The future of pesticide regulation


It is often said that timing is everything. Our Children's Toxic Legacy was meant to contribute to the long-simmering debate surrounding food safety. It offers recommendations on how the pesticide regulatory system could be reformed, in light of the author's belief that the current system does not ensure adequate protection for our youngest, and potentially most vulnerable, citizens—infants and children.

The latest round of discussion had been going for more than a decade, with various pieces of legislation being put up for consideration for at least five years. Suddenly, in just a few weeks during the summer of 1996, the various factions came together and crafted a bill—the Food Quality Protection Act of 1996 (FQPA)—that was passed unanimously by Congress and signed by the president on 3 August 1996. Because this book was published after FQPA was passed, author John Wargo's message could get lost. It shouldn't. Wargo offers guidelines that would provide a new—and, presumably, more health-protective—"architecture for pesticide risk assessment and management" (p. 270). Although they came too late to influence this new legislation, these guidelines can be used to assess whether FQPA and its implementation are responsive to concerns that the regulatory apparatus in place before FQPA was passed failed to protect human health.

The guidelines fall into three areas: understanding the risks and benefits of pesticide use (the science), informing consumers of these risks and benefits (the right-to-know), and managing the risks. Wargo argues that the kinds and quality of information that have been available for risk assessment, benefits analysis, and decision making, and the practices by which this information is used, do not promote health-protective policies.

Although FQPA does not explicitly enhance the US Environmental Protection Agency's (EPA) data-gathering authority (except for endocrine disruptors), the legislation does mandate new ways to use risk-related data. Prior to FQPA, when asked to approve a new use of a single pesticide on a single food crop, EPA would assess the potential risk from that new use alone as well as the potential risk from that new use combined with the risks from any existing food uses. Now, FQPA mandates that before approving a pesticide for a new food use or allowing an existing use to continue, EPA must consider not only other food uses but also all other exposures to that pesticide (e.g., from lawns, pet products, and drinking water) as well as to any other chemicals (not just pesticides) with which it shares common toxicities (the concept of cumulative effects). In addition, EPA must make a specific finding of safety for infants and children. It should be noted that many of the recommendations of the National Research Council (NRC) Committee on Pesticides in the Diets of Infants and Children, on which Wargo served, have been incorporated into the new legislation (NRC 1993).
These new mandates will necessarily prompt the generation of new and better data by pesticide manufacturers and formulators, which will want to obtain data to argue for retention of existing uses of pesticides or the development of new ones, and by government and other research scientists, who will need data to study such questions as age-related differences in pesticide sensitivity. The answers to such questions will aid the development of exposure models that illustrate the distribution of risks for a population.

With respect to the consumer’s right-to-know, FQPA requires EPA publish and distribute, via large grocery store chains, a brochure that provides a general description of the risks and benefits of pesticide use in agriculture as well as the importance of eating a varied and nutritionally sound diet. Even before FQPA, EPA initiated procedures to improve its communication mechanisms—both paper and electronic—to make more information about the pesticides it regulates available to the public.

FQPA has significantly changed the management of risk from exposure to potential carcinogens in food. Before FQPA, pesticides in food were regulated under two sections of the Federal Food Drug and Cosmetic Act. One section of this Act (409) prohibited the approval of any food additive that shows the potential to induce cancer in humans or animals (the Delaney clause). It still does. In those cases in which a pesticide residue occurred in a processed food at levels higher than in the raw food, it was regulated under section 409. If that pesticide had been shown to induce cancer in humans or animals, then the use on both the raw food and the processed food could not be approved. The other section of the Act (408) allowed the use of a carcinogenic pesticide on raw foods, but only if no residues occurred in processed foods at levels higher than in the raw food.

FQPA has consolidated the regulation of pesticides on food into section 408—the section that did not contain the Delaney clause—and established a single uniform health-based standard of “reasonable certainty of no harm.” This change is consistent with Wargo’s recommendations; it also is responsive to the opinions and recommendations of the first of two NRC panels on which Wargo served (NRC 1987).

FQPA also requires that, during the next ten years, EPA reevaluate every approved food use “on the books” (approximately 9000). In doing so, EPA is to “do the worst first,” meaning that the most hazardous or risky pesticides should be reevaluated first. So it is that the organophosphate and carbamate insecticides and those pesticides that are considered to be probable human carcinogens will be looked at first—that is, during the next two years. This strategy is consistent with Wargo’s recommendation to “allocate regulatory attention to reducing the greatest risks in the shortest possible time” (p. 287).

Overall, most of Wargo’s guidelines for the new “architecture” of pesticide regulation are being or will be implemented, either as a consequence of the new legislation or as the result of self-initiated reforms in EPA’s pesticide program. How well the reforms are being implemented will take some time to become apparent, although it is certain that many interested stakeholders will continue to scrutinize EPA’s efforts to carry out its mandates. Will full implementation of FQPA, along with EPA’s other reforms, really assuage Wargo’s concerns about pesticide risks, particularly to infants and children? Only time will tell.

Wargo begins his book by describing the history of pesticide use; since the middle of this century, pesticides have been used to control the carriers of serious diseases, such as malaria. During the last 50 or so years, pesticide use in the growing of food has burgeoned as agriculture has become addicted to the use of chemical pesticides, or so some would say. But it is becoming more clear, as Wargo points out, that with this exponential rise in pesticide production and use has come, perhaps inevitably, increased pest resistance, which in turn has prompted still more pesticide use. Wargo damns the regulatory system that has grown up and around these steep increases in pesticide use. For example, he explains that the US Department of Agriculture (USDA) had the original responsibility for registering pesticides, but because it was also responsible for promoting agriculture, it did little to assure the protection of human health or the environment. When EPA was created in 1970, the registration responsibility moved there from USDA and the food tolerance-setting responsibility moved there from the Food and Drug Administration. However, people moved, too, so much of the tradition and philosophy of the preexisting regulatory process was transferred as well. More than 25 years later, some of that philosophy still remains and could make effective reform of the pesticide regulatory system more difficult to achieve.

Wargo, a faculty member of the School of Forestry and Environmental Studies at Yale University, laments that the existing science does not allow us to fully understand the risks or benefits of pesticide use; he then documents why he believes that this is so. His experience as a member of the two NRC committees provided him with the opportunity to see firsthand the kinds of information that the regulators can require of the regulated, as well as the state of the science in general.

But even if we knew all that we needed to know with respect to the science of pesticide use—both its risks and benefits—would that be enough? The issue of using the information wisely to make sound regulatory decisions remains a difficult challenge, given the unabating pressures from many stakeholders, each of whom possesses an agenda that may be at odds with others. One gets the sense from the author that the system may not be up to that challenge—certainly not in its pre-FQPA state, or perhaps, in any case.

This book is not for the casual reader. Rather, it is for the scientist, the economist, those interested in environmental issues, and public policy aficionados. Wargo charts a difficult course in describing, in detail, the birth and maturation of the pesticide regulatory system as it exists in the United States. He clearly expended substantial effort in researching the topic as well as capitalizing on the efforts of the two NRC committees of which he was a
member. In five or ten years, we should be able to better manage the risks and benefits of pesticides, but will we have found ways to manage pests with less reliance on the more toxic conventional chemical pesticides? Maybe greater focus and increased resources need to be directed toward exploring alternative agricultural practices and integrated pest management techniques that require little or no use of pesticides that do not meet EPA's reduced risk criteria.

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WHERE HAVE ALL THE RIVERS GONE?


In 1971, I lived in Southeast Asia, studying the ecology of the massive Mekong River ecosystem. The river meandered 2600 miles from its headwaters in the Himalaya Mountains to its confluence with the South China Sea without a single dam or bridge across it. The local villagers lived along its banks in harmony with the dynamic monsoon rains that changed the river's character during each wet and dry season. However, even 26 years ago, it was clear that a dramatic increase in the construction of large dams was altering the natural flow of major river systems around the world. Many new river impoundment projects were either planned or under construction throughout the world, and Southeast Asia was no exception.

The proponents of large-scale dam construction are primarily engineers and economists who are convinced that river development projects provide the best approach to local economic development and improved standards of living for the indigenous people of the region. In A History of Dams, Norman Smith (1971) sums up the general viewpoint of most proponents of dam projects (p. xiii):

Not only do dams represent some of the most impressive achievements of engineers over the centuries, but their vital role in supplying water to towns and cities, irrigating dry lands, providing a source of power and controlling floods is more than sufficient to rank dam-building among the most essential aspects of man's attempt to harness, control, and improve his environment.

Silenced Rivers offers a strikingly different perspective on the environmental, social, and economic impacts of large-scale dam projects. Patrick McCully urges us to embrace a different environmental ethic, one that is devoid of the language and concepts of "controlling and enslaving wild, unruly, and wasted rivers" (p. 312). He guides the reader through the evolution of the mindset that equates the building of large dams with other products of the dominant ideology of the technological age—products like nuclear bombs and automobiles. McCully tackles the complex array of technical and sociological factors that produce the impacts of large-scale dam operation by meticulously detailing and carefully documenting the history of ancient and modern dam-building experiences.

The detailed history and vivid descriptions of the numerous large-scale dam projects chronicled in Silenced Rivers make it an extraordinary book. The author provides the reader with a litany of dam projects around the globe—Aswan, Brenda, Entrepenas, Pak Mun, and Sanmenxia, to name a few—and carefully describes the long list of empty promises associated with their construction and operation. Silenced Rivers tells the story of lost fisheries, lowered water quality and diminished water supply, increased waterborne disease transmission, and the severe economic shortcomings of large-scale dam projects. Most important, it tells the story of how these cumulative impacts affect the indigenous people living in project areas.

McCully describes the connection between the essential biodiversity of a watershed area and the indigenous people living there. He focuses on the potential for severe, and often irreversible, damage to these essential resources and the suffering of the indigenous and tribal people who depend on them. The statistics are staggering: an estimated 10.2 million people were displaced by reservoirs in China alone between 1950 and 1989, and in the Philippines, almost all of the large dam projects built or proposed are in areas inhabited by the nation's 4.7 million indigenous people. Silenced Rivers clearly illustrates the parallel between the destructive effects of dam projects in developing nations and the history of the impacts of dam building on Native Americans. The issue of resettlement on reservations to facilitate dam construction is particularly troublesome and strongly suggests that we are incapable of learning from the tragic mistakes of our own recent history.

Silenced Rivers is a timely book that addresses a major category of global environmental change. It should be read by engineers, planners, policymakers, and natural and social scientists interested in sustaining global environmental and economic systems. The number of dams worldwide has jumped from approximately 5000 in 1950 to 40,000 today. Many more dams are either under construction or planned for the near future, including in tropical regions of Africa, Asia, and Latin America that support rich and unique reserves of biodiversity. Although tropical terrestrial and aquatic ecosystems represent only 26% of Earth's land surface, they generate a remarkable 60% of the world's essential