

Is Arizona Headed the Way of Easter Island? Water, Growth and Public Policy in an Arid Place

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Keynote speakers always face the “dilemma of the title.” Because programs have to be printed long in advance, as a keynote speaker you are asked what the title of your talk is going to be long before you have figured it out. In a somewhat hasty and perhaps ill-considered moment after I had just finished Jared Diamond’s book *Collapse*, I thought Easter Island seemed like a provocative metaphor, so let’s ask the question whether Arizona as a function of water management has any risk of the Easter Island scenario.

When, two days ago I started thinking about this speech and realized that I had given it a provocative title leading you all to expect me to offer an apocalyptic vision of the dry, hot desert reclaiming the place where we live, I thought ... this is not exactly an upbeat kind of thing to be doing to start a conference. So I went back and tried to come up with some analogies and positive ways in which over the course of the next couple of days we might be able to think together about water use in Arizona, the future, public policy and the sustainability of our place.

Let me begin by talking about Diamond’s analysis. In *Collapse*, he identifies five factors for why societies in history and pre-history have failed. Those are: 1) relationships with friendly nations—a trading partner that is critical to your economy disappears. 2) Relationships with enemy nations—your society is eradicated by bad guys. 3) Global climate changes—crucial things that happen to the planet at various points in time that make particular locations no longer habitable. We’re not going to talk much about global climate change today, but if you layer that on top of the other things that we are going to be talking about, it may exacerbate the challenges that we face. 4) Local environmental damage—resource depletion, the Easter Island story. 5) The final factor is how you respond to the other four.

For many hundreds of years no one could figure out how the giant stone heads on Easter Island got where they are. The place on the island where the rock is quarried is not near where the stones are erected. It was hard to imagine how the heads could have been moved, because Easter Island does not have any trees. It did not look like there was any way to build sleds or rollers or

transfer mechanisms. Through the work of several scientists we now know that there were once a lot of trees on the island. There were very big palm trees and therefore ways to build sleds and transport the rock heads. Through carbon dating of campfires it appears that the complete deforestation of the island took place between AD 900 and somewhere around AD 1500.

Easter Island was a thriving society, granted with somewhat peculiar religious imperatives, that wiped itself out by cutting down all of its trees. The image is graphic, startling and provides a wonderful metaphor for the planet earth, petroleum, greenhouse gas and other kinds of challenges.

Diamond visited ASU last year, and he said that as he has talked about the Easter Island scenario with his students, he has asked them: what do you suppose the guy thought who cut down the last tree? What did he say as he cut it? Their answers were: “Don’t worry about it, technology will provide, there will be a substitute for wood.” Or maybe he said, “It’s my tree, it’s my land and I’ll cut it if I damn well please.” Or, “More research is needed, it is not clear that the trees are really that important.” The reality is that the guy did not know he was cutting the last tree. The critical tree was not the last tree standing. The problem was that as the trees were slowly depleted, the ecosystem that replenished the forest began to decline and so at some point the critical tree was cut but no one knew. There was a point of no return.

Sustainability, as you all know, is *the* hot buzz word in academia today. It seems to be one of those kind of “I know it when I see it” phenomenon, sort of like pornography. The most commonly accepted definition is that of the Buntland Commission, a U.N. Commission that defined sustainable development as “meeting the needs of present generations, while not compromising the ability of future generations to meet their needs.” Notice that it is a very anthropocentric definition. The role of the ecosystem, in the Buntland view, is to sustain future generations of humans. Importantly, there is more to sustainability than simply resource preservation. It is typically talked about as the three circles of a Venn diagram which intersect. One of those circles is the environment and the existence of environmental values. Another is also economic and protection of a thriving, human economy. The third circle is social equity—so that if the economy is thriving it is not thriving just for a few. Where those three circles intersect is the kind of “sweet spot” of sustainability, where you have a thriving economy, but you are also preserving the environment and have a high degree of social equity. The question is kind of how do you get to the sweet spot.

The debate about sustainability often devolves into two almost quasi-religious camps. One view is the Easter Island, or “Spaceship Earth” view. This view, born out of the Puritan ethic perhaps, is that we have to cure whatever problems exist by living better, less impactful, more frugal lives in terms of per capita resource consumption. We have been bad and we must atone by riding bicycles and living in straw bale houses. Those of us who live in the desert are viewed as a extraordinarily bad example of the human species in terms of consumption of water, energy and other resources. We, in particular, must atone for those sins by living a harsher and more difficult existence.

In the other camp we have a sort of “managed risk” view. This view of technocrats and plumbers (many of whom are in the audience today) of actuaries and many politicians, is: calm down, do not look too far ahead, these systems are largely self-regulating and technology will provide most of the answers. If you try to look too far out, you are likely to make big mistakes. The whole debate tends to be hijacked into those two camps, and also tends to focus only on resource allocation issues rather than on the other two circles in the diagram.

How do we even think about this issue on a local level? “Think globally, act locally” makes a great bumper sticker, but what real guidance does it give us about making public policy choices? Again, the debate often gets pushed to the extremes. At one end is the “Simon Winchester view.” Winchester recently wrote a book called *A Crack at the Edge of the World*, about the great San Francisco earthquake early in the 20th century. I was listening to him in an NPR interview on April 18th. At the end of his talk about San Francisco, he offered the further extrapolation that it was pretty clear that there are at least three American cities that should never have been built. San Francisco was one because of the earthquake faults. New Orleans was another. The third was Phoenix because “there’s no water there.” I later saw him on PBS where he altered number three to be Tucson rather than Phoenix. (One suspects that he would probably put Las Vegas in the same camp although he likely considers it beneath notice altogether.) This is an interesting view because he has lumped together the phenomenon of catastrophic events—hurricanes and earthquakes—with the issue of the availability of a particular resource to support an urban population. Winchester decrees that rainfall is a critical variable in deciding whether or not a city should exist somewhere.

Winchester’s position is, of course, ridiculous. Why take water and hold it as a resource a standard not applied to any other resource necessary to support a city? Should a city have to

mine all its own iron ore within its boundaries? Does all the concrete consumed in a city have to be manufactured in the city? What about food—does all the food have to be grown there? Of course not. Cities are by definition concentrations of people supported by the resource base of a larger geographic area. Water is a resource like any other; a resource susceptible to transport. We make choices about where and how to use all resources, and water is simply one of those.

The other extreme at the local level—that technology will provide—was succinctly stated by Pat Mulroy at a recent meeting in Las Vegas. Pat, plumber that she is, simply says: desalinization is the ultimate solution, it's all just about price. At some point desalting the Pacific will supply California with water and Las Vegas can take more from the Colorado. She may well be right.

It does seem to me that there are some useful questions we can ask about sustainability at the local level. These three questions might be something that could help form the dialogue over the next couple of days.

The first question that I think we should ask is: **If there are no major systemic shocks, like earthquakes or hurricanes, can we sustain the current lifestyle of whatever place we are analyzing for an indefinite period?** This question takes a snapshot look—a static view, of, for example, a city. Could its lifestyle be maintained indefinitely? When you look at Phoenix you would look at about 200 gallons per person per day and you would look at the water inputs. Of course the complexity of sustainability is you really need to do that with regard to everything, not just one variable. So you would have to look at energy and air pollution and the heat island and all these other variables and pretty soon your head starts to hurt and you decide that this is impossible. So we will stick to just the variable of water. If you eliminate the other variables and if you take that snapshot look at a city that would give you some indication of whether or not existing lifestyle appears to be sustainable indefinitely. And I think *indefinitely* is a critical word. I think if you would apply this question to Phoenix right now, the answer is probably yes. You are the experts, but I think at our current population level, we can probably sustain this lifestyle pretty much on an indefinite basis. Is that true of Tucson? Probably, if they were to learn to drink CAP water. Prescott? Pinal County? Las Vegas?

The second question adds the variable of trajectory: **Are current trends moving away from equilibrium or toward it?** You may not be at “equilibrium,”—in the sweet spot—but are you moving closer or farther from it? Here is where you have to add growth rates and usage

trends. Here, real tensions emerge between economic well-being and environmental issues. And so let's apply this filter to Phoenix. We have in Phoenix an economy that is largely built on the phenomenon of population growth. That is what drives this place. Is that sustainable in and of itself? This is the question Jon Talton frequently asks. To be perpetually growing your population is to be moving away from the sweet spot with regard to sustainability. Eventually you would have to acquire new resources. That is not to say you couldn't perhaps add a large number of people and still remain within the sweet spot, but at some point you are going to grow away from balance.

The third query is really the Easter Island question: **Is there a point of irreparable damage?** A point of no return beyond which you have so messed up the ecosystem that you cannot recover and get back within the sweet spot. In an interconnected global environment, as to any local issue, that is unlikely to be a "yes" answer. But there are certainly issues that move you so far away from the point of sustainability that recovery would be extremely difficult or nearly impossible economically.

The last two questions suggest that when we talk about sustainability at the local level what we are really talking about is not equilibrium, but trajectory. Are things getting better? Are things getting worse? And that is perhaps the way we ought to apply the analysis to public policy decisions. So let's try that.

First, a brief aside on group decision-making. Diamond also tries to explain why has group decision-making failed in societies that have collapsed. It is especially interesting if you have read James Surowiecki's *Wisdom of Crowds*. Surowiecki's point is that diffused multiple decision makers, on balance, tend to make decent decisions because the risk of a big mistake is minimized. I have argued that that is a justification for the confused, complex overlapping bureaucracies we use in Arizona to make water decisions. But Diamond makes the point that groups do not always make good decisions. They fail to make good decisions for four reasons:

- One is they fail to anticipate the problem. An example is importing mongooses into Hawaii to control the rats that came on ships and pretty soon mongooses overrun the islands.
- Second, even after a problem arrives, there is a failure to perceive the problem. Global warming is an example, and on a local basis, the heat island may be a good example. We didn't really realize how much hotter it was getting for a very long time and so we did not do anything about it.
- Third is that you perceive the problem, but you fail to even try to deal with it. This is the tragedy of the commons. We realize that there is a problem with

everybody driving SUVs, but the incentive to any given individual not to drive an SUV is not enough to deter the behavior. The market response never catches up to the instincts of individual consumers.

- The fourth failure is that society tries to solve a problem but blows it and fails.

Let us test some Arizona water policies from a perspective of these questions about sustainability and these reasons that society sometimes fails to make good decisions.

Central Arizona Project. This was a decision to shift urban populations in the desert to be using a surface water resource. It is a good decision from a sustainability perspective. The over allocation of the Colorado River, is not a good part of the decision, and a lot of motivation was about keeping the resource away from California and other jurisdictions, which may not be the fairest social allocation. But on balance you have got to give the CAP at least an **A-** as a public policy attempting to implement sustainable goals and move us back toward the sweet spot.

Safe yield. Arizona is justly proud of this concept. It is not one that applies in very many other places in the world. It is very close to the concept of sustainability, purely on a resource question, but predates widespread use of the “s-word.” Safe yield was explicitly designed to alter the trajectory of an arid state back into that sweet spot. We are not there yet; we are not going to make the goals, but things are better. We anticipated, we perceived the problem (maybe Cecil Andrus helped us perceive the problem) and we tried to solve it. So we get an **A**.

100 year assured supply. A little something was lost in the translation between “safe yield” and a “100 year assured supply.” If you really seek sustainability, the metric should be indefinite, not 100 years. The idea was that the 100 years would be a rolling window into the future so that we would always be looking 100 years ahead. But, for example, we have allowed the 100 year assured supply requirement to be satisfied by long-term but finite leases of Indian water. We did that in the expectation that Phoenix would annex Anthem and it would become part of a municipal base, but the hundred year assured supply is probably not a true test of long-term sustainability. So that one we might get a **B**.

Groundwater recharge. Another good idea. We are trying to be ahead of the curve, to anticipate drought. We see a problem coming down the line and realize we need to deal with it. We are not sure it is a perfect solution, but we have perceived a problem, reacted and will see if

it is successful. We are not sure how much we should bank, or where we should bank it, or if it is going to be there when we go to get it, but it is nevertheless the right idea, and again we get an **A**.

Planned depletion. Do I really need to grade this one for you? “Planned depletion” weighted against a measure of sustainability. Can we “sustain” depletion? The curious thing here is that when we put the Pinal AMA in a “planned depletion mode” we did so to preserve the local agricultural economy. But it was not even a valid tool for that goal. If you deplete the aquifers you cannot preserve an ag economy. If this standard ever made sense, as the Pinal AMA begins to urbanize, it certainly no longer makes sense. That one I think is an **F**.

Disclosure. Rural areas in Arizona are not “actively managed.” We hope that by disclosing the existence of an inadequate water supply, people will not move there unless they realize the risk and they are self-sufficient enough to assume it. This is perception of the problem but failure to deal with it. This is acknowledging, in writing, in the public report, that there is a problem. We have institutionalized the essence of the tragedy of the commons. I think we get a **D**.

The CAGRDR. The perceived problem we were trying to fix with the CAGRDR was the inability of some areas to access renewable supplies and so through a complicated kind of exchange mechanism, we would allow them to grow by direct use of groundwater but use renewable supplies to eventually replenish the groundwater being mined. This seemed like a reasonable idea aimed at preserving property value and a development economy in areas of the state that might otherwise suffer. So on intent it maybe gets a **B** or a **C**. But the GRD had unforeseen consequences. We implemented a solution but it may not have worked the way we wanted it to, creating a significant loophole in terms of urban growth by allowing areas to grow based on access to membership in the GRD but without requiring the GRD itself to have a sustainable resource. So it gets I think at best a **C-**.

Try to think about upcoming issues with regard to Arizona water management and apply the questions I suggested about sustainability. Can current behavior, at a snapshot in time, be sustained indefinitely? Is the trajectory of growth and economic change such that we are moving farther or closer to the sweet spot? Is there some risk of a point of no return in decision making?

Arizona is not Easter Island. We are integrated into a global economy and we have the availability of resources that are not in Arizona to solve our problems. But Diamond’s fifth

factor is operative: success or failure is in how we respond to challenges. Let me leave you with some of the challenges I think we need to think about.

Megalopolitan population growth and the nature of landscape. We have lifestyle choices coming up. We can continue to grow a lot of people here but at some point we have to begin to compromise the way in which we live. We will need to live at higher densities with a different landscape palette. These choices have implications for the heat island. Water management has us on a trajectory that is drier, hotter and less green—but as a consequence, we can accommodate even more people. Is that the tradeoff we want? More people, but fewer trees?

The rural growth issue. Are we willing to continue to allow rural growth to occur based on a disclosure standard? Rural and urban growth are on a collision course in our state and we have to sort out priorities between them.

The future of agriculture. We have not really debated this much. We assume that the market will operate and agriculture will be priced out of business. But there are consequences to that—in terms of sustainability, system flexibility and resilience and in terms of how hot it is here. We need to think about and debate these choices.

As you go about the next couple of days, I urge you to occasionally think about Easter Island. Take solace in the fact that we are not going the way of Easter Island; but recognize that there are lessons in that tree cutting for how we make public policy decisions about the future of Arizona.