Abstract

Millions urban inhabitants daily suffer discomforts and scarcities on their water supply; governments promote lower consumption practices and water saving devices; but to no avail, as savings are demanded by new households or industries. Jevons Paradox or Khazzoom-Brookes postulate explain why efficiency gains are overcome by increases in demand. "Water recycling showers" require just few litres for prolonged pleasure, but should not be considered "water saving devices" that reduce demands, as they could increase the compound water footprint if not proper care is taken. The paper explains why and suggests an advanced checklist for "true efficiency".

Keywords: Efficient water use, water footprint, Jevons paradox, recycling showers, tragedy of the commons, true efficiency, water education, Khazzoom-Brookes postulate.

Introduction

Will super-saver showers increase our water consumption?

Perhaps the previous question might seem wrong. Any person could criticize that if these sophisticated showers do not save, then what for we require them. Before delving into the question and answer it is prudent to clarify that there are multiple and varied technologies to save water at the shower; all very useful, some old and simple and other ultra-modern and sophisticated. Some examples of them are: those which reduce the flow, or the stopper clock, or those reusing grey water at other applications.

This article could refer to any of them and we would have the same conclusions; although to best and more dramatically emphasize the point and message of the article, it mentions the recently patented technology that some manufacturers (Swedish, Australian, USA) started to promote and will launch to market by 2015.

With them, if they really accomplish what they offer, it will be possible to take 10 minutes showers or even longer ones consuming only 5 litres of water (instead of the more than 100 litres now required for those long and pleasant baths).

Their "secret" is to recycle and purify water instantly and restock the shower, just as any ornamental fountain or fish tank. Besides saving heat energy costs (gas), as the water is heated only once and kept at pleasant temperature every recycled time.

They use heat transfers and instant purification technology as in the NASA’s spacecrafts.

Corresponding Author: Mario Buenfil Rodriguez
Mexico Institute of Water Technology
E-mail: mbuenfil@tlaloc.imta.mx

Figures - Schematics of water and heat flows at the recycling showers.
So, if they are so wonderful (and independently of presenting or not health risks or if they are expensive or cheap) by using so little water, being pretty and comfortable and saving on your water and gas bills, why such strange initial question?

The importance of the issue should be central to whoever considers himself a "water culture" promoter, not so much by the novelty the showers here referred as example, but because often in a complex and counterintuitive world, there happen unintended consequences on technological solutions and on certain campaigns to save resources. Something alike a medicine prescribed by a doctor, excellent at the beginning but carrying latter harmful side effects.

For the recycling showers case we do not require elaborate hydraulic or biochemical tests to know that they carry strong side effects (of socio-economic nature). Historical experience is forceful and clear with any "saving device" promoted in the past as: 6-liter toilets instead of those requiring 18 or 12 litres; sink automatic closing faucets; water meters to bill consumption, etc. If we ask: have they really reduced our water consumption or our adverse impacts on the environment? The answer is: Of course not!

The reason is quite simple and has been known for centuries. One of the most famous explanations is called the "Jevons Paradox" (Pérez 2013). Strangely and unfortunately such phenomenon is almost unknown among "water culture" or "environmental culture" promoters. In fact the name does not matter much for such socio-economic phenomenon; Likely it could be baptized as "Khazzoom-Brookes postulate", "rebound effect", "collateral consequences", "externalities", "counter-intuitive effects" or "water footprint".

That last term may sound familiar to "water educators", although the gist of the concept is enabling to encompass the effects and consequences of direct and indirect water uses, and evaluate them against the "sustainable load capacity" of a region or country to satisfy them. That is, a wider vision and assessment (in space and time) than the isolated home consumer using a saving device is required.

When technological efficiency is improved, presumably to reduce the demand for a scarce input, if other non-technological measures are forgotten (as legislative and educational, not merely directed to the individual user) eventually increases in demand and scarcity occur for that "input". This is the central concern of this article: that through the widespread use of the novel "recycling showers", the apparent savings may result in increased water demand in a country already burdened by scarcity and conflicts of that resource.

There is a serious contradiction and confrontation in the socio-political slogans that govern us. The narrow view of short-term politicians and the goal for more dividends (greed) of big corporations always encourage to "grow more and more" as the single and highest aspiration for a country and a planet with scarce and limited resources. On the other hand we want better social security and environmental sustainability. The reality is that you can not have both directions at the same time, and when the grow and grow dominates, any individual savings will be immediately used by other consumers. So if you save a lot of water in the shower there is risk that where previously was open field, massive new housing developments or towering apartment buildings pop-up. Those will be justified with "after all they require less water and the infrastructure still withstands". Even if that were true, our demand for clothing, food, and hundreds of inputs that require water, will continue to grow, and of course our aquifers will continue overexploited. Paradoxically local savings become increases in demand and amounting water scarcity and conflicts in other places.

It should be noted that the intention here is not speaking ill about ultra-modern recycling showers; rather, they are a good technology offer with great potential. What is advised here is that these or other devices must not be seen under the illusion that they will reduce water consumption. Do not promote them for the wrong reason: their value is comfort and individual economy, not saving water. We must expand the mind and culture.

**Recommendations:**

Environmental education must move from being a repetition of routine advertising slogans as "close the faucet"; to be a practice of social and economic critic, with a legitimate aspiration of respect to ecosystems and the quality of life of future generations.

This article ends with two famous phrases that, as the Jevons Paradox, are often repeated as curiosities but up to now there is no governmental institution that understands and addresses them. Will there be any courageous water educator who accomplishes that?

"There can be no permanent progress in the battle against hunger until the agencies that fight for increased food production and those that fight for population control unite in a common effort. Fighting alone, they may win temporary skirmishes, but united they can win a decisive and lasting victory to provide food and other amenities of a progressive civilization for the benefit of all mankind".

Norman Borlaug, (Nobel Peace Prize 1970, "Father of the Green Revolution")

"The significant problems we face cannot be solved at the same level of thinking we were at when we created them".

Albert Einstein (1879-1955).

**References**


