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Science and social advocacy: A dilemma for policy analysts

by Katherine Reichelderfer Smith

Beginning in 1990, a controversy that spanned nearly two years, actively involved more than a dozen prominent agricultural economists, and was reported, in part, in five different issues of *CHOICES* magazine, revolved around the accuracy, adequacy, and appropriateness of efforts to assess the economic consequences of widescale pesticide use restrictions. A study entitled "The Economic Impacts of Reduced Chemical Use," coordinated by the consulting firm of Knutson and Associates, received particular scrutiny. That unusually ambitious study used scientists' subjective estimates of the yield and cost impacts of total, national bans on inorganic nitrogen fertilizers and/or all agricultural pesticides on major field crops as inputs to a highly credible econometric simulation model of the U.S. agricultural sector to assess the implications of assumed chemical restrictions. The study was criticized for making unrealistic assumptions about pesticide regulatory possibilities, for employing technical coefficients that led to an overestimation of economic impacts, and for inviting questions about conflict of interest, among other things. It was best defended on the basis of the technical merit of the model employed and the

integrity of its principal investigators.

This issue of *CHOICES* contains a summary of a new study by Knutson and Associates of the impacts of pesticide use restrictions on selected fruit and vegetable crops. Like the earlier study, major funding came from the American Farm Bureau, and, by admission of its authors, the newer study uses "similar methodology to evaluate the impact of pesticide use reduction." Its findings allude to correspondingly adverse economic implications for U.S. food consumers, but of an even greater magnitude than found in the earlier study focusing on commodity program crops.

Nearly all of the challenges posed to the 1990 Knutson et al. study could be reiterated, on precisely the same bases and just as persuasively, with regard to the 1993 Knutson et al. study. The question around which the newest study is framed appears exaggerated, if not downright unrealistic. There is, for example, little or no basis in reality for believing, as assumed by Knutson et al., that biological pesticides, like *Bacillus thuringiensis*, which are used extensively on fruit and vegetable crops, will be subject to regulatory or policy-induced removal from the marketplace. The study's choice of

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unlikely policy scenarios may, as before, generate unwarranted hysteria about the issue of pesticide regulation. Technical coefficients may again be challenged (as in the case of the 100-percent apple yield loss employed by the study under a “no pesticides” scenario when, in reality, organic apple markets flourish in the states evaluated for apple production impacts). And the homogeneity of perspectives suggested by the composition of the study’s steering committee and sponsors will quite predictably raise questions from those who disagree with the study’s findings about why a more broadly representative group was not sought to provide guidance and support.

A detailed critique of the strengths and weaknesses of the study is certainly possible. But for what purpose? A rehashing of old issues in this forum is not likely to change the mind of anyone who is now convinced of the accuracy or inaccuracy of the Knutson and Associates pesticide restriction impact studies. Nor would it directly address what I believe is a root cause of the strong reaction elicited by the studies—a perceived contamination of science by advocacy.

Here I review the dilemma faced by policy analysts who wish to be both socially relevant and scientifically credible and suggest some common solutions to it, drawing in part upon the pesticide restriction issue for examples.

Professionalism and advocacy as odd bedfellows

The implicit code of conduct in contemporary agricultural sciences suggests that one must choose between professionalism and advocacy and cannot occupy both roles at once. The perceived worth of “science” is connected almost inextricably to the objectivity

or, at the very least, the value-neutrality of the scientist. Thus, one who proclaims a value-laden position going into a study has diminished credibility in the current scientific culture. The notion behind this is a recognition that the analyst cannot, in fact, be absolutely value-free, and must, instead, make a conscious effort to fight against natural, biased tendencies in order to prevent inherent values from being primary determinants of how a study is framed, the study’s assumptions, choice of methods and data, or the interpretation of approximate findings.

The nobility of this internal battle has become a standard borne by well-respected agricultural scientists. It has had a substantial effect on the “science” of policy analysis.

The evolution of science as separate from soul

The roots of social science go back to the social reform movement of the late 1800s, when science was seen as an instrument for positive social change. But, by World War I, social scientists, under whose tutelage policy analysis evolved, had taken on the mantle of the natural sciences in eschewing any linkage between rigorous analysis and social activism. Since that time, overt partisanship has also been seen as incompatible with scientifically acceptable policy analysis. A number of agricultural policy analysts can attest to the sting of professional ostracism following the announcement or presumption of their partisan position in a policy matter.

This evolved professional standard has led to several phenomena. One is that models, rigorous adherence to widely accepted theories, and professionally devised concepts like “efficiency” have become major defenses against claims of unscientific conduct in policy analytic circles. This can be

problematic for several reasons. First, models are no more or less objective than the analysts who devise and use them, since a substantial amount of subjective judgment is required to construct them, decide how to utilize them, and interpret their results. Likewise, the particular scientific theory or concept that one chooses to frame or to support an “objective” piece of analysis is itself a normative decision. Dan Bromley has most articulately denounced the use of economic efficiency as an allegedly objective measure, pointing out that the analyst has a range of measures from which to gauge social welfare, and the choice of economic efficiency, as made by Knutson et al. in adherence to disciplinary tradition, restricts analysis to but one, narrow and potentially misleading set of outcomes. To be specific, arguing the merits of pesticide restriction solely on the basis of aggregate economic returns to food producers and consumers implicitly suggests that other outcomes such as environmental and health benefits and costs, income distribution or social justice are inconsequential.

Another problem with relying solely on models and theories to remain objective and avoid the stickier, presumably more subjective issues of private interests and politics, is that it can make analysis irrelevant to real world decision makers. While it is true that many policy decision makers need help from experts in sorting out increasingly complex and technical problems, this help is most useful when the technicalities are transparent and are clearly manipulated in the context of the decision maker’s often partisan world. “Black box” technical analyses summarized in the cloak of scientific jargon may be highly acceptable professionally, but are frustrating both to policy decision makers and to analysts who

believe that those policy decision makers should heed the advice that comes out of the black boxes.

Herein lies a second problematic consequence of the evolutionary route of scientific policy analysis. If those with the expertise to assess policy consequences do not, because of professional sanctions, get involved in the normative aspects of social welfare and political realities, others less qualified than they will far more effectively influence actions by decision makers. At least one set of observers (Heineman et al.) suggests that the strength of special interest groups in today's political system is to be blamed in part on policy analysts who, in striving to be scientifically objective, are "left tiptoeing along the edges of moral claims of reform and the practicalities of politics, refusing to recognize the importance of either," and creating a gap that is filled, instead, by lobbyists. Like Knutson et al., too many policy analysts decline to state explicitly what they believe "ought to be" with regard to an issue, yet veil in the trappings of science an implicitly normative message that practical policy decision makers can find hard to follow.

Between a rock and a hard place?

The evolved dichotomy of science and social advocacy poses a difficult problem for the contemporary policy analyst. Just how far can one go in recognizing and incorporating aspects of social interests and partisanship without compromising scientific integrity, or in rigorously adhering to scientific theory without losing social relevancy? The purely objective, value-neutral technician who does not account for social and political forces in framing, conducting and interpreting analyses may get high marks in professionalism but will likely have low political effec-

tiveness. On the other end of the spectrum is the strict advocate who ignores scientific convention, uses a partial set of facts selectively to support a position, and provides no information base over which others can lay their own values and perspectives. This advocating analyst can make quite a political impact, even while reaping professional scorn. Fortunately, several intermediate alternatives offer greater opportunity to be both relevant and scientifically acceptable.

The politically sensitive sensitivity analyst

The analyst who compares and contrasts a broad spectrum of politically interesting scenarios in analyzing a charged issue by standard technical methods, can earn more respect in both the political and scientific arenas than one who limits analysis and results to one or few subjectively chosen scenarios. The analytical approach known as sensitivity analysis examines and emphasizes the degree to which social outcomes (such as economic returns, environmental risk, or measures of human health) are sensitive to changes in data and policy assumptions. Such analysis can provide a tremendous amount of useful information to policy makers while simultaneously protecting the analyst against claims of bias in the selection of data and assumptions. Furthermore, if the analyst selects technical and policy factors to represent the values and beliefs of different special interests, the audience for which the analysis has meaning can be broadly expanded.

Using the case of fruit and vegetable pesticide regulatory analysis as the example, the politically sensitive sensitivity analyst might have initiated a study by polling a wide range of agricultural, environmental, consumer, and bureaucratic interest groups to discover

which regulatory scenarios each group wishes to promote and which each hopes to prevent. Poll results provide the politically relevant set of scenarios. Assessing the extent to which measures of social welfare vary across all these scenarios provides a consistent set of information for use in political strategizing or arriving at policy decisions with full awareness of how the interests of all politically relevant groups would be affected. Extra measures of scientific credibility and political utility could be added by testing how social outcomes vary with changes in technical estimates of fruit and vegetable production response to pesticide levels. For instance, if in the Knutson et al. study, outcomes had been assessed under the possibilities that horticulturalists' predictions of yield impacts were 25 percent too high (due to the possible oversight of induced innovation effects on yield sustaining technology), or were 25-percent too low (perhaps because of unanticipated, adverse pest population interactions), as well as under the single set of yield loss point estimates actually developed, neither the small group of horticulturalists nor the policy analysts themselves would have to take responsibility for failing to recognize the yield loss expectations of other groups. In effect, the sensitivity of social welfare measures to degrees of pesticide regulatory rigor ranging from NRDC's through the Farm Bureau's preferences, to expectations of technological optimists through pessimists, and to all relevant combinations of regulatory and technological futures could have been generated.

The comprehensive analyst

The comprehensive analyst not only considers the fullest possible range of relevant perspectives, assumptions, and

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technical scenarios, but also provides a full set of policy outcome measures. With regard to fruit and vegetable pesticide restriction policies, for example, expected policy outcomes might include changes in water quality, wildlife populations, farm worker health, liability insurance rates, and fruit and vegetable consumers' health as well as economic impacts on fruit and vegetable production and trade sectors. Stating merely that "negative impacts on fruit and vegetable consumption need to be weighed against the risk of pesticide-caused disease," is less satisfying to either a scientific peer or a policy decision maker than is an attempt to systematically examine the full set of costs and benefits. No analyst should be faulted for failing to provide rigorous, consistent and comparable value estimates for all benefits and costs. That can be an impossibly tall order. However, scientific palatability and political utility are enhanced by transparent efforts to catalog and capture some dimension, if no more than the mere direction of effect, of various and diverse impacts of alternative policies.

The well conditioned conditional analyst

The politically sensitive sensitivity and comprehensive analysts meet the dual demands of scientific acceptability and sociopolitical relevance by, in effect, being all things to all people. Yet it is possible for an analyst to take a more partisan position, serving the needs of a single political audience rather than the entire set of policy actors and still maintain conventional professional respect. This can be achieved by establishing a set of "straw man" policy outcomes and focusing analysis on the conditions necessary to achieve that set of stated outcomes. Because the analysis concerns estimated conditions to

meet a policy goal rather than point estimates of impacts of a policy action, the analyst can incorporate value judgments in an obvious way without sacrificing scientific credibility. For example with regard to pesticide policy, this could mean using sector models to derive the technical coefficients (yield, cost, etc.) that would be necessary to achieve a goal of pesticide use reduction without a decrease in product quantity or quality, and then evaluating the probability that these technical conditions can be met. The known relationships between unit cost of production and consumer prices (science) could be used to show that any substitute for pesticides would have to be a particular percent as efficacious and/or no more than a specific percent more costly than the restricted materials in order to keep fruit and vegetable prices within five percent of current prices. Values could then be incorporated, separately from the science, by making judgements about the likelihood that substitutes of that required nature are available or can be developed. What this does is focus discussion where it belongs—on expectations about technology and innovation.

Conclusions

Clearly, satisfying a political audience, either as an advocate or an apolitical advisor, while meeting scientific standards as they have evolved to incorporate taboos against subjectivity, is a delicate balancing act. And it is much more demanding of the analyst than is a purely scientific or a purely political approach.

If past and expected future controversy surrounding Knutson and Associates' pesticide regulatory analyses is any indication, these analysts have not been successful in satisfying both audiences. It is not because their meth-

ods are unscientific. True, critics can argue with the limited range and questionable nature of the policy scenarios and production alternatives considered in either analysis, but assumptions were never hidden and analytical approaches are standard. Knutson et al. may also have had a modicum of political impact. The newer study's sponsors must have felt it had political potential as they hosted a Congressional briefing on the findings and featured them prominently on page one of the *Farm Bureau News*.

If Knutson et al. sinned at all, it was in selecting analytical variables that obviously supported a single perspective on the pesticide policy issue, and then using "science" as a defense against their having represented any advocacy position. This is far less a breach of ethics than a simple confusion of audiences. Simultaneously addressing the needs of an advocacy group and the scientific community is possible, but it takes a lot more work than this study represents.

■ For more information

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