Technology and nature are historically interconnected

January 3 2018, by Alex Shashkevich

Stanford historian Mikael Wolfe argues that technology and nature are usually thought of as opposites, but he advocates for what is known as an envirotech approach to the historical relationship between the two – technology and the environment should be seen as interconnected.

In his recently published book, *Watering the Revolution: An Environmental and Technological History of Agrarian Reform in Mexico*, Wolfe examines Mexican land and water distribution from the 1920s to the 1960s through such an envirotech lens. He argues that the efforts to redistribute resources were unsustainable because of people's overenthusiastic belief in technology's power to fix social problems as well as their environmental side-effects.

Wolfe, an assistant professor of history, said lessons from that little-known piece of Mexican history could also apply to how people today try to solve environmental problems through technology. Stanford News Service interviewed Wolfe about his work, and about how thinking of technology and the environment as intertwined could better inform current environmental decisions.

You talk about the concept of "envirotech" in your research. What is it and why should historians and experts in other fields integrate it into their work?

The premise of envirotech, which emerged as a field of history in the

1990s, is that nature and technology not only impact one another but become so interdependent that the boundary between them dissolves. It should not be mistaken for environmentally friendly technology. Rather, it's an acknowledgment of the reality that no area in the world is untouched by human activity anymore.

I have noticed that in general many historians consider technology and nature as separate historical entities. There are historians of technology and historians of the environment. As a result, much work in the history of technology does not make any reference to the "new" environments that deployment of technology helps produce, such as reservoirs created by dams. And vice versa – many environmental historians neglect the role of technology, such as how new mining techniques in Mexico made profound changes to the environment.

I argue that those two groups need to talk to each other and embrace each other's work in order to help create a more comprehensive and thoughtful analysis of the past and present of the environment and technology.

Your research on Mexican land reform showed that people were overly optimistic about the ability of technology to fix social and environmental problems. Can you describe what happened?

What happened is in some ways a tragedy. A popular land reform that was about redistributing resources wasn't sustainable, in part because people pushing for that reform were too optimistic about technology and what it could do for them.

I focus on the historically cotton-growing Laguna region of Mexico, watered by the Nazas River that was prone to either severe flooding or

drought. The revolutionary president Lázaro Cárdenas decided to dam the river in the 1930s and promoted it as a way to provide a regular supply of water for everyone in the area. However, the dam did not fulfill those expectations, and farmers found living off the land as difficult after the land reform as before, largely because of insufficient water. This encouraged a boom in groundwater pumping in order to weather frequent droughts, and over time it contaminated and overexploited the region's aquifers.

My book shows that the government engineers' distribution of water through invasive hydraulic technology paradoxically undermined efforts to redistribute land more equally in the wake of the Mexican Revolution (1910-1920), during which hundreds of thousands of Mexicans died fighting for "land and liberty." It also reveals that engineers knew what was happening and had the authority to regulate surface water as early as Mexico's 1917 Constitution and had the power to regulate groundwater by 1945. But officials chose not to exercise that authority.

This story is thus a cautionary tale of the long-term consequences of short-sighted development policies.

How is one's understanding of that part of Mexican history improved by examining it through an envirotech lens, rather than without it?

Without approaching environmental and technological processes as overlapping and intertwined, it is very hard to understand the complexities surrounding support for or opposition to dam-building and other large ecologically invasive infrastructure projects in Mexico and globally.

Although many landowners opposed building the Nazas Dam, the

environmental reason for it – the fear that it would diminish the natural fertilizing ability of the free-flowing river – was only one component of their opposition. Just as worrying for them was the prospect of the dam facilitating a radical land reform that would expropriate their properties and take away their water rights to redistribute to landless peasants. At the same time, they were enthusiastic about groundwater pumping, which they could afford and control individually, although it was just as ecologically invasive as the dam.

Envirotech allows us to examine the relationship between environmental and technological issues along a continuum rather than as a strict binary of nature versus technology.

Does your research in Mexico relate to any decisions being made here in California?

A local issue reminiscent of the story of the Nazas Dam in Mexico is the aging Searsville Dam, which impounds Corte Madera Creek and is located in the Stanford foothills within the Jasper Ridge Biological Preserve. Built in 1892, the dam reservoir was supposed to supply water to Stanford as well as prevent flooding for people settling downstream, but the accumulation of sediment has reduced its capacity significantly over the past century. The debate over what to do about the dam and the new ecosystem it created upstream and downstream has been going on for years.

In this case, Stanford is dealing with the dilemma of envirotech. The dam is now embedded within the local environment. The artificial lake it created hosts several rare animal species, and downstream communities depend on it for flood control. It's very hard to draw a line between nature and technology in this case, as if you could just extricate the latter from the former.

Decisions about how to handle Searsville Dam could potentially forever change our local "envirotechnical" landscapes and thus need to be approached very carefully.

Provided by Stanford University