

CHOICES FOR GLOBAL SOCIAL STABILITY

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Abstract: Scientists and societal leaders increasingly agree that human activity is irretrievably changing the environment in which human life and other life forms co-exist. Action to reduce human impact on the environment is an imperative prerequisite to achieving social stability. Accelerating migration patterns due to environmental stress and population pressure have been associated with emerging conflicts. Population movement from rural areas to megacities may weaken social structures and create social chaos. Traditional dogmas, whether ethnic, religious or political, must be re-thought in this changing context if global society is to avoid collapse in a weakening ecosystem. Copyright © 2008 IFAC

1. INTRODUCTION

The 1962 publication of the book, *Silent Spring* (Carson), aroused the consciousness of many scientists and some societal leaders by noting that the benefits of large-scale science are purchased at substantial environmental costs. The focus of that book was the environmental cost of DDT. The use of DDT fell markedly over the following decades.

During the 45 years since publication of *Silent Spring*, large scale science and industrialization have been generating far larger environmental costs than DDT. Those costs are felt almost everywhere in the biosphere, a thin layer of water, land, and air riding on several layers of rock substructure covering an inner core which is essentially unaffected by human activity.

Occasionally, the non-trivial accomplishments of science and technology create an impression that human activity, especially in terms of science, has no bounds. In fact, the bounds of human activity, including science, are defined by four interwoven factors:

- a. Changes in human activity.
- b. Changes in the biosphere as a result of human activity.
- c. Capacity of the biosphere to support human life.
- d. Capacity of global society to remain stable as its support system changes.

The main body of this paper outlines consequences of human overuse of our environment. The paper also outlines a set of extremely challenging steps which may be essential to maintaining environmental stability. As environmental stability decreases, global social stability decreases.

The paper asserts that both consumption patterns and human population patterns must change if humanity is to survive.

Moreover, these changes must be rapid and spread across the spectrum of human behavior.

2. HUMAN ACTIVITY - EFFECTS ON THE BIOSPHERE

Since 1962, effects of human activity on the biosphere have been amplified by a doubled population, which, notwithstanding widespread poverty, has increased aggregate environmental loading several-fold.

The global environment is changing rapidly under current consumption levels. The effect of mass communication (especially television) has fueled demand growth at all levels of society. Consumption has risen even more rapidly in regions where rising incomes permitted people to increase consumption dramatically within a few years, most notably in East and South Asia. Demand is also amplified by unrealistic television images portraying extravagant life styles as a social norm. The pull of televised Western consumption patterns (fictitious as well as actual) has exacerbated environmental stress.

Where funds are insufficient to support increasing consumption (a majority of the developing world), there is a growing sense of inequity, leading first to rising crime and then to terrorism. Both increasing consumption and feelings of inequity are amplified by rapid growth in individualized communication: the internet, email, cell phones, camera phones, and text messaging.

New studies and statistics on the effects of global warming are released virtually every day. Analysis suggests that causes of global warming have exceeded a key inflection point. If so, slowing the growth of consumption is no longer adequate, and only reducing aggregate human consumption from current levels might check global warming (Kile).

3. KEY FACTORS TO CONSIDER

Several factors appear to be major causal agents of human stress on the global ecosystem. Studies provide no definitive

evidence regarding what fraction of contributions to global warming stems from long-term cyclical changes and what fraction stems from human activity. Some researchers claim cyclical behavior is a primary agent in global warming. A more widely accepted view is that combustion of fossil fuels beginning with the Industrial Revolution is the major cause of global warming. The release of "greenhouse gases" other than carbon dioxide is also considered a causal agent of global warming.

3.1. Increasing Consumption

Studies indicate that from 50% to 80% of the "greenhouse" effect is due to industrial activity. The biggest single factor is combustion of hydrocarbons. Other industrially generated gases exacerbate the situation.

Increased use of carbon fuels is caused by two factors:

- a. Population growth.
- b. Increased per capita consumption.

The multiplier effect of these two factors is obvious.

3.2. Deforestation and Desertification

A second very significant factor in global warming is deforestation, most crucially, cutting and burning of tropical rainforests. More than 150,000 sq. km. of tropical forest are lost each year (FAO). Deforestation and resulting changes in rain over savanna regions bordering the rainforests are major contributors to desertification. A second major cause of desertification is overgrazing of savanna areas by livestock. There is evidence that vast tracts of Central Asia were overgrazed as early as the neolithic era. Much of Central Asia has been highly arid since that era. There is similar evidence that the Sahara Desert was once fertile land, but there is much less evidence to support a hypothesis that there was a historical pattern of overgrazing in the Sahara region. Deserts are currently expanding at a rate which is difficult to document, but has been estimated at as much as 65,000 sq. km. per year. Famines in the savanna region (Sahel) south of the Sahara were severe at times in the 1960s. In recent years, famine is becoming endemic, because growing populations require more food, even as their growing presence depletes soils and water resources.

3.3. Population Growth in the Tropics

In 1962 global population was 3.1 billion. In 2007, global population was 6.6 billion. The population in the tropics alone in 2007 was greater than the entire global population in 1962. Losses of rainforest accelerated during those 45 years. One estimate (Amazon Institute) indicates that when tropical deforestation is largely complete, the total release of carbon compounds into the atmosphere due to deforestation will equal the total of carbon compounds released from fossil fuels since the beginning of the Industrial Revolution. Statistics regarding the lost capacity for carbon flux (natural conversion of carbon dioxide into carbon through photosynthesis in forests) are not available, but lost forests

clearly would have offset a portion of annual hydrocarbon consumption.

Slash and burn agriculture leaves tropical soils depleted of nutrients after three or four years. Many of these depleted lands will become arid regions threatened by desertification.

3.4. Birth Rates, Death Rates, Migration and Social Instability

During the past five decades, modern medical approaches (especially vaccinations and reductions in malaria) greatly reduced tropical death rates. During the same five decades, birth rates have fallen far more slowly, and in some regions total births per female have risen because more women live longer. Populations in many tropical and subtropical countries have tripled in the past five decades. During that same time, rainfall has declined in many areas. Whereas in the 1960s some regions in Africa occasionally depended on imported grain (often donated grain), in the early 21st century some of those regions now depend on donated grain every second or third year (Hammink). Meanwhile, the supply of grain available for aid has shrunk. Although the United States was once looked on as holding sufficient grain reserves to serve as a reserve store for the entire world, those grain reserves are no longer large enough to avert potential large scale famine.

As burgeoning family sizes could no longer be supported by traditional agriculture in some regions, people moved to urban areas by the tens of millions. Today, there are many essentially non-functioning urban areas in developing countries. Social stresses and low levels of education marginalize people as they move into increasingly crowded urban areas. Many megacities have enormous numbers of people who live almost completely outside the local economies. These masses live on the fringe of starvation. Overstressed cities cannot maintain the inadequate infrastructure they once had. Thus, except for small pockets of middle- and upper- socioeconomic classes, people live without clean water and proper waste disposal. Sanitation is non-existent.

Examination of underlying patterns of dictatorial or militaristic rule in many tropical countries suggests that autocratic rule will continue to spread until a balance is struck between population and the capacity of the national society to offer security and well being to growing populations. At some point, every population reaches a balance between births and deaths. Populations cannot grow indefinitely. Though birth rates are declining, the supporting ecosystem is rapidly losing its capacity to support current populations. Barring significant and immediate reduction in the birth rate, one of two outcomes is inevitable:

- a. A rising death rate
- b. Outmigration.

3.5 Consequences of Population Pressure

Outmigration (also known as population relocation) has provided some relief to areas unable to support their own populations. However, resulting immigration to a "host" society can easily destabilize that society. This destabilization can occur whether immigration from other areas is initially welcome or unwelcome. In many areas which have experienced large population inflows since World War 2, formerly stable areas have become destabilized. It's difficult to cite specific instances without offending some group. Nevertheless, it's imperative to cite a few regional examples to buttress the argument that inflows of population from elsewhere create new tensions and wars or social instability. Consider the following post-World War 2 flows of population and ensuing social and political instability:

- a) Ethnic Albanian population flowing into Kosovo.
- b) Ethnic Chinese population flowing into Tibet.
- c) Ethnic Tamil population flowing into Sri Lanka.
- d) Ethnic Hispanic population flowing into the U.S.A.
- e) Ethnic Jewish population flowing into Palestine.
- f) Ethnic Indonesian population flowing into Timor and New Guinea.
- g) Ethnic Arab population flowing into the Darfur region of Sudan.
- h) Ethnic European population flowing out of Zimbabwe.
- i) Ethnic Arab population flowing into France.
- j) Ethnic Turkish population flowing into Cyprus.

Some of the flows of population may be considered small and some large. Some have had minor impacts, and in some instances the impact of these population flows has been very significant. Reasons for the cited population flows vary greatly. Whatever opinion an observer may have regarding these and other significant population flows, it's clear that some of the cited instances have resulted in significant tensions and enduring instability.

Insofar as observers agree that large population flows tend to destabilize society, migration should not be seen as providing relief to overpopulation in stressed regions. We may also note that population has continued to grow in areas experiencing population outflow. This further substantiates the notion that a balance between births and deaths is, at some point, unavoidable. If stable population is unavoidable at some point, earlier action is preferable to delayed action.

Balance will result from:

- a. Greatly decreased birth rates, or
- b. Rising death rates.

It is an untenable assumption that population can continue to rise at current levels (approximately a 1.5 million person increase in global population each week) in a fixed environment, particularly because the environment in many areas already shows great stress from expanding population.

4. ACCOMMODATING TO SOCIAL CHANGE

In the short term, neither birth rates nor population flows will change materially. However, the longer the delay in

addressing destabilizing factors cited above, the greater the likelihood of major instability, i.e., war or major environmental dislocation. Moreover, at some level, environmental dislocation will likely lead to wars, the ultimate sign of social instability.

4.1. Actions to Avoid Major Instability

a. Reducing Births to Balance Deaths

It is highly important to reduce births. Obviously, this goal might seem impossible to achieve. Considering likely alternatives, war and disease, this option appears to be very desirable.

4.2. Reducing Consumption

This goal is also very difficult to achieve, but again, the consequences of inaction are even more forbidding.

4.3. Discussion of Reduced Consumption and Birth Rate

What are the links between birth rates and consumption? As noted in earlier paragraphs, marketing and communications, particularly video forms of communication, have combined to lead very significant population groups to increase consumption. Travelers through remote desert regions of North Africa have commented on refuse, notably plastic containers, in desolate and inhospitable areas which otherwise show no signs of human presence, certainly not of industrialization.

Birth rates have declined in almost every society. In tropical regions death rates have declined much more rapidly, though pressure on water resources threatens to reverse the decline in death rates. Pressure on water resources has largely been a result of rapid population expansion following introduction of new types of grains, immunization against several major diseases and provision of external food supplies, notably grain, during periods of famine.

Given that there are limits to how great a population regional ecosystems can support, and that aggregate consumption cannot grow beyond sustainable levels, there will be a point at which births and deaths become equal. Thus, it is sensible to examine means to control population and consumption through agreed means rather than procrastinating until aggregate consumption reduces the capacity of the environment to support human activity. If/when a point is reached that the environment cannot support the then current consumption levels, it appears inevitable, as noted above, that one of two outcomes will occur:

- a. Major wars, which reduce human population or annihilate humanity.
- b. Famine and disease combine to reduce population.

5. CHOICES TO MINIMIZE CATASTROPHIC OUTCOMES

One of the maxims of futures research is, "When leaders say they have no choice, the reality is that they no longer have a choice." When a "crisis" arises, reasons for the crisis often center on postponement of action until circumstances compel action.

Global change and pressures from consumption due to excessive demand in affluent regions and excessive population growth in developing regions combined during the latter half of the 20th century A.D. to put humanity on a collision course with our shared environment. In the early 21st century it is increasingly evident that human activity has already collided with the environment, and that the environment on which all human activity depends is already losing resiliency and supportive capacity.

5.1 Confronting Suboptimization

Systems studies, in the technical realm and in the societal realm, reveal that suboptimization carries related costs. It is possible to optimize one or two aspects of system behavior at resultant costs in other aspects of the same system. This can happen in two distinct ways:

- a. Performance of a selected subsystem can be optimized at the cost of suboptimal behavior in the system as a whole. With respect to global society, the well being of self-selected nation states has been suboptimized to the detriment of the larger societal system.
- b. Performance of a system (or a selected subsystem) can be optimized for a selected time interval without regard to costs over a longer time interval. This is known as short-term management (or as short-term thinking).

Nation states and other groups capable of exercising influence, e.g., religious groups, social class strata, and ethnic groups, among others, have clearly attempted to optimize their own situations with little regard for costs to the larger, shared global system, particularly the shared ecosystem

5.2. Leadership Issues

Leadership groups have attempted to optimize both subsystems and the global system to maximize performance within selected time frames, without regard for longer time frames. Frequently leaders select relevant time frames according to one (or more) of three time horizons:

- a. The current political time horizon of each leader's "term-of-office," however that term may be defined.
- b. The expected lifetime(s) of the leadership group in power.
- c. The expected lifetimes of their own children.

It is unusual for leaders to look beyond all three of the time horizons cited here. It is also unusual for leaders to attempt to optimize system behavior for the broader society, in contrast with suboptimization focusing on each leader's subgroup (nation, religious group, social stratum, or ethnic group)

5.3. Learning to Optimize for Long-term System Stability

Objective analysis of the global situation in the early 21st century suggests that it is important to avoid both environmental collapse and major wars.

Objective analysis also suggests that all humans, both collectively and individually will suffer significantly in the foreseeable future unless action is taken to reduce human loading on the environment and to replace suboptimization as defined above with systemic optimization for the longer term. To do less is to invite societal chaos in the no-longer distant future.

6. CONCLUSION: A SCENARIO FOR CREATING LONG-TERM STABILITY

If this paper has seemed to present a forbidding scenario for the future, it may be because without significant societal change, future prospects for humanity are grim. At the same time, there is a genuine opportunity to develop a path toward long-term global stability, a path toward a future which recognizes that within one or at most two generations humanity will either reduce its overall burden on the shared environment or the environment will cause humanity to destroy itself in catastrophic wars. Past human behavior suggest that totally destructive war will result if there is no joint action to live sustainably in the environment we share.

6.1. Steps to Stability

- a. A necessary, but not sufficient, step toward stability is to achieve wide agreement that the clash of human activity and the larger ecological environment is already underway.
- b. A second step is to convince leaders in national groups as well as religious groups, social strata, and ethnic groups that there is no viable alternative to full cooperation. Traditional dogmas, whether ethnic, religious or political, must be rethought within our changing environment if global society is to avoid collapse as we cope with a weakened ecosystem. Adapting long standing dogmas may, at first, seem impossible, but as religious, political, and ethnic leaders consider how the world has changed since their dogmas and historical memories were formed, they may realize that even the most rigid systems of dogma include "higher" values, referring either to stated social presuppositions or to a divine creator, who instilled these values through foundational documents (constitutions, philosophical treatises, or sacred texts).

When these two steps have been successfully undertaken, the most difficult step remains: the step which will fulfill the "sufficient" condition for human survival. This step will demand major sacrifice from almost everyone in the intermediate term. We will only be able to reach this "sufficient" level of consensus if we are continually reminded that there is no genuine alternative. One means of achieving this consensus is akin to the "balance of terror" which kept the world from total destruction during the Cold War.

The new Cold War of the future will be "won" if humanity balances the terror of non-cooperation and the accompanying

terror of environmental collapse against the costs of cooperation.

Humanity has never reached this type of consensus in the past. The historical record suggests that human nature is inimical to this type of consensus.

Given the ongoing collision of human activity with our weakening environment, we should be motivated to reach a new, though unprecedented, social consensus and create genuine hope for the future.

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