

CENTRE FOR BHUTAN STUDIES

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Weighting

Setting indicator weights is a crucial component of the measurement design as it may impact the index value and the resulting ranking. Equal weights are used especially when each indicator or dimension is judged to be normatively roughly equal in importance. A range of statistical tools are also used to assign weights such as principal component analysis, factor analysis, regression coefficients, data envelopment analysis (DEA) and the benefit of doubt approach (BOD).¹ Weights developed using statistical tools also require judgments in order to design the particular application – they are not value free. And if the weights are updated with each survey, this creates challenges in comparing an index across time as the weights are subject to change as data changes over time. If the weights are not updated, this creates challenges in defending their use in a different period.

To set normative weights, a variety of procedures are used, such as participatory approaches, expert opinion, survey data, or author selection, etc. A normative judgment must be made explicit and might be defended on different grounds. The weighting structure might be argued to reflect the intrinsic value of the indicators to a community or country, or to reflect an existing consensus or precedent. Or it may be justified procedurally. Experts' weights might be a simple average of expert survey results or might be justified in other ways.² Moreover, weights may also be justified or influenced by the urgency or perceived priority for political intervention in a particular indicator.

¹ See OECD 2008. **Benefit of the doubt (BOD)** -- *e.g.* Human Development Index (Mahlberg&Obersteiner 2001); Sustainable Development (Cherchye&Kuosmanen 2002); Social Inclusion (Cherchye, et al. 2004); Macro-economic performance evaluation (Melyn&Moesen 1991; Cherchye 2001); Unemployment (Storrie&Bjurek, 1999; 2000).

²**Budget Allocation** -- *e.g.* Employment Outlook (OECD 1999); Composite Indicator on e-Business Readiness (EC 2004b); National Health Care System Performance (King's Fund 2001); Eco-indicator 99 (Pré-Consultants NL 2000) (weights based on survey from experts); Overall Health System Attainment (WHO 2000) (weights based on survey from experts).



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For the GNH Index, the following approach has been adopted. The nine domains have been assigned equal weights as they are considered equally important from a GNH point of view.

While each of the nine domains are given equal weights of 1/9 and so have equal importance in producing the final index value, each of indicators within them does not. There are 33 indicators underlying the nine domains. In three domains, the indicators within a domain were equally weighted (psychological wellbeing,

living standards, and time use). In three domains, 'self-report' indicators such as self-reported health status were weighted at 20% and the objective indicators at 30% (culture, community, health). In three domains, subjective indicators (such as perceived environmental issues or perceptions of government performance) were given a 10% weight and objective indicators the remainder (health, governance, environment). The weighting for the indicators thus has been based on the nature of the indicators; objective indicators are given higher weights than subjective ones with the exception of psychological wellbeing where all indicators are subjective or self-reported.

The robustness of the GNH Index and its analyses are being tested for different weighting structures to explore and analyze its sensitivity to changes in relative weights.



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Domain	Indicators	Individual indicator weight		Domain weight	Total weight	
		Fraction form	Percentage form		Fraction form	Decimal form
Psychological wellbeing	Life satisfaction	1/3	40%	1/9	1/27	0.037037
	Positive emotion	1/6	10%	1/9	1/54	0.018519
	Negative emotion	1/6	10%	1/9	1/54	0.018519
	Spirituality	1/3	40%	1/9	1/27	0.037037
Health	Self reported health status	1/10	10%	1/9	1/90	0.011111
	Number of healthy days	3/10	30%	1/9	1/30	0.033333
	Disability	3/10	30%	1/9	1/30	0.033333
	Mental health	3/10	30%	1/9	1/30	0.033333
Time use	Work	1/2	50%	1/9	1/18	0.055556
	Sleep	1/2	50%	1/9	1/18	0.055556
Education	Literacy	3/10	30%	1/9	1/30	0.033333
	Schooling	3/10	30%	1/9	1/30	0.033333
	Knowledge	1/5	20%	1/9	1/45	0.022222
	Value	1/5	20%	1/9	1/45	0.022222
Cultural diversity and resilience	<i>Zorig chusum skills</i> (Artisan skills)	3/10	30%	1/9	1/30	0.033333
	Cultural participation	3/10	30%	1/9	1/30	0.033333
	Speak native language	1/5	20%	1/9	1/45	0.022222
	<i>Driglam Namzha</i> (code of etiquette and conduct)	1/5	20%	1/9	1/45	0.022222
Good Governance	Political participation	2/5	40%	1/9	2/45	0.044444
	Services	2/5	40%	1/9	2/45	0.044444
	Governance performance	1/10	10%	1/9	0/1	0.011111
	Fundamental rights	1/10	10%	1/9	1/90	0.011111
Community vitality	Donation (time & money)	3/10	30%	1/9	1/30	0.033333
	Safety	3/10	30%	1/9	1/30	0.033333
	Community relationship	1/5	20%	1/9	1/45	0.022222
	Family	1/5	20%	1/9	1/45	0.022222
Ecological diversity and resilience	Wildlife damage	2/5	40%	1/9	2/45	0.044444
	Urban issues	2/5	40%	1/9	2/45	0.044444
	Responsibility towards environment	1/10	10%	1/9	1/90	0.011111
	Ecological issues	1/10	10%	1/9	1/90	0.011111
Living Standard	Household per capita income	1/3	33%	1/9	1/27	0.037037
	Assets	1/3	33%	1/9	1/27	0.037037
	Housing	1/3	33%	1/9	1/27	0.037037
	Total	9/1			1/1	1.000000



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