



From Murky Reality to a Fresh Future: Solving the Water Crisis

(Enhanced Clean Water Innovation for the Latin America region)

By Jack Dyer and S. Hagerty Le May

Capturing the value in the global water technology: how collaboration can bring revolutionary water solutions to the Latin American countries. Water infrastructure is critical in our lives and businesses. A strong and reliable water infrastructure allows efficiency and lower costs. By investing in the water foundation, we can revolutionize the water technology and ensure the continued flow of water.

Clean Innovation: the Water Crisis Solution

Several industries, such as oil and gas, spend billions of dollars yearly in order to manage, handle and remediate produced water as effectively as possible. These huge costs, however, do not include the value of hydrocarbon reserves, which are made economically inaccessible because of related water costs. Even small improvements in the economics would substantially save costs and increase economically producible hydrocarbon reserves.

Latin America is one of the most water abundant regions in the world. With some of the world's largest rivers like the Amazon, Parana, and Magdalena, the potential for water availability in this region is tremendous. Yet, poor farming practices, deregulated industrialization and urban poverty have consistently contaminated Latin America's water resources, resulting in the destruction of water sources and causing most Latin Americans to become "water poor". And millions live without access to clean water at all when region's water abundance could provide each person with around 110,500 cubic feet of water every year (the average resident has access to only 1,010 cubic feet per year). In order to save related costs and provide enough clean water sources, innovation is needed wherever the electrical/clean water infrastructure is insufficient.

The water demand for 2020 for the Latin American countries, including Argentina, Bolivia, Brazil, Mexico, Nicaragua, and Peru, is expected to rise as the expanding middle class adopts an increasingly water-intensive lifestyle (these countries will be among the world's highest per-capita users of water). These regions are rich in water resources. Thus, clean water will become critical as the population grows

throughout Latin America. Since the bulk of the region's water use is directed into agriculture (which provides less than 5% of GDP) and the industrial demand for clean water is likely to rise faster than overall economic growth, the region will have to rely increasingly on desalinated water, which is expensive and energy-intensive, and will become more so in the future.

More Water Innovations Needed In The Latin American Region

To initiate this discussion we'll need to accept a simple working definition of *creativity* as the act of coming up with a new idea, and *innovation* as the act of reducing that new idea to useful practice or purpose. Such activity can more measurably help the health and welfare of a people (and their nation) when that useful practice or purpose is commercial in nature. In the greater Latin American region ("Region"), this is especially so if the commercial innovation concerns the production of more usable water by industry and/or drinking water by people ("clean water"), something fundamental to civilization and societies.

We're not talking about gigantic seawater distillation and/or wastewater recycle-treatment factories along with their pipeline transportation systems ("infrastructures") that take many years and hundreds of millions to billions of euros or dollars (most often requiring government financing) to bring online before able to deliver clean water. That's already been accomplished, (more so for drinking water and electricity) and more capability is being planned or already under construction, but it will take even more time and increased investment.

The cornerstone *innovations* - changing seawater into drinking water/treating waste water- in addition to the development of the electrical energy industry - have enabled the growth and modernization of the peoples of the Region and much of the urbanization of their societies.

The practical reality is that wastewater treatment, drinking water from the sea and/or electricity supply are still absent ("off-grid") in many geographical areas throughout the Region. It is possible that expansion of those infrastructures will become incrementally more uneconomical due unsustainable subsidization as they are further expanded in the future.

The core of this discussion is about what new ideas need to be innovated in the Region so that clean

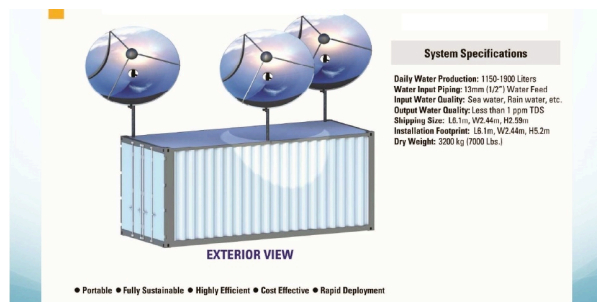
water can become more readily available wherever the electrical/clean water infrastructure is insufficient or absent. This is especially true for situations where the scale of the need for clean water wouldn't necessarily engender financing by a Regional government.

A Water Innovation Reality

A proven, patented, commercial innovation that can treat any source of unclean water (from domestic or industrial waste or from the sea) without any need for electrical power at all does exist. It is experiencing widespread adoption throughout the Americas, as well as the Pacific Rim and elsewhere.

The innovation is the fundamental principle needed in Latin America: recognizing its utility, identifying where this innovation could/should be employed, and just how to make that Regional commercialization occur.

Create the image in your mind of a box the size of a shipping container.



The dimensions for the box would be about 6.1m x 2.6m x 2.4m with a weight of around 3200kg. It would contain the entire system (equipment, conduits & controls, etc) powered by the sun, to receive unclean water from any source and convert it to clean water.

Yes, it's fully self-contained. This box is relatively easy to transport (by road, rail or sea), to put in place (pushing, pulling, rolling, by crane or on a temporarily parked truck trailer) and put into operation (e.g., erection of sun-light collectors, connection of input and output conduits, initiation of remote monitoring) at a production cost of ~ \$65,000 per box (or "unit"). Each individual unit would produce clean water (<1ppm TDS, exceeding WHO standards) at a rate of 1150-1900 liters/day depending upon the nature of the unclean water source and intended clean water use, duration of sunlight

exposure - all at competitive prices for the resultant water.

One step further: imagine multiples of these boxes connected one to another so as to handle larger volume requirements (a modular system).

With the unit or modular system image in mind, what specific situations where the application for this reduction-to-a-useful-purpose, i.e., clean water, comes to your mind (where can/should the box or modular system be used)? What about...

- In connection with remote, off-grid oil/gas exploration & production activities whether conventional or unconventional, on land or offshore
- A roof-top [drop in place] capability for treating/reusing wastewater in multistory residential/office buildings
- At off-grid villages or small municipalities with scant water infrastructure
- For remote off-grid tourist/adventure possibilities
- For off-grid isolated temporary or permanent security & control, surveillance or military installations or outposts

What comes to mind from the foregoing is but part of the needed collaborative innovation process needed for the Region.

The other necessary part for a collaborative Regional innovation to occur is imagining just how to secure and commercialize this clean water capability.

The box being commercialized in the US could be manufactured just as well in the Region using a great many commonly available materials. With a ~\$10 million investment, construction of a production facility and a thorough training program of local personnel could be achieved in less than a year. Also, this will add to the creation of more jobs and help fulfill public and social policy initiatives for the region, as well as solve the looming water scarcity problem. Some form of joint venture between the initial US innovator and a Regional innovator would appear an expedient course of action. What do you think?

A response from you, the reader will initiate a second part of such a collaborative clean water innovation.

Your ideas and inquiries about this needed clean water innovation in the Latin American Region sent by email would be welcomed and appreciated by the authors:



Jack Dyer, Founder of Synergics,
www.synergics.com
Email: jack@synergics.net



S. Hagerty Le May, Founder and Chairman of
International Alliance Associates, LLC,
www.interalli.com
Email: hagerty@interalli.com