

Scales of Engagement, Challenges, and Opportunities in Linking Public Policy and Research

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At times, as we attempt to address and respond to the public relative to the challenges and opportunities linked to policy implications for university research, we lose sight of the importance of understanding scales of engagement in developing effective strategic research priorities. Global and national level policies and agendas at times drive priority research thrusts, yet state and local policy decision-makers and incentives, as well as the public at large, can strongly influence university research agendas and strategies and must not be minimized. Often, strategies that are sensitive to maximizing research potentials between global, national, state, and local policies and attitudes have the greatest potential to advance university research success and create sustainable development opportunities. This paper provides a brief overview of some of the science challenges we face and the context for adjusting to public policy implications at multiple scales, with particular examples framed within the context of Kansas State University.

The Global and National Scale

As Alan Leshner has pointed out (2003), science is an integral part of everyone's lives: "virtually every major issue facing our global society today has science and technology components at its core: terrorism and other forms of violence, economic productivity, health status, global warming, and the need for sustainable development." The international and national levels of policy response to these core issues have created research challenges and opportunities as scientists attempt to address these substantial research questions.

In part, the resulting challenges and opportunities for the research university

relate to public perception and attitudes toward a particular science issue, and in part we are influenced—both good and bad—by international or national policies that incentivize or restrict research agendas. At various times, efforts by scientists to "enlighten" the public have only further divided the public on certain sensitive issues. Mad cow disease, genetically modified plants, human and reproductive rights, such as stem cell research and cloning, and creation theory linked to evolution and intelligent design, are just a few examples of issues challenging scientific research results relative to public views.

International and federal policies in response to long-term global change create other challenges for the research university. Global warming, for example, is gaining considerable debate, and international policies have evolved to address problems identified through scientific research. Yet despite the Kyoto Agreement and pressures by international partners, such as the G8, the United States government has not taken a conclusive position on global warming, and even some scientists who have researched the global warming phenomenon are now under scrutiny regarding the validity of those findings (Monastersky, 2005).

Post 9/11 federal policies related to immigration, debates related to renewal of the Higher Education Act, and strategic priorities related to major federal agencies have also had and will continue to have ongoing impact on university graduate programs and research. Real and perceived policies related to international graduate student access to American universities, for example, have had an impact on many major U.S. universities, and at least in the short-term have reduced what has often been perceived as a positive complementary infusion of a significant scientifically skilled graduate student international population.

The reauthorization of the Higher Education Policy Act could further increase federal performance expectations of universities receiving federal funding. Federal agency funding priorities are also changing as new strategic security research thrusts gain higher levels of congressional support.

National Policy Debates, State and Local Level Adjustments, and Kansas State University

As previously mentioned, the use of somatic cell nuclear transplantation versus other forms of stem cells (including matrix cells from the umbilical cord) draws considerable debate at the national as well as state levels, and has strong implications for scientific inquiry. At the federal level, only limited forms of stem cell research have access to federal research funds, and Kansas and other states have threatened to further regulate stem cell research and any link to cloning.

A team of scientists at Kansas State University (M. Weiss, D. Troyer and D. Davis), in partnership with a University of Kansas researcher (K. Mitchell), has done extensive research on umbilical cord matrix stem cells that are readily available and much less controversial than stem cells linked to somatic cell nuclear transplantation. These umbilical cord matrix cells exhibit characteristics of stem cells that have the capacity to self-renew and differentiate into multiple cell types. Efforts are underway at Kansas State University to establish a center for such stem cell research; the center's science advisory board will include representatives from The University of Kansas and KU Medical Center.

Genetically modified crops have also created some debate at various policy levels because of perceptions that such modifications are unwholesome and might contaminate existing crops. Such work has been done in part at K-State to improve plant resistance to either herbicides or insects. K-State's H. Trick's research and patent, for example, has

transgenically modified soybeans to create greater resistance to soybean cyst nematode. A significant portion of most planted varieties of soybeans have been transgenically modified and play an important role in this crop's long-term economic success in the United States.

Concerns about Mad Cow disease (BSE—bovine spongiform encephalopathy) have gained considerable attention—from state to national to international levels—and have fostered evolving policies linked to concerns about this disease. K-State agricultural economics researchers B. Coffey, J. Mintert, S. Fox, T. Schroeder, and L. Valentin have recently estimated (2005) that even as strong as the domestic beef industry is at present, Mad Cow issues and concerns in 2004 cost the U.S. between \$3.2 and \$4.7 billion. KSU is currently a USDA approved test site for BSE, although, to date, no animal has been tested.

Kansas Senate Bill 345, Performance Agreements, and Kansas State University Research

Coupled with passage of Kansas Senate Bill 345 in 1999 and some restructuring of Kansas Higher Education was a movement toward block grants for Kansas regents universities, tuition retention, evolving performance agreements from the Kansas Board of Regents, and incentives for looking anew at revenue sources and creative approaches to sustain and, where possible, enhance university success. At Kansas State University, state level funding as a proportion of our total appropriation has dropped from over

40% approximately ten years ago to approximately 27% in the most recently completed fiscal year. In response to this trend and Senate Bill 345 (in which K-State identified as one of its performance goals increased levels of research funding and alumni support) Kansas State University has been working aggressively to identify alternative financial resource areas that will allow the university to make continued progress on numerous fronts. One progress area includes creative ways to advance K-State's position as a premier land grant institution while enhancing our success in competitive extramural funding.

Two years ago K-State created the "Targeted Excellence" program that includes a \$2 million per year investment for five years in selected areas that will advance K-State's stature and respond to overall national and global concerns. The Targeted Excellence program has a strong focus on interdisciplinary, integrative collaborations geared to exploiting and developing institutional strengths, with overarching national and global concerns for security and resource sustainability as factors of influence, collaborations, and emphases. Projects funded are focusing on themes that maximize outcomes potential through sensitivities to policies at multiple levels. Targeted Excellence projects selected at K-State were results of peer review by both on-campus and national-level panelists. Top awards have received up to \$2 million total over five years.

An example of one project funded is in the area of food safety and security (C. Kastner as P.I.). This project grew out of activities of the KSU Food Science

Institute and the university's longstanding commitment and leadership to food safety. This project will also help strengthen K-State's position as a leader in bio-food security as the university completes its new \$50 million BL3 agricultural building that will provide a forward-looking site for cutting-edge bio-food security related research.

Another Targeted Excellence funded project is focused on a more integrated approach to managing water resources, a critical resource issue not only in Kansas, but nationally and globally (D. Steward and S. Welch are P.I.'s). The research provides an integrated scientific support approach within the natural human system for water-use decisions at all scales; it involves faculty from engineering, the sciences, and social sciences across the university community.

We are also exploring ways to extend our Targeted Excellence and related research initiatives through such approaches as: (1) enhanced community--state partnerships, (2) enhanced links to the National Institute for Strategic Technology Acquisition and Commercialization (NISTAC), and (3) capitalizing on opportunities presented through the Kansas Bioscience Authority and related partnering with The University of Kansas and K.U. Medical Center. NISTAC, for example, which is a partnership between the state, local government, and Kansas State University, provides opportunities to extend our research discovery to commercialization ventures that enhance state and local economic development while the Kansas Bioscience Authority

that came out of the 2004 legislative session provides K-State a unique opportunity to extend our expertise in the biosciences to new levels of success and state economic gain through special state investments. These are but a few ways in which we need to be more entrepreneurial as we respond to public policy at the federal, state, and local levels as we reinvent ourselves in new and positive ways.

Conclusion

Clearly this is a period of significant transition as universities respond to changing public policy at various scales of influence that extend from local to state to national levels and beyond. Our future success will, in part, be determined by how well we engage the public at all scales of operation as well as how effectively we create new approaches to enhance revenue streams to our university research enterprise within new public policy environments.

In the public policy arena we need to:

1. use concerned citizen groups to more effectively engage local communities and the public at large relative to the value of science;
2. ensure that there are more trained "science" journalists who can help communicate the scientific basis and opportunities associated with scientific discovery;
3. have a more coordinated effort at all levels (national, state and within universities) to popularize science;
4. better articulate the impact of science (both historically and now) on the quality of our lives, and

5. better understand the impact of scale and relationships better in different modes of operation – from local (including within universities) to state to national.

Simultaneously, we need to explore creative alternative revenue sources through new partnerships and ideas that allow research universities to continue to thrive as beacons of research discovery and engines for economic development. The time for such effort is now.

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