Gross National Happiness

Can Environmental Economics Offer a Way Forward?

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Introduction

The aim of this article is to suggest that economic planning concepts and tools currently exist which might be of practical interest to those individuals working within the Royal Government of Bhutan (RGOB) who are responsible for interpreting and applying *in practice* the concept of Gross National Happiness (GNH). The suggestions presented in this paper are heavily indebted to the work of Professor David Pearce and others at the Centre for Social and Economic Research on the Global Environment in England. I do not claim to be saying anything that has not been articulated elsewhere; my purpose is simply to encourage Bhutanese officials to benefit from on-going intellectual effort driven largely by growing environmental concerns in other countries. Indeed, in response to Lyonpo Jigmi Thinley's call for a more comprehensive measure of development, such as GNH, I have referred to a simple indicator of sustainable development that has been proposed by Pearce and Atkinson (1992). While no doubt the GNH debate will continue, introducing an indicator of this kind could be a positive next step for RGB to consider.

This paper has arisen out of a letter written to *Kuensel* in December 1998 which, in turn, was triggered by the debate ensuing in that newspaper concerning the notion of GNH [*Kuensel*, Vol XIII, 45-48] as an indicator of development in Bhutan. It is certainly a unique and intriguing measure of development that has been proposed for Bhutan.

My interest lies in considering how best this theoretical concept might be operationalised for use by decision-makers within government. Facing the daily realities of setting economic policy and formulating development plans, such staff will require practical guidelines that enable them to establish an economic environment within which development activity can thrive in accordance with the principles of GNH.

I make no pretence of the fact that my understanding of Bhutan and its impressive environmental and cultural heritage is very limited; indeed, my experience of Bhutan amounts to no more than a few weeks in Thimphu. Notwithstanding these constraints, I would like to suggest that within the discipline of environmental economics, there already exists an array of conceptual approaches and tools that might, if appropriately broadened, provide government an immediate opportunity to explore the contents, dimensions and contradictions of GNH and to translate it to the operational level.

According to Lyonpo Jigmi Thinley [*Kuensel*, Vol XIII, 46], the "non-quantifiable goals" of Bhutanese development are "environmental preservation, cultural promotion, and good governance." This article will focus on the first of these three goals, "environmental preservation". That said, it may be that the conceptual framework of environmental economics can be adapted to facilitate rational decision-making concerning the safeguarding and promotion of Bhutan's cultural traditions; I believe "good governance" necessitates an altogether separate initiative from government.

The tenor of Lyonpo Jigmi Thinley's statement is that RGB is not anti-economic growth *per se*. Instead it is more that RGB wishes to promote the view that policies designed to promote improvements in the material well-being of Bhutan's citizens should be informed by, and tempered with, equally pressing concerns for preserving the environment (and promoting its

culture). The potential value of an environmental economics approach to policy making in Bhutan is that it explicitly recognises that her economy and environment are inextricably linked.

The essence of the environmental economics model lies in a sequence of logical steps (Turner *et al*, 1994). First, evaluating the *economic* importance of Bhutan's environmental resources; second, identifying the *economic* causes of perceived threats to, and actual deterioration in, the country's environment; third, outlining *economic* incentives to slow, halt and reverse any such decline. The fundamental presumption of this approach is that Bhutan's environment cannot be isolated from what occurs in her economic sphere of activity. However it seems to me that this linkage – between the economic and the environment domains in Bhutan – is precisely what is implied by the concept of GNH. The two go hand-in-hand with each other: good economic policy making should help to preserve Bhutan's environment whilst not harming her level of economic growth.

In this paper I wish to provide a brief introduction to the subject of environmental economics and the approaches it employs to tackle environmental issues and problems. I wish also to address the concept of sustainable development from an environmental economics perspective, since this notion is at the heart of Lyonpo Jigmi Thinley's concerns, and RGOB's desire for an alternative indicator of development. Before I turn to these two topics, I would like to digress briefly and suggest why environmental economists believe that environmental preservation is important.

Why is it important to preserve the environment?

The moral case for preservation

In recent times moral concerns connected with economic growth and development have come to the fore. Questions concerning the rights and wrongs of rapid growth modern economic systems have surfaced, in particular regarding their potentially negative impact upon the prospects of future generations and non-human nature, as well as exacerbating declining moral standards in modern society.

Many people would resist the very questioning of the worth of the environment. They would argue that humans have a *moral obligation* to preserve the environment. This obligation, they would suggest, is related to the immense capacity that humankind possesses to destroy much of that environment; with such power comes a responsibility. There are also related arguments that assert the inalienable rights of ecosystems and non-human sentient beings. There is clearly religious support in Bhutan for such views – the debate on GNH in *Kuensel* late last year included letters written by Buddhist monks. In conserving the environment, there is a deeply held belief that humans have a stewardship role on behalf of some Greater Being.

An economic argument for preserving the environment

Environmental economists do not deny the moral case for preserving Bhutan's environmental resources. For example, there are many instances when it simply isn't right to destroy this landscape or cut down that forest. But there are other arguments for protecting Bhutan's environmental heritage. An environmental economist would suggest that for RGOB policy makers and planners, the economic argument is often more persuasive. This is particularly so when the moral case for preservation (i.e. the 'right thing' by nature) contradicts other rights such as the right of Bhutanese people to develop economically and their right to have food and shelter.

Economists are acutely aware of the fact that the capacities of natural environments impose very real limits and

boundaries upon economic activity. Concern about the environment in the economics profession has a long history: individuals such as Malthus in the eighteenth century, Ricardo and Marx in the nineteenth century, and, more recently, the authors of '*The Limits to Growth*' (Meadows *et al*, 1972) have all believed (for different reasons) that there were limits to economic growth. In an essay entitled 'The economics of the coming Spaceship Earth', Boulding (1966) incorporated concepts and ideas from economics and science in order to develop a perspective of the economy that emphasised the interdependencies between economy and environment. He suggested that the economy should be viewed as a circular resource flow system, and that the environment imposes a set of constraints according to its stock of resources and its natural ability to assimilate wastes. Boulding argued that it would be imprudent to act as if we had access to unlimited resources, 'sources' and 'sinks' that exist simply to be exploited (he described this as the 'cowboy economy'). Instead, we should learn to treat planet earth as a 'spaceship' in which we should be concerned about reducing wastes, recycling materials, conserving exhaustible energy sources, and identifying previously untapped energy sources such as solar power.

An environmental economist accepts the hypothesis that there is an extensive interdependence between the economy and the environment. Because of this, some of its analysts have also pointed out that the design of economies (free market, planned, or mixed) offers no guarantee that the life support functions of natural environments will persist. Unfortunately, there is an absence of information and analysis that could demonstrate whether any particular economy is consistent with the natural environments, which are necessarily linked to that economy. We do not have what we could call an existence theorem that relates scale and components of an economy to the set of environment-economy interrelationships underlying that economy.

Without this theorem we run the risk of degrading and perhaps destroying environmental functions.

It is clear that RGOB is interested in sustaining her economy over time. This is readily apparent from the statement by Lyonpo Jigmi Thinley to the United Nations. In order to take the GNH debate further, that is into the realms of practical economic planning, it is important for policy makers and other government officials henceforward to establish some economic principles and objective decision-making rules for preserving the environment, thereby permitting sustainable economic development.

What is environmental economics?

Environmental economics is a branch of economics; it shares a common history with its parent discipline. The origins of 'modern' environmental economics lie in the 1960s at the time when the 'green' movement was beginning to take root, and influence government policy in developed countries, although its roots can be traced right back to the eighteenth century with the writings of Thomas Malthus.

Economy-environment interrelationships

Whilst it may seem self-evident, there is a crucial point to understand at the outset about the basis of environmental economics; that is, the economic system which enables us to enjoy 'modern' living standards relies on the support of ecological systems of plants and animals and their interrelationships. The relationship between the two spheres of activity is not the other way around.

Environmental economists perceive the real economy in which we all work and live as an 'open' system. This implies that in order to generate income and wealth for its inhabitants the economy must first extract resources from the environment, process them so that they are available for

use as end-products, and, finally, dispose of large amounts of resulting wastes back into the environment. This is the so-called 'materials balance' perspective on the economy; it is fundamental to environmental economics analysis.

On the basis of this materials balance model of the interface between the economy and environment, it is apparent that resource extraction/harvesting activities start off the process of economic activity. The environmental economics literature often categorises natural resources as 'renewable' and 'exhaustible'. A renewable resource is able to regenerate itself: thus, fish and trees are renewable resources. In contrast, the total quantity of an exhaustible resource is fixed, so that any use of it in a given time period means that there is less of it available for later time periods. Strictly speaking, however, the renewable/exhaustible distinction is misleading. First, a great many renewable resources – fish and trees, for example – are exhaustible if they are not conserved in a sustainable fashion. Consequently, a more apposite distinction might therefore be between renewable and 'non-renewable' resources. A renewable resource will, given an appropriate management regime, regenerate itself; non-renewable resources do not have this capability. A second complication is that many resources are in fact mixtures of renewable and non-renewable elements: primary forests and soil, for example.

Unfortunately, it is beyond the scope this article to describe this branch of environmental economics any further. Suffice it to say that there is a strong body of theory concerning the economically optimum rates at which renewable and non-renewable resources can be harvested/exploited.

Environmental functions as economic functions

If we accept the materials balance model, three basic functions are provided by the environment as follows:

1. As a supply of resources, both renewable and non-renewable;

2. As a sink for assimilating waste products arising from human activity;

3. As a source of services which from which humans can benefit; for example, a sense of aesthetic pleasure giving rise to artistic expression, recreational pursuits, and perhaps fulfilling a spiritual longing.

Turner *et al* (*op.cit.*) suggests that these three roles are all subsumed by the one general function of natural environments, that is the provision of life support.

Environmental economics argues that it is reasonable to consider all these environmental functions as economic functions. The reason is that all three functions have an economic value that is positive. In other words, if we were able to trade them in a market-place, they would all have positive prices. It is this belief that helps environmental economists to understand why natural environments are, so often, mistreated. Since there are no markets for these economic functions, there are no market prices for many environmental goods and services. Because society as a whole does not acknowledge the positive prices for these economic functions, there is market failure resulting in abuse of the environmental resource.

Valuing environmental functions

In order to help correct economic decisions that treat natural environments as if they were free goods and services, thereby leading to their overuse, the valuation of environmental functions is an important task facing the environmental economist. A number of methods and techniques have been developed, based on concepts of 'willingness-to-pay' and 'willingness to avoid', in order to impute monetary values for

these non-market environmental assets; for example, contingent valuation, hedonic pricing (pricing of pleasure), travel cost methods, and so on.

It is understandable that, for many, environmental economics is an unfamiliar and sometimes controversial subject. But if an environmental economist talks about valuing environmental assets in money terms he is not devaluing the level of debate; he is not reducing the importance of Bhutan's environment. On the contrary, money comes into the debate because it is one useful indicator of what people want and do not want with regard to environmental resources. Strange as it may seem, environmental economists are concerned with overall human wellbeing, not money *per se*! The economic approach brings insights into a powerful set of analytical tools that might be useful in the quest to conserve Bhutan's environmental heritage; tools that have started to be used in other countries.

Environmental cost-benefit thinking

Environmental economists generally advocate what they call 'cost-benefit thinking', which can be applied to individual projects or to policies or even wider courses of action. Simply put, the aim is to compare all the relevant benefits from, say, building a new road with the costs of such a project, including the environmental effects. Both costs and benefits are translated, as far as is feasible, into monetary terms and discounted over a given time period. Only projects with benefits greater than costs, *including environmental benefits and costs* are acceptable. The decision rule becomes:

$$S_t \, (B_t - C_t \pm E_t) \, (1 + r)^{-t} > 0$$

where,

B = benefits of undertaking the project

C = costs of undertaking the project

E = environmental benefits and costs associated with the project

t = time period

$(1 + r)^{-t}$ = factoring in the discount rate

In the context of environmental problems and issues, there have been two main successes arising from the use of this kind of environmental cost-benefit thinking:

1. the unpriced but valuable functions of natural environments have been integrated into cost-benefit analyses of real world projects;

2. the kinds of economic damage done to national economies by resource depletion and pollution have been highlighted.

This is, however, only the start. Once RGOB, say, has decided on an 'acceptable' level of environmental quality assisted by *inter alia* economic cost-benefit analyses, there are still further questions to be addressed.

Environmental economic instruments

To transform this environmental quality level decision into reality requires a modification of behaviour on the part of Bhutanese producers and consumers. This change will be influenced among other factors by the economic environment in which they operate which, in turn, will be dependent on RGB planners setting the appropriate environmental economic policy to induce the required changes. Needless to say, there is a continuing debate within environmental economics concerning the relative merits of command and

control regulations and market-based incentives to preserve the environment.

Following Norton (1994), in choosing an environmental economic preservation policy, RGOB policy makers would need to determine:

1. What are the policy instruments and technologies available to RGB for preserving the environmental resource in question;

2. What are the objectives of RGOB's environmental preservation policy, with particular reference to the environmental resource in question; the perceived level of environmental risk; the extent and reliability of environmental preservation methods; the full (social) costs of preserving the environmental resource; the impact of the policy upon different socio-economic strata of citizens within Bhutan;

3. How cost-effective are the different policy instruments with respect to these RGB environmental preservation objectives.

A regulatory approach would involve RGB issuing an order to do or not to do something, e.g. to cut down an area of natural forest. In contrast, market-based incentives do not require such directives but, instead, payments (i.e. taxes, subsidies) which, in principle, encourage the economically rational individual to change his environmentally destructive behaviour. Given certain assumptions it can be shown that the most cost-effective way of achieving some predetermined level of environmental quality is via the imposition of a tax or related economic incentive instrument. However, if some of these assumptions are eased, and other considerations such as equity and ethical concerns are introduced, the case in favour of the incentive approach is much less clear cut. In the absence of a 'blueprint', it is beholden to RGB economic

planners to ensure that the environmental economic policies they promote are indeed optimal.

Admittedly, this has been a very cursory introduction to some of the ways in which environmental economists think about issues pertaining to the environment. I would suggest that many of the concerns that are currently motivating theoretical and practical developments in environmental economics are of direct relevance to RGB policy makers and economists who are currently tackling environmental preservation problems in Bhutan.

I would now like to turn to the subject of sustainable development. This is a subject that has exercised the minds of many environmental economists, and it is the topic that underpins Lyonpo Jigmi Thinley's statements concerning GNH.

The concept of sustainable development

Defining sustainable development

In the environmental economics (and other!) literature, it is possible to find many definitions of sustainable development (SD). The debate has uncovered a range of approaches that vary because they are founded on alternative environmental ideologies. Pearce *et al* (1989) suggest that from the 'ecocentric' perspective, the extreme 'deep ecologists' seem to come close to rejecting even a policy of 'modified' development based on the sustainable use of the environment. For them only a minimalist development strategy is morally acceptable. In contrast, other analysts assume that there will continue to be a very high degree of substitutability between all forms of capital (physical, human and natural capital). From this 'technocentric' perspective, they argue that the maintenance of a sustainable economic growth strategy over the long run merely depends on the adequacy of the investment expenditure. To them,

investment in natural capital is not irrelevant but it is not of overriding importance either. These two extreme positions are often labelled as *very strong sustainability* and *very weak sustainability*, respectively.

The most publicised definition of sustainability is that of the World Commission on Environment and Development (1987). The Commission defined SD as: "development that meets the need of the present of the present without compromising the ability of future generations to meet their own needs."

Whatever the standpoint, it is generally agreed that SD is economic development that continues over the long run.

Measuring sustainable development

A more challenging task, now facing RGOB, is how to determine the necessary and sufficient conditions for achieving SD. In practice, how do RGOB planners compensate future generations for damage that current economic activity might cause? One approach is to ensure that this generation leaves the next generation a stock of capital no less than is available today. Remember: capital provides the capability to generate wellbeing through the creation of goods and services upon which human wellbeing depends.

Let us revert to the 'very strong sustainability' and 'very weak sustainability' positions that were noted above. Under a 'weak sustainability' interpretation of SD, it would not be necessary for RGOB to single out the environment (natural capital) for special treatment, it is simply another form of capital. Therefore, what is required for SD is the transfer of an aggregate capital stock no less than the one that exists now. In other words, RGOB planners can pass on 'less' environment so long as they pass on more roads and machinery, or other man-made physical capital. Alternatively, Bhutan can have fewer roads and factories as long as she

compensate future generations by having more forests or more education (i.e. human capital).

A 'strong sustainability' understanding of SD would not permit RGOB officials to assume perfect substitution between different forms of capital. From this viewpoint, some elements of the natural capital stock cannot be substituted by man-made capital, except on a very limited basis. For example, ecosystems are essential to human survival because they are life support services and as such cannot be replaced. These assets are considered to be 'critical natural capital' and since they are not easily substitutable, if at all, the strong sustainability rule requires that RGOB protects them.

As Lyonpo Jigmi Thinley implies in his statement to the UN, the danger is that a failure to account adequately for *natural* capital (i.e. environmental resources) and the contribution it makes to economic welfare and income will lead to misperceptions about how well the economy is really performing. Traditionally, economic development has been measured in terms of Gross National Product (GNP) per capita. His concern is well founded because the current system of producing GNP indicators used in many countries fails, in almost all cases, to account for natural capital assets which play a vital part in providing a flow of output/income over time.

Lyonpo Jigmi Thinley's proposes a new measure of development, namely GNH. This accords with the view of environmental economists who argue that GNP needs to be modified and extended if it is properly to measure SD. Extended national income accounts (i.e. those that look beyond market-based outputs, incomes and expenditure) are essential in order to improve policy signals relating to SD. The impact of different policy instruments with respect to RGB environmental preservation objectives was touched upon earlier in this article.

GNH might therefore incorporate two adjustments, one for the depreciation of natural capital (changes in quantity) and the other for degradation of the natural capital stock (changes in quality). Whilst this might not fully reflect the intentions of the RGOB as implied in Lyonpo Jigmi Thinley's statement, it is at least a step in the right direction.

Simple indicator of sustainable development

Pearce and Atkinson (1992) suggest a SD rule. Their indicator of SD states that an economy must save at least as much as the sum of the depreciation on the value of man-made and natural capital. They use the analogy of a business: if a business consistently fails to save enough money to reinvest to cover depreciation of its capital assets, it might survive in the short term, but not for very long. In other words, the enterprise would be unsustainable. According to Pearce and Atkinson, the same is true for an economy.

The indicator of SD thus becomes that an economy must save more than the depreciation on its man-made and natural capital if it is to be considered sustainable:

$$Z ³ S/Y - d_M/Y - d_N/Y$$

Z must be greater than or equal to zero for sustainability

where,

Z = sustainability indicator

S/Y = gross savings ratio

d_M/Y = depreciation of human-made capital

d_N/Y = depreciation of natural capital

Applied to Bhutan, the country's national savings ratio (savings divided by some measure of income like Gross Domestic Product) must be at least as great as the depreciation on its natural capital and man-made capital stock, if it is to pass Pearce and Atkinson's simple sustainability test.

Dealing with uncertainty

An important issue is how RGB economic planners should deal with situations of uncertainty. They are obliged to design economic policies which are sensitive to a very difficult trade off, namely the use of resources to satisfy today's demands for improved living standards against conserving Bhutan's environmental resource stocks and flows to guarantee long-run sustainable benefits. Not only do they have to cope with uncertainty, but also contend with possible 'irreversibilities', i.e. those decisions once taken that result in changes that are physically impossible to rescind or prohibitively expensive to reverse, e.g. the loss of primary forest.

In terms of SD it is important that future generations are guaranteed the same opportunities that were open to the past. This is often described as the 'intergenerational social contract'. Adherence to this contract is achieved by maintaining a constant level of capital for the next generation. This decision will imply a 'social opportunity cost': present day society will be obliged to forgo development benefits for the sake of future generations. If present generation RGOB planners decide to honour this 'intergenerational social contract' they could decide to rule out in advance development activities that could result in natural capital depreciation beyond a certain threshold of damage, cost and irreversibility.

Steps for sustainable development in Bhutan

Following Turner *et al* (*op. cit.*) a number of operational principles for the sustainable utilisation of the Bhutan's environmental resources is suggested for consideration by RGB economic planners:

1. There should be a correction of any market and intervention failures related to resource pricing and property rights in Bhutan;

2. The regenerative capacity of renewable natural capital should be maintained (i.e. establishing appropriate harvesting/extraction rates) and steps taken to ensure that any threats to waste assimilation capacities and life support systems are minimised;

3. RGOB policies concerning technological change should be designed such that switches from non-renewable to renewable natural capital are fostered;

4. Technical progress should focus on improving the efficiency of existing production systems in preference to throughput-increasing technology;

5. The rate at which renewable natural resource substitutes are created should determine the rate at which renewable natural resources are exploited;

6. The carrying capacity of the remaining environmental resource stock should determine the overall scale of Bhutan's economy. RGB should be encouraged to continue with its careful approach to economic development given the uncertainties present.

Conclusion

RGOB appears to be serious in its desire to adopt an alternative indicator of development, one that encompasses more than mere economic growth. This will require policy makers and planners to consider ways of incorporating these wider concerns in their current array of analytical tools. This brief article has attempted to show that the discipline of environmental economics may offer concepts, approaches and decision rules that are of direct relevance to the GNH debate in Bhutan. Whilst environmental economists would be the first to admit that some of their analytics are at present simplistic, they do at least offer RGOB the opportunity to turn the rhetoric of GNH into a series of pragmatic next steps.

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