A Short Guide to Gross National Happiness Index

Karma Ura
Sabina Alkire
Tshoki Zangmo
Karma Wangdi

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The Centre for Bhutan Studies
Post Box No. 1111
Thimphu, Bhutan

Phone: 975-2-321005, 321007
Fax: 975-2-321001
Email: cbs@druknet.bt

www.bhutanstudies.org.bt
www.grossnationalhappiness.com

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Karma Ura, President, Centre for Bhutan Studies

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Summary

Bhutan's GNH Index is a multidimensional measure and it is linked with a set of policy and programme screening tools so that it has practical applications. The GNH index is built from data drawn from periodic surveys which are representative by district, gender, age, rural-urban residence, etc. Representative sampling allows its results to be decomposed at various sub-national levels, and such disaggregated information can be examined and understood more by organizations and citizens for their uses. In the GNH Index, unlike certain concepts of happiness in current western literature, happiness is itself multidimensional – not measured only by subjective well-being, and not focused narrowly on happiness that begins and ends with oneself and is concerned for and with oneself. The pursuit of happiness is collective, though it can be experienced deeply personally. Different people can be happy in spite of their disparate circumstances and the options for diversity must be wide.

The GNH Index is meant to orient the people and the nation towards happiness, primarily by improving the conditions of not-yet-happy people. We can break apart the GNH Index to see where unhappiness is arising from and for whom. For policy action, the GNH Index enables the government and others to increase GNH in two ways. It can either increase percentage of people who are happy or decrease the insufficient conditions of people who are not-yet-happy. In the way the GNH Index is constructed, there is a greater incentive for the government and others to decrease the insufficiencies of not-yet-happy people. This can be done by mitigating the many areas of insufficiencies the not-yet-happy face. Not-yet-happy people in rural Bhutan tend to be those who attain less in education, living standards and balanced use of time. In urban Bhutan, not-yet-happy people are insufficient in non-material domains such as community vitality and culture and psychological well-being. In Thimphu, the capital, for example, the biggest insufficiencies are in community vitality.

The GNH Index provides an overview of performance across 9 domains of GNH (psychological wellbeing, time use, community vitality, cultural diversity, ecological resilience, living standard, health, education, good governance). The aggregation method is a version of Alkire-Foster method (2007, 2011). The index is

aggregated out of 33 clustered (grouped) indicators. Each clustered indicator is further composed of several variables. When unpacked, the 33 clustered indicators have 124 variables, the basic building blocks of GNH Index. Weights attached to variables differ, with lighter weights attached to highly subjective variables. A threshold or sufficiency level is applied to each variable. At the level of domains, all the 9 domains are equally weighted as they are all considered to be equally valid for happiness.

Three cut off points have been used to identify degrees of happiness. Not all people need to be sufficient in each of 124 variables to be happy. People are diverse in the ways and means they can have fulfilling life. Not all variables need to be present to be happy. People have freedom of choice in which ways they can make life fulfilling, so not all variables have universal applicability. For such reason, we divide the Bhutanese into four groups depending upon their degree of happiness. We use three cutoffs: 50%, 66%, and 77%. People who have achieved sufficiency in less than 50% are 'unhappy', and they comprise only 10.4% of the population. A total of 48.7% of people have sufficiency in 50-65% of domains and are called 'narrowly happy'. A group of 32.6%, called 'extensively happy', have achieved sufficiency in 66-76% – in between 6 and 7 domains. And in the last group, 8.3% of people are identified as 'deeply happy' because they enjoy sufficiency in 77% or more of weighted indicators – which is the equivalent of 7 or more of the nine domains.

In order to have one overall index, the GNH cut off was set at 66% of the variables, which is the middle cutoff used above. People can be considered happy when they have sufficiency in 66% of the (weighted) indicators or more – that is, when they were identified as extensively happy or deeply happy. The GNH Index value for 2010 is 0.743. It shows us that 40.8% of people in Bhutan have achieved such happiness, and the remaining 59% - who are narrowly happy or unhappy - still enjoy sufficiency in 57% (not 66% as required by the index) of the domains on average. The cut off does make a difference in the GNH Index. The middle cutoff gives a relatively low score of GNH index is a result of its requirement that a diverse set of conditions and states, represented by 124 variables, must be simultaneously prevalent for a person to be robustly happy. It is a

tougher measure because it is not focussed on survival like poverty, but rather on flourishing over a wide array of conditions. However the GNH Index, and the four categories of people – unhappy, narrowly happy, extensively happy, and deeply happy – will be reported and analysed when the GNH Index is updated over time, as they are in this report. Taken together they will provide a nuanced picture of the composition, diversity, and evolution of GNH across Bhutan.

I. Introduction

This guide introduces the 2010 Gross National Happiness (GNH) Index of Bhutan. It explains the origins of the concept of GNH, its grounding in Bhutanese culture and history, and describes how the concept is being operationalized in the form of the GNH Index in some novel and innovative ways. Any discussion of the GNH in Bhutan must begin from the understanding that it is distinct from the western literature on 'happiness' in two ways. First it is multidimensional – not focused only on subjective well-being to the exclusion of other dimensions – and second, it internalizes other-regarding motivations. While multidimensional measures of the quality of life and well-being are increasingly discussed, Bhutan is innovative in constructing a multidimensional measure which is itself relevant for policy and is also directly associated with a linked set of policy and programme screening tools. This guide presents the GNH Index which provides an overview of national GNH across 9 domains, comprising of 33 clustered indicators, each one of which is composed of several variables. When unpacked, the 33 clustered indicators have 124 variables.

The 2010 GNH survey from which the index is drawn has evolved from a 2006 pre-pilot and a 2008 nationally representative survey. In its present form it is nationally representative and also representative at the rural and urban area and by districts or Dzongkhags. In-depth sections on the domains and indicators cover the motivation behind the selection of each as well as the weights, cut-offs and results. The GNH Index identifies and aggregates information on happiness drawing on a special adaptation of the Alkire-Foster method for measuring multidimensional concepts such as poverty and wellbeing. This ensures that the national measure is rigorous, and that it is intuitive and can be examined in many policy-relevant ways.

Overall, in 2010, 10.4% of people were 'unhappy' according to the GNH index; 47.8% are 'narrowly happy', 32.6% are 'extensively happy'; and 8.3% are 'deeply happy'. These four groups correspond to people who have achieved sufficiency in less than half, 50-65%, 66-76%, and more than 77% of domains. The 2010 GNH Index uses the middle cutoff. Its value is 0.743, and shows that overall, 41% of Bhutanese are identified as happy (meaning they are extensively or

deeply happy), and the remaining 59% enjoy sufficiency in 57% of the domains on average. Recall that 48.7% of these 59% are already narrowly happy, but because we wish to expand GNH we consider them not-yet-happy for policy purposes. The low score of GNH is a result of the GNH index which requires a diverse conditions and states, represented by 124 variables, to be prevalent for a person to be robustly happy. GNH Indices and their subcomponents are also reported for each of the 20 districts, by gender, by rural-urban area, and, for illustrative purposes, by age and certain occupational categories.

Table 1 below presents the definition of each of the groups used in this analysis. It then gives the percentage of the population who belong in each category in the 2010 GNH Index results. The final column provides the average percentage of weighted indicators, or domains, in which people in each group, on an average, enjoy sufficiency.

	Definition of groups ~ Sufficiency in:	**Per cent of population who are:**	**Average Sufficiency of each person across domains**
Happy	**66%-100%**	**40.8%**	**72.9%**
Deeply Happy	77%-100%	8.3%	81.5%
Extensively Happy	66%-76%	32.6%	70.7%
Not-Yet-Happy	**0-65%**	**59.1%**	**56.6%**
Narrowly Happy	50%-65%	48.7%	59.1%
Unhappy	0-49%	10.4%	44.7%

Table 1: *Categories of GNH, Headcounts and Sufficiency*

The analysis has two parts: first, the well-being of the people who have been identified as 'happy' is examined, to show the indicators in which they enjoy satisfaction. The in-depth analysis of who is happy according to the GNH index 2010 includes analysis at the district level, as well as by rural and urban categories, gender, occupation, education and income-levels. Some individual examples are presented, to show that the 'happiest' people vary by age, district, occupation, gender, and sufficiency profiles.

The second part focuses on how to increase happiness. The GNH index was primarily devised to provide policy guidance to increase happiness, particularly by focusing on the not-yet-happy people so that their situation can be improved. It will also help us to

understand better the diverse kinds of happiness. Hence a second part of the analysis scrutinizes the domains in which not-yet-happy people lack sufficiency. As such the 'not-yet-happy' and the question 'how can GNH be increased?' are key components of the section.

The GNH Index, like the philosophy of GNH which motivates it, is very much a living experiment, seeking to convey more fully the colour and texture of people's lives than does the standard welfare measure of GDP per capita; to enrich the dimensions and the methodology well beyond the HDI Index, and to draw together some innovative work from other initiatives seeking to measure human progress on a shared planet.

i. Origins of the concept of GNH

Although the term "Gross National Happiness" was first coined by the 4th King of Bhutan the concept has a much longer resonance in the Kingdom of Bhutan. The 1729 legal code, which dates from the unification of Bhutan, declared that "if the Government cannot create happiness *(dekid)* for its people, there is no purpose for the Government to exist."[1] In 1972, the 4th King declared Gross National Happiness to be more important than GNP, and from this time onward, the country oriented its national policy and development plans towards Gross National Happiness (or GNH). The Constitution of Bhutan (2008, Article 9) directs the State "to promote those conditions that will enable the pursuit of Gross National Happiness."

While there is no single official definition of GNH, the following description is widely used:

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[1] Extracted from Rje Mkhan-po 10, Bstan 'dzin Chos rgyal, Lho'I chos 'byung bstan pa rinpoche'i 'phromthud 'jam mgonsmonmtha'i 'phrengbazhesbyaba. Written during the years 1755-59. The Legal Code dated 1729 (earth bird year) is attributed to the 10thDesiMiphamWangpo while he was serving on the Golden Throne of Bhutan, as representative of the Shabdrung Rinpoche, and based on the Shabdrung's earlier work. KMT, Thimphu has reprinted this book 2004. See p. 253.

> *Gross National Happiness (GNH) measures the quality of a country in more holistic way [than GNP] and believes that the beneficial development of human society takes place when material and spiritual development occurs side by side to complement and reinforce each other.*[2]

From the start it is vital to clarify that GNH in Bhutan is distinct from the western literature on 'happiness' in two ways. First it is multidimensional – not focused only on subjective well-being to the exclusion of other dimensions – and second, it internalizes responsibility and other-regarding motivations explicitly. As the first elected Prime Minister of Bhutan under the new Constitution of Bhutan adopted in 2008 put it,

> *"We have now clearly distinguished the 'happiness' … in GNH from the fleeting, pleasurable 'feel good' moods so often associated with that term. We know that true abiding happiness cannot exist while others suffer, and comes only from serving others, living in harmony with nature, and realizing our innate wisdom and the true and brilliant nature of our own minds."*[3]

It includes harmony with nature (again absent from some Western notions of happiness) and concern for others. The brilliant nature he alluded to consists of the various types of extraordinarily sensitive and advanced awareness with which human beings are endowed and can be realized.

The nine domains articulate the elements of GNH more fully and form the basis of the GNH index. The earlier four pillars of GNH are included as part of the nine domains.[4] The first three domains

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[2] http://www.educatingforgnh.com

[3]Opening Address of 'Educating for Gross National Happiness' Conference: Lyonchhen Jigmi Y. Thinley, Thimphu, Bhutan 7th December, 2009.

[4] The 10th plan of Bhutan specified GNH by focussing on four pillars: "In order to translate the multi-dimensional concept of GNH into core objectives … four strategic areas were initially defined" (p.16). These areas, called the "four pillars of GNH", are: 1. Sustainable & equitable socio-economic development; 2. Environmental conservation; 3. The preservation and promotion of culture; and 4. Good governance.

are very familiar from a human development perspective – living standards (such as income, assets, housing), health, and education. The next three are a bit newer – the use of time (and time poverty), good governance and ecological resilience. And the last three are more innovative – psychological wellbeing (which includes overall happiness, but also emotions and spirituality), community vitality and cultural diversity and resilience.

The index weights the nine domains equally. 33 cluster indicators are used to identify whether people have achieved sufficiency or not and create the index. For presentational simplicity they are also combined to produce nine domain-level indicators. Each sub-component indicator of the GNH Index is on its own useful for practical purposes of different agencies.

	Domain	**Indicators**
1	Psychological wellbeing	4
2	Health	4
3	Time use	2
4	Education	4
5	Cultural diversity and resilience	4
6	Good Governance	4
7	Community vitality	4
8	Ecological diversity and resilience	4
9	Living standards	3
	Total	**33**

Table 2: *Number of indicators under each domain*

ii. Purpose of the 2010 GNH Index

Since the mid-2000s, steps have been taken to build a GNH Index which would draw as fully as possible on the holistic and deliberate vision of development as it has evolved in Bhutan. In a 2007 Government Round Table meeting, Dasho Karma Ura proposed that a GNH index would be used in: 1. Setting an alternative framework of development; 2. Providing indicators to sectors to guide development; 3. Allocating resources in accordance with targets and GNH screening tools; 4. Measuring people's happiness and well being; 5. Measuring progress over time; and 6. Comparing progress

across the country.[5] These purposes, each of which have specific implications for measurement, are elaborated below.

1. Setting an alternative framework of development: Bhutan's GNH vision of development is distinctively holistic. The 10th plan explicitly seeks "to address a more meaningful purpose for development than just the mere fulfillment of material satisfaction."[6] Hence the nine domains of GNH, taken together, reflect the purpose of development. If certain dimensions contract, or are being crowded out by material progress, the GNH Index must explicitly convey such information as the imbalances enter, in order to catalyze public deliberation and if relevant, action.

2. Providing indicators to sectors to guide development: Certain indicators must either monitor activities by the public sector or else change when sector priorities are realized. For example 'electricity', a component of the GNH, is a priority in the 10th five-year plan. Insofar as the GNH indicators monitor outputs, the GNH Index provides incentives to ministries to deliver services, because their accomplishments will visibly contribute to higher GNH the next time the Index is updated. Methodologically this requires an index that can be broken down into its component indicators.

3. Allocating resources in accordance with targets and GNH screening tools: While the composition of the GNH is not a sufficient guide for policy, a clear understanding of how the *achievements and shortfalls* in different dimensions of GNH vary over time and space and group provides key information for policy design and subsequent resource allocation. In terms of targeting, the GNH Index can show which Dzongkhags are lacking in which indicators, and can also identify and target the 'least happy' people and describe them by age, district, gender, etc. In terms of screening tools, the GNH indicators can be used as a check list, to convey in concrete terms the kinds of activities and achievements that constitute GNH.

4. Measuring people's happiness and well-being: The measure and its component indicators aim to capture human well-being in a fuller

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[5] Royal_Government_of_Bhutan 2008a

[6] Royal_Government_of_Bhutan 2008b

and more profound way than traditional socio-economic measures of economic development, human development or social progress have done. This also requires the measurement methodology to be understandable to the general public. Case studies can be provided of differently happy people, in order that citizens can assess whether the index broadly seems intuitive and has room for their own aspirations and values.

5. Measuring progress over time: The component indicators of the GNH are to be sensitive to changes over time. Some indicators must be directly responsive to relevant changes in policy. In this way, the composition of well-being, as well as its overall level, can be observed over decades. Similarly, inequalities among groups, and populations that require special attention can be identified. The GNH Survey hence must be repeated regularly, for example every two years.

6. Comparing progress across the country: The GNH Index should be able to make meaningful comparisons across the Dzongkhags, which vary widely in terms of climate, culture, access to services, and livelihoods. The survey hence must be representative by Dzongkhag; and the methodology of measurement must be subgroup consistent and decomposable.

Taken together these six requirements have been used to specify the indicators and composition of the GNH Index. It must be policy-sensitive – changing over time in response to public action; and others reflect strengthening or deterioration in the social, cultural, and environmental fabric whether or not at present these states are the direct objective of policy. In certain sectors, the indicators must reflect public priorities. The indicators must be assumed to be relevant in future periods as well as at the present time in order to measure progress across time. And the GNH Index must be sub-group consistent hence decomposable by regions and groups.

iii. GNH Survey 2010

The GNH Index is based on a survey of 7142 people which was completed in all 20 districts of Bhutan in the year 2010 and is representative by rural and urban area and by districts or Dzongkhags. The survey itself was developed by the Centre for Bhutan Studies (CBS) and builds on previous surveys on GNH. The

survey covers all nine domains and gives innovative insights into happiness which are not found in most other national surveys. Indeed in fielding the GNH surveys, the CBS argues that the quality of the data is unusually high and this is because the enumerators working often in remote rural areas took time with the participants to explain the purpose of the index, to share the importance of understanding their own insights and perspectives, and so enabled the respondents to answer the survey questions fully and completely and reflectively. The survey builds on a 2006 pre-pilot questionnaire and also on the 2008 GNH survey which was representative nationally but not by district. It repeated some of those questions, and learning from those experiences and the analysis of that survey also improved them.

In order to measure the 9 domains of GNH, 33 indicators have been selected according to 5 different criteria. First of all the indicators have to reflect the normative values of GNH which have been articulated in official documents such as the National Development Plan and in statements by His Majesty the King, the Prime Minister and other ministers. It also reflects the normative values which are embedded in the culture and traditions of Bhutan. The second criterion for the indicators relates to their statistical properties: each indicator was analysed extensively to ensure robustness. Third, the indicators were chosen such that they would accurately reflect how happiness is increasing or evolving in different regions over time and among different groups accurately. Fourth the indicators had to be relevant for public action – although government policy is by no means the only way of increasing GNH. Many domains of GNH can be facilitated by appropriate government policies and by government policies that create incentives for business, NGOs and citizens to support GNH in its many dimensions. And lastly, the indicators have to be understandable as far as possible by ordinary citizens. They have to reflect and relate to people's own experiences in their own lives, so that the GNH index would not only be a policy tool but would also be something that people could use to imagine the many different ways of being happy in the Bhutanese context.

There are four indicators in every domain, except time use which has two (sleep and work), and living standards, which has three. Because the object of enquiry is happiness people will think the key

questions are "How happy am I? How can I be happier?" but actually these hedonic questions are not present in the index although they were present in the survey and have been analysed. The following section presents the indicators that have been included in the index.

II. Domains and indicators

This section explains each of the nine domains and 33 indicators of the GNH Index 2010, how they have been constructed as well as the cutoffs that have been set. The GNH index uses two kinds of thresholds: sufficiency thresholds, and one happiness threshold. Sufficiency thresholds show how much a person needs in order to enjoy sufficiency in each of the 33 indicators. The overall happiness threshold meanwhile answers the question "how many domains or in what percentage of the indicators must a person achieve sufficiency in order to be understood as happy"? The Happiness threshold will be presented later in this paper.

Figure 1: *The nine domains and 33 indicators of the GNH index*

i. Psychological Wellbeing

Psychological wellbeing is an intrinsically valuable and desired state of being. Diener, et al (1997) categorize indicators of psychological wellbeing according to reflective or affective elements, while the

Sarkozy Report[7] (Stiglitz, Sen and Fitoussi, 2009a, p. 44) emphasizes the importance of using diverse wellbeing indicators. It states, '...different aspects (cognitive evaluations of one's life, happiness, satisfaction, positive emotions such as joy and pride, and negative emotions such as pain and worry)…should be measured separately to derive a more comprehensive appreciation of people's lives.' Besides the reflective life evaluations and hedonic experiences, an additional aspect of spirituality has also been included in the domain.

Life satisfaction

This indicator combines individuals' subjective assessments of their contentment levels with respect to health, occupation, family, standard of living and work-life balance.[8] The respondents were asked to say how satisfied or dissatisfied they were in these five areas on a five-point Likert scale (1= very dissatisfied, 5=very satisfied).

The life satisfaction indicator sums their responses across the five areas. It could have a score as low as 5 (low satisfaction) or as high as 25 (high satisfaction). The sufficiency threshold for the life

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[7] The report narrates an extensive review of the composition of subjective wellbeing into two major components: first, the evaluation of a person's life as a whole or of various domains and second, the measurement of the actual feelings. Both the components are reflected in the psychological wellbeing domain of GNH and were computed separately. The report states, 'that these measures provide information about the determinants of quality of life at the level of each person. These determinants include both features of the environment where people live and their individual conditions, and they vary depending on the aspect considered.' Further, it highlights that these subjective measures provide information beyond what is being given by income.

[8] A five item Likert scale was used rather than the single item question on life satisfaction because dissatisfaction in life is usually due to dissatisfaction in any of multiple areas of life. One of these areas can pull down the satisfaction level (Diener, 2006).

satisfaction score is set at 19, and 83 per cent of people enjoy sufficiency in life satisfaction.

Emotional balance (positive and negative emotions)

Ten self-reported emotional items were selected for this indicator. Positive emotions, or non-disturbing emotions, such as compassion, generosity, forgiveness, contentment and calmness were included while selfishness, jealousy, anger, fear and worry were used to represent negative emotions. In Buddhist perspective, the negative emotions may be more accurately called disturbing emotions during which people cannot experience with much clarity and that might lead often to formation of poor intentions. For both sets of emotions the respondents were asked to rate the extent to which they have experienced them during the past few weeks with reference to a four-point scale[9]. The scale ranges are: 1 'never', 2 'rarely', 3 'sometimes', and 4 'often'.

Both the positive and negative emotion indicator scores run from 5 to 20 (from low to high incidence of positive or negative emotions). For positive emotions, a sufficiency threshold of 15 was set which identifies 58.8 per cent as being adequate at positive emotions. The negative emotion indicator consists of two components of sub-indices. The emotions included are selfishness and jealousy in one sub-index and anger, fear and worry in the other sub-index. Thresholds of 5 (for two items with maximum score of 8) and 7 (for three items with maximum score of 12) were set respectively for two sub-indices of negative emotions. With this threshold, about 64.6 per cent of the respondents were deemed as not suffering from disturbing or negative emotions.

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[9] A number of different time frames have been used in various studies (Green, Goldman and Salovey 1993; Watson, Clark and Tellegen 1988; Watson and Tellegen 1999).The use of a 'few weeks' reference period is not ideal; ideally we would have information on average emotional experiences throughout the past year. But this may be too difficult to recall accurately. The GNH emotional indices will be partly inaccurate as a reflection of annual emotional states for at the individual level because 'the past few weeks' will not have been representative for all respondents. However they were the best that could be constructed from the available data.

Spirituality

The spirituality indicator is based on four questions. They cover the person's self-reported spirituality level, the frequency with which they consider karma,[10] engage in prayer recitation, and meditation. Self-reported spirituality level describes the person's judgement on his or her own position on the spirituality continuum. The question of the consideration of karma asked people to what extent they take into account their own volitional impulses and actions as having moral consequences in future just as they did on the present. Measures of social engagements are dealt in both community vitality and time use domains. Here, indicators of sacred activities were limited to praying and meditation as two separate events although these activities are not mutually exclusive. All the four indicators run on a four-point scale of 'regularly' to 'not at all' except for the spirituality level which ranges from 'very spiritual' to 'not at all'.

The indicator sums the scores across the four questions. Scores range from 4 to 16 with 16 indicating a greater degree of spirituality. The threshold has been set at 12 which implies that at least three of the four indicators must be rated 'regularly' or 'occasionally' for individuals to be defined as happy. The indicator identifies 53 per cent of people as adequate in terms of spirituality level.

ii. Health

In the indigenous healing science practiced as a branch of the official health system in Bhutan, health has always been associated with both physical health and mental health. Health is outcome of relational balance between mind and body, between persons and the environment. Typically, an individual is said to be well only if both heat-pain is absent from the body and sorrow is absent from the mind. The social and material conditions for creating good health

[10] Jeffrey Hopkins defines karma as "A general term used loosely for behavioral cause and effect. Also called: karmic impulse." See http://archive.thebuddhadharma.com/issues/2002/fall/karma_panel_fall02.htm> Accessed on [14.2.2012]

such as clean air or water or nurturing family relationships or community relationships have been incorporated in other domains. Similarly, emotional balance and spirituality have also been included in the psychological wellbeing domain.

Self-reported health status

Questions persist about how accurately this simple self-reported indicator proxies objective health and nutrition states, and the extent to which it is affected by 'adaptive preferences' (Easterlin, 2003). The self-reported health indicator is used here as a proxy measure and to complement other health indicators (healthy days and disability) and is consequently given only one-tenth of the total weight for health, and only one-third as much weight as any of the other three indicators. The ratings range on a five-point scale from having 'excellent' health to 'poor' health.

For a person to be sufficient in self-reported health status, he or she must have a rating of 'excellent' or 'very good'. A large majority (73.8 per cent) have met the sufficiency condition in self-reported health.

Healthy days

This indicator reports the number of 'healthy days' a respondent enjoyed within the last month. The mean number of healthy days for Bhutan is 26 days (SD=7.7) and the median is 30 days. To allow for normal illness and for elderly respondents, the threshold has been set at 26 days and 76.2 per cent meet the sufficiency threshold.

Long-term disability

This indicator examines an individual's ability to perform functional activities of daily living without any restriction (U.S. Department of Health and Human Services 2000). Participants were asked whether they had any longstanding illness that had lasted over six months. If the answer was 'yes', they were then asked, using a five-point scale, whether the disability restricted their daily activities. The scale ranged from 'never' to 'all the time'. However, no further information on the intensity of disabilities was elicited.

The threshold is set such that those individuals who are disabled but are 'rarely' or 'never' restricted from doing their daily chores are

classified as sufficient. Conversely, individuals with a disability whose daily activities are restricted 'sometimes' are classified as deprived. With this threshold, about 89.5 per cent achieve sufficiency.

Mental health

This indicator uses a version of the General Health Questionnaire (specifically GHQ-12) developed by Goldberg. It consists of 12 questions that provide a possible indication of depression and anxiety, as well as confidence and concentration levels. It is calculated and interpreted using the Likert scale with lowest score at 0 and highest possible score at 36. Each item has a four-point scale, but there are two types of scales depending on the structure of statements. Some questions range from 'not at all' to 'much more than usual' and some from 'more than usual' to 'much less than usual'.

Since the GHQ-12 satisfied similar reliability and validity tests in Bhutan as in other places, the 12 questions were computed using the standard procedure. The threshold was set at normal wellbeing (15) and 85.8 per cent achieve sufficiency.

iii. Education

GNH highlights the importance of a holistic educational approach that ensures Bhutanese citizens gain a deep foundation in traditional knowledge, common values and skills. In addition to studying reading, writing, maths, science and technology, students are also encouraged to engage in creative learning and expression. A holistic education extends beyond a conventional formal education framework to reflect and respond more directly to the task of creating good human beings. It is important for Bhutan that an education indicator includes the cultivation and transmission of values (Ura, 2009).

Literacy

A person is said to be literate if he or she is able to read and write in any one language, English or Dzongkha or Nepali. In literacy, 48.6 per cent have attained sufficiency. Schooling on a universally

accessible basis grew from the 1970s onwards. The backlog of older generations who did not go to school shows up as low literacy rate.

Educational qualification

The education system in Bhutan has two major components: formal education and non-secular institutions such as monastic schools, plus non-formal education (NFE). This educational indicator includes formal schooling, education imparted by monastic schools and NFE.

The threshold for education was set such that persons have insufficient education if they have not completed six years of schooling from any source, including government, non-formal, or monastic schools. With this threshold, only 37.3 per cent have attained six years of schooling, again due to the fact that schooling and non-formal education began relatively recently in Bhutan.

Knowledge

This indicator attempts to capture learning which could have occurred either inside or outside formal institutions. Five knowledge variables were chosen: knowledge of local legends and folk stories, knowledge of local festivals (*tshechus*), knowledge of traditional songs, knowledge of HIV-AIDS transmission, and knowledge of the Constitution. The first three kinds of knowledge capture certain forms of local traditions, especially oral and performance based ones. The responses for each question follow a five-point scale which ranges from 'very good knowledge' to 'very poor knowledge'. Responses are aggregated to create a maximum score of 25 which indicates 'very good' knowledge in all areas, while the minimum score of 5 indicates 'very poor' knowledge.

The threshold is set to 19 which implies that Bhutanese should have an average of 'good' knowledge across the five variables. When the threshold is applied, only 7.5 per cent have sufficiency in knowledge. Sufficiency in knowledge is low compared to other indices; only 3 per cent rated 'good' or 'very good' in all five knowledge indicators. It suggests a divergence between rising literacy and declining knowledge about their respective locality.

Values

This indicator asked respondents whether they considered five destructive actions to be justifiable: killing, stealing, lying, creating disharmony in relationships and sexual misconduct. In a society influenced by good values, e.g., by Buddhism, individuals are expected to tame themselves with respect to five destructive actions. Moral consequences of virtues and non-virtues are typically revealed through speech, body and mind and in the case of disinformation, the agency of speech is emphasized. The variables have a three-point response scale ranging from 'always justifiable' to 'never justifiable' along with an option of 'don't know'.[11] The values have been combined into a composite indicator in a particular manner. For killing, stealing and sexual misconduct, a value of 1 is assigned if the person reports 'never justifiable' while for creating disharmony and lying, responses either 'never justifiable' or 'sometimes justifiable' are assigned 1. The composite indicator takes the values 0 to 5.

The threshold is set at four which implies that a person can consider at least one of the values to be justifiable and 97.1 per cent achieve sufficiency in value. The 2010 GNH indicator of values used will be improved in future GNH surveys but the present finding provides some preliminary insight into these issues.

iv. Culture

The distinctive culture of Bhutan facilitates sovereignty of the country and provides identity to the people. Hence the preservation and promotion of culture has been accorded a high priority both by government and the people. Culture is not only viewed as a resource for establishing identity but also for cushioning Bhutan from some of the negative impacts of modernization and thereby enriching Bhutan spiritually.

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[11] An examination of the underlying factor structure resulted in a single factor with loadings above 0.5. Internal consistency was sufficient (Cronbach's alpha of .65) to allow computation of an indicator.

The diversity of the culture is manifested in forms of language, traditional arts and crafts, festivals, events, ceremonies, drama, music, dress and etiquette and more importantly the spiritual values that people share. To assess the strength of various aspects of culture, four indicators have been considered: language, artisan skills, cultural participation and *DriglamNamzha* (the Way of Harmony).

Language

The language indicator is measured by a self-reported fluency level in one's mother tongue on a four-point scale. It should be clarified that mother tongue is defined as natal tongue which is a dialect. There are over a dozen dialects. Only in Western parts of the country does the mother tongue coincide with the national language, Dzongkha. The ratings vary from 'very well' to 'not at all'.

Since almost everyone seems to be fluent in their mother tongue, a high threshold is necessary to maintain standards. And for this reason, the threshold is set to 'very well'. With this threshold, at present an impressive 95.2 per cent of respondents are classified as sufficient.

Artisan skills

This indicator assesses people's interest and knowledge in thirteen arts and crafts, collectively known as *ZorigChusum* and reports on number of skills possessed by a respondent. These skills and vocations are the basis of historical material culture of Bhutan when it was trading far less. The 13 arts and crafts include 1) weaving (*Thagzo*) 2) embroidery (*Tshemzo*) 3) painting (*Lhazo*) 4) carpentry (*Shingzo*) 5) carving (*Parzo*) 6) sculpture (*Jinzo*) 7) casting (*Lugzo*) 8) blacksmithing (*Garzo*) 9) bamboo works (*Tszharzo*) 10) goldsmithing and silversmithing (*Serzo* and *Nguelzo*) 11) masonry (*Dozo*) 12) leather works (*Kozo*) and 13) papermaking (*Dezo*). For the indicator, people were asked if they possessed any of the above 13 arts and crafts skills. The mean was 1.01 with a SD of 1.15.

A sufficiency threshold has been set at one, which implies that a person must possess at least one skill to be identified as sufficient. About 62 per cent of the respondents are categorized as having

achieved sufficiency. The dominant or commonly shared skills today are masonry, carpentry, bamboo works and textile weaving.

Socio-cultural participation

In order to assess people's participation in socio-cultural activities the average number of days within the past 12 months is recorded from each respondent. The days are grouped on five-point scale ranging from 'none', and '1 to 5 days' to '+20 days'. The median is 1 to 5 days. About 15 per cent spent more than 13 days attending socio-cultural events in the past year and 1 per cent reported 'don't know' (these respondents were dropped).

The threshold was set at 6 to 12 days per year.[12] It identifies 33.2 per cent to have achieved sufficiency.

DriglamNamzha

DriglamNamzha (the Way of Harmony) is expected behaviour (of consuming, clothing, moving) especially in formal occasions and in formal spaces. It arose fundamentally from the conventions of communal living and working in fortress-monasteries. Certain elements of *DriglamNamzha* are commonly practiced amongst Bhutanese when they interact with each other in formal spaces. A minimal part of it is also taught for a few days in educational institutions. Respondents were asked to rate its importance on a three-point scale of being very important to not important. In addition, respondents were also asked if there were any perceived changes in the practice of this particular form of etiquette over the years.

For *DriglamNamzha*, two indicators were developed: perceived importance of *DriglamNamzha* and the perceived change in practice and observance during the last few years. The questions run on a three-point scale: perceived importance ranges from 'not important' to 'very important' and perceived change from 'getting weaker' to 'getting stronger'. Both have values of 'don't know' which have been classified as insufficient since it is considered vital to have knowledge about etiquette.

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[12] It may be that in future surveys the response categories might be revised.

The thresholds have been set at 'important' for perceived importance and at 'getting stronger' for perceived change. Both indicators need to be fulfilled for an individual to be identified as sufficient in *DriglamNamzha*. After applying the thresholds, 59.7 per cent of people enjoy sufficiency.

v. Time Use

The balance between paid work, unpaid work and leisure are important for one's wellbeing. Similarly, a flexible working life is vital for the wellbeing of individual workers and their families and communities. Since the 1970s, there has been a growing awareness of how unpaid work both at home and in communities is obscured in national accounts and so efforts have been made to include these activities, which are equally fundamental to wellbeing.

In the GNH survey, a simple time diary was administered. Information on how people use their time was collected by asking respondents to recall their activities during the previous day. Survey respondents reported activities that they did from the time they woke up until the time they slept on the previous day of the interview. For each activity the respondents were asked how long the activity lasted. The activities were then later regrouped into 60 different categories spent on different kinds of activities such as work, leisure, sleep, personal care and so on.

Time use data can yield a range of important information that provide insight into lifestyles and occupations of the people. It can also reveal the gap between GDP and non-GDP activities, that reflects the gap between market and household economy sectors. Such data are helpful in accounting for a more comprehensive output of goods and services that SNA omits (Ironmonger 1999). Time use data on 24 hours in the life of Bhutanese people can be broken down into various useful sub-categories. The distribution involves the following disaggregation: 20 districts, 7 income slabs, 11 age groups, 60 activities, and gender (Ura, 2012)[13]. However, the GNH index incorporates only two broad aggregated time use: work

[13] Ura, K., 2012. Dialogue on Time and Time Use, forthcoming.

hours and sleep. The definition of work[14] hours in GNH is not completely congruent with definitions used elsewhere and shows unusually long work duration in Bhutan. Some activities not usually defined as work elsewhere are included as part of work.

Working hours

The GNH definition of work includes even unpaid work such as childcare, *woola* (labour contribution to community works; and voluntary works and informal helps etc. In this indicator, all the following categories are classified as work: Crop farming and kitchen gardening (agriculture), Business, trade and services, Care of children and sick members of household, Construction and repairs, Craft related activities, Forestry and horticultural activities, Household maintenance, Livestock related activities, Processing of food and drinks, and Quarrying work.

Eight hours is also the legal limit, applied to formal sector, set by the Ministry of Labour and Human Resources of Bhutan for a standard work day. Since a main objective of the indicator is to assess people who are overworked, those who work for more than eight hours are identified as time deprived. 45.4 per cent achieve sufficiency when this threshold is applied. Those who do not achieve this sufficiency

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[14] Work encompasses the following activities: Agriculture related activities; Guarding crops from wild animals; Livestock related activities; Forestry related activities and related travels; Horticulture related activities; Processing of foods and drinks; Construction or repair of private infrastructures in GNH 2010 data; Construction or repair of public infrastructure; Weaving and related works; Carpentry and masonry; Others crafts; Business, trade and related travels; Services and related travels; Ferrying, carrying, transporting and related travels; Cooking; Serving or entertaining; Dishwashing; Cleaning or upkeep of dwellings; Building fire; Fetching water; Laundry; Shopping; Arranging , mending household objects; Consultations with, engaged during the visits of official or office visits to professionals; Mining and quarrying related activities; Care of children, old, sick and disabled; *Woola* (labour contribution to community works); Voluntary works and informal helps. Since time spent on this activities is calculated separately, the classification of work and non-work can be changed easily, if necessary, eg, care of children, old, sick and disabled can be taken as an activity under social and cultural activities.

are mainly women irrespective of whether they live in towns or villages, and more generally the people in the Eastern districts. People in Eastern Bhutan have longer work days compared to the rest.

Sleeping hours

Sleep is clearly beneficial for a person's health and impacts nearly every area of daily life. In general most healthy adults need an average of seven to eight hours of sleep for proper functioning (Kleitman, 1963; Doran, Dongen and Dinges, 2001; Smith, Robinson and Segal, 2011). But sleep requirements can vary substantially and some people, such as nuns and monks, would prefer and find it much healthier to devote more time to meditation and other spiritual practices than sleeping. Indeed, survey confirms that they sleep comparatively less.

Eight hours is considered the amount necessary for a well-functioning body for everyone. Both the mean and median fall around eight hours for the respondents. With this threshold, about 66.7 per cent achieve sufficiency.

vi. Good Governance

Four measures were developed to signify effective and efficient governance. These include fundamental rights, trust in institutions, performance of the governmental institutions and political participation. These indicators may be adjusted in future surveys. The governance indicators are quite innovative in combining political activities with access to government services. These are understood as part of governance and a part of the public services to be provided by the government. It also includes fundamental rights to vote, freedom of speech, join a political party, to be free of discrimination and a perceptual indicator on government performance.

Political participation

The measure of political participation was based on two components: the possibility of voting in the next election and the frequency of attendance in *zomdue* (community meetings). The

respondents are asked if they would vote in the next general election and the response categories are simply 'yes' or 'no' or 'don't know'.

An individual has to report 'yes' in the voting criteria and has to attend at least one meeting in a year to be classified as sufficient in political participation. About 92 per cent have expressed an intention to vote in the next general election, 4.7 per cent declined and 2 per cent don't know. For voting, the threshold is straight forward because it is agreed by everyone that developing true democratic processes requires the active participation from citizens – minimally, by voting. In terms of attendance in meetings the threshold has been set to one time. About 60.2 per cent attended at least one meeting. Fixing the threshold as such classifies 43.6 per cent as deprived in political participation.

Political freedom

These indicators attempt to assess people's perceptions about the functioning of human rights in the country as enshrined in the Constitution of Bhutan which has an entire article (Article 7, Fundamental Rights) dedicated to it. The seven questions related to political freedom ask people if they feel they have: freedom of speech and opinion, the right to vote, the right to join political party of their choice, the right to form *tshogpa* (association) or to be a member of *tshogpa*, the right to equal access and the opportunity to join public service, the right to equal pay for work of equal value, and freedom from discrimination based on race, sex etc. All have three possible responses of 'yes', 'no' and 'don't know'.

The thresholds for all rights were set to 'yes'. So, a person has a sufficient condition in the indicator if he or she has all seven rights fulfilled. Of the respondents, 61.7 per cent were identified as sufficient. The low achievement in this indicator is because of the 'don't know' responses which we have considered as deprived.

Service delivery

The indicator comprises four indicators: distance from the nearest health care centre, waste disposal method, access to electricity and water supply and quality. The goal is to evaluate access to such basic services, which in Bhutan are usually provided by the state.

In health services, people with less than an hour's walk to the nearest health centre are considered to have sufficient access. In cities, access is attained but crowding can lead to waiting. If households report disposing of trash by either 'composting', 'burning' or 'municipal garbage pickup' they are non-deprived. On the other hand, if the response is 'dump in forests/open land/rivers and streams' then they are deprived. As access to electricity is at the forefront of Bhutan's objectives, respondents who answer 'yes' to the question of whether their house has access to electricity are considered non-deprived. The improved water supply indicator combines information on access to safe drinking water with information on the perceived quality of drinking water. An improved facility would include piped water into a dwelling, piped water outside of a house, a public outdoor tap or protected well. For the perceived quality of water, the threshold has been set to 'good' or 'very good'. Both conditions need to be fulfilled in order to be sufficient in water.

Overall, a person is classified as having achieved sufficiency in service delivery if they enjoy sufficiency in each of the four elements. About 41 per cent have achieved that condition.

Government performance

The indicator pertains to people's subjective assessment of the governments' efficiency in various areas. To test people's perceptions of overall service delivery in the country, respondents are asked to rate the performance of the government in the past 12 months on seven major objectives of good governance: employment, equality, education, health, anti-corruption, environment and culture. These outcome-based questions enable respondents to rank

the services on a five-point scale from 'very good' to 'very poor'.[15][16] The overall indicator has a maximum value of 35 and minimum value of 7.

A threshold of 28 was adopted, which means that a person has to perceive that public services are 'very good' or 'good' in at least five of the seven objectives. With this threshold, about 78.8 per cent are considered to have achieved sufficiency.

vii. Community Vitality

The concept of GNH includes the social capital of the country, which is sustained through co-operative relationships and social networks within the community. A vital community can be described as a group of people who support and interact positively with each other. The concept outlined here also reflects GNH values and Bhutanese moral beliefs.

From a GNH standpoint, a community must possess strong relationships amongst the community members and within families, must hold socially constructive values, must volunteer and donate time and/or money, and lastly must be safe from violence and crime. It is vital that volunteering and donations of time and money be recognized as a fundamental part of any community development. The values can act as tools through which activities can be implemented for positive change in communities. The indicators in this domain cover four major aspects of community: 1)

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[15] There are numerous studies which have used different stages of performance indicators such as input, output, outcome etc. (Boyne and Law 1991; Sorber 1993; Duckett and Swerissen 1996; Hedley 1998; Stone and Cutcher-Hershenfeld 2001). A strong association between subjective and objective indicators for outcome performance indicators has been confirmed by Torenvlied and Akkerman (2009) in their multi-stage performance indicator research paper. For Bhutan, the performance index is based on outcome indicators.

[16] The response category also has the option of 'don't know' which has been re-categorized into mid-value 'average' which is considered a deprived category. This has no major impact on the results since individuals are expected to have some knowledge of the functioning of the institutions and so 'don't know' is inherently deprived.

social support which depicts the civic contributions made 2) community relationship, which refers to social bonding and a sense of community 3) family relationships, and 4) perceived safety.[17]

Social support

These indicators assess the level of social support in a community and its trends across time. They capture the giving of time and money (other goods in previous olden days) - volunteering and donating – is a traditional practice in Bhutanese societies. To capture the rate of volunteering, respondents were asked for the number of days they volunteered and for the amount they donated. Donation is expressed in the total amount of financial resources donated in the past 12 months and volunteering is measured by the days donated in the past 12 months.

For donation, giving 10 per cent of household income is considered sufficient, and for volunteering, three days per year is considered sufficient. These thresholds have been derived at from normative criteria. Overall, if persons donate 20 per cent of their income, then even if they do not volunteer it is considered sufficient and if they volunteer more than six days, but do not donate 10 per cent of their income, it is also considered sufficient. With these conditions applied, overall, 46 per cent are sufficient.

Community relationships

The two components of this indicator are 'a sense of belonging' which ranges from 'very strong' to 'weak', and 'trust in neighbours' which ranges from 'trust most of them' to 'trust none of them'. Both indicators have options of 'don't know'. Seventy-one per cent have a very strong sense of belonging, 46 per cent trust most of their neighbours, and 85 per cent trust most or some of their neighbours. The trust indicator may reveal the trustworthiness of the neighbours.

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[17] Similar concepts can be found in the following reports: Doolittle and McDonald 1978; Ahlbrandtand Cunningham 1979; Wandersman and Giamartino 1980; Riger and Lavrakas 1981; Bachrach and Zautra 1985; Davidson and Cotter 1986.

The thresholds here are based on normative reasons for sustaining and promoting a sense of community. The threshold for sense of belonging has been set at 'very strong' and for levels of trust 'some of them' and 'most of them' have been selected. For a person to have achieved sufficiency, both conditions have to be satisfied and 62.5 per cent of people are sufficient in both.

Family

For this indicator, six questions on a three-point scale of 'agree', 'neutral' and 'disagree' have been asked of the respondents. They are added together to form an indicator with 18 as the maximum score (high family relationships) and 6 as the minimum score (low family relationships).

A threshold of 16 is applied in order to allow 'neutral' responses in any two statements. Ninety-two per cent are satisfied in the family indicator.

Victim of crime

To assess safety in the community, respondents are asked whether they have been a victim of crime in the past 12 months. The crime indicator has a simple two-point scale of 'yes' and 'no'.

The threshold is set at 'no'. The crime statistics are low with only about 4 per cent being described as victims. Self reported victimisation however slightly underestimates victimisation when it concerns sexual offenses. In the next survey, other safety indicators might be incorporated to improve evaluation.

viii. Ecological Diversity and Resilience

Bhutan has always recognized the central role environmental factors play in human development. Pursuant to Article 5 (Environment) of the Constitution of Bhutan, every Bhutanese citizen shall '…contribute to the protection of the natural environment, conservation of the rich biodiversity of Bhutan and prevention of all forms of ecological degradation including noise, visual and physical pollution.…'

The environmental domain includes three subjective indicators related to perceptions regarding environmental challenges, urban

issues and responsibilities, and one more objective question, related to wildlife damage to crops. Like other subjective indicators, the interpretation of these indicators is clouded by different and possibly shifting frames of reference, so they are given a light weight of 10% of the environmental domain each. Indicators in this domain in particular may be reconsidered for future GNH surveys to better capture the full complexity of the ecological system.

Pollution

In order to test people's environmental awareness, a series of questions were developed to test the perceived intensity of environmental problems. Seven environmental issues of concern were shared with respondents, and their responses follow a four-point scale from 'major concern' to 'not a concern'.

They are not added into a single number but rather a conditional threshold is applied whereby an individual is insufficient if he or she has rated 'major concern' or 'some concern' in at least five of the seven environmental issues. Their reference frame is within the past 12 months; however, as with many subjective indicators, there might be errors with the reference frame and so it is not very practical to give more weight to perceptive data by fixing high thresholds. Hence, with the proposed threshold, 69 per cent are sufficient in the pollution indicator.

Environmental responsibility

The indicator attempts to measure the feelings of personal responsibility towards the environment. It is crucial to reinforce attitudes that will encourage people to adopt eco-friendly approaches and also to identify any deterioration in the current very environmentally aware views of citizens. The responses run on a four-point scale ranging from 'highly responsible' to 'not at all responsible'. When the threshold is set at 'highly responsible', 84.4 per cent are sufficient.

Wildlife

The wildlife indicator here incorporates information on damage to crops. There has been a growing concern about wildlife damage to crops in Bhutan (Choden and Namgay, 1996; Wang, Curtis and Lassoie, 2006). Wildlife damage can have catastrophic economic

consequences for farmers, especially vulnerable households; it also disrupts sleep patterns and may create anxiety and insecurity. A simple self-reported estimate is used as a proxy for quantitative assessment. Two simple questions on the presence and absence of damage and the severity of damage are applied to determine the impact of wildlife damage on agriculture.

The first question deals with whether respondents consider it as a constraint to farming. Responses are given on a four-point scale ranging from 'major constraint' to 'not a constraint'. The threshold has been set at 'minor constraint'. The second indicator pertains to the severity of damage, i.e. crop loss. Respondents are asked to provide an average perceived degree of crop lost, if the crop had been damaged by wildlife. It ranges from 'a lot' to 'not at all'. For both the indicators the reference frame is the past 12 months.

The threshold is fixed such that respondents are deprived if they report either 'some constraint' or 'major constraint' and account for a crop loss of 'a lot' or 'some'. The lack of actual numeric amounts or percentages of actual crop loss may give rise to errors so both conditions have to be fulfilled. With this threshold, 57.9 per cent of the respondents attain the sufficiency condition.

The wildlife indicator is rural-specific since it pertains to farmers. Individuals from other occupational backgrounds such as civil servants or corporate workers are classified as non-deprived. The rural-specific indicator is later offset by the urban issue indicator which in turn applies to urban dwellers only.

Urban issues

Bhutan is undergoing a rapid urbanisation resulting in the growth of city and town populations. Since this has both positive impacts on human wellbeing (such as improvement in energy, health care, infrastructure) and negative effects (congestion, inadequate green spaces, polluted ambience) these adverse impacts on wellbeing have been incorporated into the GNH index. Respondents are asked to report their worries about four urban issues: traffic congestion, inadequate green spaces, lack of pedestrian streets and urban sprawl.

The threshold is set such that a person can report any one of the issues as major threat or worry to be sufficient. About 84.4 per cent achieve sufficiency; this is in part because people who live in rural areas have been automatically classified as sufficient, to offset the wildlife damage indicator introduced above. This indicator mainly acts as a proxy for sustainable urban development which is one of the major objectives of the government.

ix. Living Standards

The living standards domain refers to the material wellbeing of the Bhutanese people. It ensures the fulfilment of basic material needs for a comfortable living. Over the years, the material standard of living has risen steadily due to advances in development. However, about 23.2 per cent (Royal Government of Bhutan, 2007) of Bhutanese still live in income poverty; some lack assets such as land or adequate housing.

There are a wide range of indicators used in the literature to assess standards of living. For individual-level analysis, the actual consumption of goods and services is often argued to be the most accurate. Income and expenditure levels are often used if consumption is difficult to detail. Here, we use three indicators to assess people's standards of living: household per capita income, assets and housing conditions. Assets include livestock, land and appliances, while housing conditions pertain to room ratio, roofing and sanitation. These are included so that there are enough complementary measures for self-reported household income.

Household income

Household income includes income earned by all the individuals in a household from varied sources within or outside of the country. The household income here has been adjusted for in-kind payments received.

In the literature, two types of thresholds are generally used, either a fixed threshold like a poverty line or relative thresholds such as mean or median income. The poverty line for Bhutan is Nu. 1,096.94 per person per month in the Poverty Analysis Report (Royal

Government of Bhutan, 2007).[18] The mean household per capita was generated by dividing the household income by household size, without equivalence scales. In Bhutan Living Standards Survey (BLSS) 2007 it was Nu. 31,834.30. When a poverty line threshold (Nu. 1,096.94) was used on individual income, the headcount estimation made by the Poverty Analysis Report (Royal Government of Bhutan, 2007) was 23.2 per cent.

For the GNH index, it would not be sensible to use the poverty line as a threshold because the threshold should reflect sufficient income. The GNH living standards domain refers to higher conditions for wellbeing than poverty lines. One option would be to use a relative income threshold for the sufficiency threshold, as is commonly done in European countries. Thresholds like 60 per cent of the median or 50 per cent of mean income are often used to identify poverty.[19]

Yet for the GNH indicator an absolute sufficiency threshold was chosen, since the GNH values and encourages people to achieve happiness through their accomplishments, and discourages a relative approach in which one is satisfied only if one has relatively more income (or other achievements) than one's peers. In this regard, a threshold is computed from a GNH data- adjusted poverty line[20] by the multiplying the national poverty line by 1.5. It would have amounted to Nu. 14,200 per person per year in the BLSS 2007

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[18] The poverty line given here is a measure for absolute poverty developed by the National Statistical Bureau of Bhutan in 2007 and is based on food and non-food needs.

[19] See for example, Gordon (2006) and Hillyard et al (2003).

[20] The GNH data poverty line has been adjusted for the difference in the medians between BLSSR data and GNH data. Poverty line for GNH data = Poverty line (PAR 2007)*Median (BLSSR data)/Median (GNH data)

data.[21] The income threshold classifies 54 per cent of people as sufficient.

Assets

An asset indicator has been used as an indicator of living standards in many studies (Montgomery *et al* 2000; Morris *et al* 2000; Filmer and Pritchett 2001; Case *et al* 2004).[22] The indicator uses data on selected household assets, such as durable and semi-durable goods of everyday use, to describe household welfare. The concept is based on evidence that income/expenditure measures are incomplete measures of the material wellbeing of households especially in developing countries where such data may have higher measurement errors. The studies found that the asset indicator was robust, produced internally coherent results, and was consistent with financial means. Further, asset data were found to be more reliable and easier to collect.[23] However, it is necessary to note that the items of the indicator are taken from a generic list of goods, the uses of which may not be the same across all household members, and quality aspects of the goods owned were not included.

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[21] The questionnaire for income and expenditure in the GNH Survey differed from the BLSS, and the GNH data had different median and mean values from the BLSS as well as different district rankings by poverty and average per capita income. As a result, in the income indicator, we implemented the sufficiency threshold of 1.5 times the poverty line in the original BLSS 2007 dataset, to obtain the percentage of people who enjoyed sufficiency in income. We then mapped the same percentage onto the GNH income per capita data. In using the percentage from BLSS data we are assuming that the distribution in both surveys is equivalent and that the percentage of people who enjoy 1.5 times the poverty line in 2010 is the same as in 2007, both of which are strong assumptions.

[22] The asset index developed by Filmer and Pritchett (1999) has been used in Demographic and Health Surveys (DHS) to estimate reasonable wealth effects.

[23] Enumerators of the GNH surveys pointed out that the asset index was more accurate since it's easier for respondents to reflect on their ownership than on income. Additionally, enumerators could confirm the ownership by actually seeing goods in the household. So, the asset index is less likely to contain reporting bias.

Commonly, asset indicators are defined by appliances such as a mobile phone, radio or TV or bicycle; however, because of the socio-cultural context, livestock and land ownership were also considered assets. Livestock is understood as an integral component in agricultural and rural economies in Bhutan. Most farming is still subsistence farming, and the difficult terrain makes it challenging to use modern equipment. Thus, the work must be done by animals and humans. Moreover, animals provide households with transport, fertilizers and foods and also employment. So, it is a critical asset especially for poor households. Similarly, land ownership is particularly relevant for rural agricultural-based economies. In some of the focus group participants' perceptions, a decent living standard always included livestock and land ownership.[24]

The asset indicator is created consisting of three major components: 1) appliances (mobile phone, fixed-line telephone, personal computer, refrigerator, colour television and washing machine) 2) livestock ownership and 3) land ownership.

The thresholds are applied at two levels: they are set initially on each of the three indicators and then later, an overall threshold is applied to classify insufficiency in the asset indicator.

For a measure of appliances, a series of household items that could be considered amenities for the family was developed. Principal component analysis has been used to determine the selection of appliances. The first factor explained 80 per cent of the variance and contained six appliances – mobile phone, fixed-line phone, personal computer, refrigerator, washing machine and colour television. The mobile phone could be dropped from the list of appliances since, in general sense, the utility is marginal and limited to the one who owns it. For the other appliances, the scope of functional utility is much wider and other members of the household might have access. However, in rural areas if a household owned a mobile phone then that would imply that every household member had some access to it. Moreover, fixed-line phones are being replaced by mobile phones

[24] The analysis is based on focus group discussions conducted by Sabina Alkire, Tshoki Zangmo and Tshering Phuntsho in Wangdiphodrang and Punakha in 2011.

even in urban areas; only 21 per cent of urban households now have fixed-line phones. So, in the end, all six items loaded in the first factor were considered for the asset indicator. The sufficiency threshold was set to three and 31 per cent are sufficient in appliances.

It is widely known that livestock constitute an important source of income, especially in rural areas and nomadic areas of the country. They contribute to a household's livelihood by providing cash income or in-kind income through the sale of animal products or animals themselves and thereby act as savings for future security. Although the importance of including livestock as an asset is generally agreed upon, setting a threshold becomes challenging because of the difference in the capital and maintenance costs of different species, which are usually higher for larger ruminants. Larger ruminants require more fodder while smaller domestic animals, such as chickens, can survive on a lesser amount. And so, based on the rates of an average domestic purchase, a threshold is defined. It was observed that an average price of 40 chickens would be equivalent to the average rate of others. Ownership of chickens has been reclassified accordingly. In terms of thresholds, Bhutan's national MPI (2010) sets it at three, but for the GNH index it has to be set higher. And so, livestock has been set to five normatively. About 41.3 per cent of the respondents are sufficient in livestock.

The data on land were collected in the categories of dry land and (un-terraced); wetland (irrigated and terraced); *panzhing,* which is a type of land use where land is cultivated after leaving it fallow to improve soil fertility; orchards; kitchen gardens; and *tseri*, which refers to shifting cultivation. Although the Land Act of 2007 banned *tseri* cultivation, the survey shows about 14.4 per cent of the respondents still practice it. The average land holding is 2.9 acres per household (SD =3.6). The average rural land holding is 3.39 acres per rural household, and for urban areas it is 0.86 acre per household.

In setting the sufficiency cutoff for land, there are numerous factors that need to be taken into consideration such as quality of land, household size, area and type of farming practices and sources of other income. The household size plays a role as smaller families might require smaller land holdings and larger families might need

more land. The region of location is also a huge determinant since an agriculture-based economy usually requires more land holdings. Lastly, the type of farming must also be considered, for instance whether the land is being used for crops or orchards or just as pasture for animals and also whether the particular household has other sources of income. Given the wide range of factors that require equal attention, it is challenging to set a threshold that fulfils all these conditions.

The focus group discussions carried out in some districts concluded that five acres was the threshold for a rural farming household with an average family size of five. It was decided that for farming-related activities an average of five acres would be sufficient to grow crops or fruits or for livestock management. The land asset is included to reflect assets for rural areas, and so understanding land ownership in rural areas is pertinent for setting the threshold. In rural areas, only 26 per cent of households have five or more acres of land, while about 44 per cent have three or more acres of land. For the Multidimensional Poverty Index (MPI) of Bhutan 2010, the threshold was set to one acre, but the GNH index is not a poverty measure and so a minimum threshold cannot be applied. The average household size in rural areas is 4.7, and the sufficiency threshold for an average land amount was normatively set to five acres. About 22 per cent are sufficient; however, note that the GNH also includes urban dwellers whose income comes mostly from employment, so they would be regarded as deprived in this sub-indicator (but not necessarily overall as we see below).

The final threshold across the three assets is applied so that if a household possesses sufficiency in appliances *or* livestock *or* land then the household is classified as being sufficient in assets overall. This implies that any one condition of the three can be satisfied to be in order to be labelled non-deprived. This threshold was selected based on its flexibility to incorporate individuals from diverse occupational backgrounds, as well as from varied areas of residence. For example, livestock and farm land may not be very relevant to a person who is employed in a service occupation but may be particularly valid in remote areas. It must be understood that the objective of an asset indicator is to supplement information income with some crude indicator of wealth. Asset indices may move more

slowly than income and expenditure. This gives rise to data reliability issues for GNH index analysis attempting to capture trends in wellbeing over time. This requires not only that we interpret results with due caution but that we also keep in mind the complexities of combining the three assets together. However given the issues with the income data mentioned above, both indicators were included to improve accuracy. Application of the overall conditional threshold identifies 74.1 per cent of Bhutanese to have achieved sufficiency.

Housing quality

The domain is incomplete without including an indicator of housing conditions. The benefits of good housing can be observed from both an individual as well as from a community perspective. On the individual level, having one's personal space is considered fundamental for one's biological, psychological and social needs since it is a place where most spend a significant part of their everyday lives.[25] Studies show the critical impacts that poor quality, overcrowded and temporary accommodation can have on an individual's physical and mental health.[26] From a community standpoint, aspects such as combating social exclusion and discrimination and strengthening social cohesion cannot be achieved unless there are proper living spaces and a decent standard of accommodation. Studies show strong associations between the likelihood of criminality and educational attainment (Lupton and Power 2005; Fagan and Davies 2007; Friedman 2010). Overcrowded accommodation, which is based on the number of rooms and number of household members, can lead to family disintegration, weakening community ties and is considered to give rise to a variety of social ills. Therefore, insufficient housing conditions can pose a

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[25] Many studies have confirmed that good housing is at the top of the hierarchy of human needs (Burns and Grebler 1986; Kiel and Mieszkowski 1990).

[26] These are just some of the studies that show the impact of housing quality on welfare. For example, Housing, Health and Climate Change: Developing Guidance for Health Protection in the Built Environment: Mitigation and Adaptation Responses, World Health Organisation (2010)

threat to not only the wellbeing of individuals but also the community at large.

The quality of housing is composed of three indicators: the type of roofing, type of toilet and room ratio. The thresholds have been set based on the Millennium Development Goals such as corrugated galvanized iron (CGI) or concrete brick or stone for roofing, pit latrine with septic tank for toilet and two persons per room for overcrowding, and all three conditions must be met. So, overall an individual is sufficient in housing if he or she lives in a house that has a good roofing structure (CGI or concrete brick or stone), a pit latrine with a septic tank, and uncrowded rooms. In reality, having a higher quality roof may by far outweigh toilet condition as far as housing quality is considered. With the stated threshold, about 46.2 per cent are sufficient in housing quality.

III. Weighting

The nine domains of GNH are equally weighted. This is because they are of equal importance, none can be permanently ranked as more important than others but each might be particularly important to some person or some institution at a given point in time. The 33 indicators are roughly equally weighted but the subjective and self-report indicators have lighter weights and the indicators which are anticipated to be more objective and/or more reliable have relatively higher weights when the domains mix subjective and objective indicators. There are equal weights among all indicators in three dimensions: psychological well-being; time use and living standards.

In three domains, health, good governance, and ecological diversity, subjective indicators receive only 10% of the weight of the domains and the other indicators within those domains are equally weighted. The five indicators which receive 10% weight of their respective domain each, because they are subjective, are as follows: in the domain of health – self reported health status; in the domain of governance – governance performance and fundamental rights; and in the domain of ecological diversity and resilience – responsibility towards the environment and perceptions of ecological issues. In the last three domains, education, culture and community, self-reported indicators are weighted at 20% each and the other indicators are weighted at 30%. In education, the two self-report based indicators are knowledge and values. In cultural diversity and resilience, the two self-report based indicators are speaking a native language and *DriglamNamzha*. And in community vitality the two self-report based indicators are community relationships and family relationships.

Domain	Indicators	Weight	Domain	Indicators	Weight
Psychological wellbeing	Life satisfaction	33%	Time use	Work	50%
	Positive emotions	17%		Sleep	50%
	Negative emotions	17%	Good governance	Political participation	40%
	Spirituality	33%		Services	40%
Health	Self reported health	10%		Government performance	10%
	Healthy days	30%		Fundamental rights	10%
	Disability	30%	Community vitality	Donation (time & money)	30%
	Mental health	30%		Safety	30%
Education	Literacy	30%		Community relationship	20%
	Schooling	30%		Family	20%
	Knowledge	20%	Ecological diversity & resilience	Wildlife damage	40%
	Value	20%		Urban issues	40%
Cultural diversity & resilience	Zorig chusum skills (Thirteen arts & crafts)	30%		Responsibility towards environment	10%
	Cultural participation	30%		Ecological issues	10%
	Speak native language	20%	Living standard	Per capita income	33%
	Driglam Namzha (Etiquette)	20%		Assets	33%
				Housing	33%

Table 3: *Respective weights of 33 indicators*

In this way the weighting on the indicators tries to both preserve accuracy and also to prevent future GNH indices being too affected by changes in the frame of reference or changes in the aspirations of people which might affect their subjective or self-report indicators. However these are difficult decisions to make. Many indicators in the GNH survey could be argued to be self-report based. Indeed to some extent all could be self-report based indicators. However we have tested the GNH index robustness to changes in these weights and those results which are presented later show that it is relatively robust for policy purposes for small changes in the weighting structure.

IV. Thresholds

The GNH index uses two kinds of thresholds or cutoffs: sufficiency thresholds, and one happiness threshold. Sufficiency thresholds show how much a person needs in order to enjoy sufficiency in each of the 33 cluster indicators. It asks how much is enough to be happy. Each of the 33 cluster indicators has a sufficiency threshold and each person in the survey is identified as enjoying sufficiency or not in each indicator. How are these sufficiency thresholds set? Who decided?

There were different inputs to calibrate these decisions. Some use relevant and appropriate international standards e.g. for hours of work, and overcrowding in a house. Some use national standards e.g. a sufficiency income is equivalent to 1.5 times the income poverty line for Bhutan. For other indicators there wasn't a literature or precedent in Bhutan or internationally to set sufficiency thresholds. For this reason, some rely on normative judgements. This is because GNH is innovative and there are no international or national standards for these indicators e.g. for positive emotions. In this case, the GNH thresholds are based on normative judgements which have been shared and discussed in consultative sessions. The final and important inputs were participatory meetings. The Centre for Bhutan Studies held consultative conversations with different institutions and leaders in government, and focus group discussions with communities in different rural areas and sought their input, checking with them the thresholds on test or trial GNH indices while the final GNH index was still being finalized. And their insights proved very useful but also drew attention to the fact that no one set of thresholds will be accurate across all people in Bhutan. And that is why it is very important to have a second cut-off, of a sufficient happiness threshold which allows for a lot of variation between people, based on their own personalities and aspirations as well as on their material, community and climactic circumstances. All of the indicators with their cut-offs will not be equally meaningful or relevant in the many varied contexts of Bhutan – but they need not be. The second threshold permits diversity.

In reporting the GNH, we divide the population into four sub-groups by applying three cutoffs, which refer to people who have achieved sufficiency in 50%, 66%, and 77% of the weighted

indicators. This enables us to identify the unhappy, narrowly happy, extensively happy, and deeply happy. We can analyse each of these groups' achievements separately. For each person, we have their personal profile of achievements across all 33 cluster indicators, and these profile provide a rich basis for analyses of these four different GNH Groups – the indicators and dimensions in which they lack sufficiency, and how these change by gender, region, age, and occupation.

To calculate the GNH index, we choose one threshold or cutoff. We could choose the lowest cutoff in which case we would find that only 10% of Bhutanese were unhappy. However this would restrict the policy focus to a small set of the population, leaving the rest unsupported. So instead, we choose the middle happiness cutoff of 66%. Thus the not-yet-happy group includes both those who are unhappy and those who are narrowly happy – a total of 41% of people. Our analysis of how to 'increase GNH' focuses on increasing the sufficiency of these groups.

This middle cutoff is referred to as the happiness threshold or cutoff. It is set across the 9 domains and the 33 cluster indicators. The question that it asks is "how many domains or in what percentage of the indicators must a person achieve sufficiency in order to be understood as happy"? Here it is important to acknowledge that this approach is an experiment. Happiness is a very deeply personal experience and any measure of it is necessarily imperfect. The index is offered to the people of Bhutan for understanding, discussion and debate to see if it frames and captures their understandings and how this might change or be improved.

The happiness threshold was set based on three criteria. The first is diversity as not all of the indicators have universal applicability. It may not be necessary to have sufficiency in all of the indicators to be happy e.g. a person who is very old might not need sufficiency in education indicators in order to be happy. They might have other members of their family who can read for them or explain things that require a formal education and their wisdom and skills may suffice for their own happiness. Some people, such as atheists for example, may not participate in prayer recitation or meditation.

The second is measurement error. Responses might not be completely accurate about peoples' values in different cultures – for example, people may be hesitant to say what exactly their beliefs or practices are for fear of seeming proud or ostentatious. Because of the difficulty of allowing for these differences, (as it is done in poverty measures) it seemed reasonable not to require sufficiency in every domain.

The third and last criterion is freedom of choice. Many people are fully happy without achieving sufficiency in every single indicator. Maybe they are not healthy but they have achieved a kind of flourishing, fulfilment and richness of life that is important. Maybe they are illiterate or have material challenges but that need not necessarily be decisive for their happiness. Thus to allow some freedom of choice we have set the happiness threshold at 66%.

V. Methodology

The GNH itself is constructed using the Alkire-Foster method (2007, 2011) for measuring multidimensional concepts such as poverty, wellbeing or inequality (see Appendix for the formal methodology). It is a robust method which identifies a group – in this case those people who are not-yet-happy (vs. those who are happy) by considering the 'sufficiencies' they enjoy. It is a flexible method which has been fully tailored to the needs and context in Bhutan. This includes identifying the happiness gradient – the four population subgroups according to the percentage of weighted indicators in which they have sufficiency.

Like other measures in the Alkire-Foster family, the GNH Index is created from two numbers:

i. **Headcount ratio:** % of people who are happy
ii. **Breadth:** % of domains in which people who are not-yet-happy enjoy sufficiency (this is similar to "intensity" in poverty measures using the Alkire-Foster method)

To construct the GNH Index using this methodology six steps are followed:

1. Choose indicators
2. Apply sufficiency thresholds (who has enough)?
3. Apply weights for each indicator
4. Apply the happiness threshold
5. Identify two groups:
    a. Happy people (extensively and deeply happy)
    b. Not-yet-happy people (policy priority) (unhappy and narrowly happy)
6. Identify among the not-yet-happy people, what percentage of domains they lack sufficiency, and in what percentage they enjoy sufficiency.

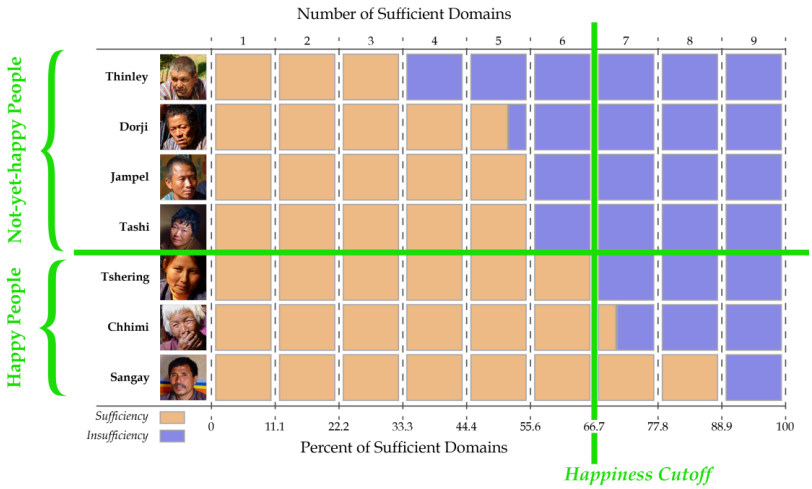

Figure 2: *Identifying who is happy according to the GNH*

Figure 2 uses an illustrative sample of 7 people with 9 domains to show how step 5 works in practice.[27] The people at the top have sufficiency in the fewest domains, while those at the bottom have the most.

How do we move from this picture to the GNH? Here 4 out of 7 people are not yet happy – 4/7 = 57%, while 3 out of 7 people are happy – 3/7 = 43%. Once we have this figure, to compute the GNH Index, we only need to know one more thing: Among the not-yet-happy people, what percentage of domains do they enjoy sufficiency?

[27] Note that this is a simplification: the actual calculation uses 33 indicators and calculates an individual deprivation profile based on these rather than only 9 domains, but the same principles apply.

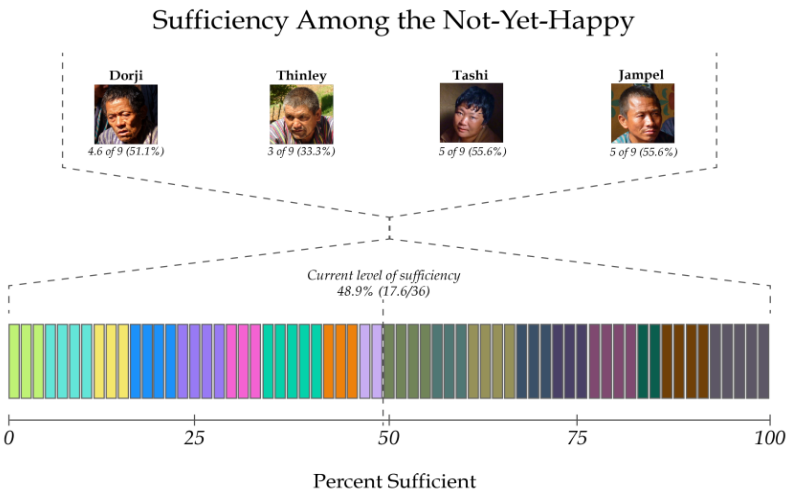

Figure 3: *Calculating the % of domains in which not yet happy people lack sufficiency*

Figure 3 shows how we arrive at this figure. The not-yet-happy enjoy sufficiency in 48.9% of domains, and lack it in 51.1% of domains in this example.

To calculate the GNH, the data of the population are aggregated into a decomposable 'Adjusted Headcount M_0' measure that is sensitive to the 'breadth' of achievements (Alkire and Foster, 2007, 2011). M_0 is constructed by multiplying H_nA_n, where H_n represents the percentage of people who have not achieved sufficiency in 6 domains thus are identified as not-yet-happy, and A_n is the average proportion of dimensions in which those not-yet-happy people lack sufficiency.

The Adjusted Headcount ranges in value from 0 to 1, with larger numbers signifying greater insufficiencies and less happiness. In order to create the GNH Index in which a higher number reflects greater happiness, the Adjusted Headcount is subtracted from 1 to obtain the GNH. Therefore, GNH = 1- H_nA_n.

The GNH Index formulae can also be written GNH = H_h + (H_n x A_s), where H_h are the percentage of happy people [H_h = (1 - H_n)] and A_s is the percentage of dimensions in which the average not-yet-happy

person enjoys sufficiency [$A_s = 1-A_n$].[28] This way of presenting the same results focuses on happiness and sufficiency; the first presentation focuses on the not-yet-happy people and their insufficiencies. Both formulae create the same number, and both are useful in explaining the GNH Index. The GNH Index can be decomposed by population sub-groups and broken down by indicators.[29]

So returning to our example, we take the following three numbers:

1. The percentage of happy people we call H_h which is 43% in the example.
2. The percentage of not-yet-happy people H_n which is 57% in the example.
3. The percentage of domains in which not-yet-happy people enjoy sufficiency we call A_s which is 48.9% in the example.

They are then combined into a final GNH formula as follows: **$GNH=(H_h+H_nA_s) = 43\% + (57\% \times 48.9\%) = 0.7309$**

Now, to identify the happiness gradient, apply the two additional cutoffs – 50% and 77%. These enable the identification of the two additional groups.

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[28] This is a very simple re-arrangement as follows: GNH $=1-H_nA_n = 1- H_nA_n - H_n + H_n = (1-H_n) + (H_n-H_nA_n) = (1-H_n)+ (H_n)(1- A_n) = H_h + (H_n x A_s)$, since $(1-H_n)=H_h$ and $(1- A_n)= A_s$.

[29] The GNH is subgroup consistent and decomposable and satisfies dimensional monotonicity. It is related to Alkire and Foster's M_0 measures which satisfy key additional properties such as Symmetry, Scale invariance, Normalization, Replication invariance, Poverty Focus, Weak Monotonicity, Deprivation Focus, Weak Re-arrangement, as well as Dimensional Monotonicity, and Decomposability. See Alkire and Foster 2011.

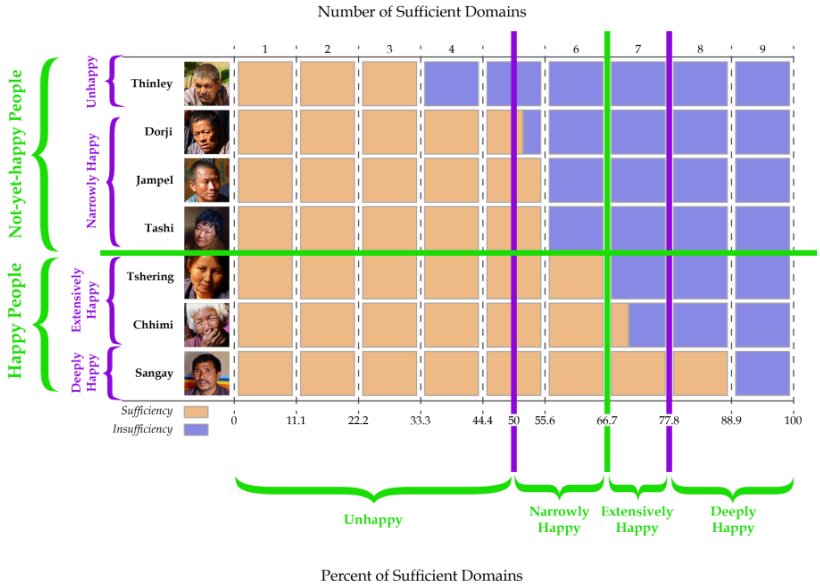

Figure 4: *Happiness gradient*

As Figure 4 shows, when we apply the 50% cutoff we find that only one person, Thinley, is unhappy. Looking between 50-65% we find three people are narrowly happy: Dorji, Jampel and Tashi. Two people have sufficiency in 66-76% of domains: Tshering and Chhimi. And finally, one person, Sangay, is deeply happy with achievements in over 77% of domains. We can compute the average sufficiency for each group also: for example, in the case of the narrowly happy people, the average sufficiency is [(4.6/9 + 5/9 + 5/9)/3] = 54%. We could also look at their composition (see Figure 23).

VI. What does the GNH Index show us?

The index provides an overall picture of how GNH is distributed in Bhutan and can also be used to zoom in to look at who is happy and those that are 'not yet happy', and to zoom further to look at unhappy, narrowly happy, extensively happy, and deeply happy. The GNH can also be unpacked in different ways to tell different stories. It can be decomposed by subgroups like Dzonkhags, age groups, gender, or some occupations. It can also be analysed by each dimension & indicator. All of these functions make it a useful tool for policymakers as they seek to address the question of 'how can GNH be increased?'

Overall, most Bhutanese enjoy sufficiency in value, safety, native language, family, mental health, urbanization issues, responsibility towards environment, satisfaction in life, government performance, healthy days and assets. Between 50-60% of Bhutanese enjoy sufficiency in ecological issues, negative emotions, community relationship, artisan skills and *DriglamNamzha*. Less than half of Bhutanese enjoy sufficiency in literacy, housing, donations, work, services, schooling, cultural participation and knowledge.

Each of the GNH indices are also reported for each of the 20 districts, by gender, by rural-urban area, and, for illustrative purposes, by age and certain occupational categories. Standard errors are presented, as are robustness tests for weights and cutoffs, measured with respect to group rankings and also, for the first time, with respect to the percentage contribution of each indicator.

VII. Understanding happiness

The GNH value is 0.743. It shows us that 40.8% of people in Bhutan have achieved happiness, even after the structure of the GNH Index requiring a wide array of conditions to be met. Those who are not happy still enjoy sufficiency in 56.6% of the domains, i.e. have sufficiency in 56.6% of the 124 weighted conditions. Happiness according to the GNH is reached when people reach sufficiency in roughly six out of the nine domains or the equivalent proportion of weighted indicators. How do the lives of happy people look?

i. Domains

Figure 5 shows how much each domain contributes to overall GNH index. We can see that all nine dimensions contribute to GNH and no domain is unimportant. However, the amount of contribution to GNH varies across domains.

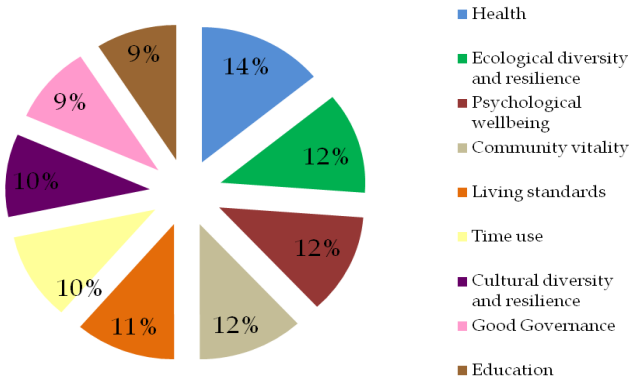

Figure 5: *Contribution of domains to GNH index*

Good health (14%), community (12%), ecology (12%), and psychological well-being (12%) contributed most to GNH of happy people in 2010. Happy Bhutanese did not necessarily have high education (9%). Nor did they score equally high in Good Governance (9%).

ii. Indicators

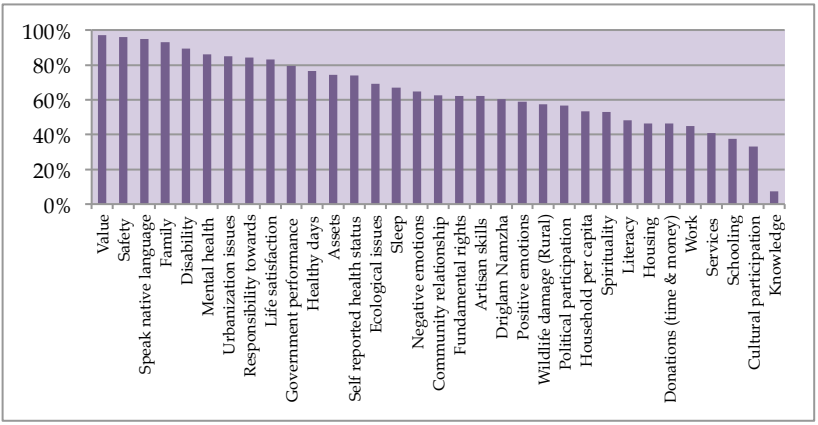

Figure 6: *Proportion of people enjoying sufficiency in each indicator*

The highest proportion of Bhutanese enjoy sufficiency in value, safety, native language, family, mental health etc. On the other hand, most Bhutanese people lack sufficiency in knowledge, participation in festivals, donations, having more than 6 years of schooling, enjoying government services, participating politically, and believing in the practice of *DriglamNamzha*.

iii. Dzongkhag (district)

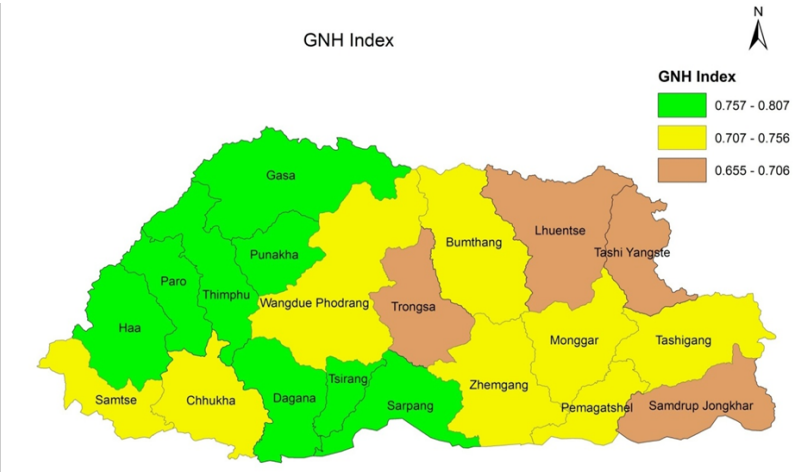

Figure 7: *GNH index score of happy people by Dzongkhag (district)*

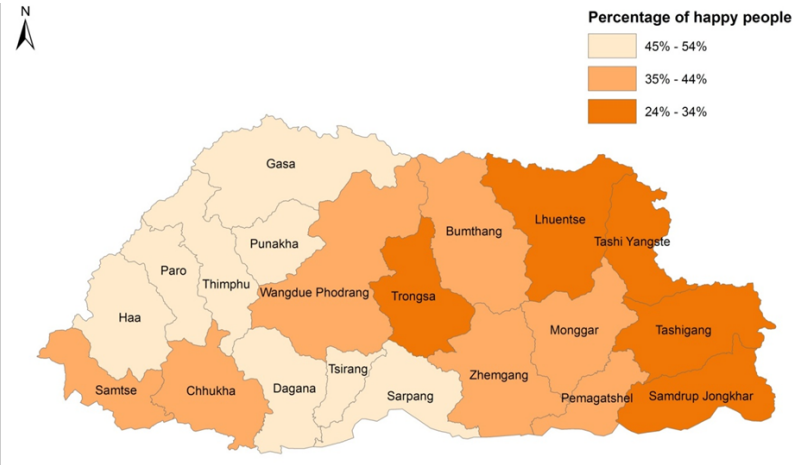

Figure 8: *Headcount of happy people by Dzongkhag (district)*

The GNH reveals a large amount of equality between the regions and the range between regions is very small. One district is probably the unhappiest – Samdrup Jongkhar.

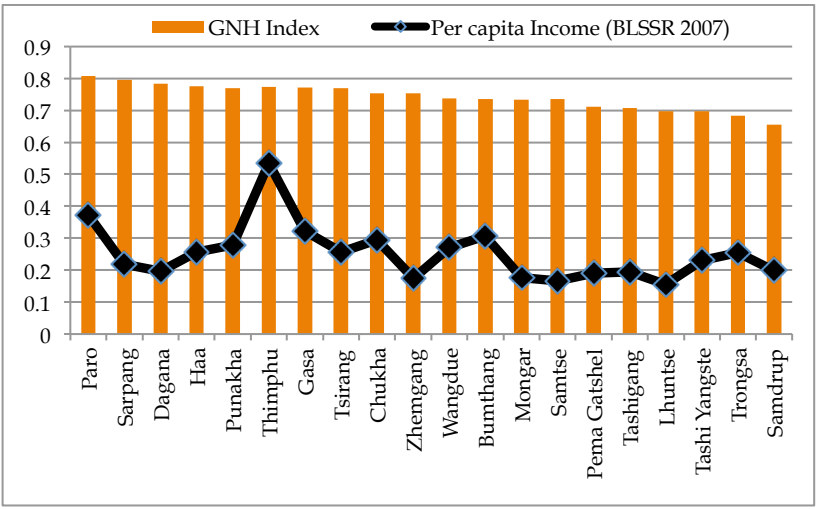

Figure 9: *GNH compared with per capita income*

GNH ranks districts differently than does per capita income. Thimphu (the capital) is not ranked highest in GNH terms yet it has the highest per capita income of any district of Bhutan. Dagana and Zhemgang do much better in GNH than on income criteria.

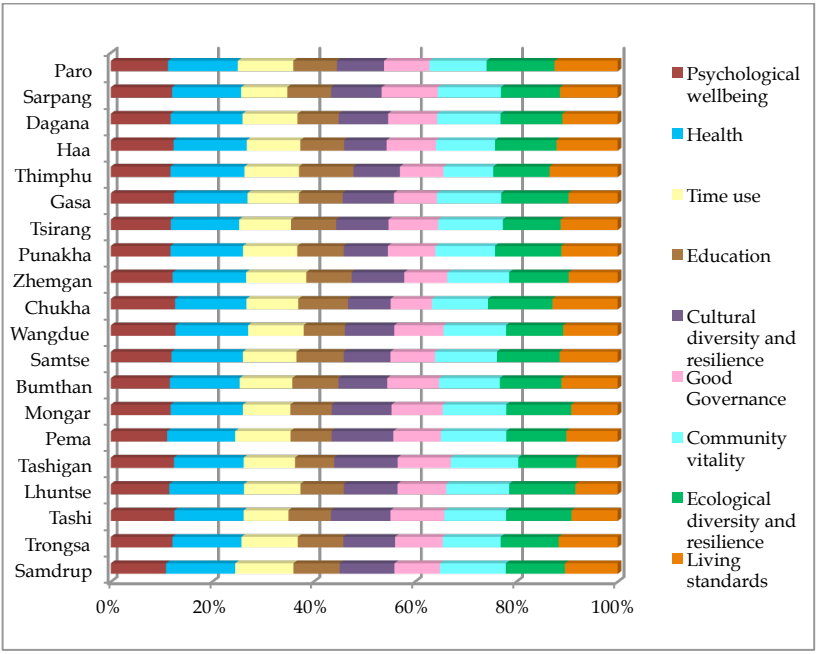

Figure 10: *How the nine domains contribute to happiness by Dzongkhag*

The composition of happiness changes somewhat across Dzongkhags. Thimphu does better in terms of education and living standards, but worse in community vitality. Thimphu and Chukha are also home to the highest number of happy people – and the highest numbers of not-yet-happy people (they are the biggest two Dzongkhags in terms of population) in absolute terms.

iv.Rural and urban populations

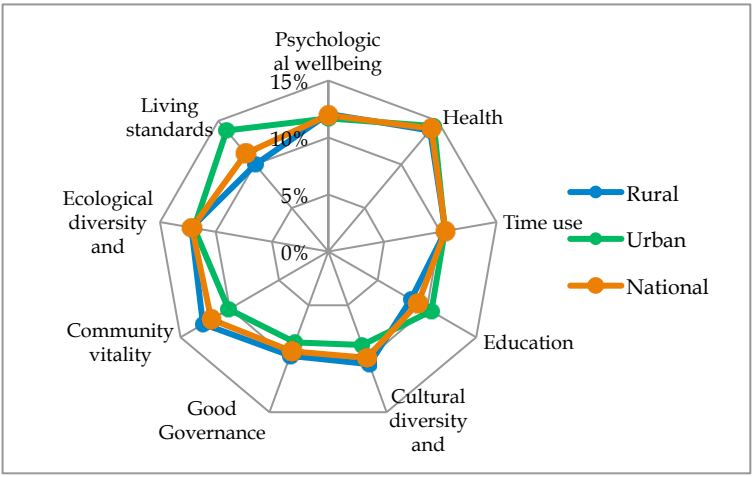

Figure 11: *Contribution of domains to happiness by region*

In general, rural people are less happy than urban people but it is rather balanced. 50% of urban dwellers are happy on GNH criteria and 37% in rural areas. The composition of happiness also differs; in rural areas, community vitality, cultural diversity and good governance contribute more to happiness. In contrast, living standards, education and health contribute more to happiness in urban areas. Urban people have insufficiency in governance, time use and culture, while in rural areas insufficiency is worst in education and living standards.

v. Gender

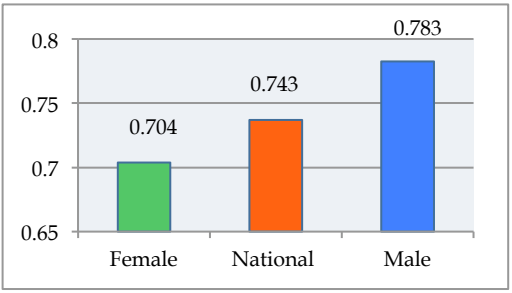

Figure 12: *GNH index by gender*

When we decompose the GNH index by gender we see that men are happier than women. 49% of men are happy, while only one third of women are happy, a result which is both striking and statistically significant. Women do better in living standards and ecology. Men do better in education, community vitality and psychological wellbeing. Men and women are about the same in health, time use, governance, and culture.

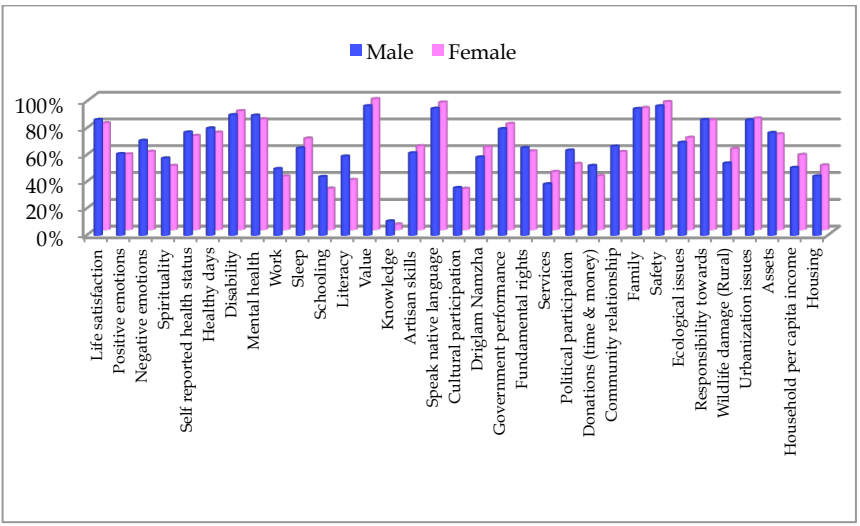

Figure 13: *Percentage of Bhutanese having sufficiency in each indicator by gender*

vi. GNH Index by Age groups

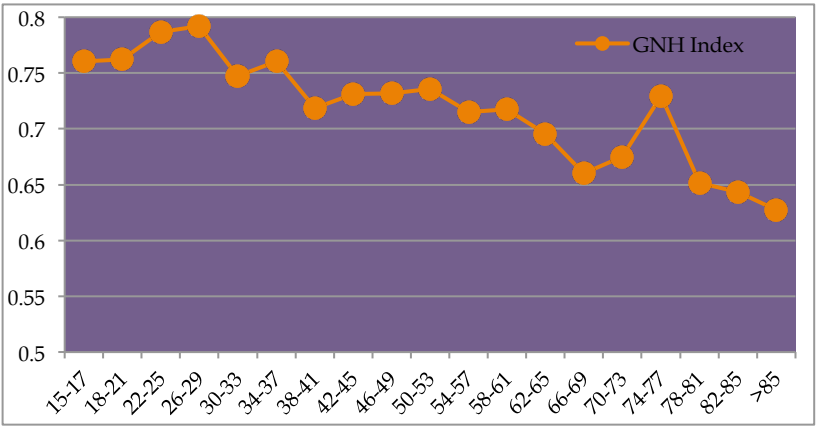

Figure 14: *GNH index score by age group*

Happiness, as measured by GNH, varies across age groups. Young people are relatively happier than the old, although the relationship is not a perfect linear (as shown in figure 14). Somewhat similar trend is also observed in case of the subjective wellbeing (see figure 15). The subjective wellbeing variable asks people to say, on a scale of zero to 10, whether they consider themselves: 0 (Not a very happy person) - 10 (Very happy person). Figure 16 shows the distribution of population by the level of subjective wellbeing. About 88 per cent of Bhutanese have rated their subjective wellbeing level of five or more on zero to 10 point scale. Interestingly, however, half of the people whose subjective wellbeing is listed at 6-10 are happy by the GNH criteria, but the other half are *not* moderately or deeply happy by the GNH indicators.

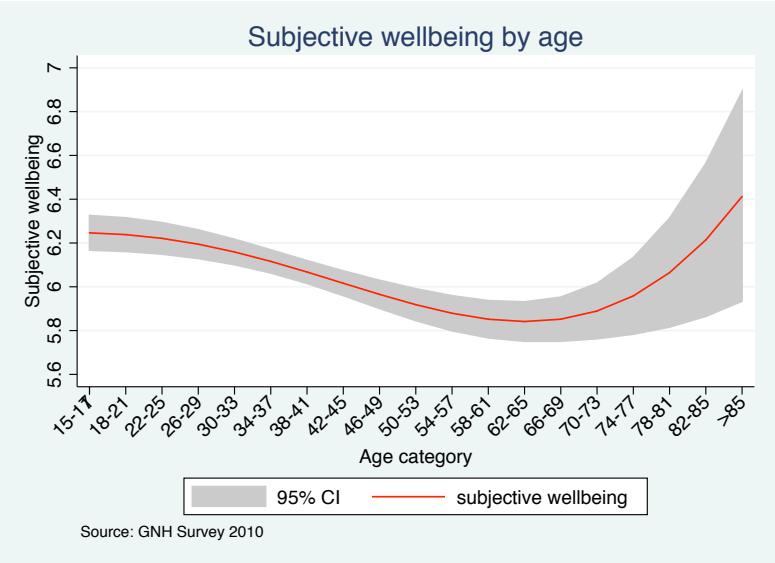

Figure 15: *Subjective wellbeing by age group*

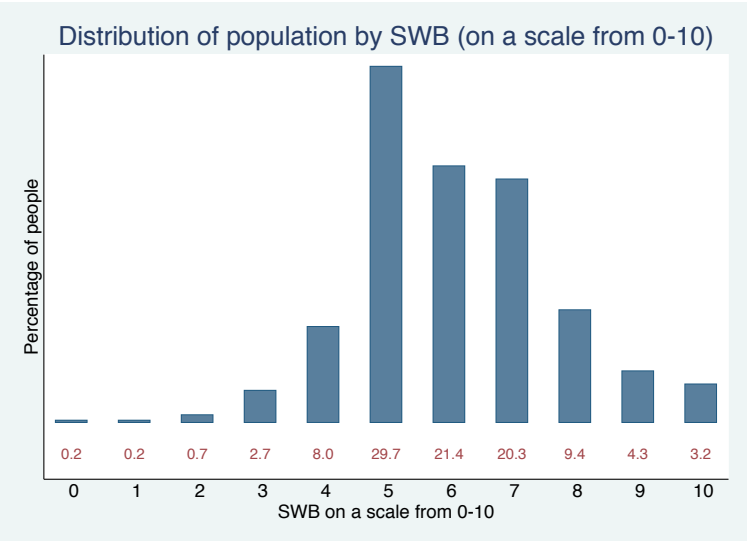

Figure 16: *Distribution of population by subjective wellbeing level*

vii. Educational level

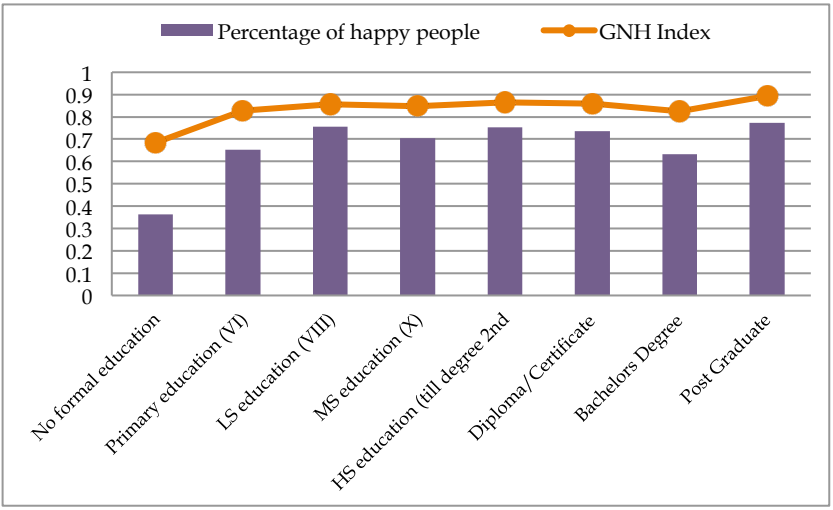

Figure 17: *GNH Index and percentage of happy people by educational level*

People who have been identified as happy by the GNH Index don't necessarily have good education. Those who are educated to post-graduate level are a little bit higher, though a lack of formal education clearly goes with lower happiness. We can also see that as education increases, contribution of living standards & education to happiness increases; governance and culture decrease.

viii. Occupation

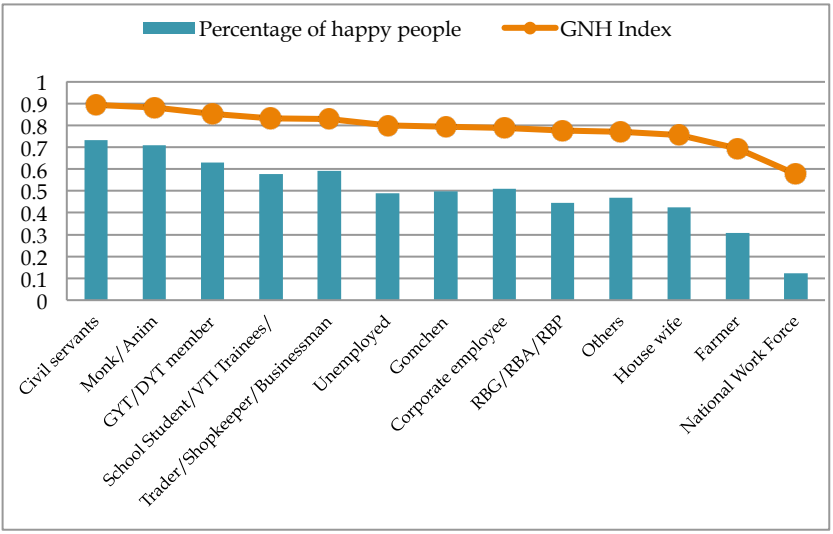

Figure 18: *GNH Index and percentage of happy people by occupational status*

The sample is not fully representative by occupational group, so the following findings are illustrative rather than robust rankings. The national work force are clearly and strongly the unhappiest group – they are often poorly paid, migrants doing manual labour such as taking care of roads. Clearly, it is the worst group followed by farmers, the biggest group in the survey.

ix. The deeply happy

Any analysis of the 'happy' people would be incomplete without a brief exploration of the subset of happy people who are identified as 'deeply happy. These comprise 8.3% of the population. Two-thirds of these are male, and one-third are female. Sixty-nine per cent of the deeply happy people live in rural areas, and 31% in urban areas – so interestingly, whilst the GNH Index is, overall, lower in rural areas, deep happiness is higher. The ages are spread from less than 20 years old to more than 65, with 59% of the deeply happy people being less than or equal to 40 years old. Deeply happy people live in

every single district of Bhutan, with the highest numbers living in Thimphu, Samtse and Chukha. Still, only 12% of the deeply happy people live in Thimphu. Eighty-four per cent of the deeply happy people are married and twelve per cent are never married; the rest are divorced, separated or widowed. Twenty-six per cent of deeply happy people have no formal education; 28% have completed primary school; and some deeply happy people pertain to the remaining categories of education. Finally, deeply happy people pertain to every occupational category except the national workforce. The highest share of deeply happy people are farmers – 34% - followed by civil servants (18%). This small snapshot of happiness across Bhutan shows that deep happiness is accessible to people of different ages, occupational categories, regions, and educational backgrounds. The fact that two-thirds of deeply happy people are men is of clear policy interest.

Deeply happy people, on average, enjoy sufficiency in 81.5% of the domains. However it can be interesting, still, to look at the domains in which even they lack sufficiency. Interestingly, there are some insufficiencies in each domain, although these are very low in health. Overall, deeply happy people have the lowest deprivations across the four groups of happiness in health, living standards, time use, and psychological well-being. They have the *highest* relative (not absolute) contributions from deprivations in governance and culture.

x. The many faces of GNH

The GNH Index, like the philosophy of GNH which motivates it, is very much a living experiment, seeking to convey more fully the colour and texture of people's lives than does the standard welfare measure of GNI per capita. It reflects the fact that happiness is a deeply personal matter and people will rarely agree on a set definition. Indeed, happiness has many faces, as the GNH survey shows. Here are the stories of just some happy people whose experiences of GNH were captured in the 2010 survey and who were identified as happy by the GNH Index.

These profiles help to enrich our understanding of happiness according to GNH and show that different groups – literate or

illiterate, urban or rural, young or old, monk, farmer, or corporate worker, can all be happy according to these models.

One such happy person in the GNH survey was a married corporate employee aged 35 living in urban Chukha. He has completed 10th class, and has achieved sufficiency in nearly all indicators. He was a bit sleep deprived, and did not feel a deep sense of belonging to his community, but was overall very satisfied with his life. When asked what contributed most to happiness he said: to be healthy, to meet basic needs, to have peace in the family, to be religious.

Another happy person whose experiences were captured in the GNH survey was a married woman farmer aged 44 living in rural Tongsa. She was illiterate, and was deprived due to wildlife damage to her crops, and thought she never felt forgiveness among the positive emotions – yet was happy. She mused that she felt happy when she was able to do her household work, when she was harvesting potatoes, and as she wove.

Another happy person in the GNH survey was a widowed *gomchen* aged 70 living in rural Thimphu. He had no formal education, and was deprived in education, housing, sleep and did not participate politically. He observed that getting good agricultural products from the land contributes to happiness.

Another happy person as defined by the GNH index is an unmarried young woman aged 26 living in urban Tashigang. She completed a bachelor's degree and is a civil servant living alone. She scores highly across domains, although she misses a sense of belonging. When asked what contributes to her happiness she replied: love, family, friends, education, and enough money.

VIII. Increasing Happiness: Policy implications

Aside from deepening our understanding of happiness, the GNH Index is formulated to provide an incentive to increase happiness. Civil servants, business leaders, and citizens of Bhutan may ask, 'how can I help to increase GNH?' The GNH Index can help them answer this question in practical ways. It also enables the Government and others to track changes over time. In general, there are two mechanisms by which public policy action can be directed so as to increase GNH; it can either increase percentage of people who are happy; or increase the percentage of domains in which not yet happy people enjoy sufficiency.

i. Insufficiencies by domain

To improve GNH we can look at people who are not-yet-happy and look at the areas where they lack sufficiency – 59% of Bhutanese are not-yet-happy, and they are deprived in roughly 4 domains each. The not-yet-happy people are more deprived in all 33 indicators than the happy people (Figure 19). The biggest deprivations are in education, living standards and time use. Among the not-yet-happy, women are unhappier than men.

Rural people are less happy than urban people although their intensities are similar. But the composition of insufficiencies vary. The urban groups have bigger insufficiencies in governance, time and culture and in rural areas the biggest problems are education and living standards. The difference here is thus in terms of the more material domains versus those that are about community, culture and spirituality. In Thimphu, the capital, for example, the biggest deprivations are in community vitality.

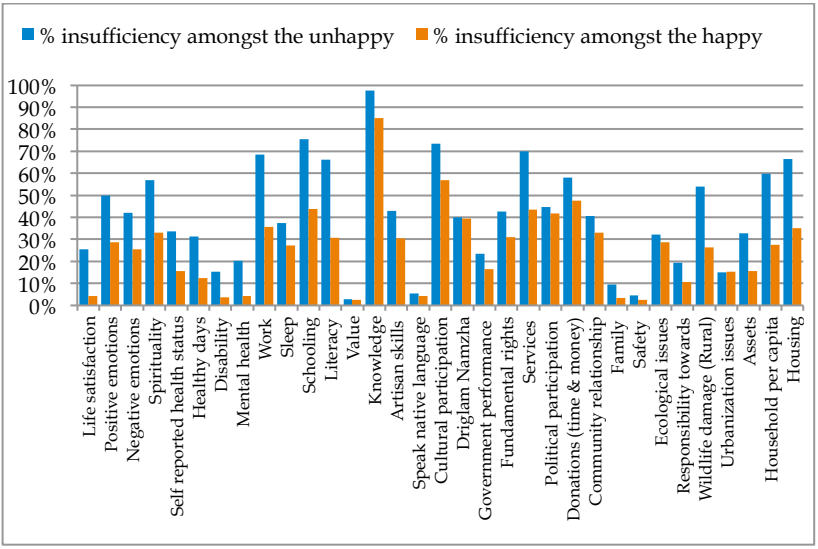

Figure 19: *Proportion of people with insufficiencies in each indicator by happiness*

Across all indicators we see that there is no indicator in which orange bars are higher than blue – none in which 'happy' people have more insufficiency than not-yet-happy. Looking at psychological well-being, health, and time use, we see that the 'not-yet-happy' always have higher insufficiency. In education, culture, and governance, the groups are least different in Value, Language, *DriglamNamzha*, and Political participation. Both have highest deprivations in education. In community, ecology, and living standard, the strong differences are in wildlife damage and in living standard indicators. Happy and not-yet-happy people's insufficiencies in community and ecology are otherwise rather close and in urbanization, almost equal.

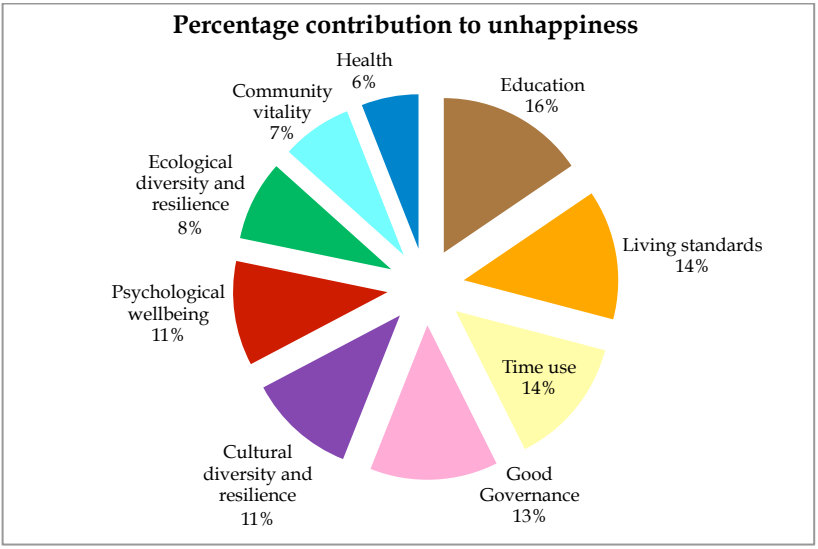

Figure 20: *Contribution to happiness*

Health is the lowest contributor to unhappiness followed by community vitality. Education is the highest contributor to unhappiness. We can also break apart each domain to see where the biggest sources of unhappiness are coming from among the indicators.

Figure 21 illustrates this for the education domain. The highest insufficiency is in the knowledge indicator. Bhutanese experience low levels of knowledge in cultural & historical aspects of the country & in health and politics.

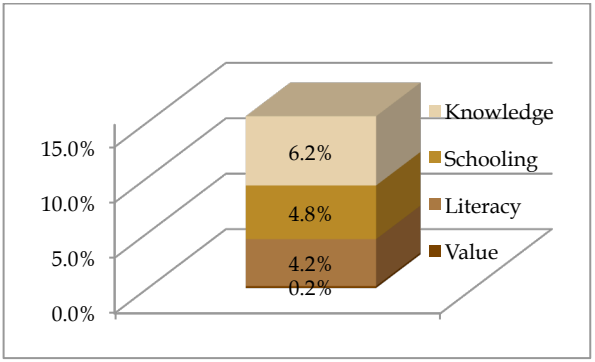

Figure 21: *Contribution of Education indicators to unhappiness*

ii. Who can increase GNH?

Increasing happiness is not only the business of government. The GNH requires civil servants, people in their personal lives, business leaders and others to ask how they can increase the GNH. It tries to offer the index as a public good. His Majesty the King Jigme Khesar Namgyel Wangchuck clearly mentions that:

> *Our nation's vision can only be fulfilled if the scope of our dreams and aspirations are matched by the reality of our commitment to nurturing our future citizens.*

The people who are not-yet-happy are an important policy priority and thus it is important to look at the areas in which they enjoy sufficiency and the areas in which they still lack sufficiency. Government, monasteries, communities and individuals and households efforts can contribute to increasing GNH.

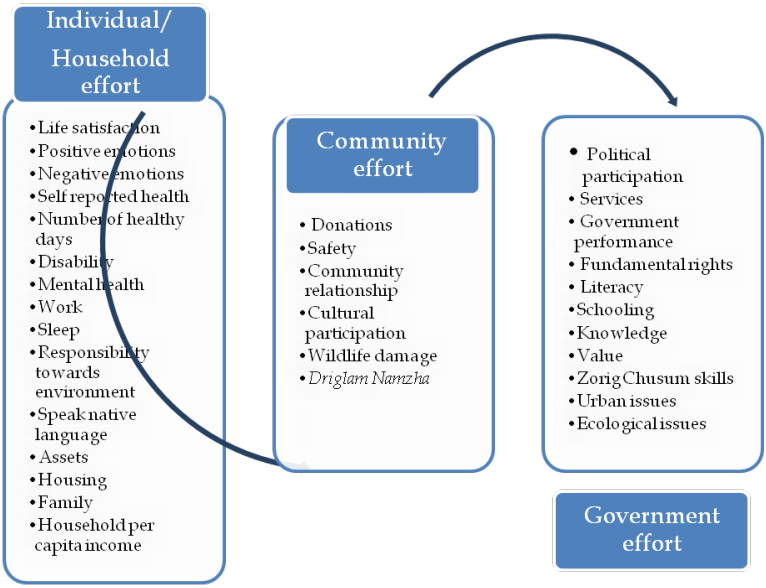

Figure 22: *Overlapping responsibilities for increasing happiness*

While responsibility for some indicators is shared across government, community and households, there is a lot of overlap between the areas of actions.

iii.Insufficiencies by Happiness group

Figure 23 shows the percent contribution of each domain to the insufficiency of the four population groups that we identified. As can be seen, clearly the average insufficiency is lowest, as we would expect, among the deeply happy group. We can also see that the absolute contribution of each indicator is the lowest in the deeply happy group. The biggest contributions to insufficiency among the unhappy are living standards, education, and psychological well-being – a combination of traditional and innovative measures of well-being. Time pressures and a lack of governance including access to services is also very high. Deprivations in community and ecology contribute relatively less to insufficiencies of the not-yet-happy.

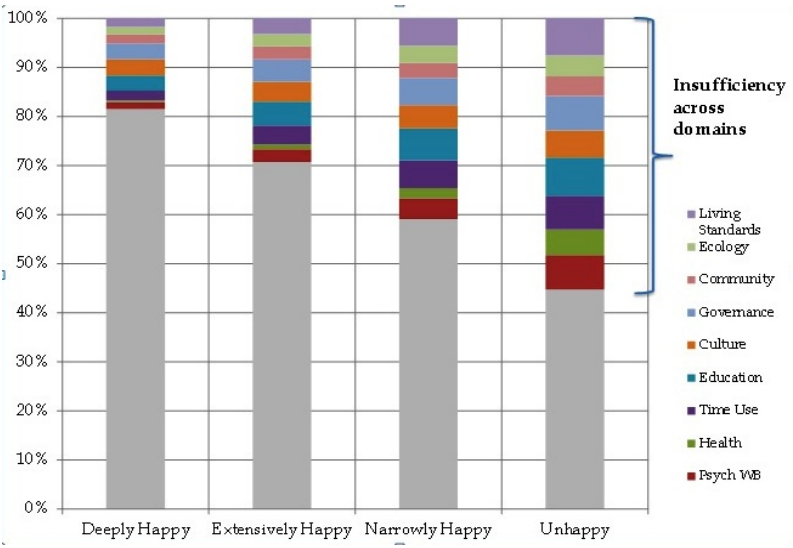

Figure 23: *Insufficiencies across domains by happiness groups*

iv. The Unhappy

Those who achieve sufficiency in less than half of domains are considered unhappy. In 2010, 10.4% of Bhutanese were unhappy. Who are these people? Sixty-nine per cent of the unhappy people are women and thirty one per cent are men. Eighty-four per cent of unhappy people live in rural areas. Although the unhappy come from every age cohort, 57per cent of the unhappy are over 40 years old. Samtse, Tashigang, and Chukha are home to the most unhappy people, followed by Thimphu and Samdrup Jonkhar but there are some in each district nationally. And seventy-six per cent of unhappy people are married. While 90 per cent of unhappy people have no formal education, others pertain to every other educational category except that there are zero unhappy people who have completed a diploma or post-graduate studies. Seventy-nine per cent of unhappy people are farmers, but unhappy people are drawn from all occupations except that there are zero unhappy people among the monks, *anim*, GYT and DYT.

Across domains, the unhappy people show markedly higher per cent contributions to their deprivations from living standards, health

deprivations, and psychological ill-being. This profile of unhappiness, when contrasted with the profile of the deeply happy people, is quite striking, in showing that no single category finds happiness unattainable, but in the same way very few categories leave one 'immune' from unhappiness, with the possible exception of post-graduate education and the monastic or spiritually committed life.[30]

v. Building GNH

The GNH has been presented to provincial district-level leaders to allow them to review their policies against the district-level results and see how they could alter policies according to the results. The wider goal is to promote a public dialogue around the index so people can share their own understandings and appreciate how they could increase their own GNH. Policy and programme screening tools have already been in use since the 2008 index, and all agencies whether public or private are encouraged to think holistically.

It is through the insight, creativity, and thoughtfulness of many Bhutanese – civil servants, business people, civil society leaders, religious leaders, and family members – that GNH will be expanded over time. And so it seems fitting to end this short guide to the GNH Index with a reflection from the 5th King of Bhutan, which urges all, particularly those in government, to ponder their own values profoundly, and seek to advance the common good.

As His Majesty the King said, "GNH has come to mean so many things to so many people but to me it signifies simply - Development with Values".

"We strive for the benefits of economic growth and modernization while ensuring that in our drive to acquire greater status and wealth we do not forget to nurture that which makes us happy to be Bhutanese. Is it our strong family structure? Our culture and traditions? Our pristine environment? Our respect for community

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[30] Recall that sample sizes are such that the decompositions by occupational group and higher education cannot be taken to be representative but are shared for illustrative purposes only.

and country? Our desire for a peaceful coexistence with other nations? If so, then the duty of our government must be to ensure that these invaluable elements contributing to the happiness and wellbeing of our people are nurtured and protected. Our government must be human." (The Madhavrao Scindia Memorial Lecture delivered by His Majesty the King, 23 December 2009 in New Delhi).

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Appendix:

i. Methodology: GNH Index

Let $M^{n,d}$ denote the set of all $n \times d$ matrices. The typical element $y \in M^{n,d}$ is the matrix of achievements of n people in d different dimensions. For every $i = 1,2,...,n$ andi = 1,2 ... nt = 1,2 ... T, the typical entry y_{ij} of y is individual i´s achievement in dimension j. The row vector $y_i = (y_{i1}, y_{i2}, ..., y_{id})$= (, , ... ,)contains individual i´s achievements in the different dimensions; the column vector $y_{\cdot j} = (y_{1j}, y_{2j}, ..., y_{nj})$, , gives the distribution of achievements in dimension j across individuals. Let $z_j > 0$ be the sufficiency cutoff value in dimension j. The sum of entries in any given vector or matrix v is denoted by $|v|$, while $\mu(v)$ is used to represent the mean of v (or $|v|$ divided by the number of entries in v).

For any matrix y, it is possible to define a matrix of deprivations from sufficiency $g^0 = [g^0_{ij}]$, whose typical element g^0_{ij} is defined by $g^0_{ij} = 1$ when $y_{ij} < z_j$, and $g^0_{ij} = 0$ when $y_{ij} \geq z_j$.[31] That is, the ij^{th} entry of the matrix is 1 when person $i$has not achieved sufficiency in dimension j, and 0 when he/she has sufficient.

For each of the d dimensions we apply a weighting vector $\omega_d$such that $\sum_1^j \omega_j = 1$. The insufficiency profile of person i is then generated by summing the weights of the dimensions in which person i has not achieved sufficiency.

Following the methodology to identify the multidimensionally poor proposed by Alkire and Foster (2007), let ρ_k be the identification

[31] Note that in some cases the sufficiency cutoffs are identified as weak rather than strong; this is explained in the domains and indicators section.

method such that $\rho_k(y_i, z) = 1$ when $c_i \geq k$, and $\rho_k(y_i, z) = 0$ when $c_i < k$. That means that a person is identified as not having achieved happiness if he or she does not have sufficiency in at least *k* dimensions. Once identification is applied, a censored matrix $g^0(k)$ is obtained from g^0 by replacing the ith row with a vector of zeros whenever $\rho_k(y_i, z) = 0$. This matrix is used to generate the GNH Index and to analyse how happiness might be increased.

To construct the GNH Index, we first construct an Adjusted Headcount, given by $M_0 = \mu(g^0(k))$, which is the sum of the weighted indicators of those people who do not enjoy sufficiency in any indicator ($|g^0(k)|$) divided by total the number of people (n). It can also be expressed as *HA* where *H* is the Headcount Ratio $H = H(y;z)$ defined by $H = q/n$, where *q* is the number of people in set Z_k. *A* is the average percentage of dimensions in which people who are not yet happy experience insufficiency, and is given by $A = |c(k)|/(q)$ M_0 summarises information on the incidence of unhappiness and the average proportion of dimensions in which a not yet happy person lacks sufficiency. It satisfies *dimension monotonicity* and is also decomposable by population groups.

The GNH is constructed by subtracting M_0, from unity; that is, it is GNH = 1- M_0.

The measure M_0, like all members of the $M_\alpha(y;z)$ family, are decomposable by population subgroups. Given two distributions *x* and *y*, corresponding to two population subgroups of size $n(x)$ and $n(y)$ correspondingly, the weighted average of sum of the subgroup poverty levels (weights being the population shares) equals the overall poverty level obtained when the two subgroups are merged:

$$M_0(x,y;z) = \frac{n(x)}{n(x,y)} M_0(x;z) + \frac{n(y)}{n(x,y)} M_0(y;z)$$

Clearly, this can be extended to any number of subgroups such as Dzongkhags, women and men, rural and urban, and so on.

Additionally, once the identification step has been completed, the M_0 index can be broken down into indicator. To see this, note that M_0 can be expressed in the following way: $M_0(y;z) = \sum_{i=1}^{n} \mu(g_{*j}^0(k))$, where g_{*j}^0 is the jth column of the censored matrix $g^0(k)$. Thus $(\mu(g_{*j}^0(k)))/M_0(y;z)$ is the contribution of indicator j to the overall shortfalls in gross national happiness. Itemizing these shortfalls clearly provides information that can be useful for government policy.