

## Prioritising the Variables Affecting Human Security in South-East Asia

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*Human security is usually framed as a multidimensional concept that depends on socio-political, economic, health-related, and ecological 'pillars'. An assessment of human security requires an analysis of the nested relationships between those variables. Focusing on South-East Asian countries we illustrate how those relationships can be used to prioritise determinants of human security. Such priorities are important because policies directed at promoting human security require definite starting points and targets. What emerges is a collage of nested systems in which global and regional environmental patterns exert the dominant influence. We assess the long-term human security prospects of South-East Asian countries by comparing their ecological footprints. South-East Asia's major ecosystems have not yet been overly incapacitated by the impact of its human populations. Human security policies could be much improved by addressing the growing inequities in ecological footprints and by public education campaigns on the significance of ecosystem health.*

**Keywords:** Human Security, Environmental Security, Ecological Footprint, Sustainability, Overshoot

*Menschliche Sicherheit wird für gewöhnlich als multidimensionales Konzept charakterisiert, das auf sozio-politischen, ökonomischen, gesundheitsbezogenen und ökologischen „Säulen“ basiert. Eine Untersuchung menschlicher Sicherheit erfordert demnach die Berücksichtigung der Wechselwirkungen zwischen diesen Variablen. Anhand der südostasiatischen Länder illustrieren wir, wie diese Wechselwirkungen genutzt werden können, um die Determinanten menschlicher Sicherheit zu priorisieren. Derartige Prioritäten sind notwendig, da eine Politik zur Stärkung von menschlicher Sicherheit klar definierte Ausgangs- und Zielpunkte benötigt. Es entsteht eine Art Collage von ineinander greifenden Systemen, in denen globale und regionale ökologische Muster einen bestimmenden Einfluss ausüben. Wir untersuchen die langfristigen Perspektiven von menschlicher Sicherheit in den südostasiatischen Staaten durch einen Vergleich ihrer ökologischen Fußabdrücke. Südostasiens wichtigste Ökosysteme sind bisher relativ wenig durch menschliche Aktivitäten in Mitleidenschaft gezogen. Menschliche Sicherheit in Südostasien könnte also stark verbessert werden, wenn den zunehmenden Unterschieden der ökologischen Fußabdrücke entgegen gewirkt wird und öffentli-*

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*che Kampagnen zur Bewusstseinsbildung für die Bedeutung der Ökosysteme betrieben werden.*

**Schlagworte:** *Menschliche Sicherheit, Umweltsicherheit, Ökologischer Fußabdruck, Nachhaltigkeit, Raubbau*

### ***Conceptualising Human Security***

Human security as a concept first surfaced in the early 1990s when it became increasingly clear that the end of the Cold War would not be accompanied by an end to armed conflict but that instead the nature of violent conflict was changing, away from traditional interstate war towards intrastate conflicts fuelled by ethnic, religious, or ideological divisions. The discourse about security became enriched with the new insight that states are not the only entities whose security ought to concern us. Regions, communities, families, and individuals can only feel secure if they have reason to believe that their continued functioning is not going to be threatened at every turn. Furthermore, the security of the state largely depends on the security of regions, communities, families, and individuals. And occasionally states fail to fulfil their obligations as security guarantors, even to the point of threatening the security of their own citizens. It was realised that a primary requirement for human security was not merely the absence of war but the absence of structural and personal violence (Galtung, 1969). These realisations informed a shift in perspective from the state as the subject and object of security policy to the human individual as the centre of security considerations – from state security to human security (Griffin, 1995). And since human beings, unlike states, are capable of sensations and emotions, human security was recognised as partly contingent on those particular states of mind that we tend to associate with human well-being.

It follows that human security depends on variables that extend beyond what has traditionally been regarded as the political arena. The absence of violent conflict is only one of many determinants of human security, including a relative safety from acute infectious disease, minimum complements of safe fresh water and adequate nutrition, and a formal guarantee of basic human rights and dignity. Concern for security also became extended further into the future. It became acceptable to

express concern about the future well-being of one's children, and, from middle age onward, with the well-being of their children, and so on. This long-term humanitarian concern has gradually come to inform the agenda of human security, as indicated by some common definitions of sustainability (WCED, 1987; UN Millennium Project, 2005).

With those concerns in mind, how, then, should we define human security? Development agencies operating under national, super-national, or non-governmental umbrellas have adopted these extensions of the security concept into environmental and ethical dimensions. This re-conceptualisation is evident in several key policy documents of the United Nations. In the Secretary General's Millennium Report the UN's security agenda is defined as 'freedom from fear' and its development agenda as 'freedom from want' (United Nations, 2000). Thus, the UN's guiding principles on security are paraphrased in negative terms as freedom from a condition that is evidently undesirable. Similarly, Alkire (2002, p. 2) defined the objective of human security as 'to safeguard the vital core of all human lives from critical pervasive threats, and to do so without impeding long-term human flourishing'. Elsewhere (Lautensach, 2006) we suggested that those definitions are unhelpful, an argument which we can only summarise here. First, negative definitions are always fraught with logical difficulties. Second, 'freedom', 'fear', and 'want' are highly subjective and emotive concepts: the extent to which individuals will experience those sensations depends on differential metabolic states, emotional states, situational and associative contexts, as well as cultural backgrounds. An absence of wants or needs can also be caused by an absence of self-confidence, a negative self-image, or a defeatist self-concept. It is also not possible to reduce those wants and needs to minimum requirements for survival.

Another objection to those popular definitions states that the focus on 'freedoms' blinds the observer to the problem of limits or of scale. In any given quasi-closed system (such as an island, a desert oasis, or a planet) the extent to which the human inhabitants' needs and wants can be satisfied depends on the population size. Other variables, such as individual affluence and technological sophistication also apply, but only temporarily. For example, the same freedom from water shortage for a region in sub-Saharan Africa can be achieved without much effort for a population of a few thousand while remaining utterly unachievable if that population measures

in the millions.

In order to arrive at a definition of human security that might realistically allow us to promote it in specific contexts, it is helpful to first examine what sources of insecurity might threaten the global citizen. Because of the subjective nature of human security, such an examination must involve consultation with the people in question. Multinational opinion surveys<sup>3</sup> point towards criminal violence, armed conflicts (civil or international), terrorism, infectious disease, and 'natural disasters' as the events that people are most concerned about. The latter include extreme weather events, climatic aberrations, pest invasions, famines, floods, landslides, earthquakes and volcanism, and meteorite impacts. Other sources of insecurity include economic collapse, personal bankruptcy, personal accidents with traumatic health effects, and chronic health problems. Of course all of those factors potentially give rise to acute wants and needs in the individual. But by focusing on those sources of insecurity we eliminate some of the ambiguity and heterogeneity associated with the abovementioned 'freedoms' while gaining the advantage of focusing on more clearly defined targets. This would better facilitate proactive and preventive policy planning and enable us to enlist a host of descriptive-analytical sciences for our planning efforts. Returning to the example of water security, by focusing on possible causes of water shortage and on the systemic requirements for water security, the observer would be forced to take into account the limits of the local system, an essential requirement for the design of long-term effective and sustainable policies.

To summarise so far, the most useful definitions of human security tend to focus on sources of insecurity because they allow us to eliminate unreasonable, unjust, and counterproductive demands from our scope of targets – demands that are often formulated by security providers rather than by the victims of insecurity. While these definitions may not give us a more objective notion of what human security means, they enable us to more clearly identify the most deserving targets for countermeasures. Given the added strength of source analysis with regard to problems of scale we feel justified in advocating it as the superior conceptual

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<sup>3</sup> For example, one survey conducted in the UK identified crime and ill health as the greatest concerns (cf. <http://www.angus-reid.com/polls/index.cfm/fuseaction/viewItem/itemID/8084>). Of course such surveys are biased by the influence of media, the entertainment industry, and momentary scaremongering. But taking them into account decreases the extent of paternalism in security policies, where people are often told what their security needs are by a small number of individuals holding relatively secure positions in society. The same consideration applies at the international scale in the context of 'development aid'.

approach. Focusing squarely on the sources of insecurity obliges us to pay attention to areas that lie beyond the scope of peace research in Galtung's (1969) sense, namely the absence of personal violence and the presence of social justice. The reason is that some of those sources are situated outside of the social realm and are shaped by the ecological interactions between our species and its biotic and abiotic environment, beyond ethics and justice. Thus, human security in its expanded meaning includes more than peace.

A survey of the sources of insecurity suggests that a comprehensive definition of human security needs to include four broad areas which we refer to as the 'four pillars' of human security (Lautensach, 2006). They include the traditional area of military/strategic security of the state; economic security, particularly the contribution made by heterodox models of sustainable economies; health-related security, informed by epidemiology and the complex determinants of community health and health care priorities; and environmental security that models the complex interactions between human populations and their ecological support structures, the source and sink functions of their host ecosystems. Environmental security is defined as security from 'critical adverse effects caused directly or indirectly by environmental change' (Barnett, 2007, p. 5). Elsewhere (Lautensach, 2006) we elaborated on how each pillar can contribute to our understanding of the sources of human insecurity and enables us to mitigate their effects. We shall now show that environmental security plays a special role among them.

### ***The Significance of Environmental Security***

Since the inception of the Four Pillar model and other similarly multidisciplinary models (such as the United Nations Development Program's [UNDP] seven dimensions [UNDP, 1994, pp. 24-33] which cover the same areas as the four pillars), it has become increasingly clear that the most intriguing and challenging questions in human security deal with the interrelationships between the four pillars. Numerous case studies suggest that sources of insecurity have roots in more than one area. Those different roots tend to affect each other, sometimes reciprocally in a positive feedback pattern. A well-known example is the causation of violent conflict that is often situated in social injustice, economic destitution, and environmental scarcity (Homer-Dixon,

1999). Any increase in one of those variables tends to stimulate the others, which leads to a general worsening of the situation unless drastic interventions lead to simultaneous improvements in more than one of them. Any sustainable solution to the crisis requires improvements in all three areas of causation. The current situation in Sudan exemplifies this problematic.

The example also illustrates the significance of sustainability in addressing human security issues, a requirement that appears as self evident as the frequency with which it gets ignored by policymakers and theorists alike. Sustainability is defined by the balance between efforts to support the quality of life for a human population and the continued functioning of its environmental support structures, namely ecosystems.<sup>4</sup> Ecosystems consist of local communities of species and their physical environment. They serve as sources of food, raw materials, and energy, and they recycle the population's wastes. Complex ecosystems that are rich in species (occurring especially in the tropics) tend to be more resilient to disturbances, whereas ecosystems that consist only of a few species tend to be more fragile.

Human populations, like all other animal populations, obtain their sustenance from ecosystems which provide food, raw materials, and energy, and which recycle organic wastes back into biomass. Human populations are special in that they employ technology to maximise the benefits of those ecosystem processes. But regardless of this technological windfall, the capacities of local ecosystems remain limited. Generally, the environmental impact  $I$  of a human population on local ecosystems is described by the  $I=PAT$  formula, where  $P$  means population size,  $A$  stands for the affluence or economic means per capita, and  $T$  represents the technological impact per capita (Ehrlich & Holdren, 1971; York, Rosa, & Dietz, 2003). The maximum sustainable impact, also referred to as carrying capacity (Curry, 2006, p. 126) is thus described as the product of the three variables: it can be reached by small populations with a high-impact lifestyle or by larger populations where each individual demands less in terms of support services. When a population exceeds the maximum sustainable

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4 We use the term only in its original environmental meaning and do not refer to other, secondary interpretations such as cultural or social sustainability. Lemons (1996, p. 198) defined sustainability as "the continued satisfaction of basic human physical needs, such as food, water, shelter, and of higher-level social and cultural needs, such as security, freedom, education, employment, and recreation", along with the "continued productivity and functioning of ecosystems". We regard the popular 'Brundtland' definition of sustainability (WCED, 1987) to be quite useless because of its lack of conciseness, inattention to meta-ethical considerations, and its neglect of fundamental ecological limitations. A more useful definition, attributed to Steve Goldfinger (Chambers, Simmons, & Wackernagel, 2000, p. 2), states that a sustainable community is one that converts resources into waste no faster than ecological support structures can convert the waste back into resources.

impact it enters into overshoot, whereby the services of the local ecosystem are being overtaxed and, depending on their fragility, may undergo irreversible structural changes (Catton, 1980; McMichael, 2001; Meadows, Randers, & Meadows, 2004; Wackernagel et al., 2002). Inevitably the consequence for the population is such that various biological regulatory mechanisms lead to a decrease in population size, below the system's carrying capacity. Numerous precedents from animal populations have allowed ecologists to characterise and predict those dynamics with impressive accuracy.

The environmental impact can also be expressed in terms of the area of productive land required to support a population's lifestyle. This is referred to as that population's ecological footprint (Wackernagel & Rees, 1996). A population whose footprint exceeds the amount of accessible land is clearly in overshoot. This may not always have immediate negative consequences for their security as they may obtain the shortfall from other regions that are either underpopulated, defenceless, or otherwise disempowered. It is, however, often unjust and supports unsustainable patterns of consumption.

To summarise this sequence of causation, unsustainable practices sooner or later lead a population into overshoot, which in turn erodes environmental support structures and decreases their capacity to deliver resources and to accept wastes. This means that the environmental security of the population is threatened, which can manifest itself in shortages of food, energy, or other commodities, or in elevated levels of pollution. Such changes invariably compromise population health and lead to economic decline, civil disorder, and vulnerability to external enemies. Evidence is provided by the historical precedents of cultures that disappeared as a result of this sequence of effects (Diamond, 2005). The upshot is that whatever safeguards may be in place to protect the economic security of a population, its public health, its national security, and the rule of law – they seem of little help in the long term unless sustainability and environmental security are guaranteed. This resonates with Barnett's (2007) finding of a mutual dependence between environmental security and peace, and it reaffirms Norman Myers' (1993; Myers & Kent, 2004) original thesis that all security ultimately depends on environmental security. It also brings the 'four pillar' metaphor into question – more appropriate would be one in which environmental security forms the basis from which the three pillars of economic,

socio-political, and health security support human security as a whole. This does not imply that the ultimate causes for all security threats are necessarily environmental; it does mean that mitigation efforts directed at the pillars will be ineffective if the ultimate cause lies in the base, and that mitigation directed at the base may well end up solving certain problems in the pillars.

This revised model informs a different approach towards assessing the human security of countries and regions, at least in the long term. If human security in the long term depends first and foremost on environmental security, then it can be assessed by examining the extent to which sustainability is evident. The easiest way to verify whether a community or country is living sustainably is by examining the population's ecological footprint, although other approaches are being developed by experts in the new field of pherology (Ponton, 2001), the science of human carrying capacity. We will now illustrate this approach on the example of South-East Asia.

### ***Assessing Human Security Through Sustainability in South-East Asia***

We have seen that the four determinants of human security interact and reinforce each other and that environmental security forms an essential baseline because sustainability represents a *sine qua non* condition for the other aspects of human security, at least in the long term. Focusing now on the region of South-East Asia we shall apply this conclusion in order to assess its prospects for long term human security.

As explained above, the ecological footprint of a population or country is equivalent to the total bio-productive land area required to sustain its consumption of resources (food, energy, raw materials) and the processing of its wastes. It is calculated by complex algorithms that are still being refined to take into account further pherological details (Wackernagel et al., 1997). Table 1 shows the footprints of the twelve South-East Asian countries as well as their respective land areas. Normally, in order to assess whether a country is in overshoot, its footprint is compared with its available bio-productive land area in the manner of an economic comparison of demand and supply (Wackernagel et al., 1997; Ronsin, Newman & Dubois, 1999). However, in this case data on bio-productive land were either not available or based on unclear definitions.

**Table 1: Demographic and Biogeographical Comparisons of South-East Asian Countries: Sustainable Countries, At Risk Countries and Comparison Countries**

Country	Population [Thousands] (Year)	Area [ha]	Individual Footprint [ha/Person] (2009 data)	Collective Footprint [ha] <sup>(5)</sup> = Claimed Footprint	Sustainability Quotient <sup>(6)</sup>	Annual GNI per Capita [USD] <sup>(7)</sup>
..... Sustainable Countries .....						
Burma / Myanmar	50,020 (2009)	67,657,800	1.07	53,521,400	0.79	< 975 (est.)
Cambodia	14,805 (2009)	18,103,500	0.83	12,288,150	0.68	640
Laos	6,320 (2009)	23,680,000	0.91	5,751,200	0.24	760
Papua New Guinea	6,732 (2009)	46,284,000	1.40	9,424,800	0.20	1,040
..... At Risk Countries .....						
Indonesia	240,272 (2009)	190,456,700	1.48	355,602,560	1.87	1,880
Malaysia	28,318 (2009)	32,984,700	3.68	104,210,240	3.16	7,250
Phillippines	91,983 (2009)	29,976,400	1.42	130,615,860	4.36	1,890
Singapore	4,998 (2009)	73,232	4.2	20,991,600	286	34,760
Thailand	67,764 (2009)	51,312,000	2.70	182,962,800	3.57	3,670
Vietnam	88,069 (2009)	33,121,000	0.95	83,665,550	2.53	890
..... Comparison Countries .....						
South-East Asia <sup>(8)</sup>	599,281 (2009)	493,649,332	1.60 (0.83 – 4.2)	959,034,160	1.94	2,644 <sup>(9)</sup>
EU (27)	495,000 (2010)	420,000,000	4.99 – 9.88 Av. 5.1 (2005)	2,524,500,000	6.01	38,839
Canada	33,931 (2010)	998,467,000	7.66	259,911,460	0.26	43,640
USA	309,186 (2010)	982,663,000	12.22	3,778,252,920	3.84	47,930
World	6,818,500 (May 2010)	14,894,000,000 <sup>(10)</sup>	2.1 (2005)	14,318,850,000	0.96	8,654

Sources: NationMaster, World Wildlife Fund, CIA World Factbook, Living Planet Report, Global Footprint Network (GFN), Redefining Progress

We therefore resorted to a simple comparison of national footprint to national territory, giving a sustainability quotient (SQ). We consider this simplification acceptable for two reasons. First, South-East Asia does not include extensive regions of non-productive land such as deserts or alpine mountains, making it likely that a country's area of bio-productive land approaches its total territory minus urban areas which are not extensive, relative to other regions. Second, this simplified comparison produces an optimistic estimate of sustainability, in the form of the SQ as the ratio between the two areas. An optimistic estimate might preclude some of the criticism that such comparisons invariably attract. We will address some possible objections below.

The ratio between collective footprint and available productive land area, i.e. the sustainability quotient, provides a measure of the effort required of each country to reach the goal of sustainability. The most extreme situation is obviously that of Singapore, with a footprint 286 times its territory (which is largely not bio-productive). However, as a city-state it carries a separate status, one of obligatory ecological dependence on surrounding lands, a circumstance which evidently has not impeded its growth so far. For Singapore, sustainability can only ever be reached with significant help from its neighbours, Malaysia and Indonesia. This example also illustrates the limits of an analysis based solely on national statistics; many aspects of environmental security are more clearly described by data across bio-geographical regions. The significance of national SQ values is that they directly relate to national polities.

The other eleven countries form a continuum ranging from clearly sustainable (Burma, Cambodia, Laos, Papua New Guinea [PNG]) to clearly unsustainable situations (with the Philippines and Thailand being the worst off), as listed in Table 1. Not unexpectedly the SQ values seem to correlate inversely with per capita GDP, which suggests an interesting relationship, namely that poverty might somehow facilitate

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5 The collective ecological footprint is calculated as the footprint per person multiplied by the population size.

6 The sustainability quotient (SQ) is calculated as the collective national footprint divided by the area.

7 Annual gross national income per person was reported in the OECD Atlas, October 2009.

8 South-East Asian totals and means were calculated without Timor-Leste and Brunei.

9 This figure is reported for East Asia and the Pacific. For South Asia it is only USD 963.

10 The number represents the total planetary land area. A more appropriate number for footprint analysis is 13.4 billion ha of biologically productive land and water area (GFN, 2005), although that, too, probably represents an overestimate. Most of the more detailed analyses suggest that the critical SQ of 1.0 was already exceeded during the mid-1980s and has steadily increased ever since (MAB, 2005).

sustainability. We do not mean to imply causality but a correlation seems to be evident. However, several clarifications are in order. Average per capita statistics are quite an unreliable measure of poverty as they say nothing about the differences between urban and rural communities, nor do they say much about the poorest section of the population – and even if they did, such a number would only measure spending power which often does not reflect at all how those people perceive their own ‘poverty’ in terms of the quality of their lives. Also, Table 1 shows high values of GDP correlating with low degrees of sustainability. We hold this to be a direct result of the growth ideology, the belief that greater affluence represents a worthwhile goal in itself and must be pursued by all possible means through ‘economic growth’. Following that ideology, most development agencies regard low-GDP countries as natural targets for remedial action. Sadly, most development aid programs and associated agencies have taken this ideology on board quite uncritically, resulting in ‘development’ towards increased consumption and away from the goal of sustainability (Myers & Kent, 2004).

We also derive some encouragement from those numbers insofar as they show the potential of South-East Asia to get it right in time. The comparison of the regional mean with the data for North America and the EU shows the extent to which those ‘developed’ countries are still entrenched in their colonialist tradition of extracting their livelihood from other parts of the world. Clearly they are very far from being able to satisfy their demands from the resources of their own territories. Thus they are the main contributors to humanity’s global overshoot, estimated at about 40 percent (SQ = 1.4) (Wackernagel et al., 2002); by the late 1990s humanity appropriated 40 percent of the biosphere’s net primary photosynthetic productivity (Vitousek, Mooney, Lubchenko, & Melillo, 1997). South-East Asia, on the other hand, although sharing some culpability, does not face the same daunting obstacles on its path towards sustainability. We wish to emphasise that nature inevitably makes populations reach sustainability one way or another: their co-operation merely renders the transition less painful. Thus, the major good news emanating from this analysis is that South-East Asia’s transition, although traumatic in terms of reversing economic trends that have by now assumed the status of a crypto-religion, is unlikely to bring as much hardship as other regions will face.

In our analysis of numerical data we have not commented on several possible objections to the pherological approach, which we wish to rectify in closing. One frequent objection rests on the claim that human populations are incommensurable with other animal populations because of their use of technology. We know of no evidence suggesting that the advent of agriculture and other technology has changed the principle of our basic dependency on ecosystems; however, it did result in maximum sustainable impacts being more closely approached or even increased, and it served to obscure the fact of our dependency. Agriculture has led to profound modifications of supplier ecosystems, which increased their yield and decreased their complexity (Rees, 2004). Adaptive technology has allowed for a much wider range of habitats to be colonised by humans at a global scale, and it has helped us establish trade links to transport resources and wastes between distant locations. What it has not done and cannot do is to change our status as a consumer species, as opposed to producers and decomposers. Certainly the exceptionalist ideals of the pervasive anthropocentric ethics do not make it so.

Another objection states that the consumption patterns of a modern community or country, its global trade and migrations, are too complex to be expressed merely as a land area. Most developed countries, especially urban centres, are deeply dependent on daily infusions of food, fuel, fresh water, and other supplies and services from its trade partners. This is illustrated in Table 1 by the extreme SQ value for Singapore, and it reflects an extreme economic and ecological dependence that resulted from profound ecological modifications. What portions of local ecosystems in such 'highly developed' places that have not been paved over have long been changed into intensive agricultural production systems, which many endemic species could not accept as their habitat, resulting in their extinction. While it is true that all local populations and ecosystems are connected with neighbouring regions and with the biosphere through complex biogeochemical cycles and migrations, the human situation represents merely a quantitative extension, not a qualitatively different situation. Furthermore, footprint analysis is equipped to take such exchanges of goods and services into account.

Lastly, we wish to engage with the argument that this kind of analysis merely points to an area of inadequacy without offering much help towards mitigating the situation. A detailed analysis of the components that contribute to a country's footprint, based

on data that are not shown in this paper but that were instrumental in the footprint calculations published by others, itemises and quantifies the areas of consumption. It readily allows for specific measures directed at reducing specific demands. It does not, however, address the problem of unrealistic costing as evident, for example, in the ubiquitous practice of not including environmental costs in transport and fuel use. Should those fuels ever become scarce as the 'peak oil' scenario suggests, or should their use become restricted as part of mitigation measures to address climate change, the impact of the resulting reality check can be mitigated through timely and directed restrictions to the most expendable areas of consumption. Also, at the international scale, comparisons of national footprints can identify the transition needs for rich and poor countries and guide appropriate transition initiatives promoting distributive justice. Voltaire's dictum that "the rich require an abundant supply of the poor" certainly holds true at the global scale as well; in this situation, however, the poor will be able to advise the rich on how to cut their consumption with minimal trauma.

Our moderately optimistic conclusion that South-East Asian countries are relatively secure from threats emanating from unsustainable practices also requires a few qualifications. First, our comparison of national footprints against national territory inevitably leads to an underestimate of risk. This is clearly seen in the SQ of Canada, where the bio-productive area is obviously far smaller than the total area. Secondly, although footprint analysis addresses an important aspect of human security – we believe that it is the most important one in the long term – it does not reveal sources of human insecurity relating to the other three 'pillars' of the model, nor can it identify environmental problems that are not dependent on the population's impact, such as climate change. The recent unrest in Bangkok and the underlying problems with corruption and autocracy shows that some threats to human security are only very tenuously and indirectly linked to environmental security. Moreover, national footprints are based on average levels of consumption: in countries with extreme stratification such as the US and many developing countries, such numbers only touch the surface of the underlying internal problems of inequity. A national average also does not reflect territorial inequity, as in the case of continental and insular Malaysia. In the long term, however, the findings provide valuable insights for the designers of development policies. In some countries, especially Laos, Burma, Cambodia, and PNG, neither population growth nor current economic 'growth' poses a threat to long

term human security as of yet; excessive economic dependency is not in evidence which makes the transitions to sustainability easier. In other countries, such as the Philippines and Thailand, the two trends need to be tackled together with great urgency, but differentially in urban and rural areas.

We believe that educational reform offers huge potential in mobilising the coming generations to take an active part in the required transition to sustainability (Lautensach & Lautensach, 2010). The United Nations recognised this to some extent in 2002 by naming 2005-2015 the 'UN Decade of Education for Sustainable Development'. Every child and teenager needs to understand what ecological footprints can tell them about their future, and how important ecosystem health and a stable population are for the future security of their families and communities.

Besides education, direct intervention and re-direction of economic policies will be necessary in the countries with the highest SQ values in order to ease them into sustainable modes of zero growth (Daly & Cobb, 1994; Myers & Kent, 2004). This would include the Philippines, Thailand, mainland Malaysia, and Vietnam. However, taking into account data on economic stratification would allow policymakers to determine those communities where a large footprint is caused only by the excessive consumption of elite minorities, which should be politically easier to tackle; economic growth would merely need to be slowed, not reversed. The overarching political emphasis of those interventions should be on the protection, strengthening, and expansion of ecological support systems on the one hand, and the stabilisation of population growth and consumption on the other. With their environmental security thus secured, the citizens of South-East Asian countries will have the opportunity to ensure that economic security, public health, and socio-political stability will ensue.

Overall, the comparison of South-East Asian SQ values with North America and Europe indicates that the region has a little more time to deal with those problems, compared to other parts of the world where the number of options seems much diminished. Considering the massive ideological obstacles on the path to sustainability<sup>11</sup>

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11 As we elaborated on elsewhere (Lautensach & Lautensach, 2010), those obstacles consist mainly of beliefs, attitudes, ideals, and values that are dominated by the ideology of progress. They rely on our propensity to create myths and to rely on those myths for conceptual explanations and for normative justification and evaluation (Rees, 2004). Specifically, those myths include the intrinsic value of economic growth and the belief in its indefinite continuation (also referred to as cornucopianism) (Ehrlich & Holdren, 1971), an ill-informed optimistic outlook on historical developments, scientism, moral nihilism and materialism, consumerism, and the ideal of dominion over nature informed by Cartesian dualism and anthropocentrism (Lautensach & Lautensach, 2010). It is the guiding influence of myths that Chet Bowers (Bowers, 1993, p. 99) referred to when he asserted that "humans are essentially cultural beings (in thought, communication and behaviour), and it is as cultural beings that they interact with the

a little extra time to influence the course of events may make all the difference.

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larger biotic community". In addition, certain peculiarities in the human psyche dispose people towards denying the signs of the crisis (Lautensach, 2009). Those peculiar characteristics include the inability to perceive one's environment in a holistic way; the inability to extrapolate to global dimensions; the inability to extrapolate to the long term; difficulty in detecting gradual change (Odum, 1982); and difficulties with sifting significant information from nonsense (Gordon & Suzuki, 1990). A second group of characteristics is perhaps best described as moral ineptitudes. It consists of the negation of moral responsibility and a lack of moral scruples. A third group of reasons for denial, sometimes referred to as 'mental habits', are wishful thinking, self-deception, groundless optimism, and *akrasia* (weakness of will) (Gordon & Suzuki, 1990).

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