

HOPE SPRINGS ETERNAL

*Wade in the water, wade in the water children, wade in the water
God's gonna trouble the water (Gospel song)*

From the balcony I watch the waning moon, rising like Venus' sister over the mountains Vista del Mar and Cerro Esperanza. Citizens of Santa Cruz have wisely invested their hopes for the future in these mountains. On July 25th, anniversary of the Annexation of Guanacaste, 12 years of effort were rewarded: Bosque Nacional Diria was proclaimed the newest of Costa Rica's National Park system.

One of the prime movers in the initiative was Coca Sánchez, the environmentally conscious owner of a popular hardware store.. Almost ten years ago, on the sidewalk in front of his business, he pointed up to these same mountains and told me, “we have to protect these forests, they will provide the water for the children of Santa Cruz, long after we are gone.”

Years later I read the 1997 report by the A&A, the national water agency which stressed the importance of these “upland recharge zones” in recharging our region's underground aquifers. The same report predicted future conflict over water resources due to development along the coast. The most recent –and most publicized-- of these struggles, pitted citizens of a small town against a prominent coastal development which is trying to tap into the seemingly endless supply of an inland aquifer and pipe it out to homes, golf courses and condos along the coast.

The massive diversion of water resources in the western US inspired a book with the catchy title *Cadillac Desert*. In my home state of California, the first spurt of growth of Los Angeles was fueled by diversion of water from the Owens Valley, a high plain to the east of the Sierra Nevada. Photos of the area reveal that it used to look like valleys in Switzerland, with fruit trees and fertile grazing lands in summer. Now it looks like an alpine version of the Gobi Desert. The hydrology has been changed forever by the diversion of water going to lawns, car washes and swimming pools in the greater metropolitan area of Southern California.

In many ways the environmental transgressions of the past have helped shape the current trend of conservationism—both philosophical and practical. Costa Rica has earned world renown for its efforts to protect biodiversity in its National Parks. Even the business community is beginning to see the green light. A recent article by a CEO in *La Nación*—*Business and the Environment*—stressed that corporate captains have no choice but to put both environmental-- and social concerns—on the “bottom line” of their balance sheets, if they want to stay in business. In response to my letter applauding his perspective, the author added somberly “Let's hope this shift of perspective on the part of Costa Rica's business community happens before its too late.”

Frankly, part of the problem lies in the lack of multi-disciplinarity in professional education. If you're an ecologist, you have a job, you don't have to do the heavy lifting that is required of entrepreneurs who put it all on the line, take the risks and stress of 16-20 hour work days to get a business going and keep it that way. Leonardo da Vinci may have noted quite accurately that "water is the driving force of all nature," but in the human "ecology," the **flow** that counts most, is "money, honey." On the other hand if you're an economist or MBA by training, natural resources may or may not find a place in your spreadsheet. You have stockholders to keep happy, boardmembers waiting to grill you for the slightest mistake in planning, execution or accounting. "But it was raining for two months straight..." just doesn't mean much to people who spend their lives in air conditioned offices.

As I mentioned before, there are signs of change in the business community—and not just in Costa Rica. Dr. Karel Samsom, MBA Wharton, PhD. from Universiteit Nyenrode, The Netherlands Business School, is now a professor at Nyenrode University in The Netherlands and at the Bren School of Environmental Sciences, UC, Santa Barbara. He works extensively in the new approach to "sustainable economics," and was part of a course here at El Centro Verde last January on Ecological Development.

Karel provided me with an economics perspective on water use in Guanacaste. I explained that a watershed which feeds an aquifer had been deforested for cattle, therefore reducing its ability to recharge the aquifer, and was now slated for increased pumping.

What you are describing is analogous to consistently paying your operating expenses by selling off assets which are the very resources which generate the sales, the revenue stream, of your business process, in the first place. Now, in cash-strapped situations this may occur in the case of a great necessity for a short term solution. However, routinely done, it means capital destruction

Although it sounds exactly like my personal approach to finances, I realized that I had failed to mention to Karel that downstream is one of the most biologically diverse areas in the world, the wetlands of the Rio Tempisque, Palo Verde National Park and the Gulf of Nicoya. These complex ecosystems-- which depend on and have evolved with--a balance between fresh and SALT water --may or may not concur with the decision that pumping 326 liters per second out of one of its tributaries is in fact sustainable. In economics, this would be analogous to siphoning off funds which are part of the cash flow of another series of enterprises.

If lessons from the US are of any use, the replumbing of the Colorado River to green up the arid west, has led to "immense downstream environmental costs," estimated by one researcher at the University of Arizona at \$ 2.4 billion annually. Functioning ecosystems provide benefits, known as ecosystem services, to humans. *This* relatively new concept was developed precisely to avoid the "destruction of capital" mentioned above. And it is already at work in Costa Rica. Surcharges on electric bills are paying landowners to protect the forests in the watersheds upstream from hydroelectric plants. The prudent

approach is to analyze the benefits AND the costs, **all the costs**, before proceeding with a significant change in any region's hydrology, "before it's too late."

Ironically there are so many alternatives to the pump and dump approach.

A first time visitor to Guanacaste just asked me last week why there were no tanks for harvesting water off roofs like in the Bahamas, Australia and, closer to home, San Jose. I shrugged and told her that my approach has been to capture all the water in the rainy season. Swales, terraces, catchment basins, seasonal ponds and lagoons form the backbone of the landscape plan at El Centro Verde and then infrastructure, crops and ornamental plantings are located accordingly. Roads, roofs and impervious surfaces drain into catchment basins and the water percolates in, plants stay greener, longer, without irrigation in the dry season.

On a broader scale this approach of *Conservation Development*, theory—and practice—is being employed at a nearby residential development. The goal is to percolate the maximum amount possible of rainfall back into the same aquifer from which we draw in the dry season. A prominent "water feature" will be a seasonal stormwater retention wetland that will hold up to 3000 cu.m. of water during storms and release it slowly into the streams and recharge the water table. This approach is **mandatory** in drought prone areas of India, for example, and we have been guided by engineers in both India and the US.

A friend of mine who is a truck driver in Arizona came up with a creative application of these same techniques. He designed an entire golf course to work as a huge water harvesting trap as a way of raising groundwater levels. The "rough" at the edges of the fairways was then planted to native trees, drought resistant and serving as wildlife habitat.

Many conservation developments in both the US and Europe also feature biological methods of wastewater treatment. Stated briefly, effluent goes in yucky, and passes below the soil level, hence no odor, through any combination of wetlands or aquatic systems, and comes out perfectly suitable for irrigation. The wetlands plants can include many of the spectacular tropical species—gingers, elephant ears, canna lilies—**and you're not wasting water**. You're purifying it, free water for landscape and without the chlorine, the oxidation ponds and all the other industrial approaches which are commonly applied to large developments.

All this stuff does not take the intelligence of, say, Franklin Chan, the Costa Rican astronaut working on a plasma motor for NASA, who just visited the gulf of Nicoya. In fact, there is a functioning wastewater treatment wetland in nearby Nicaragua which processes the effluent for a community of 1000 people. According to a friend at A & A, they even grow trees and bananas in the thing..

Businessmen, and women, who are wary about investing in "new" or "alternative" approaches to water management on their projects in Guanacaste should reconsider—not

just for the future, not just to save some undiscovered molluscs in the swamps downstream from their pumping stations. One reason: Marketing.

The USA and to a lesser extent Europe, is currently experiencing the **largest intergenerational transfer of wealth in the history of mankind**. Lowball estimates are \$47 trillion. The baby boomers are getting their inheritances, the kids are in college and mom and dad are ready to slow down the pace. A full 30% fall into the amply documented category “cultural creatives.” These people are not the Michigan Boys back for another romp. They have the smarts, the values and the financial wherewithall to pay more --and invest in—products and projects which address on a practical and local level the global environmental problems that have surfaced as our generation has come of age. You can bet the farm on that.

Any project director who fully employs Conservation Development guidelines in Guanacaste will not only be doing themselves a huge favor. They will be showing the entire country how to put its reputation for environmental conservation into the day-to-day practice of building a sustainable future—for Guanacastecos, for gringos, and yes, for golfers as well. Remember, just like the in the Boy Scouts, we’re supposed to leave the “campground” cleaner than we found it. You can join Coca Sanchez and me, gazing up at *Cerro Esperanza*, the Mountain of Hope, knowing that you left more natural capital in the bank, not less, for the children of the future

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