Quantitative and Qualitative Review of NIFA Capacity Funding

Prepared by:
TEConomy Partners, LLC.
Authors: Simon Tripp, Martin Grueber, Dylan Yetter
Joseph Simkins & Alyssa Yetter

Prepared for:
National Institute of Food and Agriculture

Published:
March 2017
Evaluation of NIFA Capacity Programs: Study Highlights

The U.S. agriculture, forestry, fisheries, and natural resource industries, together with the social and economic structures that sustain them, are critically important to national well-being and economic performance. Operating in all U.S. states and territories, and most individual counties, this agriculture value-chain constitutes a nationwide economic system that supplies products to all Americans and provides the fundamental economic driver for rural and small town America. Increasing productivity and output by more than 2.5 times since the 1940’s, while utilizing less total acres, U.S. agriculture is the envy of the world and a true American success story. This track-record of success has not, however, occurred by chance. Rather, it has resulted from the intense and deliberate application of scientific R&D and technological development – with the involvement of the federal government and state and local (county) governments.

The federal government, through the USDA, both performs research and funds research through the National Institute of Food and Agriculture (NIFA) undertaken by other institutions, primarily academic institutions, across the United States. A key component of this federal funding has been Capacity Funding specifically dedicated to supporting research and Cooperative Extension programs at America’s land-grant universities. With roots in legislation passed in 1862, NIFA has asked the question of “whether Capacity Funding remains a productive model for supporting academic institution-based research and extension in the 21st century?” TEConomy Partners, LLC was retained by NIFA to conduct a formal evaluation to assess current and future “fitness to purpose” of the Capacity Funding model.

The evaluation included detailed quantitative analysis of research productivity and other factors relevant to evaluating Capacity Funding. The core finding is that Capacity Funding carries substantial and significant ongoing advantages as an R&D and extension funding model. It not only continues to be a highly relevant model for NIFA funding, but also may be considered a model for consideration by other federal R&D funding agencies.

A key advantage of Capacity Funding is the financial leverage it receives through matching state funds, and additional local level (typically county level) funding. TEConomy finds Capacity Funding to generate an additional $1.86 in non-federal funding for every $1 in federal funds received. This leverage finding alone is compelling, but so too are multiple other advantages identified for the Capacity Funding model:

- Providing a relatively predictable base of funds, Capacity Funding allows universities to sustain the specialized personnel and scientific facilities and instruments, research station infrastructure and extension operations needed for complex agricultural and associated research programs.
- Capacity Funding is particularly well suited to supporting the practical, applied research needs of agriculture, forestry, associated industries, and the communities and populations that sustain them. Capacity Funding allows research and extension activity to be directed towards the spatially specific needs of individual states, regions, communities, and populations. The ability to focus on applied research has direct relevance to producers and specialized local or niche crop needs that would be unlikely to receive national-scale attention.
- Across all areas of research examined by TEConomy (except forestry), Capacity funded research generates significantly higher volumes of publications per million dollars of federal funding compared with Competitive Funding.
- Capacity Funding provides the flexibility to fund rapid research and extension work in response to emergencies or emerging issues.
• Capacity Funding can fund the sustained, long-term work required to improve crops and livestock and advance them forward to commercial use.
• Funds can be allocated to support the research programs of junior-faculty, and thereby boost the career and research productivity of early-career faculty and researchers.
• Capacity Funds provide the ability to improve the infrastructure and capabilities of land-grant institutions in smaller states, and help non-R1 land-grant universities, such as the 1890 and 1994 institutions, engage in research and successfully compete for Competitive grants.

A goal of federal funding for research is not only to expand the universe of knowledge (via academic publishing) but also to ensure knowledge is deployed in furtherance of positive outcomes for the U.S. economy and society. By supporting an integrated land-grant system of research and Cooperative Extension, Capacity Funding helps assure that important research discoveries, innovations, and technologies are brought to the attention of those needing to implement them whether they be in production sectors or among communities, families, or individuals.

Work supported by Capacity Funding is found to be responsive not only to needs identified at the local and regional level, but also responsive to the 2014 Farm Bill Priorities for NIFA. TEConomy’s cluster analysis of NIFA project data shows that the overwhelming majority of Capacity funded projects (almost 9 out of 10) are in 2014 Farm Bill priority areas. In addition, it is found that the impact of land-grant innovation on patenting in agriculture and associated technologies is also important, influencing up to one in every six agriscience patents (as identified through analysis of patent citations). This patenting is particularly focused around cutting-edge applications of biotechnology and associated life sciences and physical sciences.

The universe of research inquiry supported by NIFA Capacity Funding is extremely diverse, but approximately two-thirds of Capacity funded projects (65.4 percent) demonstrate focus in “production” oriented areas of R&D, including agronomy, animal science and livestock, fisheries and aquaculture, and forests and forestry. Other areas addressed include important health and welfare, family and youth, community development, and environmental domains. Generally, the more state, regional, or local the nature of solutions required, the more suited Capacity Funding is to supporting R&D and extension activity. Because much of the need for R&D and knowledge diffusion is driven by local variation in production environments and communities, Capacity Funding remains a highly relevant, flexible, and crucially important funding tool for the foreseeable future.

There continues to be significant potential for the United States in leveraging its world-class agricultural and associated science and engineering capabilities for further economic growth and societal resilience. It is logical to conclude that given the importance of agriculture and associated industries, and the opportunities for further economic development and societal advancement contained within them, continuity of Capacity Funding programs is recommended. TEConomy notes, however, that compared with other major federal R&D funding agencies (including NIH, NSF, NASA and DoE) the USDA and NIFA R&D efforts receive the least amount of funding, by a quite considerable margin. Over the past 20-years the R&D budget for USDA represented only 4.3 percent of the R&D funds distributed across these five federal agencies. Indeed, in just the two most recent years, the NIH research budget alone has exceeded the entire 20-year budget for USDA research.

Based on the research herein, TEConomy concludes that Capacity Funding carries substantial and significant ongoing advantages as an R&D and extension funding model. It is logical to conclude that were a larger federal budget allocated to NIFA for the funding of research and extension activity, primary allocation should be made predominantly via Capacity Funding increase mechanisms. Indeed, the robust findings in favor of Capacity Funding suggest that this funding model should also be examined for relevance to other federal R&D funding agencies.
Special Thanks:

Elements of the evaluation performed herein required the administration of a survey to university leadership, research and experiment station directors, and Cooperative Extension Directors at U.S. land-grant universities and colleges. The process of distributing these surveys was kindly facilitated by the Association of Public and Land-grant Universities (APLU) and the American Indian Higher Education Consortium. The TEConomy Partners’ research team thanks these organizations for their assistance.

The link to the full 147 page report is http://bit.ly/2osfr4M