To some, humankind might well appear to be winning its battle with nature. But, if the conflict continues for much longer, it is certain to lose the war. Long before we have managed to extinguish all the other species that share this planet with us, the destruction of its fragile life support systems will surely have wiped out whatever we value as civilization.

More and more people inhabiting the planet, each wanting more and more things: this is hardly a sustainable proposition in the face of a finite resource base. Human ingenuity and technology can only buy us a little time – they cannot solve the underlying, fundamental problem. That can only be done by slowing the growth of demand for the services that our environment provides.

Over the past 30 years, the limits set by nature have become increasingly evident to some of us. But to many more they have not. The main reason is, of course, that for most people – as for most ostriches – it is easier to ignore impending danger than to make the inconvenient changes needed to deal with it. For them, such limits will become apparent only after they have already been transgressed. The trouble is that – given the exponential mathematics of natural processes and the long lag times between cause and effect – when the proof becomes available, it is already too late.

But how much proof do we need? Fossil fuels may well appear to be plentiful today, but even dyed-in-the-wool petroleum geologists admit that it will not be many decades before they become quite scarce, particularly if everyone starts using them as cavalierly as the industrialized countries do now. Why else would well-informed nations go to war to protect supplies of such resources?

Support systems
The threats to life support systems – the stratospheric ozone shield, global climate, biodiversity – have already reached stages where, within a decade or two of being recognized, they have raced to the top of the international agenda.

Of all resources and natural processes, water is the one over which major conflict is most likely to occur within the next few decades – not just among nations, but also between provinces and within communities. The signs of such conflict are already with us, sometimes manifest in outright violence, sometimes camouflaged by uneasy truces and agreements: in the American Southwest, in the Danube Basin, in the Indian Subcontinent.

Water is the lifeline of most human activity: agricultural, industrial, domestic. Nearly 70 per cent of all living tissue and more than 50 per cent of all raw materials in industrial production consist of water. Not only civilization, but life itself, depends on water.

Water has been taken for granted – and never explicitly treated as a resource – because it has been freely and plentifully available for most of history, and in most parts of the world. But, suddenly, it no longer is. Population growth and economic activity have, within the space of a few decades, taken it from worldwide abundance to local scarcity.

The primary reason for this is that, by tradition, water has been an ‘open access’ resource. It has been available, on a first-come first-served basis, freely and for free. This meant that it was used, and misused, without concern for its intrinsic cost or for its contribution to value addition. Or for the impact on its long-term availability. And, of course, as it becomes increasingly scarce, it goes...
mainly to those who have the political power or economic capital to appropriate it by controlling the sources and distribution channels.

Recent studies have shown that water, more perhaps than any other resource, is grossly underpriced. Many users in agriculture, industry and homes get it at a price that is one hundredth that of the cost of delivering it. And one thousandth that of the value it adds to the products or services it makes possible.

No wonder our agriculture and industry depend on technologies that waste this precious resource with so much profligacy. And result in such rapidly accelerating scarcity.

Achieving equity
Water, like any other scarce resource, needs to be priced. Neither too high, nor too low – but judiciously graded to make it accessible to all segments of society. It also needs to be placed within the local control of communities, which can decide on its distribution among the different uses and users who need it.

Only thus will it be conserved and sustained – and also be equitably and fairly available to everyone, rich and poor.

We are now at a point where water scarcity is not only constraining agriculture and industry, but severely jeopardizing the health of our people. As the population grows and each person demands more and more goods and services that depend on water, this scarcity can only get worse.

Dual cycle
Water shortage is at the root of two of the prime examples of the vicious cycles in which socioeconomic processes can get caught up. In the first case – the vicious cycle of poverty and water – lack of clean water leads to disease, loss of productive time and financial costs, which in turn lead to loss of disposable income and therefore to inability to pay for clean water, which in turn leads to further deterioration in health and productivity, which in turn leads to loss of income, and so on.

The second, perhaps not so obvious, outcome is the vicious cycle of affluence and influence. Those who can afford to do so buy high-quality water for all their needs, and ensure that they are adequately insulated from the impacts of the general scarcity of the resource. This is not a minor phenomenon: the money spent today in many countries on bottled drinking water is comparable to the total funds spent by public agencies on drinking water supply. The rich no longer have a major stake in the quality and performance of the public service and little incentive to use their influence to change policies or investment priorities.

The result is a move towards privatization of services for the rich and marginalization of the services accessed by the poor.

Neither type of vicious cycle can ultimately be good – for anyone, rich or poor.

Viable balance
Achieving a viable balance between supply and demand for water is no easy task. The issues are complex and causes often get mixed up with effects. Supply and demand are often not independent of each other: interventions that increase supply can also increase demand, frequently resulting in little net improvement at best, and at worst in a counterproductive boomerang effect. Most present policies and actions unfortunately have a tendency to deal with symptoms and cures rather than prevention, getting short-term gains at the expense of long-term societal goals.

No complex problem can be solved with simple, one-dimensional measures. So, particularly, it is with water. Even so, it is useful to work on such issues through conceptual frameworks that are easily and widely understandable. For water, as for other resources, these boil down to the three primary pillars of sustainable development:

- The people-nature issues – management of water resources.
- The people-machine issues – technologies for water.
- The people-people interactions – institutions for water.

The solutions lie in bringing back the trees and regenerating the aquifers; installing local, small water-harvesting structures; full-cost pricing; very careful, judicious use of subsidies; water-conserving technologies; and responsive management systems. These in turn need the same three pillars of human endeavour: good management practices to encourage the natural resource conservation, good science to design such practices, and good institutions of governance to help internalize them as community decision-making processes.

Ashok Khosla, the 2002 UNEP Sasakawa Environment Prize laureate, is President of Development Alternatives.