

Stability and Economic Crisis: Costa Rica, 1978-83', *International Studies Quarterly* 31 (Sept. 1987), 301-26.

⁹¹Ekkart Zimmermann and Thomas Saalfeld, 'Economic and Political Reactions to the World Economic Crisis of the 1930s in Six European Countries', *International Studies Quarterly* 32 (Sept. 1988), 326.

⁹²The argument that democracies are less inclined to war is often traced to Kant. For a thorough discussion, see Michael Doyle, 'Liberalism and World Politics', *American Political Science Review* 80 (Dec. 1986), 1151-70. This kind of second-stage intervention may be particularly difficult here, because environmental change may reduce the prospects for success of democratic regimes.

⁹³See Richard Rosecrance, *The Rise of the Trading State* (New York: Basic, 1986).

⁹⁴Robert Gilpin, *War and Change in World Politics* (Cambridge: Cambridge Univ. Press, 1981), 94 and 191; A.F.K. Organski and Jacek Kugler, *The War Ledger* (Chicago: Univ. of Chicago Press, 1980); and Jack Levy, 'Research Note: Declining Power and the Preventive Motivation for War', *World Politics* 40 (Oct. 1987), 82-107.

chapter ten

Population and (In)security:

National Perspectives and Global Imperatives¹

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This chapter examines some of the complex interconnections between demographics and security on the national, international, and global levels. 'Security' refers broadly to a feeling or condition of being secure, or 'safe'. But two questions are also crucial: Secure from what? And how much security is enough? For the purpose of this chapter it is assumed that human beings seek security both from want and from harm in the form of threats or acts of oppression, forced deprivation, and/or violence, including crime, military attack, invasion, and conquest.

This discussion focuses on three issue areas of particular relevance to the cold-war and post-cold-war eras: (1) wars of decolonization; (2) migrations of large populations (with particular attention to war-generated movements of refugees); and (3) the impacts of growing numbers of people (in close conjunction with rapid technological development and resource availabilities) on the security of social and natural environments within the global system. Towards this end, this chapter draws upon a conceptual framework and analytical approach developed in the authors' earlier studies of international conflict and war and recently applied to interrelationships among national, international, and global environments — natural and social.

Dimensions of Security and Insecurity

In both academic and policy-making communities, prevailing views of security have been shaped by three distinct conceptions of what it means to be 'secure'. These perspectives owe their intellectual origins and analytical foundations to different disciplinary bases; they proceed from different premises, establish different priorities, and generate different types of predictions. So far there has been little agreement as to what 'overall' security really means, and progress towards integrating the different approaches has remained limited.

Three Views

In general, academic perspectives on security have developed in three phases. The first is the conventional view that defines the security of states in terms of strategic military defence and global security in terms of the prospects for resolving conflicts and avoiding (or winning) wars. Thus the academic field of 'strategic studies' in the United States and elsewhere addresses issues of the 'high politics' of war and peace and focuses almost exclusively on military considerations. A recent review of the field (Nye and Lynn-Jones, 1988) summarizes and reinforces such tendencies. This conventional perspective defines the 'security dilemma' as an inadvertent outcome of national interactions whereby a move designed by one state to ensure its security is construed by others as hostile, thereby contributing to *insecurity* on both sides and commonly leading to arms races, international crises, and sometimes war.

As described by Richard Ullman (1983), a second, revisionist phase in the development of security studies widens the frame of reference to include a number of different approaches. But it leaves basic assumptions, concepts and functions undefined and provides no criteria or procedures for bounding the security concept.

In a third phase of such studies the national-security phenomenon is seen as inherently multifaceted. This approach attempts to integrate the conventional and revisionist views by bringing their characteristic features together in an internally consistent framework and linking security issues across the three interconnected levels of *structural*, *regime*, and *strategic* security. This approach recognizes that a state can be threatened from 'below' (by individualistic or organizational pressures on the regime, revolution, civil war, and the like); from 'above' (by oppressive or otherwise threatening governmental initiative, policy, or action); or strategically, from outside (by the expansionist or other antagonistic activities of other states).

In the structural realm, many activities that are economically, politically, strategically, or otherwise 'normal' and constructive (e.g., manufacturing, certain types of agriculture, disposal of medical wastes) can be environmentally threatening. Environmental costs rise with (a) population size (numbers of 'consumers' or claimants); (b) levels of technology (knowledge, skills,

capacities for obtaining, transforming, and 'consuming' resources); and (c) resource access and availability.

At the structural level, security is defined as a viable balance or ratio between the size of a state's population and the demands of that population relative to the level and characteristics of its technology, economic performance, and resource endowments; in other words, the structural dimension refers to a country's economic foundations. Similarly, security at the regime level is defined in terms of the capacity of a government to protect itself from domestic disorder or revolt. And strategic security is identified as the ability of the state to defend itself from external coercion, attack, or invasion. A state is insecure to the extent that any of these dimensions of security is threatened or eroded. Indeed, insecurity in one area inevitably means insecurity in others: for example, regime security is undermined to the extent that a government is unable to manage either structural or strategic security.

A Multidimensional Perspective

The theoretical foundations of this integrated view of security were first advanced in broad theoretical terms by North (1990) and then in a set of case studies (Choucri, Brown, and Haas, 1990). A detailed study of the three dimensions of security for Egypt, a country where threats to security are complex and diverse (Choucri, forthcoming), shows that the population variable (interacting with technology and resource availabilities) is critical, since population is a basic denominator for any socio-economic, political, or strategic variable contributing to national power and performance. Central to the integrated view, therefore, are demographic factors and their interaction with technological change and resource access in shaping actions, reactions, and patterns of international conflict and violence (Choucri, 1974, 1984).

The economic, political, and strategic interactions among states can be viewed in terms of 'offensive' and 'defensive' bargaining and leveraging (threatening, punishing or otherwise negative exchanges) within and between states (North, 1990: 11-19, 42-8; Choucri, North, and Yamakagi, 1992). The problem of 'governance' within and between states can be defined as one of consensus formation and the management of contending pressures and strains.

Concepts of security and insecurity are further complicated when the concept of environmental security is introduced. All human activities, from the individual to the state, international, and global levels, can be seen as taking place within a nest of Chinese boxes — that is, people act within state environments (natural and social); states (and their populaces) act within the international environment; and the international system operates within global environments (planetary and social). Within this intensely interactive world, the ability of states to regulate natural forces and, to a lesser but considerable extent, movements of people is limited, and for this reason the

definition of security in terms of states and their regimes (governments) is inadequate.

It is not easy to devise scalable indicators of happiness or security for purposes of comparison between individuals or groups or nations. By contrast, it is quite easy to identify countable phenomena that make individuals (groups, nations) feel more, or less, *unhappy* or *insecure*. Almost any indicator of serious loss—numbers of refugees, war dead, dangerous pollutants of the earth's atmosphere—can be expected to aggravate feelings of insecurity. This suggests the analytic utility of *insecurity* measures in addition to whatever security indicators may be available.

As the twentieth century draws to a close, a major challenge is how to identify linkages that connect in persuasive ways the many individual needs, demands, and activities undertaken for personal reasons that in the aggregate, over large populations, contribute to unintended—and sometimes undesirable—outcomes: that is, to national, international, or global insecurity. Under such circumstances, the treatment of security/insecurity phenomena in strictly national terms can be misleading; it may also be disruptive within the international and global systems. Crucial steps in constraining such tendencies include the integration of security/insecurity theory and analysis within broader international and global frameworks.

In principle, a carefully calibrated *balance* between (a) demographic and economic growth and (b) development of effective, efficient, and adaptive knowledge, skills, and resource applications could provide a key to the future sustainability of planetary life forms. But pervasive unevennesses in population growth, resource availability, and technological development tend to shape the ways people—from individuals to large corporations and whole nations—interact with each other and with the planet and its resources.

Framing the Master Variables

Population—interacting with technological advancement—directly affects the sustainability of a society's resource base (and overall environment) under the pressures of its needs, wants and demands. Although *sustainability* may be defined in many ways, the basic criteria were put forward by the World Commission on Environment and Development (and were central to the deliberations of the United Nations Conference on Environment and Development): A sustainable society is one that meets the needs of present generations without compromising the ability of future generations to meet their own needs.

The *master variables* within and between states—*population*, *technology* (knowledge and skills), and access to *resources*—are so interactive that they are analytically inseparable. Nevertheless, a legitimate case can be made for the recognition of *population* as the critical variable, since without people the other two master variables—technology and resource availability—would be (for our purpose) meaningless. Although there are no populations any-

where without some knowledge and skills, and no people anywhere who could survive without some minimal level of resources (food, water, shelter), the demographic variable is clearly dominant. From this perspective, then, the second and third master variables can be viewed as attributes of the population (demographic) variable. To the extent that knowledge/skills and resource applications (including consumption) differ from individual to individual and from organization to organization (including states), it becomes analytically appropriate to treat population and the technology and resource attributes as co-independent and intensely interactive variables. The larger the population in a community or society, the greater is the aggregate demand for energy and other resources.

Technology enhances the capabilities of people to obtain and transform resources. Historically, however, the greater the advances in knowledge and skills, the greater has been the demand for energy and other resources. The greater the population growth and the more rapid the technological development of a country, the greater is likely to be the expansion of its activities and interests beyond home borders.

In order to achieve co-operatively what they cannot accomplish individually, people seek to influence the decisions and actions of others by bargaining and leveraging ('influencing') each other (and their organizations, institutions) interactively and establishing coalitions in support of their preferred behaviours and outcomes. Such activities contribute to organizational decisions, policies, and actions, but to the extent that such leverages are perceived as negative (threatening, punishing, violent) they often fuel escalations of competition, conflict, and war. These outcomes are not 'inevitable', although they are often treated as if they were.

Unevenness in the interactive growth and development of the master variables within and across societies contributes to unevenness in the size, development, and capabilities of such societies, to differential capabilities among them, and to competitions, conflicts, and disasters on playing (and survival) fields that are not easily rendered level.

The central figure within this framework—the only relevant thinking, feeling, deciding, acting, goal-seeking actor in the system—is the individual human being, whose demands and capabilities combine to produce action. In this context 'demand' refers to potential as well as actual claims exerted by people on the regime, or government, and the overall political system. These claims can be wide-ranging, including symbolic as well as material concerns.

Kenneth Boulding (1956) has identified individual decision-making as an effort to narrow or close a gap between fact and value or, more simply, between 'what is' and 'what ought to be'. Similarly, Richard Cyert and James March (1963) have defined group decision-making processes on organizational levels in terms of bargaining and leveraging within a leadership élite and the achievement of a winning coalition in support of a particular outcome.

A somewhat different 'decision-making' process is evident in the uneven

growth and development of states. Here the 'decision-making' is a long-term, more or less gradual and unintended process with a 'social-steering' effect. In practice, such 'deep-level' decisions are driven by whole populations of individuals seeking to close their personal (or group or organizational) 'is'/'ought to be' gaps. In the increasingly global society as it (unevenly) grows and develops today, the ubiquitous 'decision' to procreate is among the more fateful outcomes of this 'deep' social-steering function.

Integrative Propositions

The main threads of the preceding discussion—the three master variables, the unevenness among them, and the various types of decision-making—are integrated in the following propositions:

1. Insofar as the growth of a population accelerates relative to technological advancement, demands for energy and other resources may be expected to increase and development to be constrained.
2. To the extent that technology (knowledge and skills) is accelerated in advance of population growth, one may expect development to be enhanced and resource availabilities to expand (through exploration, 'discovery', territorial conquest, or trade) and demand for energy and other resources to accelerate—along with resource depletion, pollution, and other manifestations of degradation. Environmental costs are constrained, however, to the extent that resource and technological applications become more efficient.
3. In general, the rising demands associated with population growth, combined with commensurate technological development, tend to generate 'lateral pressure': i.e., a disposition to expand activities and interests outward—beyond national borders—in terms of imports, exports (including new markets) and strategic security.
4. When the expanding activities and interests of two or more countries experiencing high lateral pressure intersect, their relationships commonly 'get out of hand' and lead to previously unintended consequences.
5. A critical inference, therefore, is that behavioural inertias generated by uneven growth and development processes can shape decision- and policy-making and action on organizational (including state), international, and global levels in ways that neither leaders nor rank-and-file citizens (including voters) are likely to comprehend or even recognize. Commonly, in fact, the decisions and activities of individuals applying their own values (how many children to have, for one clear example) in pursuit of their personal objectives aggregate to 'steer' whole societies in unintended or inadvertent directions (e.g., overpopulation on a rapidly depleted resource base) and create paradoxes and policy dilemmas that can immobilize or grievously distort subsequent decision and policy-making and outcomes at higher organizational

(including state, international and global) levels and invite 'irrational', undesirable, or even disastrous outcomes.

Lateral Pressure and the Rise and Fall of Empires

Collisions of the lateral pressures of two or more countries often contribute to the 'war/peace paradox' wherein a 'defensive' move by one side may be construed as an offensive move by the other side, and a conciliatory move by one side may be interpreted by the other as either a sign of weakness or an opportunity that it should take advantage of. Thus, each in pursuit of its own security—or responding to feelings of insecurity—two parties to a conflict commonly exacerbate their differences and create 'inextricable' crises that lead them into war.

World history between the early seventeenth century and the outbreak of World War I provides many examples of lateral pressure as European nation-states—characterized by rising populations, advancing technologies, and spiralling demands for resources—expanded their activities, interests, and territorial holdings into South, Southeast, and Eastern Asia, the Americas, and eventually Africa. In search of treasure—whether spices, gold, 'heathen' souls, furs, farmlands, or timber—several of these countries rapidly transformed themselves from nation-states into intensely competitive commercial and later industrial empires, as distinct from the older agrarian empires of China, the Ottoman Turks, Austro-Hungary, and the Russian Tsars.

Consistent with the propositions in the lateral-pressure theory, the expanding activities and interests of these new empires (and subsequently the German and Japanese upstarts of the late nineteenth century) led to nearly four centuries of bitter competition, rivalry, and war.

Colonial and Collision Wars

Throughout the era of colonial expansion, two kinds of war were widespread. First were *colonial wars*, which amounted to force exerted for purposes of colonial subjugation or for the incorporation of contiguous, often sparsely populated land directly into the territorial domain of the imperial state (e.g., the Mexican and Indian wars of the United States).

Second were wars of *collision* between the expanding activities and interests of the imperial states themselves (Portugal and Spain, Spain and England, England and Holland, England and France, France and Russia, etc.) in competition for colonial jurisdictions or in defence of their territories and trade routes. Competition for colonial territories and trade routes was not necessarily the only factor in warfare between great powers, but it tended to become the major issue whenever the interests and activities of powerful states collided. In many, if not most, conflicts and wars, moreover, it has been commonplace for states or empires competing for land and other resources, markets, trade routes, and so on to incite and 'mobilize' ethnic, religious, and

nationalistic emotions and loyalties, which are then invoked to rally domestic support for external activities and interests. A religious, patriotic, or nationalistic war may often reflect a territorial, commercial, or other more tangible interest. Expansionism and war tend to be 'multi-causal'.

Historically, great empires have always collapsed, or at least shrunk to more manageable size, sooner or later. The fall of the Roman empire is only one example: the empires of ancient Egypt, Assyria, China, and India, of the Incas, Mayas, Aztecs, and many others have all suffered similar fates. Over time, uneven growth and development, expansion, colliding activities and interests, together with accumulating domestic inefficiencies and contradictions, have led to the decline and eventual disruption or dismemberment of over-extended states and empires—the case of the USSR being only the most recent example.

Twentieth-Century Cases

Early in the twentieth century the ancient Chinese empire collapsed, in large part under its own weight. World War I contributed to the demise of the Austro-Hungarian, Ottoman, and Tsarist empires, although those of China and Russia were retrieved from the historical dust-bin, however temporarily. After two succeeding decades dominated by the imperial aspirations of Mussolini and Hitler, World War II destroyed these two upstarts and their empires, and in its aftermath contributed, in turn, to the relatively voluntary dissolution of the vast commercially based empires of Great Britain, France, Belgium, the Netherlands, and Portugal. (The Spanish empire of the sixteenth, seventeenth, and eighteenth centuries had already collapsed by the wayside.)

Following World War II both the USSR and the US expanded their territorial and industrial activities. The lateral pressures exerted by the former amounted to a revitalization and continuation of Tsarist expansionism. US lateral pressures, on the other hand, were continuations of British expansionism under a new flag and a new constitution—from the Atlantic seaboard across the Alleghenies, the Great Plains, and the Rockies to the Pacific (all Indian country) south and southwestward into the Caribbean and Mexico, westward to Hawaii and the Philippines, and northward to Alaska (the only territory actually paid for).

The notion of *national* security is difficult to identify in these empires. There is ample evidence that among imperial leaders, the distinction between nation and empire was often obscured as threats to colonial holdings were interpreted as threats to the empire and hence to the nation. Clearly the security concept may be twisted to mean whatever one wants.

Empirical Framework for Global Analysis

To facilitate the empirical investigation and analysis of states and their growth and relationships through time, this section presents an empirically

derived global framework in which the three master variables—population, technology, and resources—may be examined in conjunction with an open-ended array of intervening and conditioning variables that can be introduced as the problem under scrutiny requires.

Profile Groups

In accordance with all possible combinations of unevenness in the growth and development of the three master variables through time, any state may be categorized as belonging to one of six empirically identifiable and defined configurations or groups (see Table 10.1).

Table 10.2 presents the empirical referents for each group. These figures define the profile of each nation in the six groups, providing a 'snapshot' of its growth and development configuration or structure. Through time, however, each country can be envisaged as making its own way down a broad growth and development *pathway* or trajectory shared with other nations in its group.

Dynamics of Change

Since the rates of change and changes in rates of change of each master variable (or indicator) of each nation are likely to be different (uneven growth and development), there is always the possibility that within a time series analysis one or more countries may be transformed at some point from one profile group into another. Such transformational trends can be analysed and (within margins of error) projected by at least two strategies: calculating the rates of change of the variables themselves; and/or calculating the (changing) gaps between each of all possible pairs of all the master variables through time.

The social, economic, and political activities and public policies that shape such transformations can be ascertained in two primary ways: (a) the conventional decision- and policy-making activities undertaken by heads of state and their advisers who are charged with governing the country; and (b) the aggregate outcomes of all the bargaining, leveraging, and other activities of the populace and their coalitions and coalitions of coalitions in pursuit of interests affecting the growth and development of their country. Such 'deep' decision- and policy-making, however difficult to identify, commonly affects the trajectories of a nation's master variables in complex ways.

The table indicates major differences among states in terms of their population/technology/resource-access ratios and characteristics and their overall capabilities. Individual states tend to be constrained or empowered by their individual population/technology/resource-access ratios. Thus countries with radically different profiles—Bangladesh or Burundi, for example, as contrasted to France or the United States—differ substantially in terms of their domestic capacities and dispositions for resource distribution, allocation, or 'sharing'. Something similar can be observed within countries as well: that is,

Table 10.1. Profile Definition

Group I:	Resources	>	Population	>	Technology
Group II:	Population	>	Resources	>	Technology
Group III:	Population	>	Technology	>	Resources
Group IV:	Resources	>	Technology	>	Population
Group V:	Technology	>	Resources	>	Population
Group VI:	Technology	>	Population	>	Resources

NOTE: For operational purposes, groups have been defined as follows. For every country, each master variable was computed as a share of the *global* total for that variable. The variables in each group definition were then arranged in proportional terms. Thus the group profiles were determined by relative shares. This simple method provides information about (1) relative size of master variables within states and (2) relative constraints among the master variables within states. The same information is provided (3) across states within each profile and (4) across states and across profiles. Following Kindleberger (1962), we use area as a rough indicator of resources; as an indicator of technology, following Kuznets (1966), we use GNP.

SOURCE: Choucri and North, 1993.

who among the populace of any one of these states (individuals, ethnic or national minorities, social and/or economic classes, warlords, or, in some instances, clan chiefs) gets what, when, and how (Lasswell, 1958). These internal phenomena lie close to the heart of rebellions, revolutions, and civil wars.

Uneven Growth and Development: Implications for War

Wars, which have been ubiquitous throughout written history, have been analysed and explained in many ways. The linkages among growth, development, and the natural environmental and their conflictual and ecological impacts appear increasingly compelling. But there is a major definitional problem. At what point does a coup, mass murder, uprising, crisis, or series thereof become a war? And is there a reliable distinction between revolutions and civil wars? Or between a major power's provision of loans, weapons, intelligence, military advisers and other assistance to a nation at war and active participation as a combatant? How much difference does it make to draw such a distinction? This analysis has set 1,000 casualties as the threshold between other forms of violence and war — and established the commitment of troop units to battle as the threshold for formal participation.

Lateral Pressures and Wars of the Cold War

At least two phenomena set cold-war lateral pressures apart from previous manifestations. Associated with one of these were the pervasive idiosyncrasies of Marxist-Leninist strategies and tactics — ideological, psychological, political, and strategic — that to one degree or another induced antagonists to

Table 10.2. Growth and Development (1986)

	POPULATION (% global)	AREA (% global)	GNP (% global)	GNP DENSITY (\$US)	POP. DENSITY (sq. km)
GROUP I					
Brazil	2.837	6.469	1.655	1,810	16
Iran	0.935	1.252	0.571	1,895	28
Argentina	0.635	2.103	0.481	2,350	11
Algeria	0.459	1.810	0.383	2,590	9
Cameroon	0.215	0.361	0.063	910	22
Sudan	0.463	1.904	0.048	320	9
Kenya	0.434	0.443	0.042	300	36
Tanzania	0.471	0.718	0.038	250	24
Jordan	0.074	0.074	0.037	1,540	37
Colombia	0.594	0.866	0.236	1,230	25
Peru	0.406	0.977	0.143	1,090	15
Zimbabwe	0.178	0.297	0.036	620	22
Ethiopia	0.892	0.929	0.034	120	36
Angola	0.184	0.948	0.031	522	7
Bolivia	0.135	0.835	0.026	600	6
Afghanistan	0.316	0.492	0.020	200	24
Mozambique	0.291	0.609	0.020	210	18
Nicaragua	0.070	0.099	0.018	790	26
Congo	0.041	0.260	0.013	990	6
Somalia	0.113	0.485	0.010	280	9
Chad	0.105	0.976	0.005	160	4
Laos	0.076	0.180	0.004	178	16
GROUP II					
China	21.602	7.266	2.089	300	110
India	16.015	2.499	1.497	290	238
Indonesia	3.410	1.458	0.539	490	87
Nigeria	2.113	0.702	0.436	640	112
Turkey	1.055	0.594	0.378	1,110	66
Thailand	1.078	0.391	0.281	810	102
Iraq	0.338	0.331	0.264	2,424	38
Egypt	1.019	0.761	0.250	760	50
Pakistan	2.033	0.611	0.229	350	123
Philippines	1.174	0.228	0.212	560	191
Malaysia	0.330	0.251	0.195	1,830	49
Syria	0.221	0.141	0.112	1,570	58
Bangladesh	2.115	0.109	0.109	160	717
Morocco	0.461	0.340	0.088	590	50
Vietnam	1.297	0.251	0.082	196	192
Tunisia	0.150	0.125	0.055	1,140	45
Guatemala	0.168	0.083	0.050	930	75

Table 10.2 — Continued

	POPULATION (% global)	AREA (% global)	GNP (% global)	GNP (\$US)	POP. DENSITY (sq. km)
Burma	0.779	0.514	0.050	200	56
Sri Lanka	0.330	0.050	0.043	400	244
Ghana	0.271	0.182	0.034	390	355
Dominican Rep.	0.135	0.037	0.031	710	135
Uganda	0.312	0.179	0.023	230	64
Burundi	0.098	0.021	0.008	240	171
GROUP III					
S. Korea	0.851	0.074	0.650	2,370	423
Portugal	0.209	0.070	0.152	2,250	111
N. Korea	0.428	0.092	0.126	909	173
GROUP IV					
USSR	5.761	17.024	15.571	8,384	13
Canada	0.525	7.581	2.388	14,120	3
Australia	0.328	5.842	1.260	11,920	2
Libya	0.080	1.337	0.132	5,128	2
Oman	0.027	0.228	0.043	4,980	2
GROUP V					
US	4.952	7.115	27.90	17,480	26
GROUP VI					
France	1.135	0.416	3.924	10,720	101
UK	1.162	0.186	3.323	8,870	231
Spain	0.793	0.384	1.243	4,860	77
Netherlands	0.299	0.031	0.967	10,020	356
Belgium	0.203	0.024	0.604	9,230	319
Greece	0.205	0.100	0.243	3,680	76
Israel	0.088	0.016	0.176	6,210	205
Kuwait	0.037	0.014	0.165	13,890	100

SOURCE: Choucri and North (1993)

improvise rough countermeasures (leverages, 'dirty tricks') of their own. The other—perhaps in the long run overriding—phenomenon was the development of nuclear weapons and the missiles for transporting them.

Some Empirical Evidence

The introduction of these two cold-war phenomena into the minefield of post-World War II 'decolonization' conflicts was deadly. In effect, nearly half a century of colonial 'disinvestment' wars fought by the last great empires

Table 10.3. Summary of Wars (1945-91)

LOCATION	WARS	INT'L	DECOLON.	CIVIL	DEAD
Europe, North America, Australia	5	3	0	2	0.2 mil.
Middle East/Islamic	37	10	4	23	5.3 mil.
Africa	26	2	7	17	4.5 mil.
Asia	46	14	5	27	17.0 mil.
Latin America	27	6	0	21	0.6 mil.
	141	35	16	90	27.6 mil.

SOURCE: Adapted from Sullivan, 1991: 34

including the United States (by 'association' and also in view of its own expansionist tendencies) presented to the USSR, several of its satellites, and the People's Republic of China what amounted to open invitations for intrusions of their own—whether through ideological and organizational subterfuge, or by supplying military advisers and weapons to rebelling colonies (or fractions of colonial populations).

Because of definitional differences, available listings of wars fought since the end of World War II differ substantially. As of 1992, according to the criteria used here, 94 wars have been fought since 1 September 1945. In contrast, Michael Sullivan (1991: 34-42) cites 141 international, colonial and civil wars over roughly the same period. Of these, only 5 were fought on European soil; of the remainder, 26 were fought in Africa, 27 in Asia, and 27 in Latin America (Table 10.3).

For the world, Sullivan (1991: 27) reported a cumulative total of 25 million war deaths during the period 1945-90. This aggregate is accounted for by 17 million war deaths in Asia, 4,500,000 in the 'Islamic zone', 650,000 in Latin America, and 200,000 in Europe.

Colonial Wars

Of the 94 wars since 1945, 46 were associated, directly or indirectly, with colonies or former colonies of the recent past. The former colonial empires (excluding the United States) involved in these conflicts were Spain (1), Portugal (2), Netherlands (2), Belgium (1) France (9) and the United Kingdom (13). Other conflicts were wars either with or by colonies of the past. Thus the wars between the two Koreas (a former Japanese colony) and the two Vietnams (formerly French-held) were in part, at least, consequences of the expanding influence of the USSR in eastern Asia.

A typical pattern of 'decolonizing' warfare (see Table 10.4) was commonplace during the 1950s and 1960s when countries in Groups IV (the USSR, Canada, and Australia), V (the US) and VI (the UK, France, Belgium, the Netherlands, and Spain) intervened—on opposing sides—in numerous countries of Groups I (Angola, Algeria, Panama, Afghanistan, etc.), II

Table 10.4. Wars of 'Decolonization'

Indonesia (I)	vs	Netherlands (VI), UK (VI)	1945-46	5,000
Indochina	vs	France (VI)	1946-54	600,000
Kenya (I)	vs	UK (VI)	1952-53	15,000
Tunisia (II)	vs	France (VI)	1952-54	3,000
Morocco (II)	vs	France (VI)	1953-56	3,000
Algeria (I)	vs	France (VI)	1954-62	1,100,000
Cameroon (I)	vs	France (VI), UK (VI)	1955-60	35,000
Angola (I)	vs	Portugal (III)	1961-65	50-75,000
Mozambique (II)	vs	Portugal (III)	1966-88	30-60,000
Zimbabwe (I)	vs	Rhodesia	1972-79	19,500
Guinea-Bissau	vs	Portugal (III)	1962-74	15,000

SOURCE: Adapted from Sullivan, 1991: 34-8

(Morocco, Indonesia, Vietnam, etc.), and III (North and South Korea, Hungary, and Lebanon). The anomalous country was Portugal, a former colonial empire with a Group III profile.

In these and other conflicts involving former colonies, old empires were not rigidly opposed to decolonization, but they were inclined either to retain some measure of dominion with respect to former colonies (as was achieved in the cases of Canada and Australia) or otherwise to influence the 'direction' that independence movements might be 'persuaded' to take in a cold-war world, where local communist movements, backed by the USSR or China, were preparing to take over wherever they could.

In human terms, one of the costliest of these wars was the Korean War of 1950-53 during which four empires of the past (United Kingdom, France, Belgium, and the Netherlands), two former British colonies by settlement (Canada and Australia) and Greece joined the United States in support of South Korea against the North, which received arms, other military equipment, and 'advice' from the Group IV USSR and active troop support from Group II Communist China (like the Soviet Union, a Marxist-Leninist empire transformed from an empire of the old order). Total casualties numbered some 3,000,000. At that time, or within a few years thereafter, the British, French, Belgians, and Dutch were all involved in their own 'private' decolonization conflicts.

By the early 1950s highly organized, highly effective revolutionary movements were threatening in French Indochina, Dutch Indonesia, and many other former colonies in various parts of the world. Following the US assumption of responsibility in Vietnam (Indochina) from the French, fighting there exacted up to 2,300,000 casualties by the mid-1970s. Lower levels of carnage continued for years after the US withdrawal.

Despite continued disagreement over the 'causes' of this nearly worldwide conflict, the uneven growth, development, and lateral-pressure dynamics that contributed interactively to colonization of various expanses

of the earth and to the uneven growth (including population growth) and development (including 'modernization') of the former colonies still operate, but from a new, continually changing base. The consequent activities and expectations of the new states—including expectations of security in whatever forms they imagine it—are exerting unprecedented impacts upon the world and social and natural environments. But new problems—and many old ones—create serious obstacles.

Of the 94 wars since 1945, 31 were wars of decolonization and 58 were civil wars (see Table 10.5 for the major ones). Small alterations in criteria, however, would change these distributions considerably. In fact, few of these 'civil' wars were entirely internal or 'domestic': many, if not most of the combatants were supplied, or even actively supported, by external countries, movements, or agencies like the CIA or KGB, or were targets of intervention by 'insecure' and/or opportunistic neighbours. (See Table 10.6 for the major international wars.)

'Civil' Wars and Self-Destruction

Presided over by often ruthless, sometimes uncertain, occasionally bewildered leaders of poverty-stricken, often unruly, in some instances starving, populations, the 'new world order' has been characterized less by stability, equilibrium, and security than by instabilities, disequilibria, and insecurities that appear to be better explained by chaos theory than by conventional rational-actor assumptions. Overall, if World Wars I and II, putting an end to empires, seemed to make the world safe for liberated nation-states (if not true democracies), then the cold war's termination has caused numbers of nations to shatter into smaller and smaller pieces.

The self-destruction of the USSR and its East European satellites was hastened, if not 'caused', by the gross misappropriation of human and material treasure of a large and rich resource base. The unexpected termination of the cold war and four-and-a-half decades of almost unconstrained military growth and development also left the United States with stubborn disturbances in its domestic economy and unprecedented national indebtedness. Just as World War II liquidated the 'old order', so the cold war destroyed the 'new order' of the superpowers including military, political, and economic bonds forged, sustained, and justified by incongruous alliances in fear of shared destruction. Group III Yugoslavia (population > resources > territory) provides depressing evidence of a country that rapidly tore itself apart once its regime was sufficiently weakened.

Notably, of the 94 wars, 75 were fought by developing countries—largely colonies or former colonies—in Groups I and II. The number of consistently 'peaceful' countries in these two groups is extremely small. Insofar as some of these wars were actively participated in by major powers of Groups III, IV, V, or VI, they have been categorized above as wars of decolonization. Most of the remaining wars fought by countries of Groups I and II are domestic wars

Table 10.5. Civil Wars (1945-92) with 100,000 Deaths or More, Ranked by Numbers of Deaths

Nigeria	1963-70	2,000,000
Bangladesh vs gov't (Pakistan)	1971	1,000,000
China: CCP vs KMT	1946-50	1,000,000
China: land reform	1950-55	1,000,000
Indonesia: gov't vs communists	1956-66	600,000
Ethiopia: gov't vs Tigreans	1978-91	570,000
Sudan: gov't, SPLA/SPLM	1983ff	505,000
China: Cultural Revolution	1967-68	500,000
Uganda: Idi Amin massacres	1971-78	300,000
Colombia: gov't vs left rebels	1949-72	120,000
Burundi: gov't vs Hutus	1972	110,000
Iraq: gov't vs Kurds	1961-70	105,000
Algeria: gov't vs rebels	1954-62	100,000
China: gov't vs Tibet	1956-58	100,000

SOURCE: Compiled by Robert C. North from various sources.

—revolutionary or civil—generated in large part by the grossly uneven growth, development, and resource distributions among the populace.

Refugees 'Produced' by War

Among the side-effects of the cold war was the dislocation of large populations and the dispersion of refugees beyond national borders—a unique manifestation of lateral pressures (Table 10.7). This phenomenon persisted and in some regions was exacerbated with the collapse of the USSR and its satellites.

Table 10.6. International Wars (1945-92) with 100,000 Deaths or More, Ranked by Numbers of Casualties

N. Korea, China vs S. Korea, US, and allies	1950-53	3,000,000
N. Vietnam vs S. Vietnam, US, and allies	1955-65	2,000,000
Afghanistan gov't vs Mujahideen, USSR	1978ff	1,300,000
Mozambique gov't, MNR, S. Africa, Zimbabwe	1978ff	1,050,000
Bangladesh, India vs Pakistan	1971	1,000,000
Iran vs Iraq	1980-89	500,000
Sudan, Arab North vs Black South, Egypt	1963-72	500,000
S. Vietnam, US vs Viet Cong, N. Vietnam	1960-65	300,000
Lebanon vs Israel, Syria, US, UK, and allies	1975ff	180,000
Cambodian gov't vs Khmer Rouge, N. Vietnam	1970-75	156,000
E. Timor vs Indonesia, Portugal	1975ff	159,000
Persian Gulf, Iraq vs Kuwait, US, and allies	1990-91	100,000
Guatemala left vs right, US	1966ff	140,000
Katanga (Congo/Zaire) vs Belgium, US	1960-65	100,000

SOURCE: Compiled by Robert C. North from various sources.

Table 10.7. Refugees Crossing Borders¹

COUNTRIES OF ORIGIN		COUNTRIES OF ASYLUM	
Afghanistan (I)	6,027,100	USA (V)	1,355,858
Mozambique (I)	1,427,500	Canada (V)	287,225
Ethiopia (I)	1,066,300	France (VI)	186,957
Iraq (II)	529,700	Australia (IV)	172,623
Sudan (I)	499,100	Sweden (V)	108,315
Somalia (I)	454,600	Germany (VI)	84,960
Angola (I)	435,700	Spain (VI)	38,196
Kuwait (VI)	585,500	Denmark (VI)	28,733
Kampuchea (II)	344,500	Switzerland (VI)	21,487
Sri Lanka (I)	228,000	Austria (VI)	20,521
Iran (I)	211,100	Netherlands (VI)	20,171
Rwanda (II)	203,900*	Norway (V)	17,911
Burundi (II)	186,200	UK (VI)	13,797**
Vietnam (II)	165,000	New Zealand (IV)	10,988
China (II) (Tibet)	114,000		
Bangladesh (II)	75,000		
Laos (I)	67,400		
Mauretania	60,100		
Guatemala (II)	57,400		
Burma (II)	50,800		
Zaire (I)	50,700		
Nicaragua (I)	41,900		
S. Africa (I)	40,000		
El Salvador (III)	37,300	*sources vary	
Chad (I)	34,400	**statistics for 1975-81 unavailable	

¹These cumulative data (to the late 1980s) are strongly illustrative but lack sufficient rigour for formal analysis.

SOURCE: Compiled by Robert C. North from various sources.

A distinction needs to be made between *refugees*, who, fleeing political persecution, revolution, or civil war (Richmond, 1988: 111) are 'forced' to seek asylum beyond the borders of their own countries, and *migrants*, who move—temporarily or permanently—to a foreign country for economic reasons. Individuals or whole families in both categories affect their countries both of origin and destination in various ways—socially, economically, politically, and environmentally. Refugees and voluntary migrants alike can be viewed as producers, consumers, and polluters whose effects are subtracted from the country of origin and added to the country of destination. If the latter is more highly developed than the former, the migrants—with luck or foresight—may be expected to produce more, earn more, consume more, and probably pollute more after they move than before. The plight of the refugee is likely to be more problematical.

For the better part of four decades following World War II, the cold war, together with the Third World proxy battles it spawned, was a major producer of refugees throughout many parts of the globe. With the termination of the cold war in 1989-90, hopes for a more peaceful future rose around the world.

Before the first year was over, however, 'several developments, revelations, and trends were muddying the waters of earlier prognostications'—first of all a lag between the ends of wars and possibilities for refugee peoples to return home, and second, and more disruptive, 'the absence of the Cold War framework' that, for all its evils, had kept the lid on many lesser conflicts and had served as 'a great simplifier' which 'made [US] foreign policy a great morality play of good and evil.' Later, freed from this framework, 'ethnic hatred, nationalism, and other forces' (including newly generated pressures on and competitions for resources) ran wild without 'the discipline of the old framework' (Winter, 1991: 2).

As the twentieth century draws to a close, sending and receiving countries alike are experiencing rapid technological, economic, and social changes that influence migrations in complex, often indirect and unprecedented ways that in turn contribute to and reflect environmental changes that are also complex, often indirect, and normally unprecedented.

Statehood and Refugeeism

The production of refugees has been identified as an outcome of the state-building process. The reasoning is that since nationalistic homogeneity does not guarantee consensus on other issues such as economic or constitutional functions, the new economic and political distributions emerging from the creation of a state may be achieved by revolution or civil war, producing refugees in large numbers. It is thus no accident that new states tend to be the leading producers of refugees (Keely, 1991: 22).

Refugee movements can be viewed as manifestations of lateral pressure—the expansion of a society's activities and interests (see Choucri, 1974). Refugees have been identified more specifically as 'those who flee in fear of immediate violence resulting from conflict . . . between state and civil society, between opposing armies, or among ethnic groups or class formations that the state is unable or unwilling to control (Zolberg et al., 1989: 208). In recent decades, 'most refugee-producing conflicts have involved the newly independent states and have been based on issues of internal nation building, revolutionary change, or conflicts with neighbours' (Stein, 1991: 15).

Population Movements and State Profiles

Such population movements can pose threats to sending and receiving countries alike, as well as to their interactions. They may threaten the environment not only of the latter but—less directly, but not uncommonly—of

the former. Or they can create demands and claims on the society that were unintended or unanticipated. Unintended effects can occur even when there is a policy of allowing, encouraging, or forcing people to move across territorial boundaries. Three cases—Europe after World War II, and Japan and the Middle East today—point to the negative long-term consequences of short-term policies pertaining to the importing of labour.

Among the most serious political consequences over time is the fact that, as people migrate, they influence not only the labour market in the receiving country, but the structure of political demand, environmental pressures, and the social contract. In effect, migrants from a Group I or Group II country may be expected to demand and consume more, in the long run (essentially as much as a native-born person) than they did in the country of origin. This means that a Group V or VI country with a population growth rate of 0.8 per cent (US), 0.4 per cent (France), or 0.0 per cent (Belgium), may find itself a destination for migrants from countries where the population growth rates range between 3 per cent (doubling time 23 years) and 4 per cent (doubling time 18 years). To the extent, therefore, that migrants and refugees in host countries of Groups V or VI can be expected to remain there for good (or to be replaced if they repatriate), issues of economic, political, social, and environmental integration remain salient.

The oil-producing countries of the Middle East present special demographic problems because the opportunities for employment there have attracted migrants. As a Group II country, Iraq, with a population growth-rate of 0.35 per cent (and associated domestic and external pressures), is less an anomaly than some of the others whose oil-based economies have been targets for migrants. A more striking example is provided by Group VI Kuwait, which has grown 'oil-rich', but with a 3.5 per cent population growth (prior to the Iraqi invasion) that is uncharacteristic of Group VI countries.

In principle, Group IV Oman and Saudi Arabia have the advantage of territories that are large relative to their populations, but with arid resource bases and current (early 1990s) population growth rates of 3.8 per cent and 4.0 per cent they might do well to take the conditions for a demographic transition under early advisement. The same could be recommended to Group IV Libya (3.7) and Group I Yemen (3.7).

The *World Refugee Survey* reported the global total of refugees in May 1991 at 18,355,400. The principal receiving countries for the world's refugees are in Groups IV, V, and VI. The United States leads with a cumulative total (1973-89) of 1,355,858, with Canada (268,225) and France (186,957) placing second and third (Table 10.7). Most of these refugees were produced by states in Groups I and II, poor countries where individuals, families, classes, and ethnic communities commonly compete for limited, often exceedingly scarce resources (and distributions thereof) and where warfare is likely to be almost endemic.

It will be recalled that Group I countries have territory and/or resources

that are extensive in relation to the size of their populations and thus appear to possess good potential for population growth and technological development. At the same time, however, their technologies are often so poorly developed that access to those resources is limited and reliance on imports (and the exports to pay for them) is heavy.

If, under these circumstances, the growth rate of these relatively sparse populations should accelerate in relation to existing knowledge, skills, and resource accessibility, many countries in Group I could find themselves in serious difficulties. Currently, some of them still have annual per capita GNPs in the low hundreds of dollars, combined with relatively high rates of population growth: for example, Chad (2.5 per cent), Ethiopia (2.7 per cent), Laos (2.8 per cent), Somalia (3.3 per cent) and Botswana (3.7 per cent) are already referred to as 'basket cases'.

Countries in Group II are characterized by populations that are large and growing relative to area (domestic resource base) and GNPs that are low relative to both population and area. Most, if not all, countries in this group are former Group I societies with rising birthrates that have 'outgrown' their previous earlier profiles. That is, they have been unable to hold their population densities reasonably constant while accelerating technological advancement. Thus they have locked themselves into a profile from which escape is likely to become increasingly difficult.

Many countries in Group I suffer from combinations of drought (or seasonal flood and drought), famine, and warfare that exacerbate trends toward starvation, disease, and death. Those who compete ineffectively in these countries are vulnerable whichever way they seek to turn.

Group II countries are often no better off, but the implications of their plights are different: whereas many Group I nations can still seize upon the possibility of constraining population growth and accelerating technological advancement, only drastic measures can rescue Group II countries from the 'lock-in' of high population levels exerting heavy pressures on an already damaged and depleted resource base in combination with low and inefficient levels of technology.

Many Group II countries possess extensive territories, but the sheer numbers of people overburden their natural environments with fundamental and justifiable demands. The soil, forests, water, and other resources are already in serious jeopardy; yet for lack of a sufficiently advanced technology, sufficient resources cannot be extracted, transported, processed, or in some instances even located in sufficient quantities to satisfy basic human needs. China was considered resource-poor (only limited supplies of low-grade coal and oil were known until new technologies and expanded exploration located wholly new reserves under the Maoist regime). Despite (or because of) the political oppression of the Chinese regime and the casualties inflicted during the Great Leap Forward and the Cultural Revolution, the People's Republic has produced relatively few refugees.

A few countries, including India and China, have made efforts to curb

birthrates and steer toward a Group VI profile by accelerating technological advancement well in advance of population growth and high levels of exports to pay for the importation of resources that the domestic resource base cannot supply. In effect, the intention is to emulate modern Japan—as distinct from the 'overpopulated' Japan of the late nineteenth and early twentieth centuries. This is a long pathway for an overpopulated country to travel, however, in view of China's 1987 density of 110 persons per sq. km and per capita GNP of \$300 (or India's 238 per sq. km density and \$299 per capita GNP) as compared with Japan's density of 327 persons per sq. km and per capita GNP of \$12,840.

In recent years, not without high costs in terms of civil rights, China's Draconian birth-control measures have been relatively successful, but in view of the country's huge population base, it is not surprising that the numbers of people continue to increase, albeit at a considerably lower rate (1.5 per cent) than in the not too distant past. India (2.1 per cent) has a longer way to go in this respect.

Population and the Global Environment

Profile Groups and Global Environmental Change

The by-products of population growth and technological advancement—generally toxic in nature and bearing on issues of security and insecurity—are so diverse and widespread that this chapter will confine itself to the issue of climate change, specifically global warming.

US Senator Timothy Wirth in 1987 referred to the 'greenhouse effect' as 'a challenge as compelling and as imperative as nuclear arms control. Unfortunately,' he continued, 'we cannot negotiate with the planet. Instead, the nations of the world must make choices, unilaterally and collectively, to adapt their behaviour to maintain existing climatic conditions.' He then identified 'high rates of population growth'—together with energy-efficient technologies and resources and preservation of forests—as critical policy issues that had 'been passed from the world's scientists to its public policy makers' (Wirth, 1987: xiii–xv). The director of the Institute for International Economics, C. Fred Bergsten, in his preface to a more recent book (Cline, 1992: ix) referred to global warming as 'the quintessential international economic problem'—transcending national borders, involving 'irreversible change and the risk of major adverse surprise', confronting 'international policy with the need to make decisions in the face of considerable uncertainty', and calling for 'a coordinated and multi-faceted response from a large number of countries'.

Table 10.8 shows the CO₂ emissions of some of these countries within their respective profile groups. Countries in Groups I to VI generate quite different levels of CO₂ and other greenhouse emissions, but that production tends to be relatively uniform within profile groupings. One can draw from these

Table 10.8. Growth, Development and Carbon Emissions

	POPULATION AREA		GNP		POP. DENSITY (sq. km)	CO ₂ (%) global	CO ₂ (m.t. per cap.)
	(% global)	(% global)	(% global)	GNP (\$US)			
GROUP I							
Brazil	2.837	6.469	1.655	1,810	16	5.882	2.807
Iran	0.935	1.252	0.571	1,895	28	0.472	0.884
Argentina	0.635	2.103	0.481	2,350	11	0.398	0.869
Algeria	0.459	1.810	0.383	2,590	9	0.234	0.690
Cameroon	0.215	0.361	0.063	910	22	0.070	0.159
Sudan	0.463	1.904	0.048	320	9	0.052	0.040
Kenya	0.434	0.443	0.042	300	36	0.017	0.054
Tanzania	0.471	0.718	0.038	250	24	0.009	0.024
Jordan	0.074	0.074	0.037	1,540	37	0.037	0.684
Zimbabwe	0.178	0.297	0.036	620	22	0.053	0.406
Ethiopia	0.892	0.929	0.034	120	36	0.009	0.013
Angola	0.184	0.948	0.031	522	7	0.009	0.069
Bolivia	0.135	0.835	0.026	600	6	0.017	0.172
Afghanistan	0.316	0.492	0.020	200	24	0.065	0.051
Mozambique	0.291	0.609	0.020	210	18	0.005	0.023
Nicaragua	0.070	0.099	0.018	790	26	0.009	0.168
Congo	0.041	0.260	0.013	990	6	0.007	0.023
Somalia	0.113	0.485	0.010	280	9	0.005	0.054
Chad	0.105	0.976	0.005	160	4	0.001	0.011
GROUP II							
China	21.602	7.266	2.089	300	110	8.393	0.526
India	16.015	2.497	1.497	299	238	2.685	0.227
Indonesia	3.410	1.457	0.539	490	87	3.333	1.329
Nigeria	2.113	0.702	0.436	640	112	1.099	0.704
Turkey	1.055	0.593	0.378	1,110	66	0.520	0.667
Thailand	1.078	0.390	0.283	810	102	0.520	2.063
Iraq	0.335	0.264	0.264	2,424	38	1.643	0.555
Egypt	1.017	0.760	0.250	760	50	0.301	0.400
Pakistan	2.031	0.611	0.229	350	123	0.247	0.132
Philippines	1.173	0.228	0.212	560	191	0.248	1.148
Malaysia	0.330	0.251	0.195	1,830	49	0.458	0.572
Syria	0.221	0.141	0.112	1,570	58	0.127	0.779
Bangladesh	2.112	0.109	0.109	160	717	0.047	0.030
Morocco	0.261	0.339	0.088	590	50	0.076	0.223
Vietnam	1.296	0.251	0.082	196	192	0.622	0.649
Tunisia	0.149	0.125	0.055	1,140	45	0.050	0.452
Guatemala	0.158	0.093	0.050	930	75	0.015	0.123
Burma	0.778	0.514	0.050	200	56	0.799	1.389
Sri Lanka	0.330	0.054	0.043	400	244	0.015	0.063
Ghana	0.270	0.182	0.034	300	390	0.036	0.055

Table 10.8. — Continued

	POPULATION AREA		GNP		POP. DENSITY (sq. km)	CO ₂ (%) global	CO ₂ (m.t. per cap.)
	(% global)	(% global)	(% global)	GNP (\$US)			
GROUP II — Continued							
Dominican Rep.	0.135	0.037	0.031	710	135	0.027	0.272
Uganda	0.311	0.179	0.023	250	64	0.003	0.014
Burundi	0.098	0.021	0.008	240	171	0.001	0.009
GROUP III							
S. Korea	0.840	0.074	0.650	2,370	423	0.687	1.094
Portugal	0.020	0.070	0.152	2,250	111	0.123	0.797
N. Korea	0.477	0.092	0.301	909	173	0.608	0.881
GROUP IV							
USSR	5.754	17.014	15.574	8,354	13	15.303	1.094
Canada	0.524	7.577	2.389	12,120	3	1.593	4.110
Australia	0.328	5.838	1.260	11,920	2	0.495	3.829
Libya	0.080	1.337	0.163	5,128	2	0.126	2.142
Oman	0.027	0.228	0.453	4,900	2	0.110	4.229
GROUP V							
US	4.952	7.115	27.900	17,480	26	18.192	4.974
GROUP VI							
France	1.135	0.416	3.924	10,720	101	1.489	1.775
UK	1.162	0.186	3.323	8,870	231	2.516	2.931
Spain	0.793	0.384	1.243	4,860	77	0.755	1.285
Netherlands	0.299	0.031	0.967	10,020	356	0.531	2.402
Belgium	0.203	0.024	0.604	9,230	319	0.402	2.631
Greece	0.205	0.100	0.243	3,680	76	0.243	1.603
Israel	0.088	0.016	0.176	6,210	205	0.110	1.691
Kuwait	0.037	0.014	0.165	13,890	100	0.124	4.563

SOURCE: Choucri and North (1993)

data some inferences that may be pertinent to global insecurity and security. (See Schneider, 1989: 19–23, for a scientific discussion.)

The contributions of bottom and middle Group I countries to carbon emissions and other globally threatening effluents tend to be low, but to the extent that such effluents generated by the Group as a whole are globally aggregated, their low-level resource depletions, pollutants, and other degradations cannot be discounted — especially (and paradoxically) as such countries manage to grow and develop.

Top countries in Groups I and II often suffer from some of these same problems, but numbers of them have achieved substantial industrialization and accompanying forms of development that provide higher living standards for many of their people and new possibilities for technological advancement. Since biogeochemical cycles do not respect territorial boundaries, one state's actions and degradation cannot be prevented from affecting the natural environment of another state. Industrial countries are characterized by high levels and rates of technological advancement combined with access to resources. They exhibit high levels of consumption, emit high levels of CO₂, generate extensive wastes, and produce a high volume of greenhouse gases. Then, often transported by air currents and other natural forces, these effluents contribute to global warming and degradation of the planetary environment.

Carbon Emission and Growth

The global distributions of energy use and carbon emissions carry a compelling message: at one end of the spectrum are states with large or growing populations and relatively limited basic technology, contributing low carbon emissions per capita. And at the other end are the industrial states, which currently generate more effluents and threaten the global balances more than do the developing states.

Although states all over the world generate many of the same effluents—carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), chlorofluorocarbons (CFCs), and a host of others—they do so in different ways and in varying amounts. The differences are shaped by population, levels of technology, and resource availabilities—and also by geographical location (climate zone) and policy priorities. Not all the pollutants are traceable to industrial smokestacks. Carbon dioxide, for example, comes also from biomass burning, which can be traced in part to deforestation in Brazil, Indonesia, New Guinea, the Philippines, and other parts of the tropics as well as along the northwestern coast of North America (Canada and the United States, including Alaska).

Similarly, CH₄—methane—is generated by cattle and rice fields as well as by landfills and fossil-fuel production. Traceable in part to biomass burning—slash-and-burn agriculture and, in Brazil and a number of other countries, the burning of timber-cutting refuse in the preparation of forest land for agriculture—are carbon monoxide (CO), and nitrous oxide (N₂O) gases.

The fundamental issues for countries of Groups I and II pertain to their future growth and development. It is here that the growth/development ←→ environmental sustainability paradox (and policy dilemma) emerges most starkly. For their future stability as nations and the survival of many of their less-favourably situated people, countries in these two groups *must* grow and develop with dispatch; but if their populations continue to grow, and if they rely for their development upon the technologies prevailing

in Groups IV, V, and VI, they will be in deep trouble. Specifically, a number of developing countries need to accomplish by new means (energy-efficient technologies and resources that the industrialized countries are still seeking) what countries of Groups IV, V, and VI achieved with coal, oil, and 'dirty' technologies over the better part of a century. As these nations industrialize, however, their large populations will make them significant contributors. China's CO₂ emissions per capita are only 0.5 m.t./yr, but in the aggregate it is already the world's third largest contributor of global CO₂. Imagine China with the US per capita GNP (1986) of \$17,480 and the US share of automobiles, then factor in its reserves of coal and oil—China's most readily available energy resources—and one can begin to imagine its future in the event that current modes of growth and development persist.

The level at which the future world population is expected to stabilize (estimated at 10-14 billion persons) will have radically different impacts on the global carbon budget, depending on the level of development worldwide. If the highest possible global population is reached at a global development level equivalent to that of Bangladesh (with almost trivial carbon emissions) the impact on the environment will obviously be very different from what it would be if the development level were that of Iran (the country that demarcates the global median in CO₂ emissions per capita), or Italy (close to the global per capita average; for details see Choucri 1992).

Sustainability and Security

From a systems perspective, a sustainable society is one that 'has in place informational, social and institutional mechanisms to keep in check the positive feedback loops that cause exponential population and capital growth. This means that birthrates roughly equal death rates, and investment rates roughly equal depreciation rates, unless and until technical changes and social decisions justify a considered and controlled change in the levels of population or capital.' In terms of general welfare and quality of life, such a society would have to be 'configured so that the material standard is adequate and secure for everyone'—worldwide (Meadows, Meadows, and Randers, 1992: 209). And to be physically sustainable, 'the society's material and energy throughputs would have to meet economist Herman Daley's three conditions':

- Its rates of renewable resources use do not exceed their rates of regeneration.
- Its use of nonrenewable resources does not exceed the rate at which sustainable renewable substitutes are developed.
- Its rates of pollution emission do not exceed the assimilation capacity of the environment (Meadows, Meadows and Randers, 1992: 209, citing Daley, 1971: 237).

In the terms of this chapter, sustainability also requires maintenance of a country's population/resource ratio at a socially defined and acceptable level beyond the minimum requirements for survival in terms of food, water, space, and shelter. Population serves as the denominator in both the equation for structural security (or minimal insecurity) and the basic sustainability ratio. Since structural security refers, in turn, to the broad context and viability of the society, its absence will be manifested in 'crumbling' of the state as a result of internal strains, and inability of the state and government to contain (manage, regulate, diffuse, or export) the pressures on its resource base and/or to find external sources of needed resources. In the latter case, the resort to external resources always involves some cost in the form of transport, debt, debt service, barter arrangements, political exchange, and so forth. These costs will be determined by the access, the scarcities in question, and the relative capability of the parties to the exchange.

If those in the 'favourably situated' groups do not lead the way—in demographics, technology and efficient use of resources—nations in the other groups, and in due course the global system itself, may well be doomed to persisting insecurity. It is therefore necessary to begin immediately with a world-wide strategy of (1) population constraint; (2) acceleration of technology (knowledge and skills, both 'mechanical' and organizational) within the bounds of (3) efficiency in applications of technology and natural resources—with some optimal security for each and all as a guiding beacon. To be acquired globally, a reasonable quality of life and level of security must be achieved locally—and vice versa.

Note

¹The editors are responsible for the version of this paper that is presented here. For a more complete account see Choucri and North (1993).

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