

GUEST EDITORIAL

A Fresh Approach to Sustainability

DREADFUL DEMOGRAPHIC PROJECTIONS

In connection with the International Conference on Population and Development, held in Cairo in September 1994, the international press reported the United Nations' global demographic projections for the next 150 years as ranging from a 'low' of 8 thousand million human beings around AD 2050 and about 5 thousand millions in AD 2150, to 'most likely' figures of 10 and 12 thousand millions, respectively, and to 'top' figures of 12.5 and 28 thousand million humans in the two 'target' years mentioned.

By comparison, the World Bank's corresponding projections for AD 2150 are 10, 12.5, and 23 thousand million humans, while the IIASA, situated near Vienna, Austria, forecasts a full 56 thousand million individuals as a 'worst case' in AD 2150, assuming an unchanged fertility rate or 'business as usual'.

As is now noted to our relief, after prolonged wrangling the 180 participating countries in Cairo reached a consensus on a final 'paper' calling on governments to commit US \$17 thousand millions per year by the year 2000 to actions intended to curb the global population growth — mostly by providing health care and family planning services, and by improving the education of women and their access to jobs, politics, and public life, in the hope that, when once in full control of their reproductive lives, they will choose to have fewer children.

Serious doubts remain as to the practical impact that such a 'paper' may have; but even if it has some impact, the growth-rate of the global population will probably slow down only a little, and this wouldn't begin to tackle the problem of a human presence on the planet which in the last couple of centuries has grown far too much.

HUMANKIND'S PERCEIVED IMPACT

The environmental impact of Humankind (*Homo sapiens* agg.), as defined by the well-known equation $I = P \times A \times T$, is the product of the global population (P) multiplied by the *per caput* resource consumption (A for Affluence), multiplied again by an index representing the effect of technology (T) in terms of pollution, degradation of the environment, etc. Let us take as a reference-point AD 1790, *i.e.* a time when the global population was only some 870 million people (the rationale for this choice is given below), and let us assign a value of *one* to the *per caput* consumption of energy at that time, estimated at about 0.29 TCE or tons of coal equivalent per year (a reliable indicator of the consumption of all kinds of resources), and a value of *one* to the related technology indicator. The corresponding figures for AD 1994 are a population of 5,500 million people, a *per caput* energy consumption of 9.7 (roughly 2.8 TCE per year), and a conservative technology indicator of at least *two* (probably much more).

Then the environmental impact of the human species in AD 1994, compared with that of AD 1790, *as perceived by the environment* is, as an absolute minimum:

$$(5,500 : 870) \times (9.7 : 1) \times (2 : 1) = 122.6$$

or nearly 123 times as great. Otherwise stated, the environmental impact of Humankind in AD 1994 is perceived by the environment as the equivalent of the impact of $5,500 \times 9.7 \times 2 = 106,700$ million humans of the AD 1790 impact-level, and all this is happening just 8 generations apart: really a case of *massive infestation* of the planet by one species, if ever there was one.

In two more generations, if the global population will have doubled again, the perceived impact is likely to be in the order of magnitude of 350 times greater than in AD 1790. The question is, can the Earth's environment tolerate that? There is ample reason to believe that it cannot.

EQUILIBRIUM AMONG SPECIES: A PRECONDITION FOR LIFE

Since the very beginning of life on Earth, about 4 thousand million years ago, when very few and only primitive species existed, a natural self-regulating equilibrium established itself and prevailed as a precondition for life to continue: as any one species proliferated too much, the species on which it fed would become scarcer, due to the increased consumption, so that a number of individuals of the proliferating species would starve, bringing it back down to a size commensurate with its food source; and *vice versa*.

As the number of different species grew, this self-regulating equilibrium remained the condition for their mutual survival: as long as life on Earth was allowed to develop *in a natural way*, no species could ever grow beyond what was compatible with the survival of the other species and ultimately also with its own long-term survival.

But then Man came along and, by changing the 'rules of the game', he became by far the dominant species on the planet and eventually started multiplying beyond control and damaging the environment beyond repair. When in Man's history can that crucial moment be placed? Strictly speaking, as far back as the time of the invention of agriculture, about 10,000 years BP, when not more than 5 million humans were on the planet;

however, by somewhat optimistically stretching the argument, one might claim that the crucial moment in question was the eve of the industrial revolution — hence the date of AD 1790 selected above as reference for the calculation of the present human impact on the Earth's environment.

Up to AD 1790, in fact, Man had made little real progress in the scientific, technical, and medical, fields; almost all the energy consumed in agriculture, manufacturing, and transportation, was provided by animals, winds, and waters, and the environmental damage caused by human activities could still be 'carried' and healed by the innate regenerating capabilities of the Earth's superecocomplex.

Soon afterwards, though, all this was shattered: in the last two centuries, the former balance has been irreparably upset and the planet has become more and more infested by our unique species. Infestation of this sort cannot last very long: if life as we know it is to continue on Earth, the self-regulating ecological equilibrium must be restored somehow, either by deliberate actions undertaken by the offending species itself, or by global reactions in the form of famine, epidemics, or wars, until the numbers of the human species and its impact on the planet are brought back, one way or another, to what can be sustained in the long run.

So, whether we like it or not, the real question is not 'How much more and in what manner can Mankind safely grow', but rather 'To which level must the human impact *be reduced* to achieve long-term sustainability'. Any 'sustainable development' that does not comprise a drastic reduction of the total impact is obviously untenable.

HOW TO ACHIEVE A SUSTAINABLE IMPACT

If, as suggested above, one optimistically assumes that the maximum sustainable impact of the human species on the planet's superecocomplex is that which prevailed in AD 1790, then the problem is how to get there as quickly as possible without sacrificing the life of a single existing individual.

The environmental impact equation $I = P \times A \times T$ shows that, to reduce the global impact, either the population or the *per caput* resource consumption or the technological damage to the environment (better still, all three) must be reduced. Now, under the assumed circumstances, reducing the global population to 870 million people as it was in AD 1790 would ensure long-term sustainability only if at the same time the *per caput* consumption could be reduced by 9.7 times and the technology indicator were at least halved — or, more generally, if those two quantities could be reduced by a combined factor of 19.4.

These conditions are obviously unrealistic: in fact for one thing the four-fifths of Mankind that inhabit developing countries are striving to improve their lot, thereby inevitably *increasing* the *per caput* resource consumption rather than reducing it, while developed countries can hardly be expected to reduce theirs; on the other hand, a sizeable curb of the environmental damage due to technology (in terms of pollution, waste disposal, etc.) cannot be counted on.

A less unrealistic assumption (still fairly optimistic) is that both *per caput* resource consumption and technology can somehow be kept at their present levels (which by itself would take quite some doing): in this case, to get the same total impact as in AD 1790, the global population would have to be:

$$\frac{870}{(9.7 \times 2)} = \text{about 45 million people!}$$

Obviously the target would be between 870 and 45 million human beings, should resource consumption and technology have a combined value between the two considered above.

HOW TO GET THERE

The size-trend of any population depends on the difference between birth- and death-rates. Such difference, expressed as a percentage of the global human population, is currently about 1.8, corresponding to doubling every 39 years. If the death-rate remains the same (or tends to get lower, as it does in the human population), the only way to reduce population size is by curbing the birth-rate: there is really no other solution.

A few countries with high population growth-rates have already explored various approaches to reduce their birth-rates (peer pressure, family planning campaigns, tax devices, sterilization campaigns, etc.); results have varied from sizeable or even fully effective to modest to nil.

The magnitude of the problem is best illustrated as follows: suppose the fertility rate (*i.e.* the number of children per woman) could somehow — for example by means of family planning and/or tax incentives/disincentives — be kept in the whole world at an average of 1.0 (it is now 3.5), starting immediately; it would then take until AD 2125 for Mankind to drop slightly below the population size of AD 1790 (much longer of course to reach the above-cited level of 45 million people or other levels in between). But the world isn't even considering yet moving along that way, and the Cairo Conference showed once more the many hurdles that prevent real progress from being made in that direction.

Thus Mother Nature will probably have to take over in the not too distant future to restore the lost equilibrium by the means she knows best — but then human civilization as we know it may no longer exist.

SUMMARY AND CONCLUSION

Available demographic projections indicate a 'most likely' global population of 12 to 12.5 thousand million people in AD 2150. This Author maintains that even the well-meaning resolutions of the recent Cairo Conference on Population and Development fail to tackle the problem of the *infestation of the planet by the human species*, whose impact on the Earth's environment, *as perceived by the environment itself*, is currently at least 122 times as great as it was just 8 generations ago, or the equivalent of the impact of at least 107 thousand million people of the AD 1790 level — a *massive infestation* of the planet if ever there was one!

In order to restore the natural ecological equilibrium that is the basic condition of life as we know it, but that has been shattered by Mankind, the perceived impact of the human species on the Earth's environment must be brought back to what the global superecocomplex can durably sustain: that is, rather optimistically, to the situation as of AD 1790.

To achieve that, if the *per caput* consumption and the environmental damage due to technology cannot be reduced below present-day levels, the global population must be reduced to roughly 45 million people. The alternative is to let Mother Nature take over sooner or later and restore the lost balance through famine, epidemics, and wars, thereby probably annihilating our civilization.

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GUEST COMMENT

Environment and Development: Key Role for Banks?

In the late 1980s, bilateral and multilateral funding was still mainly channelled towards large development projects. However, thanks largely to nongovernmental organizations (NGOs), the commercial and private banking world was beginning at last to become aware that the environment also mattered. But in spite of a few quite constructive attempts to address these 'new' issues (*see*, for example, UBS Phillips & Drew [1989]), most individual actions had not got much further than studies of paper-recycling and internal energy-saving, and some marketing of (allegedly) environment-friendly stocks and funds. Banks were far from reaching a consensus even on the desirability of environmental impact assessment (EIA), concerning which enlightenment was mostly subsequent (Goodland, 1992; McCammon, 1992).

Sustainability Increasingly Needed

It was at the United Nations Conference on Environment and Development (UNCED)*, in Rio de Janeiro in June 1992, well outside the corridors of high finance, that the sustainability concept was officially introduced to the world as requiring stable population *plus* clean energy. This clashed with: 'he owes it to me' *versus* 'where is my dividend?' Exorbitant amounts of money were bandied about as being essential to *begin* to address the problems on the agenda. Lines between loans, grants, and investments, remained blurred, while begging bowls were tendered in lieu of cash-flow projections. Dialogue took place behind the scenes; but there was only monologue in the plenary hall. An altruistic agenda became polarized, with delegates from developing countries focusing on (their own) development, and those from developed countries fixing their gaze on (their own) environment.

UNCED dignitaries extolled the \$1.2 thousand million commitment of governments under the pilot Global Environmental Facility (GEF), a type of partnership between the World Bank, the United Nations Development Programme (UNDP), and the United Nations Environment Programme (UNEP) (*cf.* Global Environmental Facility, 1991). GEF had been created in 1991 to 'cover the agreed incremental costs of relevant activities under Agenda 21, in particular for developing countries'. Although these costs were, at the time, being measured in many thousands of millions of dollars, nobody seemed unduly worried. Promises were made, followed by improbable conditions. Contentious issues were buried in official documents. Population control was relegated to closed sessions, to which papal nuncios could be seen striding purposefully. Self-help was not on any agenda. Moreover, despite all the talk about money, there was scarcely a banker to be seen, and no mention was heard of the harm that *misplaced* money can do. Perversely, IMF ('top cop of global finance: *Time*, 1989) and NGOs were seen as busybodies. One was left with the uneasy impression that, apart from the vague terms of reference of the GEF, two essential aspects of any financial agreement were not addressed at all: where the money was to come *from*, and who the money was to go *to*. Razzmatazz and revenue are uneasy bedfellows!

* For a brief account of which, see the report of the present Author (who represented our Foundation at UNCED) published on pp. 272–3 of our 19th volume (1993). — Ed.