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GUEST EDITORIAL

Reflections on Sustainable Development

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I find myself in the curious position of being the Chairman of the NAEP Sustainable Development Working Group and at the same time having serious doubts that sustainable development will ever occur. I question our ability to achieve sustainable development even on a limited basis, much less on a global basis. But perhaps not all is doom and gloom. Perhaps from this extreme viewpoint it may be easier to see the entire problem, whereas from previous viewpoints only fragments had been visible.

First, let me remind you of what sustainable development is: *Development that meets the needs of the present without compromising the ability to meet the needs of the future.*

That is a simple statement with rather awesome implications. The first thoughts that leap to my mind are these. Is it achievable even one time? Is it achievable all of the time? If it is achievable all of the time, will it bring us to the goal of global sustainability? Unfortunately, the answers that I come up with are no, no, and no. Let s work backwards through these three questions.

Posit #1. Assuming that every development is completely balanced, it will not bring us to a position of Global Sustainability.

This is simple math. If every new development of any kind is balanced with regard to impact and return, the amalgam of the new developments will be balanced. This is only the *future* part of the equation. We must recognize that the other part of the equation is the balance of the existing development. Global Stability (GS) must be a very complex globally collective function of *future* stability plus *existing* stability (GS = FS + ES). If the future is balanced, and the past is negative (or unsustainable), the resulting Global Stability will also be negative. The result of this simple analysis is the realization that the future development must account for existing imbalances in order to provide a positive Global Stability. Future development must be more than sustainable; it must rebalance the equation. Alternatively, we must systematically revisit existing development and rebalance each one independently.

Posit #2. Assuming that any development is sustainable, it is not repeatable at a success rate of 100%.

This is a bit more complicated, and a bit simpler. First the simple part. Statistically, achieving individual sustainability for each and every development for the foreseeable future is simply not possible. The immediate conclusion is that in the Global Stability equation the future stability must now account for new failures as well as old imbalances. What is uncertain is the degree of deviation from perfect that will occur at any given point in time. How much more than balanced will successfully sustainable future developments need to be in order to make up for future failures?

Posit #3. Sustainable development cannot be achieved even once.

This statement is based in the accumulated observations and conclusions that I, and those with whom I have conferred, have made. We can find no example of a sustainable development.

Having gone through these three positions, I would very much like to prove them all wrong. I can t. There are several reasons for this, not the least of which is our inability to measure sustainability. Measuring the sustainability of a development, existing or future, is like trying to measure a hyperactive living amoeba along it s ten most prevalent axes.

Expanding the metaphor, a development, like the amorphous amoeba, can be viewed as having numerous axes for one to measure. In the case of measuring sustainability, the major axes are often recognized as environmental, economic, political, and social. Accepting these four major axes as critical to measuring sustainable development is actually one major point of discussion and some disagreement. Many people would like to measure sustainability in the relatively simple terms of the ecological axes. This group prefers to measure the project s sustainability in terms of air quality, water quality, wildlife, and so forth.

Rather than come up with a constructed example, I ask that you consider any guidepost environmental project with which you may be familiar. For the sake of this example I will momentarily concede the extremely unlikely condition that the project is ecologically sustainable. Just ask yourself how the project is funded? What do the neighbors think? What does the government think? And finally, even if the answers to all these questions support the premise of sustainability, what assurances are there that the funding, the opinions, and the political climate won t change? If the determination of sustainability relies in any way on ongoing financial, social, or political support, then these axes must be included in the terms of measurement. This leads to a fourth statement for your consideration.

Posit #4. If a development can be deemed sustainable at the point of initial completion, it will not remain so.

And now to totally reverse myself, I also find it true that any development could be determined to be sustainable. As examples, I ask that you consider the Tektite Undersea Habitat and the Mir Space Station. These are examples in the extreme, but they define an end point in sustainability that is useful to recognize. In each of these examples, the sustainability is also based on the economic, social, and political functions. That is why both will ultimately be abandoned. But the end point that we are looking for here is one regarding the source of the energy for sustainability. In each of these, the environment is difficult enough that neither could ever be internally ecologically sustainable. Each relies on tremendous imported resources to maintain its sustainability. These are *maintenance driven* developments and are only sustainable if the maintenance is sustained. This examination of an end point leads to the hypothesis that all developments need a degree of maintenance energy to be truly sustainable.

It is apparent that each development will rely on both internal sustainability functions and external ones. For each development, it is prudent to ask how much of the sustaining effort comes from internal operations and how much from maintenance. The Mir Space Station is very much a maintenance driven function of sustainability. Maintenance is of course driven by the will to maintain housed, in the social, political, and economic context of the development.

But a maintenance driven component to sustainability implies even more than a verification of the other axes of measurement. It implies the existence of secondary effects. The secondary effects are directly traceable to the maintenance activity. Even in a huge environmental preserve, there may be exotic flora and fauna invading the area, jeopardizing the ecological sustainability. Managers then will use herbicides, traps, and other techniques to control or eliminate the invaders. What is the sustainability of herbicide manufacture and use? How long will the managers pay for the eradication of an invasive plant when the property next door continues to use the same plant for landscaping purposes?

The above situation introduces the concept of context and supports Posit #4. To go back to the amoeba, one way of measuring such oddly shaped creatures is to slow them down a little. Thickening the medium or cooling it allows the scientist to more accurately estimate the size of the animal. As with the Amoeba, measuring the sustainability of development is done subject to the context in which the measurement is taken.

Understanding the context of the development is also multidimensional and creates its own problems. There are two major aspects of context that we should consider. One is area. The other is time.

The context of area was introduced in the example where exotic species invade a pristine preserve. The larger the preserve, the more resistance it will have to external forces that might upset the internal functions of ecological sustainability. An urban nature park of only a few hundred acres may be surrounded by sources of feral cats, exotic plant seeds, and acidic rainfall.

Each development lies in a watershed and may not have an ability to influence what happens either upstream or downstream. Each development lies in an airshed. Each development lies inside or outside of ranges of various animal distributions. An extreme example might be a songbird preserve in Iowa. If the Iowa preserve has no influence or control over winter ranges or migratory route impacts, what is its sustainability?

The second context is one of time. In this discussion time will not be measured in minutes or hours but in the change of context. It has already been pointed out that a change in politics may affect a change in the will to maintain sustainability through the payment of salaries of those responsible. This is easily understood in the previous presentation where a park ranger is needed to provide maintenance energy. To get a more complete understanding of sustainable development it is important for us to look at sustainability along these other axes of measurement and use examples other than nature parks. It is just as easily recognized in the effort needed to maintain a hotel in a socially and economically sustained manner. Lowered maintenance of the structure will affect the economic sustainability.

It is a widely accepted point that lowered maintenance of civil order (crime rate) will affect economic sustainability. In some cities, managing crime has led to the use of a concept called Crime Prevention Through Environmental Design. One aspect of this program as it has been implemented so far has been the removal of urban vegetation because it gives criminals a place to hide. And so the context of criminal activity dramatically affects the ecological sustainability of the amalgamated development of the municipality.

In another example, context can be thought of as a reflection of cumulative impacts. It is obvious that a lawn of carpetgrass represents a total habitat replacement. The replacement of the habitat does not, however, preclude all natural activity because some adaptable species will find an advantage where others experience a loss. A single lawn occupying 1,000 square feet of a 2 acre wooded lot in the middle of an

otherwise undeveloped countryside does not exert a great deal of ecological pressure on the surrounding area or even upon the ecology of the two acres. The same type of lawn occurring three thousand times on 0.15 acre lots in a regional development represents an extensive replacement of habitat and an extensive shift in expansion and exclusion functions for individual species, both native and exotic.

The aboriginal slash and burn farming technology common to all continents represented a positive factor in the sustainability of the aboriginal population. The same techniques in the context of 20th century dynamics are leading to recognizable and negative shifts in the Global Stability equation.

Context also teaches the lesson that sustainable development, if achieved once, may not be reproducible. Presume for a moment that an apartment complex in Colorado had somehow achieved sustainability. Reproducing the same design in Florida, Wyoming, or even across the street, may not be sustainable because the context may not be the same. In fact, reproducing the development across the street will change the context of the first development and perhaps push its measurement of sustainability into the negative.

Placing context and cumulative impacts together may bring us to an entry point of unraveling this Gordian knot. In our current context, we as a people conduct a number of activities which contribute to the overall negative Global Stability value. We often don t recognize these activities as detracting from Global Stability because taken independently they are insignificant. To revisit lawns, the single lawn uses water, replaces habitat, requires fertilizer, requires pesticides, and demands gasoline and electricity for maintenance. The single lawn, despite these demands, is not a significant influence on Global Stability. According to the National Wildlife Federation, there are 24 million acres of lawns in the United States. After doing the math it is easy to see that the cumulative impact is severe with regard to the environment. But changing the context may have a severe impact on the economy.

The Department of Transportation publishes standards for roadway design. Each roadway is designed to be safe for vehicles traveling at certain speeds. The faster the speeds, the more gentle the curves. Each design speed is accompanied by a required recovery zone (the amount of space necessary for a driver to regain control should they exit the pavement unintentionally). The recovery zone is to be kept free of trees and other objects which may cause severe damage on being impacted by a vehicle. The Department of Transportation also typically clears and mows an area much greater than the required recovery zone. As with the lawns, if all the highways were only mowed to the edge of the recovery zone instead of the edge of the right of way, what would be the change in Global Stability?

Much of the impetus to prepare these thoughts came from my involvement in a group attempting to prepare printed guidelines for sustainable development. In this work, I found that two observations were made repeatedly. The first was the entry point of the professional. In every scenario and case study that was examined, the project was already in a negative sustainable development posture prior to the involvement of the professionals. In each case an owner or investor had already selected many of the values for variables that contribute to the sustainability of the development. To achieve a positive sustainable development rating, the other variables were forced to overcompensate and always led to failures. The guidelines were not structured to deal with the entry point problem and the drafts often resembled a list of things to do instead of an aid to assessing sustainability.

The second observation comes from the first. I have chosen it as the closing statement for this paper because I can see no progress until we can deal with this tenet. This idea has its foundation in our very constitution and will be difficult to challenge. It is the tenet that a property owner has a right to develop property to *its highest and best use.* In the context of our national history, highest and best use has been largely defined in economic terms. Any restriction of this use by government was considered a compensable taking leading government to avoid restrictions. In the context of moving towards a positive Global Stability, I suggest that the first step must be the redefinition of *highest and best use* in terms of those uses which will sufficiently contribute to the nullification of the above four positions stated in this article.

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