Prince Mahidol Award Conference, 2023

Measurements and metrics
Dasho Karma Ura, Bhutan
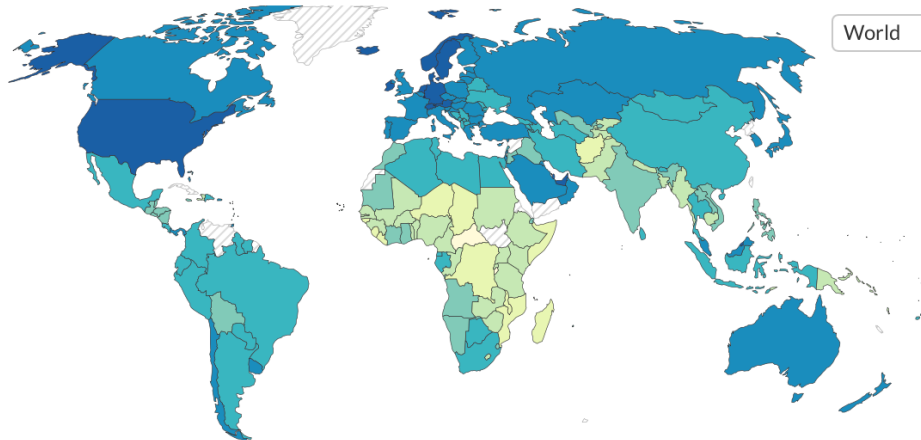### 28.1.23

Human development index
(1 = Perfect / 0 = bad)
- >0.88
- 0.82 ; 0.88
- 0.77 ; 0.82
- 0.73 ; 0.77
- 0.67 ; 0.73
- 0.58 ; 0.67
- 0.48 ; 0.58
- <0.48

A Global Projection of Subjective Well-being:
The First Published Map of World Happiness
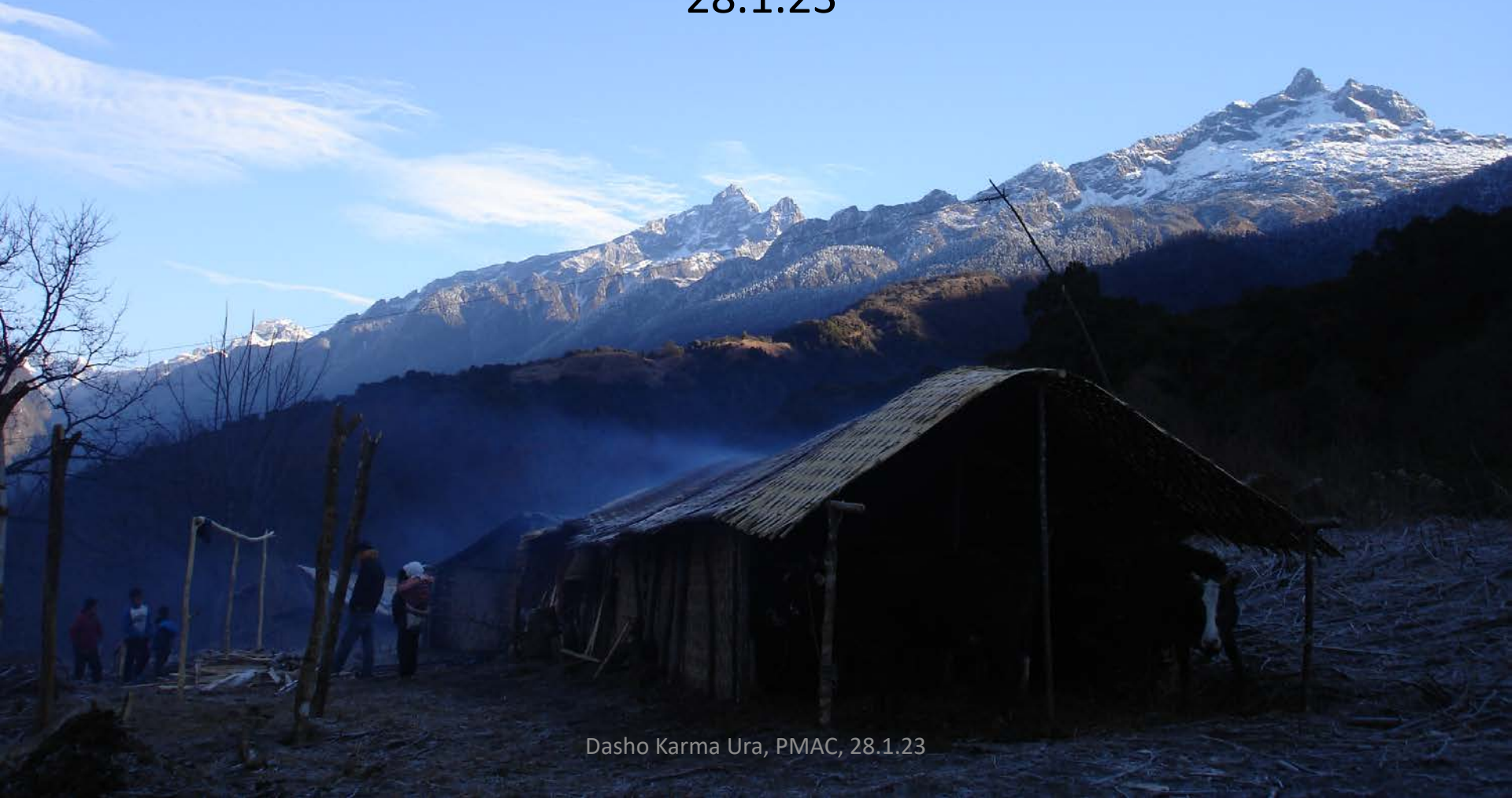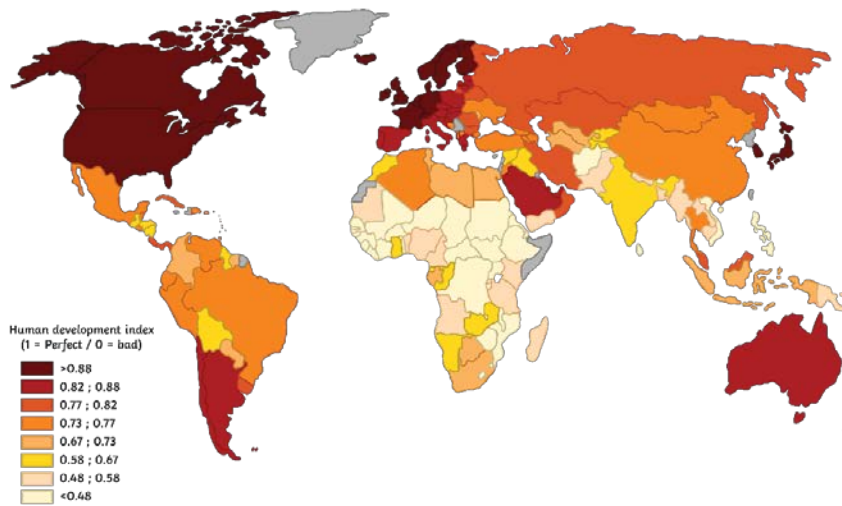
GDP per capita, 2020
Measured in constant international-$.

World
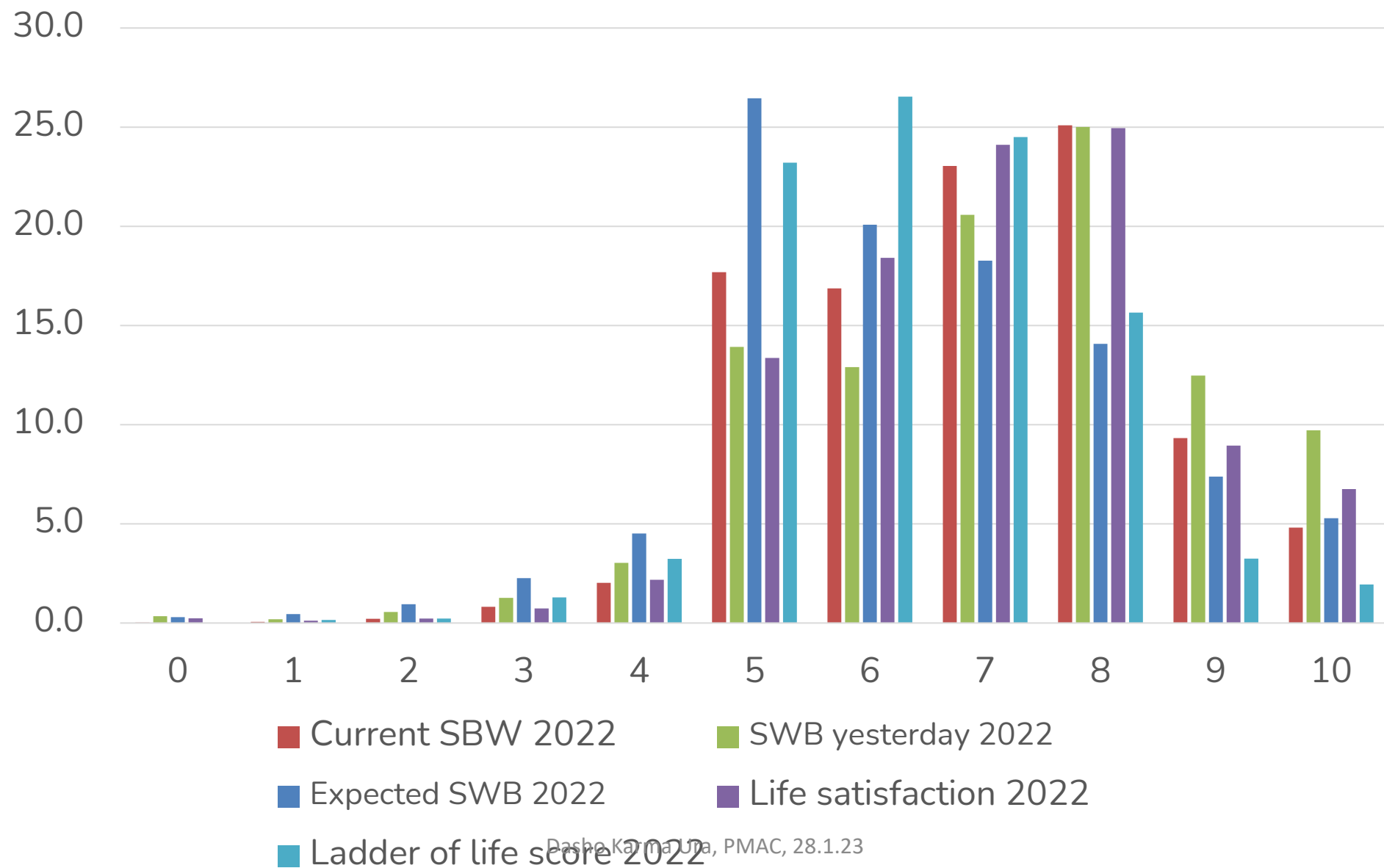
No data $0 $1,000 $2,000 $5,000 $10,000 $20,000 $50,000 $100,000 $200,000

Dasho Karma Ura, PMAC, 28.1.23

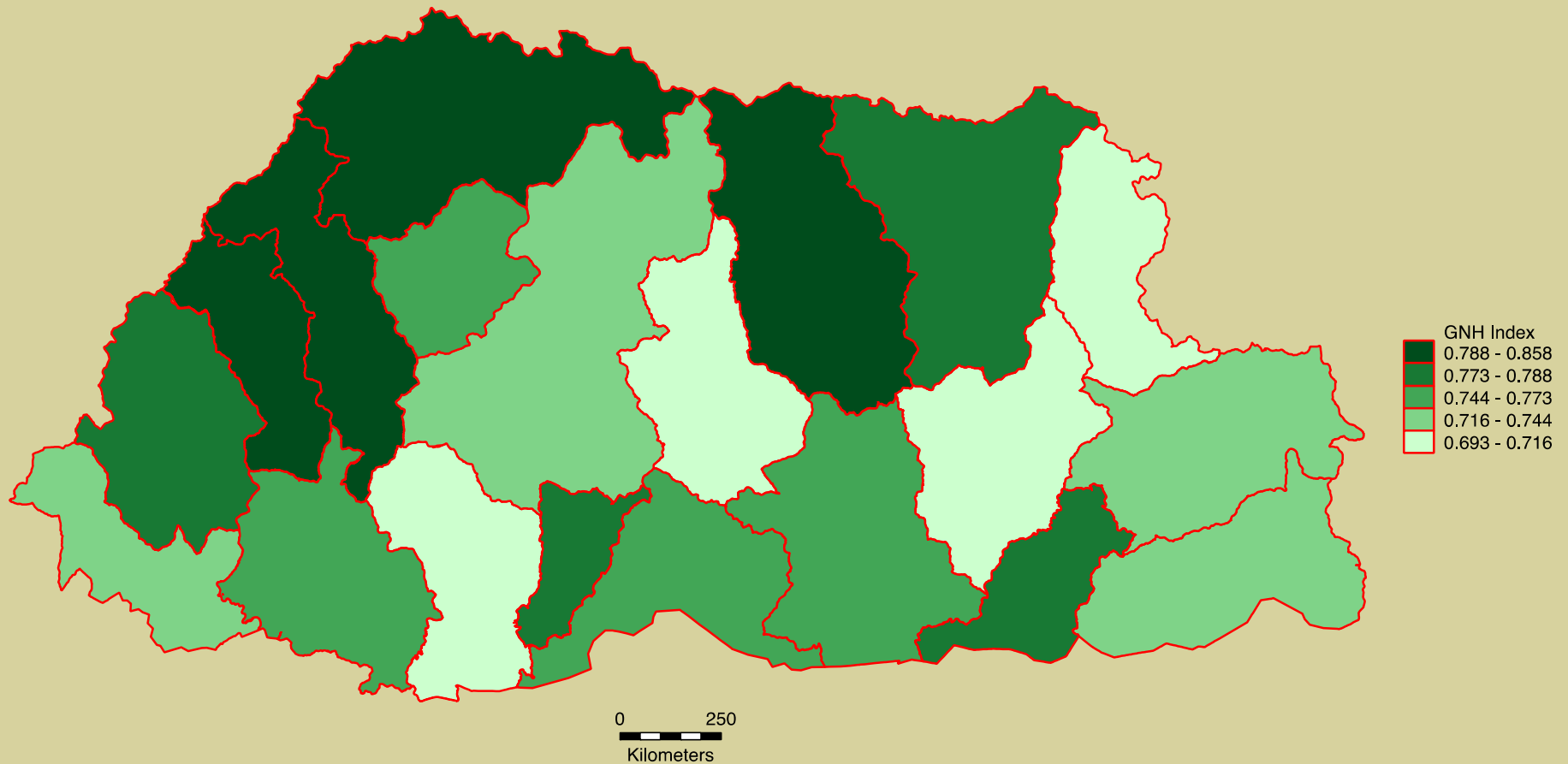Source: Data compiled from multiple sources by World Bank   OurWorldInData.org/economic-growth • CC BY

Subjective well being score 0 to 10. Question for subjective well being now. (1) Overall, how happy do you feel. (2) (2) Question for ladder of life or Cantril ladder. Overall, how do you judge your life. Number of respondents = 11,051
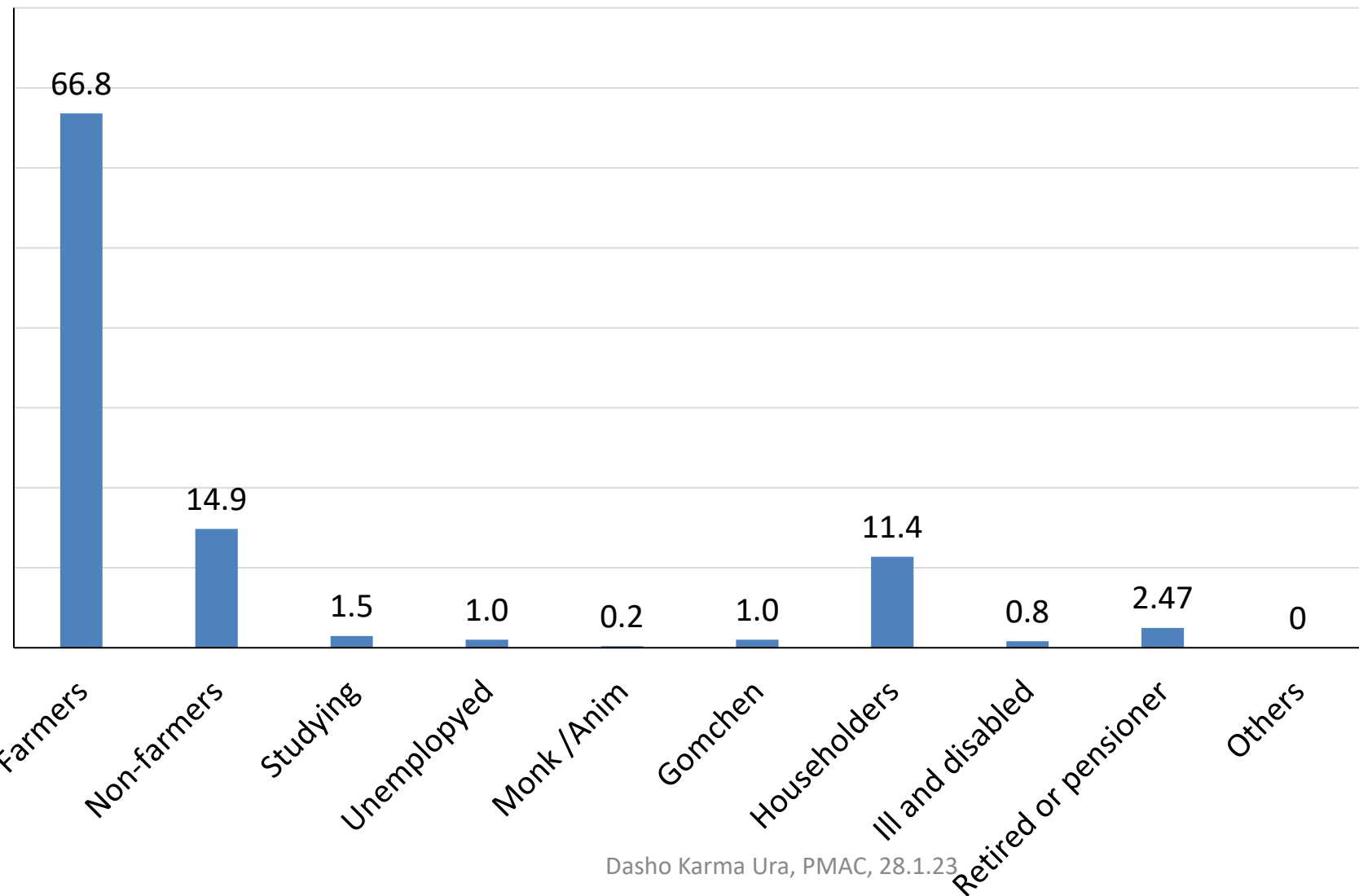
Legend:
- Current SBW 2022
- SWB yesterday 2022
- Expected SWB 2022
- Life satisfaction 2022
- Ladder of life score 2022

Pasha Karma Ujja, PMAC, 28.1.23

GNH Index, by Dzongkhag, 2015

(Darker the shade, higher the score)

GNH Index
- 0.788 - 0.858
- 0.773 - 0.788
- 0.744 - 0.773
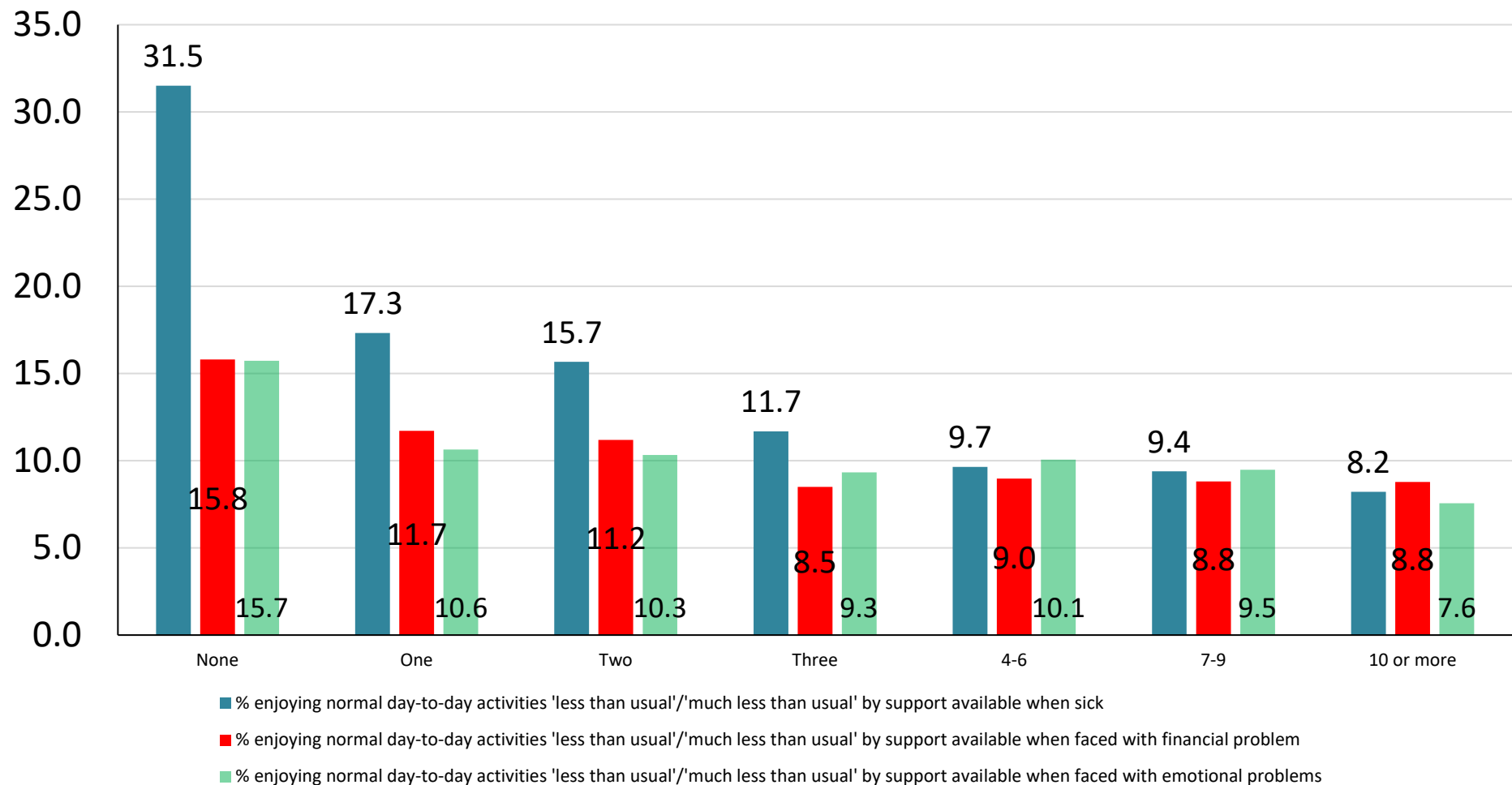- 0.716 - 0.744
- 0.693 - 0.716

0   250

Kilometers

Dasho Karma Ura, PMAC, 28.1.23

% of people from different occupational groups reporting that their work is affected by heavy or lack of rain. Number of respondents=25,341

Farmers	66.8
Non-farmers	14.9
Studying	1.5
Unemployed	1.0
Monk /Anim	0.2
Gomchen	1.0
Householders	11.4
Ill and disabled	0.8
Retired or pensioner	2.47
Others	0

Social support is a pillar of happiness. % of people who do not enjoy their normal routine declines as the number of people on whom you can depend when faced with sickness, financial and emotional problems increases. Number of respondents=25,341

Legend:
- % enjoying normal day-to-day activities 'less than usual'/'much less than usual' by support available when sick
- % enjoying normal day-to-day activities 'less than usual'/'much less than usual' by support available when faced with financial problem
- % enjoying normal day-to-day activities 'less than usual'/'much less than usual' by support available when faced with emotional problems

Data values:

Support	When sick	Financial problem	Emotional problems
None	31.5	15.8	15.7
One	17.3	11.7	10.6
Two	15.7	11.2	10.3
Three	11.7	8.5	9.3
4-6	9.7	9.0	10.1
7-9	9.4	8.8	9.5
10 or more	8.2	8.8	7.6

SEVEN QUESTIONS CONCERNING ANY WELLBEING OR HAPPINESS MEASURMENT AND METRICS
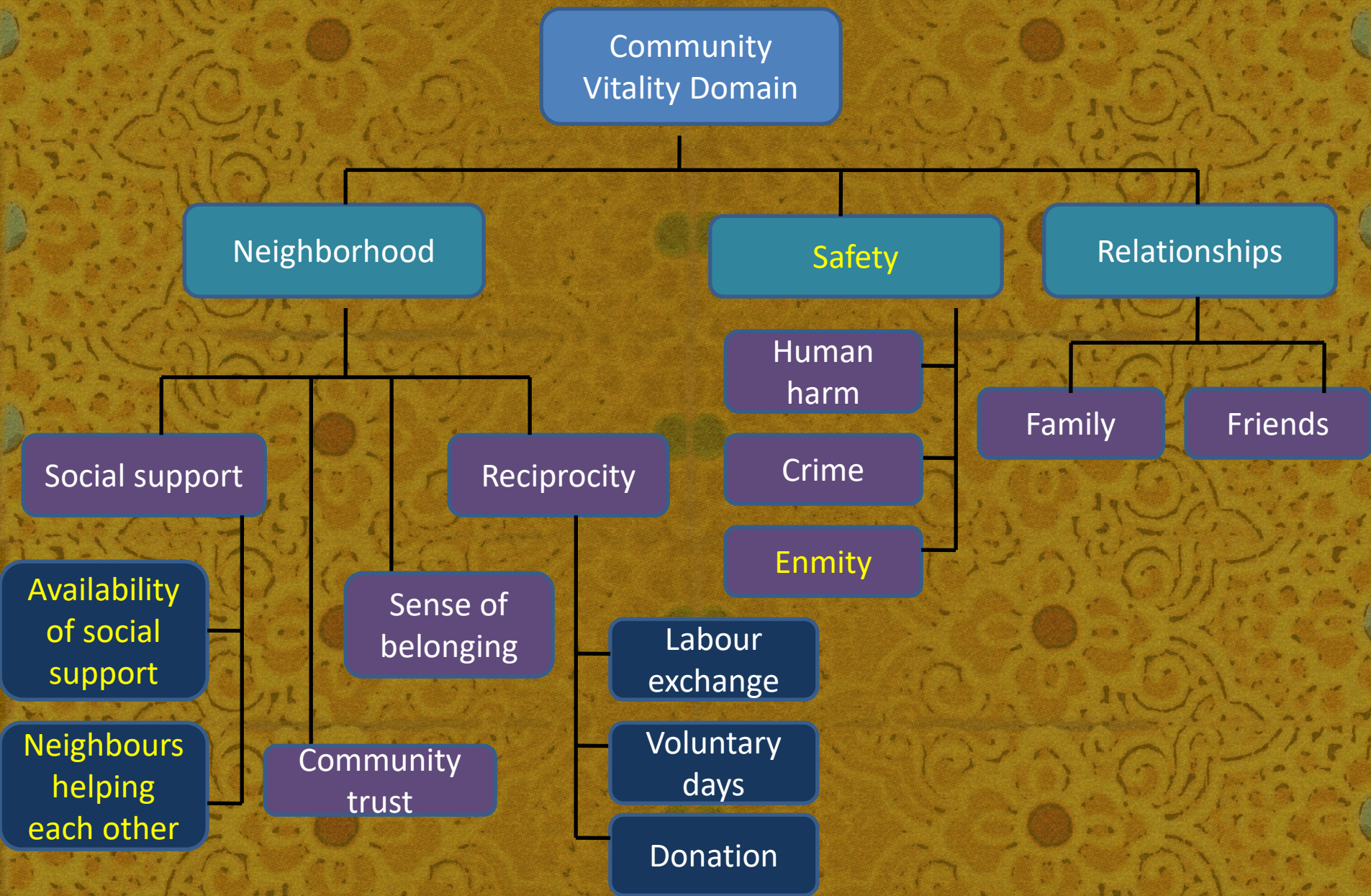
1. The question of what is to be valued for a society.
2. The question of whether we should quantify.
3. If we should quantify, the question of whether to monetize that value or whether we should directly measure it in a nonmonetary way.
4. The question of what can be considered sufficient for an individual for each variable.
5. The question of how we should weight those values we have measured.
6. The question of how should we aggregate those values that we have measured either monetarily or non-monetarily.
7. The question of what should be the frequency of producing

Well-being

Ecology

Community Vitality

Time Use

Health

9 DOMAINS OF GNH

Cultural Diversity

Education

Good Governance

Standard of Living

Dasho Karma Ura, PMAC, 28.1.23

1. The question of what is to be valued for a society.
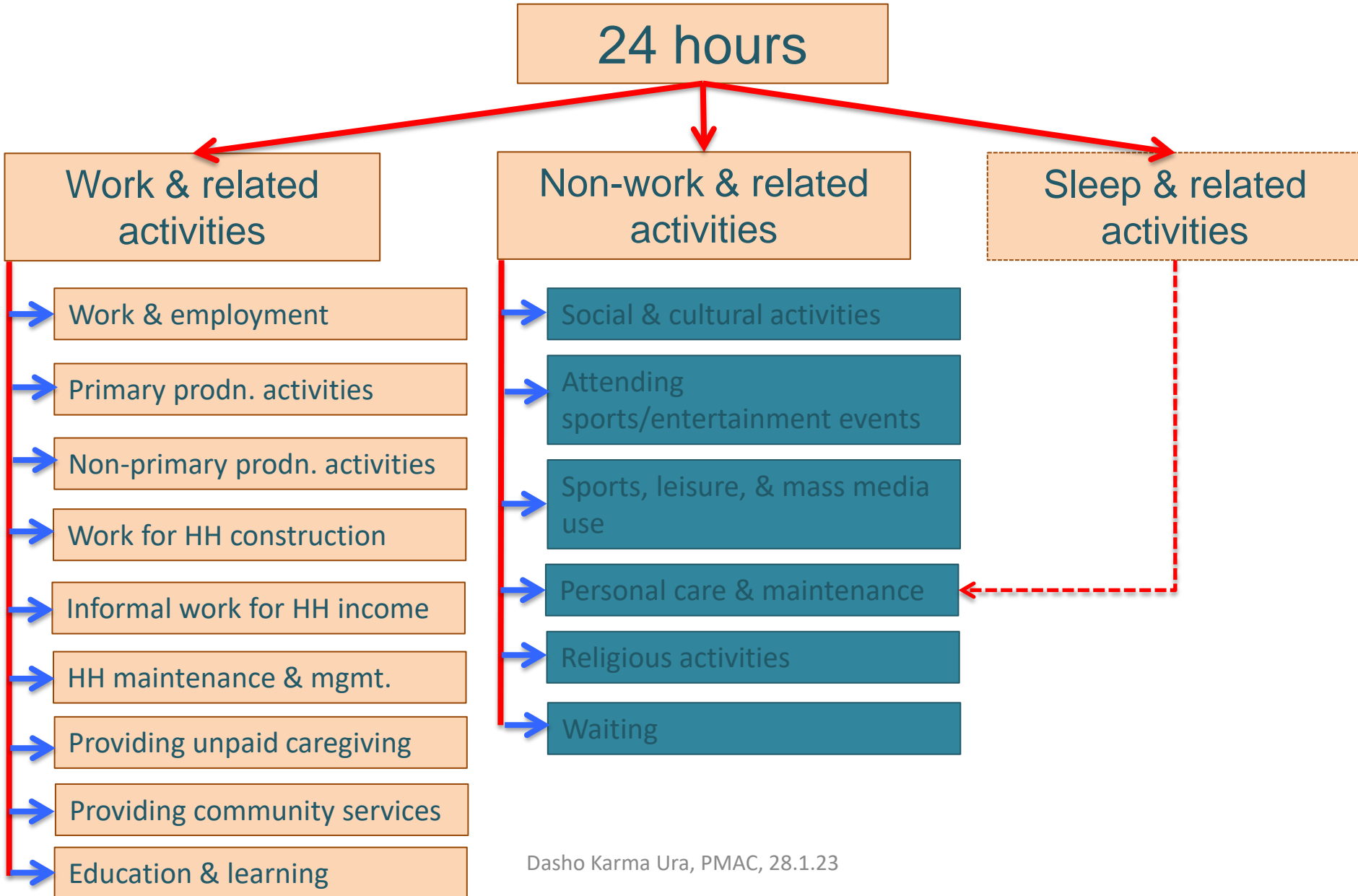2. The question of whether we should quantify.

1. **Psychological wellbeing** – positive and negative emotions, satisfaction with life domains, meditation
2. **Health** – physical and mental, stress, healthy days, disabilities
3. **Education** – schooling, values, knowledge
4. **Time use** – work, sleep, and leisure balance and time use
5. **Cultural diversity & resilience** – language, artisan skills, festivals, etiquette
6. **Good governance** – service delivery, employment, equality, elections, freedoms
7. **Community vitality** – volunteering, donation, safety, family, trust
8. **Ecological diversity** – environmental qualities, hazards, wildlife
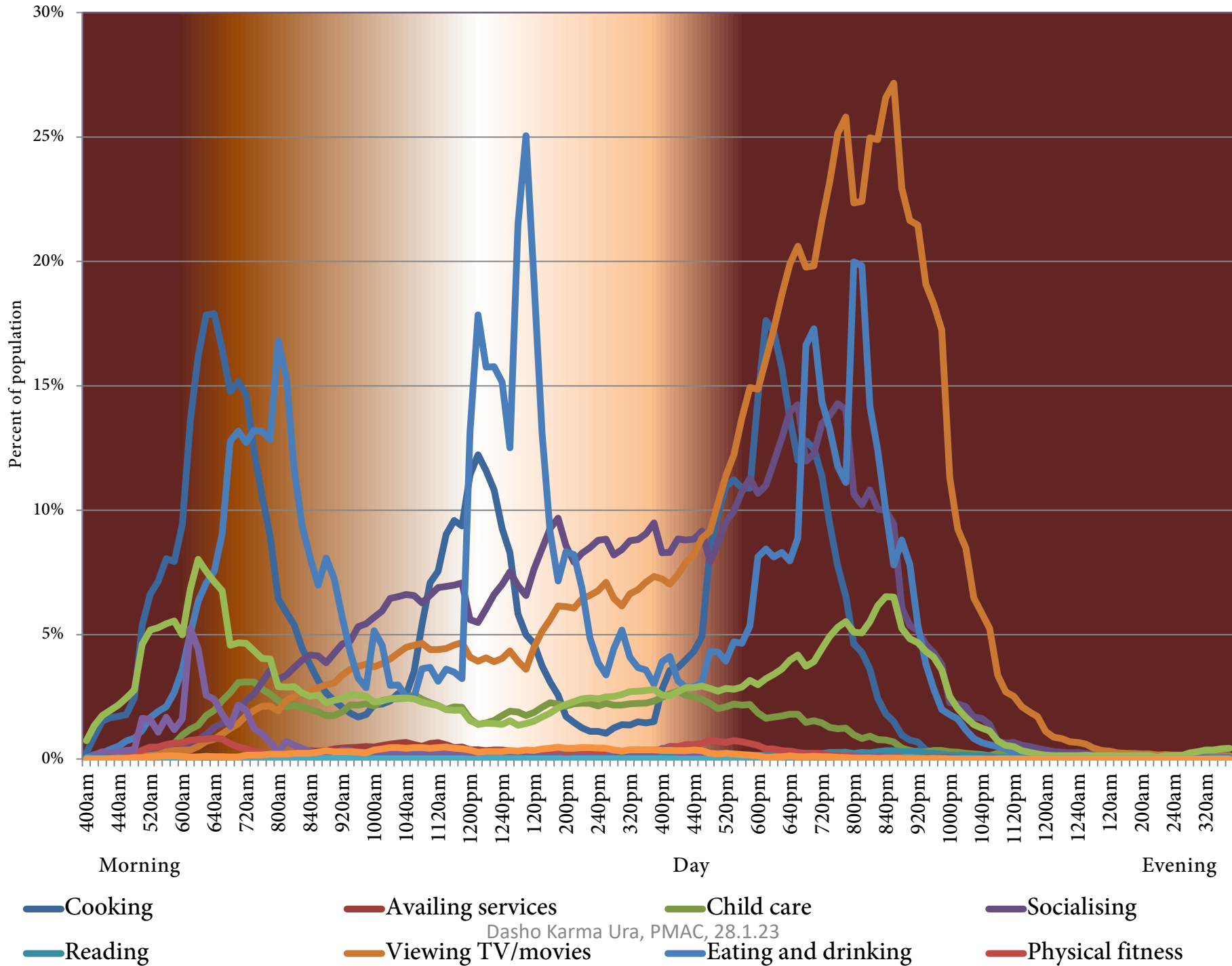9. **Living standards** – housing and asset, and income security.

The domains guide public and private actors to incorporate all vital aspects of wellbeing into plans and action.
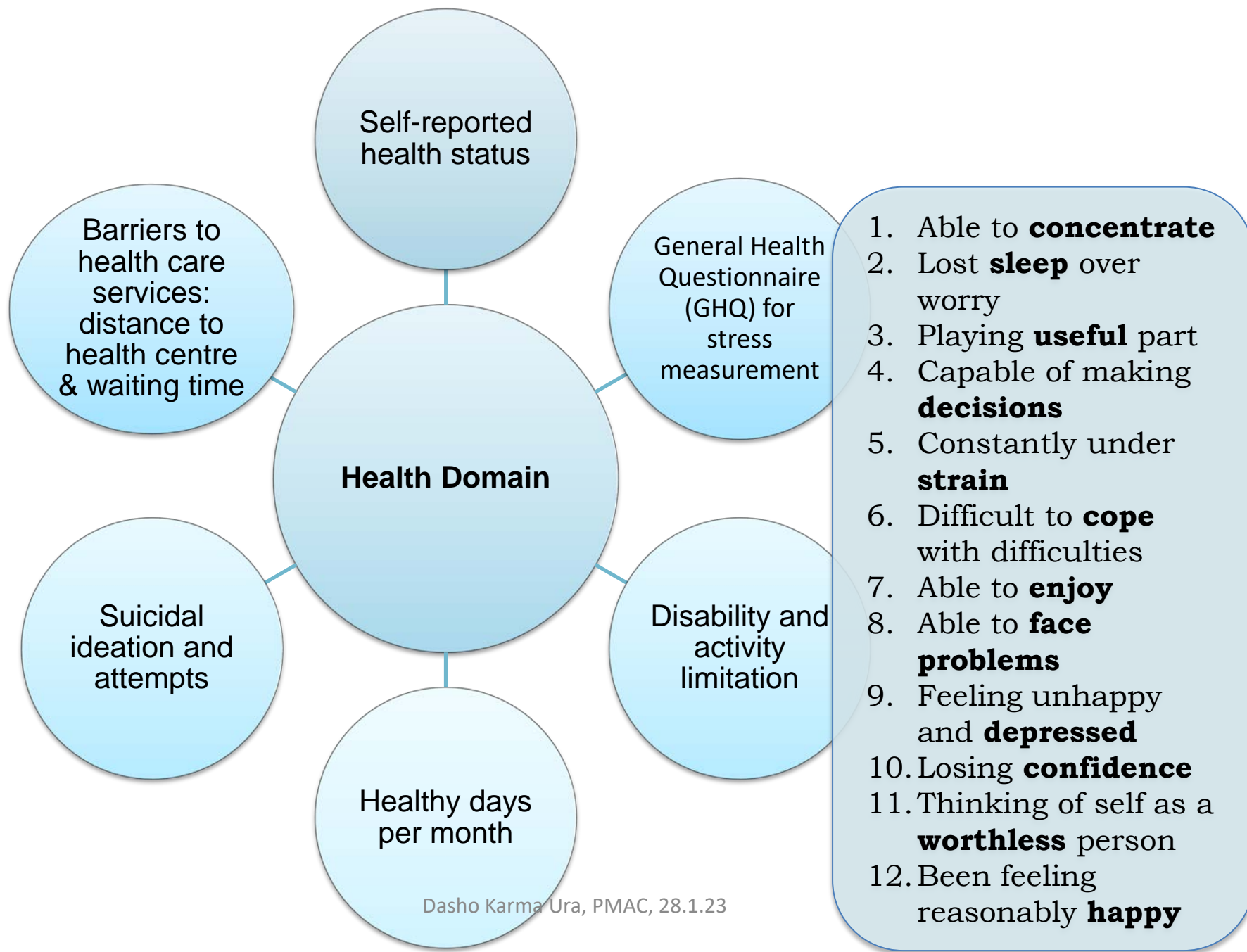
Time Use Domain

```
24 hours
```

Work & related activities
- Work & employment
- Primary prodn. activities
- Non-primary prodn. activities
- Work for HH construction
- Informal work for HH income
- HH maintenance & mgmt.
- Providing unpaid caregiving
- Providing community services
- Education & learning

Non-work & related activities
- Social & cultural activities
- Attending sports/entertainment events
- Sports, leisure, & mass media use
- Personal care & maintenance
- Religious activities
- Waiting

Sleep & related activities

Dasho Karma Ura, PMAC, 28.1.23

Dasho Karma Ura, PMAC, 28.1.23

| Cooking | Availing services | Child care | Socialising |
| Reading | Viewing TV/movies | Eating and drinking | Physical fitness |

Self-reported health status

Barriers to health care services: distance to health centre & waiting time

General Health Questionnaire (GHQ) for stress measurement

Health Domain

Suicidal ideation and attempts

Disability and activity limitation

Healthy days per month

1. Able to **concentrate**
2. Lost **sleep** over worry
3. Playing **useful** part
4. Capable of making **decisions**
5. Constantly under **strain**
6. Difficult to **cope** with difficulties
7. Able to **enjoy**
8. Able to **face problems**
9. Feeling unhappy and **depressed**
10. Losing **confidence**
11. Thinking of self as a **worthless** person
12. Been feeling reasonably **happy**

Dasho Karma Ura, PMAC, 28.1.23

Joint distribution of people reporting satisfaction with health and reporting of loss of sleep over worry.
Number of respondents: 25,341
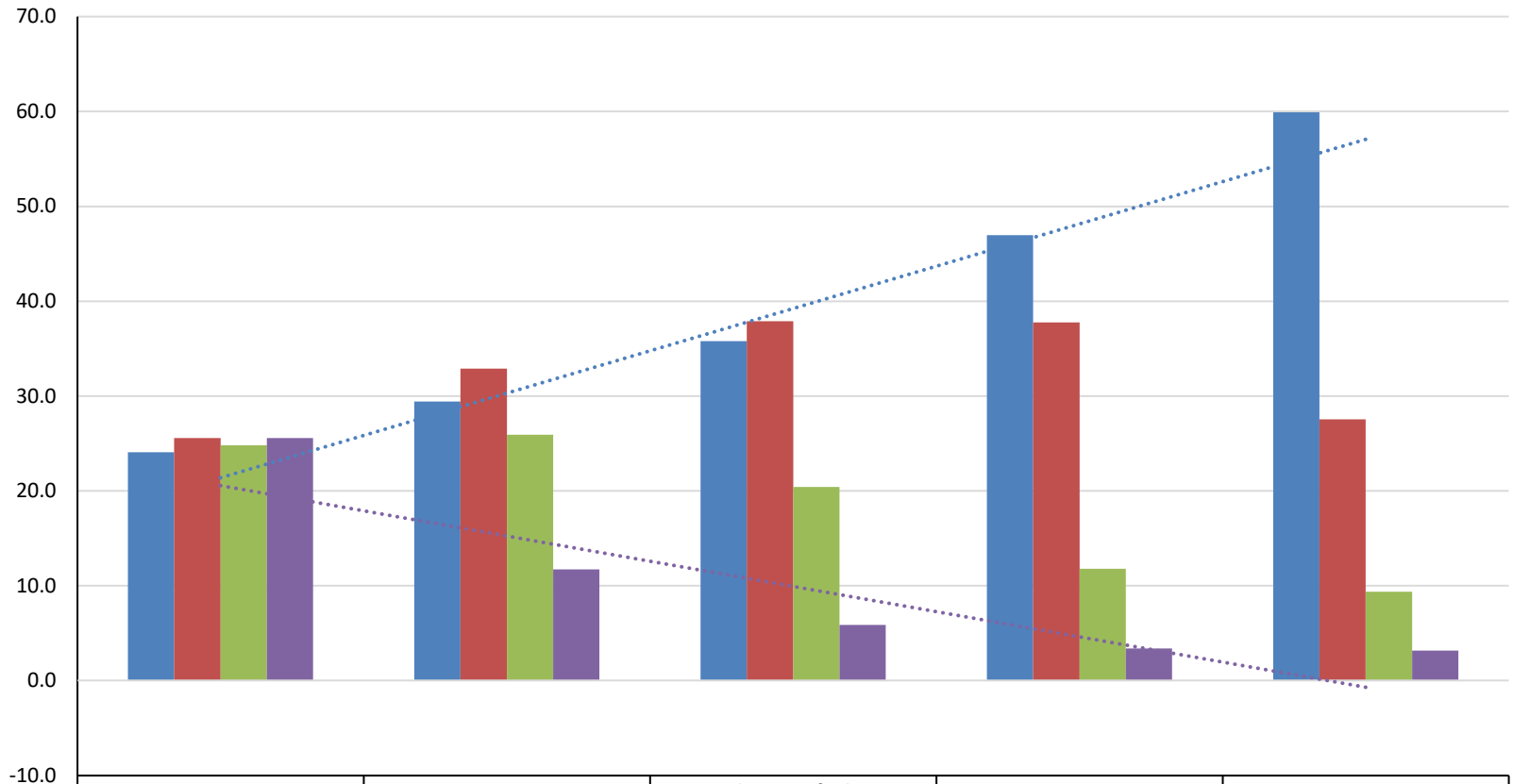
	Very dissatisfied	Dissatisfied	Neither satisfied nor dissatisfied	Satisfied	Very satisfied
■ Not at all	24.1	29.4	35.8	47.0	59.9
■ No more than usual	25.6	32.9	37.9	37.8	27.6
■ Rather more than usual	24.8	25.9	20.4	11.8	9.4
■ Much more than usual	25.6	11.7	5.9	3.4	3.2

Legend: ■ Not at all ■ No more than usual ■ Rather more than usual ■ Much more than usual ⋯⋯ Linear (Not at all) ⋯⋯ Linear (Much more than usual)

Dasho Karma Ura, PMAC, 28.1.23

Number of healthy days per month is negatively correlated with the degree of mental stress level measured by GHQ-12. r= -32. Respondent number=25,341
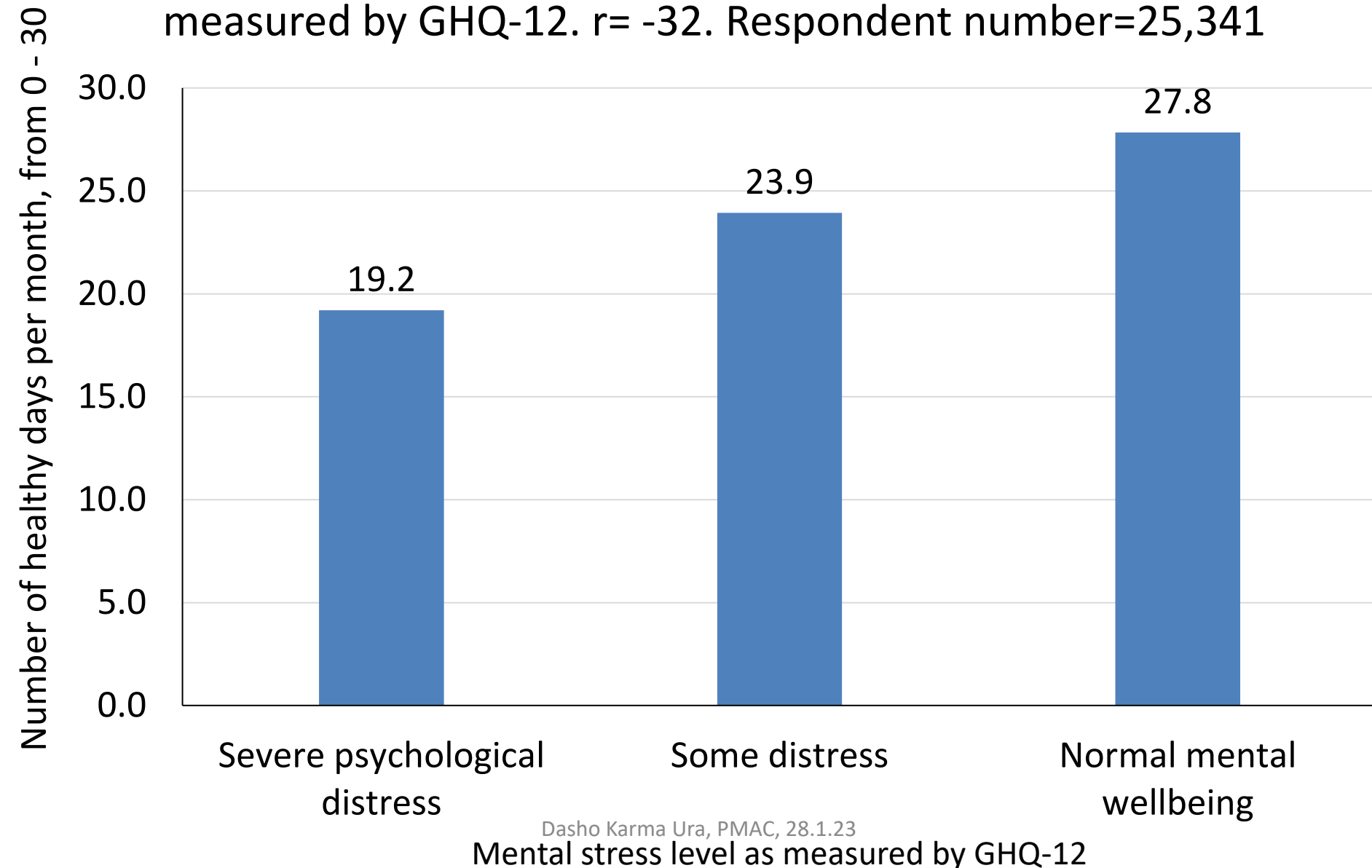
Number of healthy days per month, from 0 - 30

30.0

27.8

25.0

23.9

20.0

19.2

15.0

10.0

5.0

0.0

| Severe psychological distress | Some distress | Normal mental wellbeing |

Dasho Karma Ura, PMAC, 28.1.23

Mental stress level as measured by GHQ-12

3. If we should quantify, the question of whether to monetize that value or whether we should directly measure it in a nonmonetary way.

135 questions

- 645 answers
- 343 open ended quantitative variables
- 53 Likert scales variables
- 33 multiple choice variables
- 19 Cantril ladder variables
- 10 open-ended qualitative variables

Psychological wellbeing			**2015**			
#	Indicator	Question	Response range	Score range	Threshold
1	Life satisfaction index	How satisfied are you with your health?	1 (Very dissatisfied)-5 (Very satisfied)	**25 (Highest satisfaction score) - 5 (Lowest satisfaction score)**	**19 (Satisfaction score)**
2		How satisfied are you with your standard of living?	1 (Very dissatisfied)-5 (Very satisfied)		
3		How satisfied are tour with your major occupation?	1 (Very dissatisfied)-5 (Very satisfied)		
4		How satisfied are you with your family relationship?	1 (Very dissatisfied)-5 (Very satisfied)		
5		How satisfied are you with your work life balance?	1 (Very dissatisfied)-5 (Very satisfied)		
6	Spirituality index	How spiritual do you consider yourself?	1 (Not at all)- 4 (Very spiritual)	16 (Highest spirituality score) - 4 (Lowest spirituality score)	12 (Spirituality score)
7		Do you consider Karma in the course of your daily life?	1 (Not at all)-4 (Always)		
8		How often do you recite prayers?	1 (Never)- 5 (Several times a day)		
9		How often do you meditate?	1 (Never)- 5 (Several times a day)		
10	Positive emotion index	During the past four weeks, how often have you felt calmness?	1(Never)-7 (Few times a day)	35 (Highest posititve emotion score)- 5 (Lowest positive emotion score)	30 (Positive emotion score)
11		During the past four weeks, how often have you felt compassion?	1(Never)-7 (Few times a day)		
12		During the past four weeks, how often have you felt forgiveness?	1(Never)-7 (Few times a day)		
13		During the past four weeks, how often have you felt contentment?	1(Never)-7 (Few times a day)		
14		During the past four weeks, how often have you felt generosity?	1(Never)-7 (Few times a day)		
15	Negative emotion index	During the past four weeks, how often have you felt selfishness?	7(Never)-1 (Few times a day)	14 (Highest first negative emotion score)- 2 (Lowest negative emotion score)	Equal to or more than 8 (First negative emotion score) & 11 (Second negative emotion score)
16		During the past four weeks, how often have you jealousy?	7(Never)-1 (Few times a day)		
17		During the past four weeks, how often have your felt fear?	7(Never)-1 (Few times a day)	21 (Highest second negative emotion score)- 3 (Lowest negative emotion score)	
18		During the past four weeks, how often have you felt worry?	7(Never)-1 (Few times a day)		
19		During the past four weeks, how often have you felt anger?	7(Never)-1 (Few times a day)		

4. The question of what can be considered sufficient for an individual for each variable.

SUFFICIENCY LEVELS
THE CONCEPT OF SUFFICIENCY IS DISTINCTIVE FROM CONCEPT OF COMPARISION

Dasho Karma Ura, PMAC, 28.1.23

Domain

Cultural Diversity and Resilience

Language

Indicator

Survey question:

How well can you speak your mother tongue now?

Apply sufficiency threshold
**Example: 'Quiet well' or 'Very well'**

Insufficient	Sufficient

Not at all	Only a little	Quiet well	Very well
Insufficient		Sufficient	Sufficient
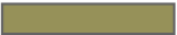
Health		2015		
#	Indicator	Question	Response range	Threshold
1	Self reported health status	In general, would you say your health is…	1 (Poor)-5 (Excellent)	4 (Good) or 5 (Excellent)
2	Healthy days	0 (Worst)-30(Best)		National average-26 days
3	Disability index	Do you have any of the following serious conditions, impairments or disabilities? Visual	1 (Yes)-2 (No)	2 (No) in all 9 disability conditions & (3 (Rarely) or 4(Never))
4		Hearing	1 (Yes)-2 (No)	
5		Speech	1 (Yes)-2 (No)	
6		No use of arm(s) or leg(s)	1 (Yes)-2 (No)	
7		Difficulty using arms or legs	1 (Yes)-2 (No)	
8		Missing body part	1 (Yes)-2 (No)	
9		Cardiovascular	1 (Yes)-2 (No)	
10		Respiratory	1 (Yes)-2 (No)	
11		Mental/psycho-social	1 (Yes)-2 (No)	
12		Does the long-term disability restrict your activities?	1 (All the time)-4 (Never)	
13	General mental health	12 item General health questionnaire	0-15 (Severe distress)-21-36 (Normal mental wellbeing)	21-36 (Normal mental wellbeing)

5.   The question of what can be considered sufficient for an individual for each variable.

6.   The question of how we should weight those values we have measured.

Let us say, there are 9 indicators belonging to 9 domains

Dasho Karma Ura, PMAC, 28.1.23
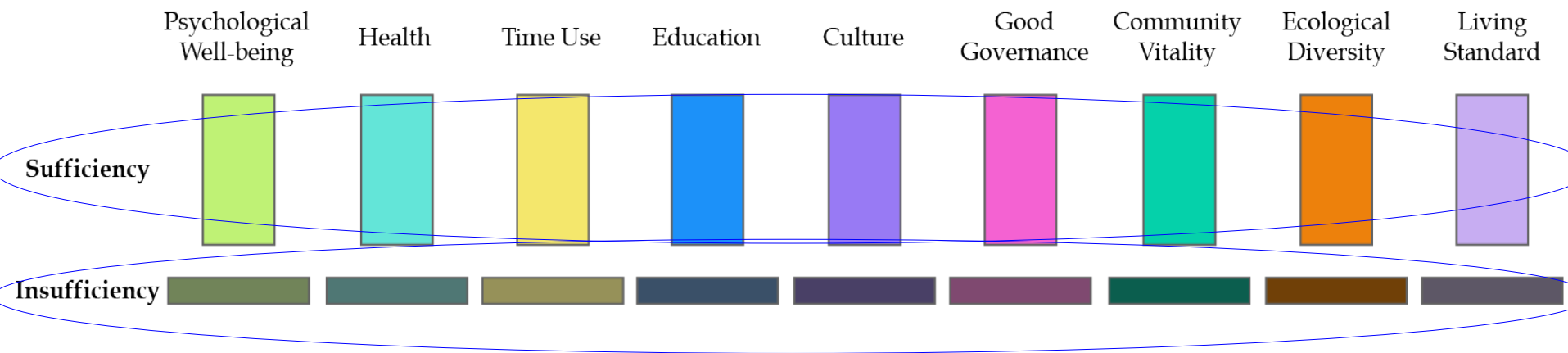
	Psychological Well-being	Health	Time Use	Education	Culture	Good Governance	Community Vitality	Ecological Diversity	Living Standard
Dorji 2 of 9 (22.2%)	▬	▮	▬	▬	▬	▬	▬	▮	▬
Sangay 7 of 9 (77.8%)	▮	▬	▮	▮	▮	▬	▮	▮	▮
Tashi 3 of 9 (33.3%)	▬	▮	▬	▬	▮	▬	▮	▬	▬
Chhimi 7 of 9 (77.8%)	▬	▮	▮	▮	▮	▬	▮	▮	▮

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Weighting

1. 9 domains are equally weighted

2. 33 indicators, 2-4 per domain

3. Relatively equal weights among 33 indicators

4. Quantitative variables have larger weights

Weights of the 33 Indicators

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

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What is Gross National Happiness Index?

The Gross National Happiness Index is a single value, multi-dimensional and survey-based measure of wellbeing and happiness of the Bhutanese population. But it is also decomposable to any degree.

Lower ← | GNH Index Value | → Higher

0 —————————————————— 1
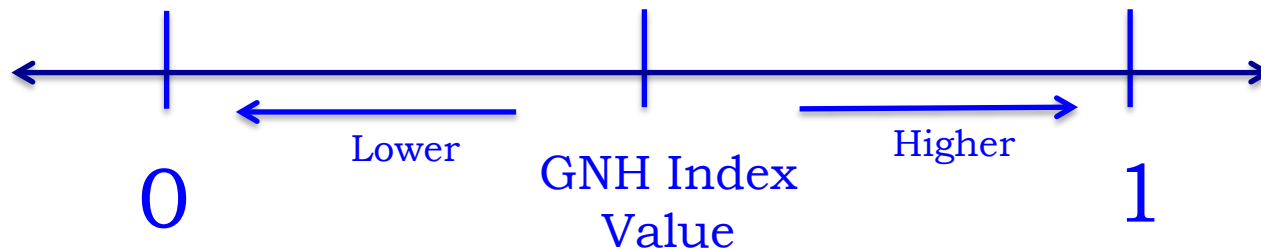
How is GNH Index calculated?

GNH Index is calculated with using Alkire-Foster methodology, which is also usee for multi-dimensional poverty indicator (MPI, 2007, 2011)

Dasho Karma Ura, PMAC, 28.1.23

Typical Dataset

Dimensions/Indicators

- Where x_{ij} is the achievement of individual i of attribute or dimension j

$$X = \begin{bmatrix} x_{11} & \ldots & x_{1d} \\ x_{21} & \ldots & x_{2d} \\ \ldots & & \\ & & \ldots \\ x_{n1} & \ldots & x_{nd} \end{bmatrix} \begin{matrix} \textbf{P} \\ \textbf{e} \\ \textbf{o} \\ \textbf{p} \\ \textbf{l} \\ \textbf{e} \end{matrix}$$

nxd

$$z = \begin{bmatrix} z_1 & \ldots & z_d \end{bmatrix}$$

$$w = \begin{bmatrix} w_1 & \ldots & w_d \end{bmatrix} \quad \sum_{j=1}^{d} w_j = d$$

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GNH Index = 0.756 in 2015

GNH Index = 0.760 in 2022

$$GNH = H_h + (H_n \times A^{suf})$$

Where,

H_h = proportion of people (deeply happy + extensively happy=%)

H_n= proportion of (narrowly happy + unhappy=%)

A_{sus}=Average sufficiency of (narrowly happy and unhappy people)

HM the IVth King, Founder of GNH

2015 GNH Index

- The percentage of Happy people we call H_h

  This is 43.4% (0.434)

- The percentage of Not-yet-happy people H_n

  This is 56.6% (.566)

- The average sufficiency amongst Not-yet-happy people we call A_n

  This is 56.9% (0.569)

$$2015 \text{ GNH Index} : H_h + (H_n * A_n)$$

$$0.434 + (0.566 * 0.569) = 0.756$$

GNH Index, by Dzongkhag, 2015

(Darker the shade, higher the score)

GNH Index
- 0.788 - 0.858
- 0.773 - 0.788
- 0.744 - 0.773
- 0.716 - 0.744
- 0.693 - 0.716

0   250
Kilometers

Dasho Karma Ura, PMAC, 28.1.23
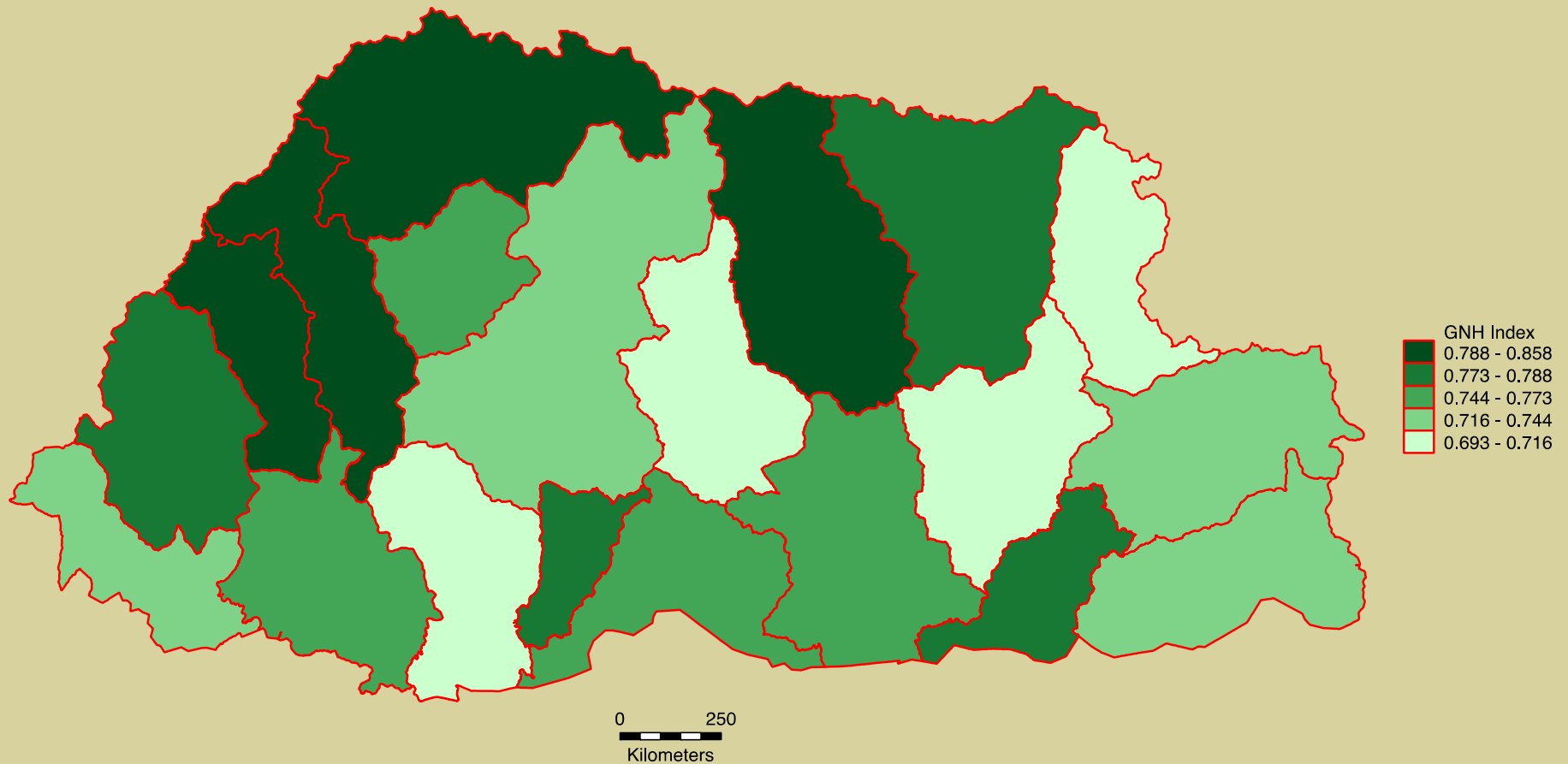
USES OR APPLICATION OF GNH INDICATORS

- To collect wide range of information under 9 domains of GNH for:
  - Measuring people's wellbeing and happiness
  - Measuring progress over time
  - Comparing progress across space

  - Setting an alternative framework for development
  - Providing indicators to sectors to guide development
  - Allocating resources

Dasho Karma Ura, PMAC, 28.1.23

Dasho Karma Ura, PMAC, 28.1.23
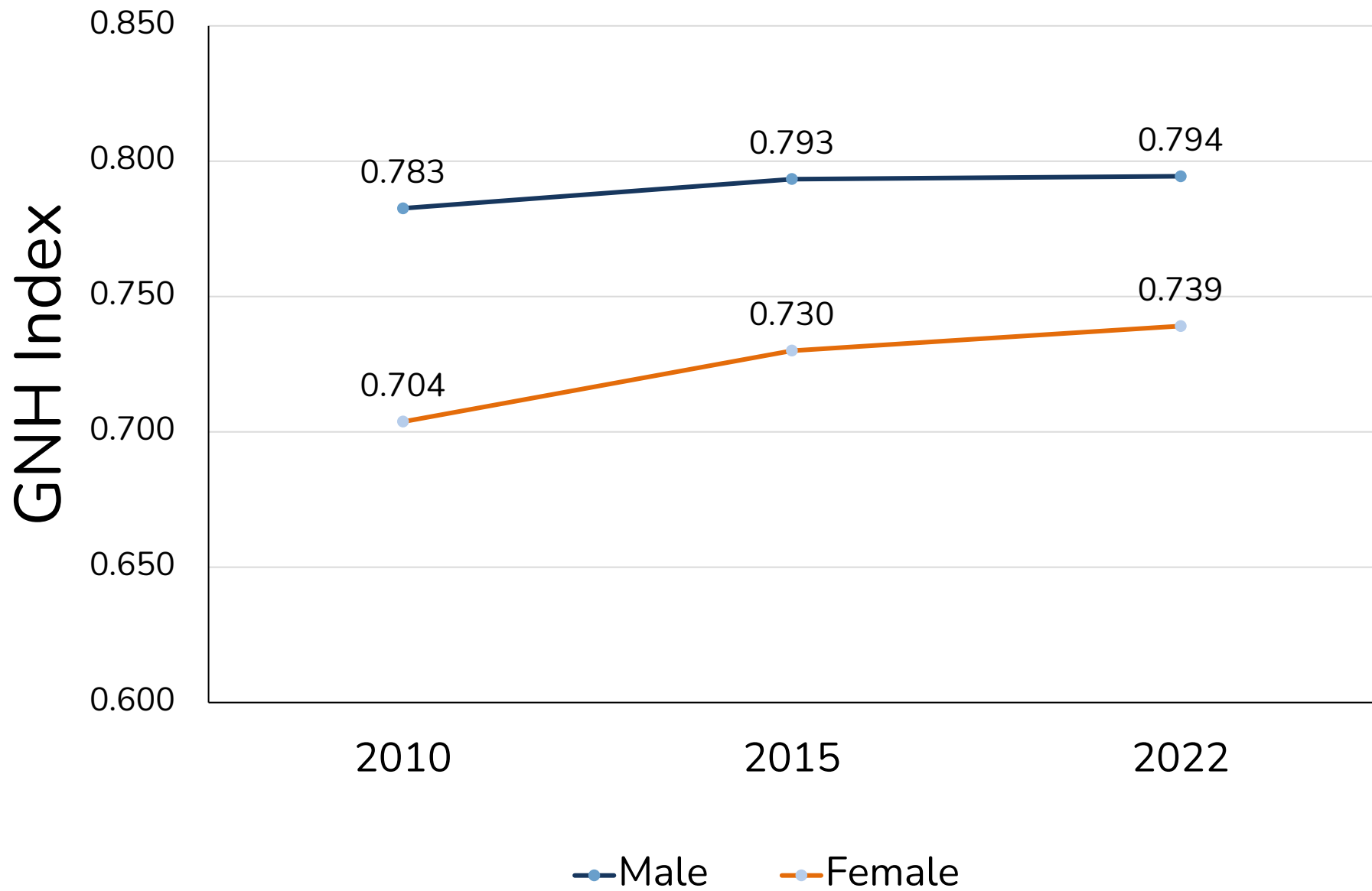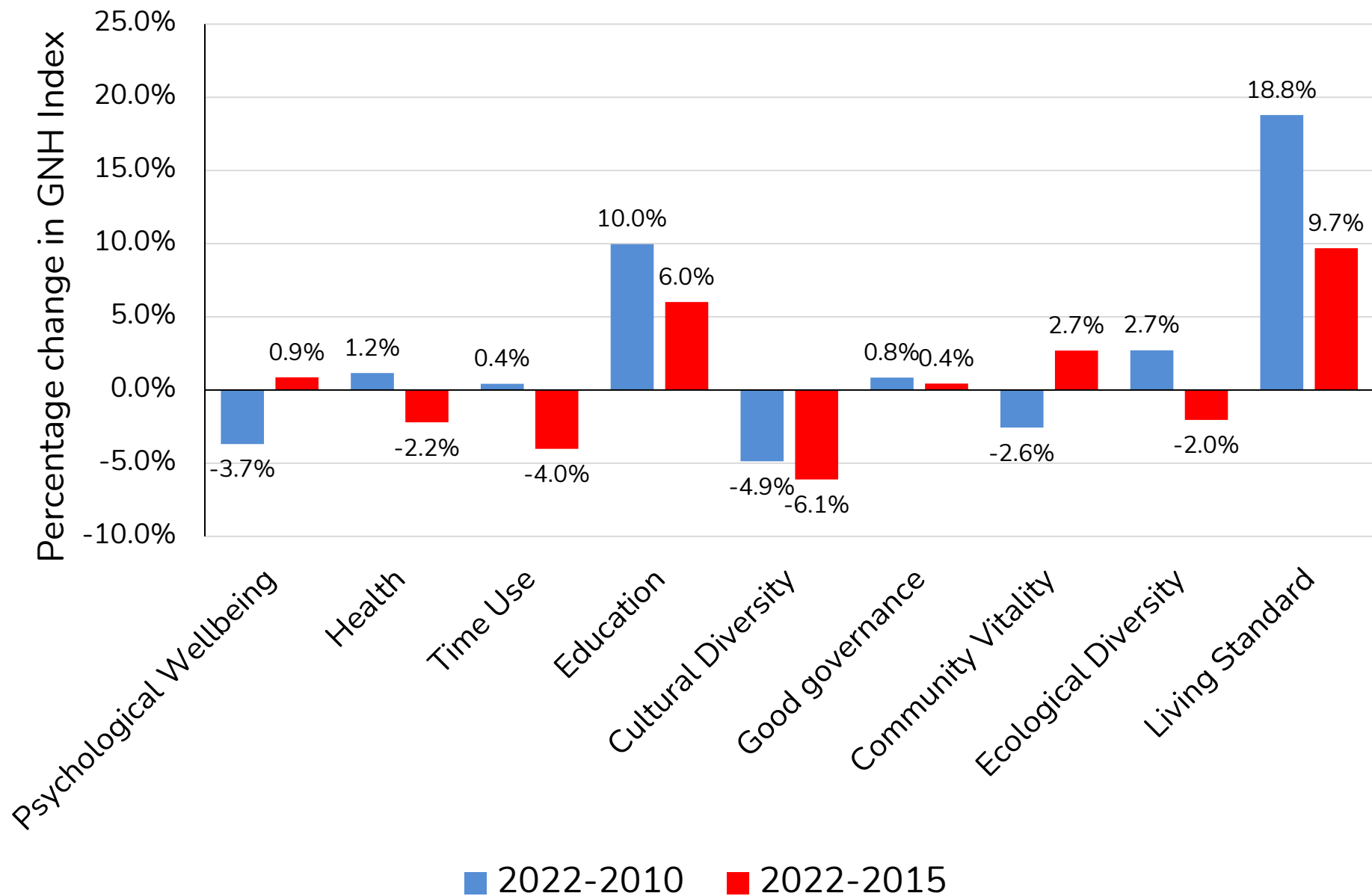
Four categories of population according to GNH index, 2022.

Category	Value
Spirituality	93.8%
	76.5%
	72.3%
Government performance	69.6%
	69.6%
	68.6%
Community relationship	68.0%
	66.7%
	62.6%
Self-reported health status	62.0%
	60.0%
	58.0%
Literacy	56.0%
	51.5%
	46.8%
Wildlife damage (rural)	46.7%
	40.9%
	40.4%
Healthy days	39.9%
	36.3%
	29.3%
Resp. towards environment	28.3%
	26.7%
	21.9%
Housing	19.7%
	16.0%
	15.5%
Speak native language	14.1%
	9.7%
	7.9%
Safety	7.2%
	5.4%
	4.9%

Dasho Karma Ura, PMAC, 28.1.23
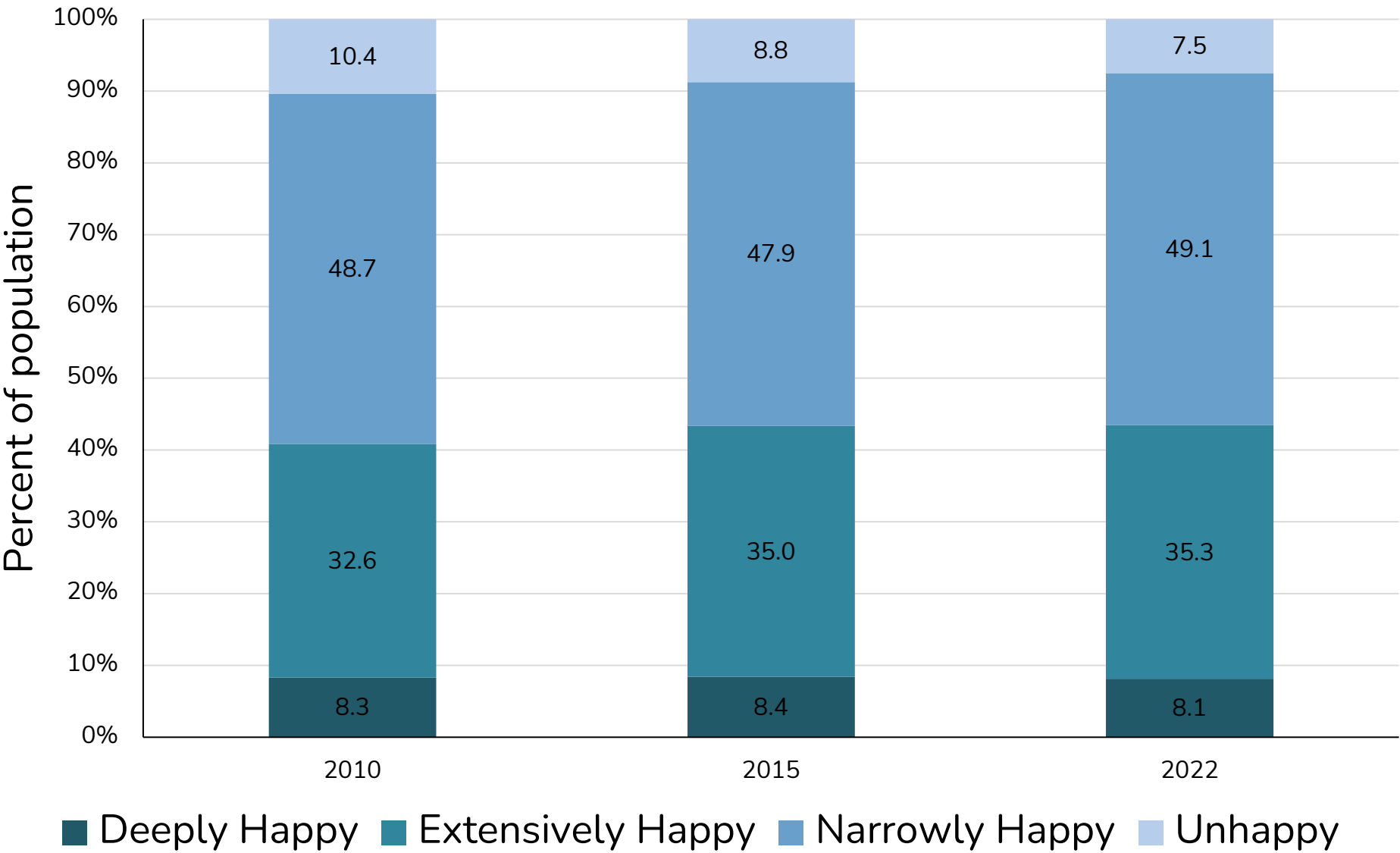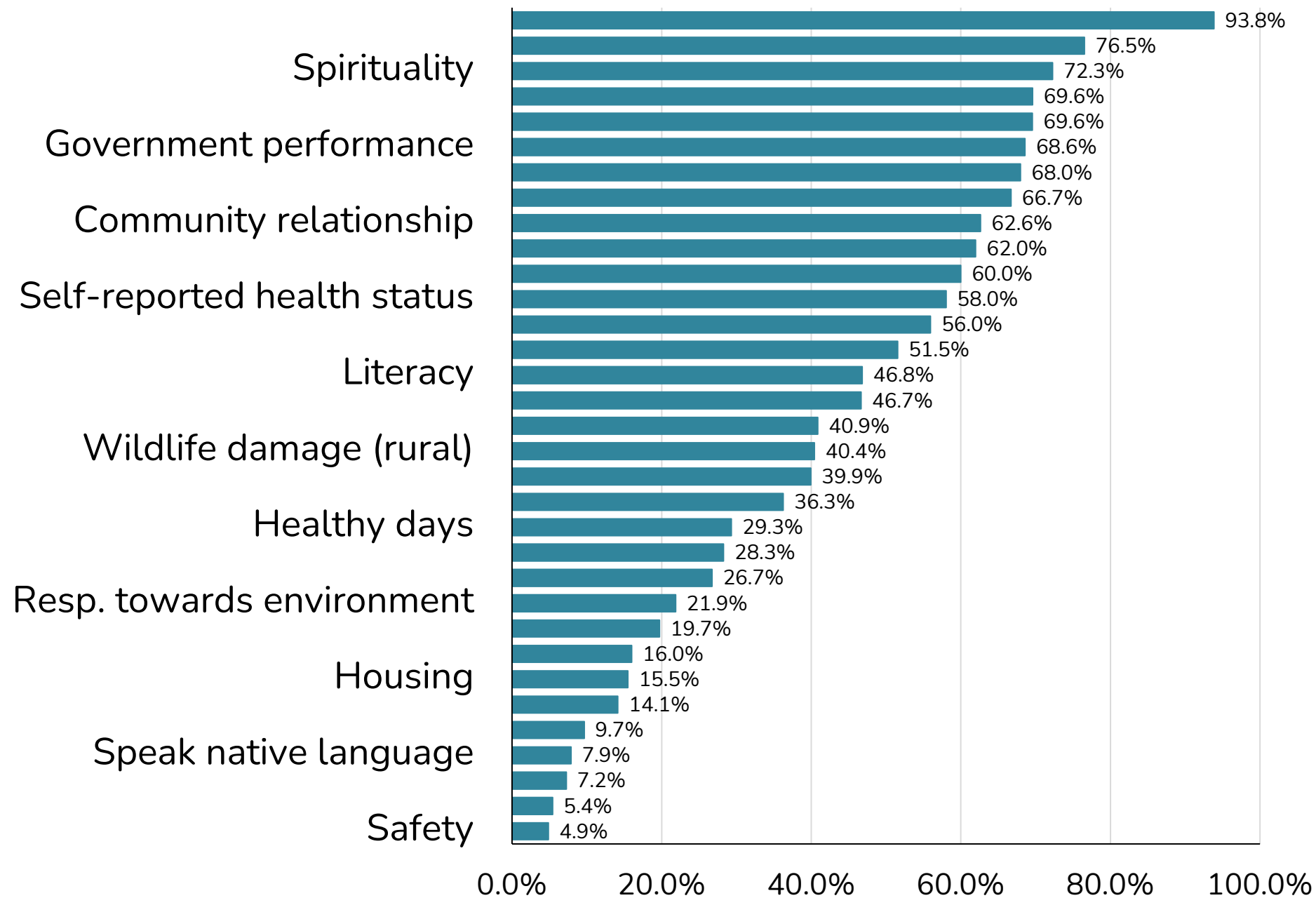
Censored headcount ratio of 7.5% unhappy population owing to insufficiencies of

Household income level varies positively with life evaluations (Cantril score), 2022. Respondent number =11,051

Annual HH income

- Mean, Nu. 441,120 (Thriving)
- Mean, Nu. 274,074 (Struggling)
- Mean, Nu. 189,339 (Suffering)

Cantril score category
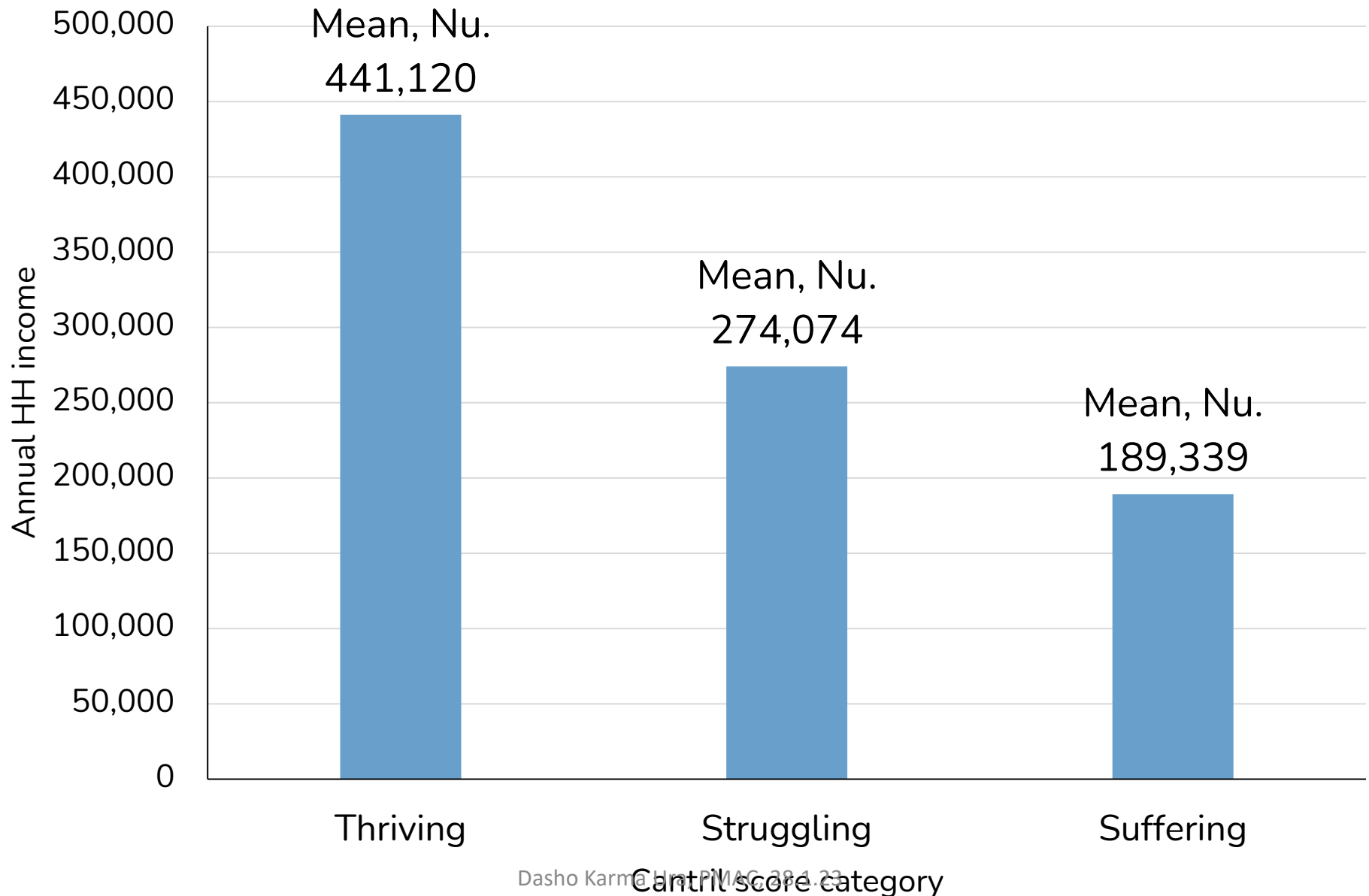
In brief, changes since 2010 till 2022: A story of rapid material development, and of cultural and psychological fragility
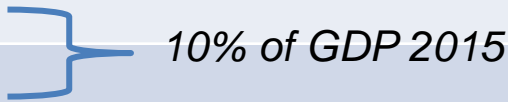
Positive changes
1. Income and housing improved spectacularly
2. Sleep trends improved marginally
3. Delivery of services improved
4. Literacy and schooling improved
5. Ecological trends improved
6. Disability trends reduced
7. Positive emotions improved

Negative changes
1. Self reported health deteriorated faster due to the pandemics
2. Spirituality and artisanal skills deteriorating
3. Perception of safety and family relationship deteriorating
4. Perception of government performance deteriorating
5. Psychological wellbeing (negative emotions) deteriorating continuously

Weights and criteria

Criteria group	Criteria subgroup	Old	New	New total
Transport cost	Distance to road head		5%	20%
	Transport cost index	10%	15%	
Poverty	Poverty	45%	5%	20%
	School aged children unschooled (6-14 years)		5%	
	Income		10%	
Health	U5MR		5%	20%
	Unhealthy days		5%	
	Unreliable water supply		7%	
	Unhygienic sanitation		3%	
Farming	Kamzhing *10% of GDP 2015*		5%	15%
	Chuzhing		5%	
	Livestock (*nor*) *4% of GDP 2015*		5%	
Population & Area	Population	35%	15%	15%
	Area	10%		
GNH	GNH index		10%	10%

Objectives of the Screening tools

- Systematically assess impacts of any policy or project on GNH
- Select GNH enhancing policies and projects
- Reject projects and policies that adversely affect key determinants of GNH
- Key GNH determinants based on a pilot and national GNH surveys

Evaluation design

- Quasi-experimental design - lacks random assignment

- Propensity Score Matching (PSM) with Nearest Neighbor

- Conventional measures of GNH – Intensity and headcount ratio

Social capital?
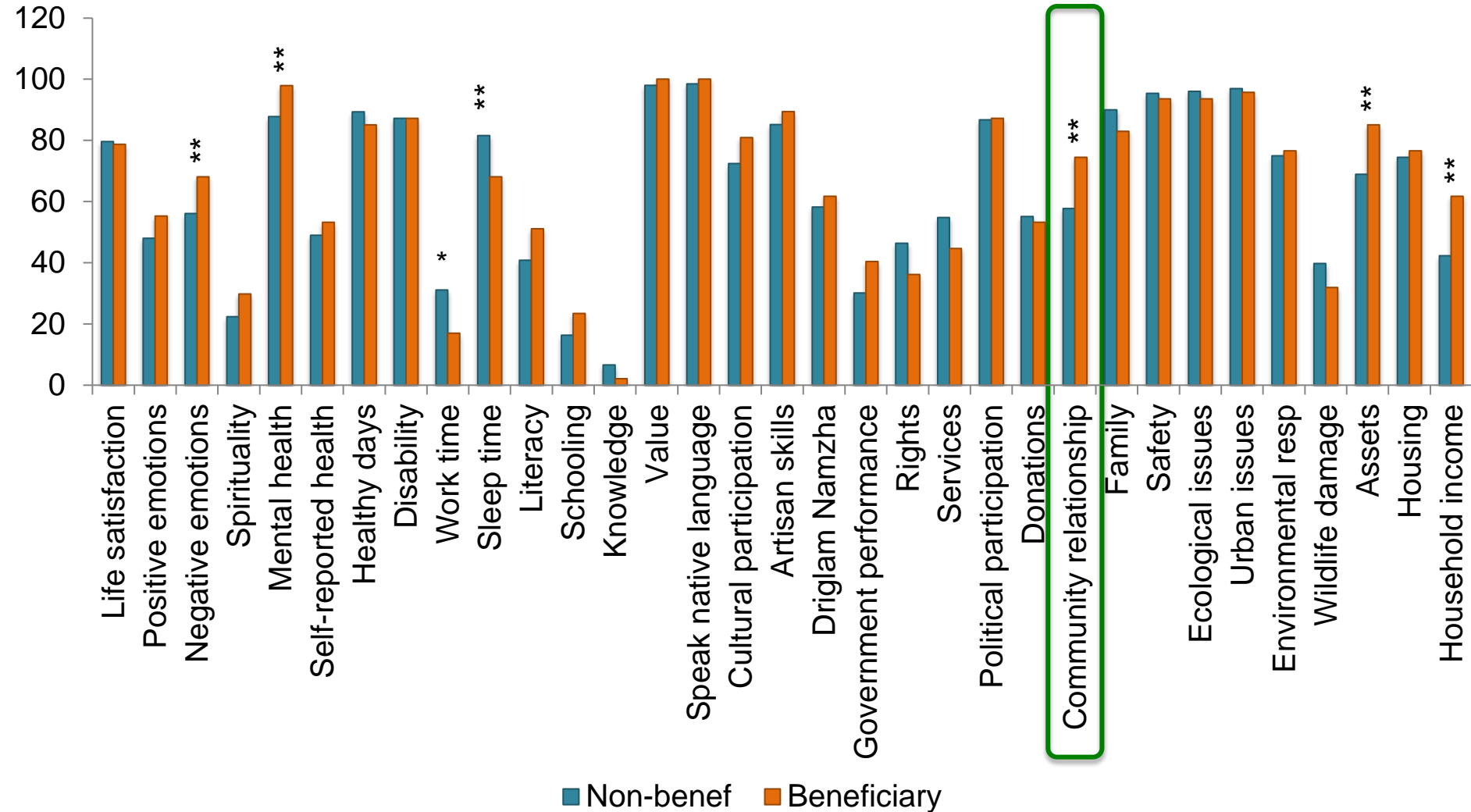
*** p<0.01, ** p<0.05, * p<0.1

Assessment framework

Worker Survey &
Mgmt. interview;
Administrative Data

Mgmt. interview;
Administrative Data

Psychological Wellbeing (7)

Time Use (6); 1

Health (3;4)

Education (2;3)

Living Standards (1;5)

Good Governance (8)

Cultural Diversity (3)

Community Vitality (7)

Ecological Diversity (7)

- Face-to-face interview
- Structured questionnaire

- Face-to-face interview
- Semi-structured questionnaire
- Administrative data; official record; third party reports

Dasho Karma Ura, PMAC, 28.1.23

Stages in the assessment process

STEP 1

Application

Application of interest

Application ✓

Review application and check eligibility

STEP 2

Action plan
- Duration ✓
- Identify team ✓
- Sampling ✓

Develop action plan

STEP 3

Worker survey
Q1.
Q2.

Data collection from workers

Company survey
Q1.
Q2.

Evidence gathering

Data cleaning
- Non response ✓
- Data entry ✓
- Site visits ✓

Verification and validation

STEP 4

Scoring

50/100 ☑☒☐

Aggregation and scoring

STEP 5

.... ✓
.... ✓
.... ✓
.... ✓
....

Final review

⌘

© CERTIFIED

Certification decision

Grading and certification

- Grading
  - Five gradations depending on the score

Score	Category	Remarks
≥90	GNH-A+	The values of a business is **almost perfectly aligned** with the GNH values
80 – 89.99	GNH-A	The values of a business is **extensively aligned** with the GNH values
60 - 79.99	GNH-B+	The values of a business is moderately aligned with the GNH values
40 - 59.99	GNH-B	The values of a business is somewhat aligned with the GNH values
<40	GNH-C	The values of a business is remotely aligned with the GNH values

National Goal		Single number GNH index
⬆		⬆
Sectoral Goal		GNH indicators
⬆		⬆
Policy Making		Budget allocation formula
⬆		GNH policy screening tools
Project Formulation		⬆
		GNH project selection tools