4.50	4.40	0.527	0.675	8
	b	Indicator1 (Income) of domain 9 (Living Standard) to living environment	10	4.30		0.823		
32	a	Indicator2 (Assets) of domain 9 (Living Standard) to QoL	10	4.40	4.15	0.516	0.627	13
	b	Indicator2 (Assets) of domain 9 (Living Standard) to living environment	10	3.90		0.738		
33	a	Indicator3 (Housing) of domain 9 (Living Standard) to QoL	10	4.60	4.55	0.516	0.6115	5
	b	Indicator3 (Housing) of domain 9 (Living Standard) to living environment	10	4.50		0.707		

Appendix 2. The QoL model (Nakanishi, 2015) is used

$$QoL = \sum_{k=1} \{w_k S_k^{-\rho}\}^{-\frac{1}{\rho}} \quad (1)$$

Where S_k is the vector of satisfaction score by domain k ; w_k is the vector of weight by domain k , and ρ is the parameter of elasticity of substitution across domains.

The weight of each domain is determined by applying the following model:

$$\Delta S_m = \sum_{k \neq 1} \frac{w_k S_{0k}^{-\rho}}{w_m S_{0m}^{-\rho}} \Delta S_m \quad (2)$$

Where ΔS_m is the improved satisfaction level of domain m , ΔS_k is the sacrificed satisfaction level of domain k , S_{0k} and S_{0m} are the current satisfaction level of domains k and m , w_k and w_m are the values of domains k and m , and ρ is the substitution parameter between domains.

The weight w_k and ρ were estimated by a non-linear regression model of relational expression of the change in satisfaction score of domain k and satisfaction score of other domains, which were reflected by the change in individual's satisfaction for k .

Appendix 3. *Satisfaction Scores and Quality of Life by Indicators*

Dimensions	Indicators	Satisfaction Scores	Quality of Life
1. Psychological	1.1. Life Satisfaction	70.65	16.07
	1.2. Emotional Balance	17.94	4.11
2. Health	2.1. Self Reported P/health	61.60	13.44
	2.2. Self Reported M/health	67.83	15.56
3. Community Vitality	3.1. Community Relationship	49.43	11.15
	3.2. Family Relationship	60.56	14.76
	3.3. Cultural Participation	54.41	11.23
4. Education	4.1. Schooling	33.76	8.23
	4.2. knowledge	55.51	11.46
	4.3. Values	74.72	18.08

Living Environ & 5. Standard	5.1. Access to social services	43.68	9.01
	5.2. Ecological & Environment Responsibilities	82.16	20.16
	5.3. Safety in Community	60.32	12.45
	5.4. Housing	30.73	6.88
	5.5. Income & Assets	50.19	11.33

Appendix 4. Taxonomy of QoL

Appendix 4.1. Definitions

Type	Name for type	Description
(A) Expert/professional's definitions		
I	Global definitions	The most common, general, type of definition - usually say little about the possible components of QOL. Usually incorporate ideas of satisfaction/dissatisfaction or happiness/unhappiness.
II	Component definitions	Break down QOL into a series of components, dimensions or domains, or identify characteristics deemed essential to any evaluation of QOL.
II a	(non-research-specific)	Identify a number of dimensions of general QOL, but may not necessarily claim to cover every possible dimension
II b	(research-specific)	Explicitly tailored to meet the objectives of a specific piece of research. May therefore overlook or exclude certain dimensions of QOL considered less relevant to the research aims.
III	Focused definitions	Refer only to one or a small number of the dimensions of QOL
III a	(explicit)	Focus on a small number of dimensions of QOL considered essential to QOL, but does so explicitly.
III b	(implicit)	Focus on one or two dimensions of the broader concept of QOL, but implicitly, without making this clear.
IV	Combination definitions	Global definitions (same as type I) that also specify dimensions (as in type II).

Source: Galloway (2006) based on Farquhar (1995)

Appendix 4.2: Subjective and objective indicators – Source: Galloway (2006) based on Rapley (2003, p.11)

Appendix 4.3. Three types of QoL Model

Model Type	Description
Conceptual Model	A model that specifies dimensions and properties of QOL (the least sophisticated type of model).
Conceptual Framework	A model that describes, explains or predicts the nature of the directional relationships between elements or dimensions of QOL.
Theoretical Framework	A model that includes the structure of the elements and their relationship within a theory that explains these relationships” (most sophisticated type of model).

Source: Galloway (2006) based on Taillefer et al (2003, p.299)

Appendix 4.4. Definitions based on objective and subjective indicators

Frequently used objective social indicators	Frequently used subjective social indicators
(represent social data independently of individual evaluations)	(individuals’ appraisal and evaluation of social conditions)
Life expectancy	Sense of community
Crime rate	Material possessions
Unemployment rate	Sense of safety
Gross Domestic Product	Happiness
Poverty rate	Satisfaction with “life as a whole”
School attendance	Relationships with family
Working hours per week	Job satisfaction
Perinatal mortality rate	Sex life
Suicide rate	Perception of distributional justice
	Class identification
	Hobbies and club membership

Source: Galloway (2006) based on Schalock and Verdugo (2002) cited in Schalock (2004), p. 206.

Appendix 4.5. Definitions based on 8 domains and corresponding indicators

Core QOL domain	Indicators	Descriptors
Emotional well-being	Contentment	Satisfaction, moods, enjoyment
	Self-concept	Identity, self-worth, self-esteem
	Lack of stress	Predictability, control
Interpersonal relations	Interactions	Social networks, social contacts
	Relationships	Family, friends, peers
	Supports	Emotional, physical, financial, feedback
Material well-being	Financial status	Income, benefits
	Employment	Work status, work environment
	Housing	Type of residence, ownership
Personal development	Education	Achievements, status
	Personal competence	Cognitive, social, practical
	Performance	Success, achievement, productivity
Physical well-being	Health	Functioning, symptoms, fitness, nutrition
	Activities of daily living	Self-care skills, mobility
	Leisure	Recreation, hobbies
Self-determination	Autonomy/personal control	independence
	Goals and personal values	Desires, expectations
	Choices	Opportunities, options, preferences
Social inclusion	Community integration and participation	
	Community roles	Contributor, volunteer
	Social supports	Support network, services
Rights	Human	Respect, dignity, equality
	Legal	Citizenship, access, due process

Source: Galloway (2006) based on Schalock and Verdugo (2002) cited in Schalock (2004), p. 206.

Appendix 5. How the QoL model is applied

Step 1: Obtained GNH Dataset

The screenshot displays an Excel spreadsheet with a green ribbon at the top. The ribbon includes tabs for Home, Insert, Draw, Page Layout, Formulas, Data, Review, and View. The Home tab is active, showing options for font (Calibri, size 12), bold, italic, underline, and text color. The spreadsheet itself contains a large table with columns labeled 'sat score 15 indicators', 'sat score 5 domains', 'QoL Cal', 'Levels', 'QoLValues', 'SatScoreChat', 'QoLChat', 'eduRegression', and 'satsScore&QoL1indicators'. The data rows are densely packed with numerical values. The status bar at the bottom shows the active cell as B1 with the formula =s_weight.

Step 3: Satisfaction score for 5 dimensions

The screenshot shows the Microsoft Excel interface. The formula bar at the top contains the following formula:
$$=IF(H5=1,0+20*RAND(),IF(H5=2,20+20*RAND(),IF(H5=3,40+20*RAND(),IF(H5=4,60+20*RAND(),IF(H5=5,80+20*RAND(),))))$$
 A blue box highlights the formula bar and the text "Functions and weights applied". The spreadsheet below has columns for 5 domains: 1. Psychological, 2. Health, 3. Community Vitality, 4. Education, and 5. Environment. Each domain has sub-columns for indicators and scores. The data rows show various indicators and their corresponding scores.

Step 4: QoL model applied

The screenshot shows an Excel spreadsheet with the following data structure:

Row	Indicator	Satisfaction	Weight	Satisfaction	Weight	Satisfaction	Weight	Satisfaction	Weight	Satisfaction	Weight	Satisfaction	Weight	Satisfaction	Weight	p value
37	Psychological	44.31222	0.149311													
38	Health	63.93311	0.416901													
39	Community Vitality	55.34127	0.157975													
40	Education	51.69087	0.122172													
41	Living Env & Std	53.32173	0.15374			1										
43	QoL by dimension															
44	Psychological	6.611876955		15.75106534												
45	Health	26.65379597		39.73137704												
46	Community Vitality	8.742563318		20.29145944												
47	Education	6.315181698		19.26420503												
48	Living Env & Std	8.197682991		19.26420503												
49	Allover QoL	56.89074068	female													
51	QoL 19, 20s, 30s	15-25		25-35		35-45		45-55		55-65		65-75		75-85		
53	Psychological	44.8838	0.140775	43.83185	0.140775	43.56783	0.140775	43.71077	0.140775	46.13485	0.210775	46.14398	0.210775	44.16038	0.210775	
54	Health	65.34844	0.304127	64.97578	0.300127	63.41984	0.300007	60.77775	0.304127	64.57884	0.304127	60.12486	0.304127	65.17947	0.304127	
55	Community Vitality	53.68701	0.112339	54.9207	0.116339	56.16474	0.116459	54.76941	0.112339	54.34386	0.212339	52.83279	0.242339	54.91401	0.272339	p value
56	Education	61.12091	0.328999	55.50862	0.328999	52.66512	0.328999	44.3214	0.158999	51.29354	0.058999	42.16816	0.028999	49.90497	0.018999	-1.80902
57	Living Env & Std	52.89348	0.113759	53.37153	0.113759	53.75963	0.113759	51.49995	0.283759	56.61636	0.213759	54.93069	0.213759	71.75012	0.193759	p value
58	QoL by dimension			1		1		1		1		1		1		
60	Psychological	6.318521286	17.17126	6.170432923	16.76881	6.133265	16.66781	6.153388	16.72249	9.724086	19.50953	9.726002	18.03833	9.307908	17.26291	
61	Health	19.87420046	36.46636	19.50096152	36.0239	19.02637	35.15437	18.48413	33.91578	19.64014	33.44494	18.28557	29.32222	15.82281	31.7873	
62	Community Vitality	6.031162307	18.38896	6.389437005	32.19209	6.540908	19.58023	6.152758	18.75971	11.53924	23.07506	12.80346	22.46703	14.95524	25.05849	
63	Education	20.1087464	35.44692	18.26230602	32.19209	17.3268	30.54301	7.047079	17.9985	3.026291	10.73015	1.222854	4.981869	0.948167	4.568377	
64	Living Env & Std	6.017135661	18.22904	6.071518388	18.3938	6.115668	18.52755	14.6136	27.77862	12.10228	24.12874	11.74196	21.65608	13.90227	26.65941	
65	Allover QoL	58.78242271		47.24593176		55.4494		52.78353		56.29555		53.95756		59.47193		