

The National Academies of SCIENCES • ENGINEERING • MEDICINE

ENHANCING COORDINATION BETWEEN LAND-GRANT UNIVERSITIES AND COLLEGES

Preliminary Observations

Introduction

Acting on a Congressional directive, USDA/NIFA asked the National Academies of Sciences, Engineering, and Medicine to establish a Blue Ribbon Panel to consider how to maximize coordination among universities and colleges of the land-grant system to improve and sustain food security in the U.S. and beyond and suggest ways to increase and communicate their collective impacts.

To that end, the panel established by the National Academies is focusing on the potential to enhance inter-institutional collaboration of participants from a diversity of land-grant institutions—including the 1890s and the 1994s—to increase knowledge generation, solve problems, and create positive opportunities across the food and agricultural knowledge system. In addition, increasing collaboration would also improve both the perception and the reality of the land-grant system as an integrated whole with goals and purposes.

This document contains the Panel’s preliminary observations about the nature of collaborative activity across the land grant system and the potential to enhance its impacts. Its purpose is to solicit reactions, ideas, and relevant information from stakeholders who participate in and/or are invested in the outcomes of those activities. You are encouraged to provide comments on any of the preliminary observations using the public comment form <http://nap.nationalacademies.org/land-grant-collaboration/form>. **Please provide comments by Friday, May 6, 2022.** The comments will inform a workshop planned for the spring of 2022, after which the panel will prepare a brief report to Congress and to USDA with findings and recommendations for follow on actions.

Section 1: Collaboration in the Land-Grant System

Preliminary Observation #1: There is a significant amount of active and successful inter-institutional collaboration and cooperation taking place in the land-grant system today. Examples of large-scale collaboration among land-grant institutions include the USDA/NIFA-funded Coordinated Agriculture Projects (CAP)¹ and activities funded by the Foundation for Food and Agricultural Research.² Other examples of collaborative work come from the Multistate Research Program supported by the federal Multistate Research Fund. Since the mid-1940s, the 1862 Agricultural Experiment Stations have worked together on pressing problems that concern two or more states. Many of these projects have participation from across the system, and include stakeholders from industry, government, and beyond, and in some institutions, faculty are required to be involved in multistate research. The Agricultural Research, Extension, and Education Reform Act of 1998 requires integration of research and extension activities in these collaborations. In addition, there are outstanding collaborations within states as well. For example, in Montana and Michigan, 1862 and 1994 institutions (Tribal Colleges) are working to

¹ <https://nifa.usda.gov/afri-regional-bioenergy-system-coordinated-agricultural-projects>

² <https://foundationfar.org/grants-funding/grants/>

enhance student and research success as well as outreach. In many states that house both 1862 and 1890 institutions, joint Plans of Work and reports are required. For example, through the Alabama Agricultural Land Grant Alliance (AALGA), statewide extension activities are carried out jointly by Auburn (1862), Alabama A&M, and Tuskegee (1890). These examples of interactions among 1862, 1890 and 1994 institutions are exemplars of collaborative intent, serving as emerging models for enhanced collaboration across land-grant institutions.

Preliminary Observation #2. Currently, inter-institutional collaborations do not routinely engage faculty from the full range of institutions across the land-grant system. For a number of reasons, collaboration among the 1862, 1890, and 1994 institutions collectively occurs much less frequently than collaborations among schools within the 1862 group. The 1890 institutions seldom serve as lead institutions for collaborations, while the 1994 schools have very limited resources for this purpose.

Section 2: The Rationale for Collaboration

Preliminary Observation #3: The nature of key questions for food and agricultural science are evolving, and the scientific approaches to address them are increasingly at the convergence of multiple disciplines, use information collected dynamically across multiple scales or geographies, and require advanced data science capability. Research, teaching, and extension that use a systems perspective, supported with data science expertise and capability, are necessary to address the multifaceted problems now facing the agriculture and food system. For example, while traditional research and extension may have focused primarily on improving crop yields, current questions are more broadly framed, for example, on how to improve crop yields in a changing climate, and/or without environmental degradation.

Preliminary Observation #4: All of us are smarter than one of us: Diversity promotes novel ideas. Given the scope of the problems and challenges that face the food and agriculture system, bringing together individuals with different methodologies, expertise, perspectives, philosophies, backgrounds, and networks offers an opportunity to generate new insights to achieving solutions to problems, and to produce broader impacts from the work of the collaboration. A first step is to recognize the diversity of potential partners from within the land-grant system (such as faculty across 1862, 1890, and 1994 institutions) and from outside of the system (such as producers and state departments of agriculture, industry and venture capitalists).

Preliminary Observation #5: Inter-institutional collaboration can allow human, fiscal, and physical resources to go further and have a broader impact. Collaboration has the potential to reduce the duplication of effort and deploy scarce resources more efficiently when the roles of collaborators and the assets brought to the project are complementary. Partner institutions need not play identical roles, and collaborations can result in different kinds of outcomes, outputs, and impacts for the project and for the partners that are mutually beneficial.

Section 3: Barriers to Collaboration and Ideas for Overcoming Them

The charge to the Blue Ribbon Panel asks it to recommend actions to enhance the success of collaborative activities among institutions in the land-grant system. Identifying and overcoming barriers is an obvious need. A number of examples of potential barriers and means to overcome them can be found in the following list.

Preliminary observation #6: Institutions use different approaches for approving funds to support faculty involvement in collaborations that may create varying expectations on the nature of collaborations and the role of participants. For example, some institutions use multi-state funds to support salaries while others may only use them to support travel to participate in meetings. The rationale and implications for these differences needs to be explored further.

Preliminary observation #7: Historical inequities have handicapped the ability of many 1890 and 1994 institutions to be full partners in collaborations with the 1862s. Different authorities guide the allocation of federal funds to 1862, 1890, and 1994 institutions respectively, with different requirements for state matching support of federal dollars, and different stipulations for the use of funds for collaboration. There is an urgent need to explore how to level the playing field for collaborative opportunities across differently resourced universities and ensure full and equitable participation among all collaborators.

Preliminary observation #8: Faculty members may already be fully committed to other grants and teaching assignments, leaving insufficient or inadequate time and resources to support new collaborative projects. Younger faculty, in particular, may face strong disincentives for pursuing collaboration. Modifying evaluation criteria for promotion and tenure to ensure that participation in collaborations is appropriately recognized and rewarded has been a longstanding need. In 1890 and 1994 institutions, fewer faculty members are generally available to share teaching, research, and extension responsibilities. The potential to provide direct funding for those who have heavy teaching responsibilities to “buy themselves out” while involved in collaboration and providing “teaching postdocs” should be explored. Ensuring adequate start-up resources for newly hired faculty and investing in “continuation” resources for newly promoted faculty may also offer possible solutions.

Preliminary observation #9: Land-grant system institutions have traditions emphasizing and rewarding competitive, rather than collaborative, research projects. Requirements to fund administrative and overhead costs to all institutions participating in a collaboration may also reduce incentives to share funds among multiple institutions. This situation is counter to the impression of the land-grant system as a unified enterprise. In exploring solutions, it is notable that the National Science Foundation (NSF) supports collaborative projects in which each PI gets their own budget for their work on the project, thus minimizing bureaucracy.

Preliminary observation #10: A lack of information about the distribution of expertise at institutions across the land-grant system or of other available assets may hinder the ability to identify suitable partners for collaboration. Collaboration organizers may not be aware of the potential for external public or private partners with assets (data platforms, technologies, funds, networks, etc.) to participate and support land-grant collaborations. Collaboration could be encouraged by using NIFA to convene a workshop or series of workshops highlighting individual investigator projects across the agency that are doing work in the same or similar areas.

Preliminary Observation #11: The time available for planning collaborations properly is sometimes inadequate. Planning is the methodical process for envisaging collaborative activities and taking steps to provide what is required for their successful implementation. Opportunities to obtain planning grants could be expanded with criteria to achieve multiple goals. For example, NIFA could fund preliminary studies or preproposals that require three institutional types (e.g., large 1862, small 1862, 1890, minority serving institutions, 1994s, etc.). An evaluation criterion for competitively awarded funding that gives inter-institutional collaboration sufficient weight by funders could make the effort more

worthwhile to would-be grantees. The challenge to applicants would be to include a diversity of disciplines, people, perspectives, and backgrounds. An open question is whether such planning awards should be focused on topics or projects of a specific scope.

Preliminary observation #12: Leading collaborations requires team building, emotional intelligence, and project-management capabilities, for which many faculty are unprepared and untrained while administrative supports may not be available to assist. Institutions might proactively identify faculty leaders and prepare them to lead collaborations. Returning indirect costs to cover additional administrative support might assist new leaders and improve the success of multi-institutional collaborations.

Preliminary observation #13: Institutions have different administrative procedures and policies for proposals, agreements, intellectual property, reporting, and mechanisms for handling funds that may create time lags, paperwork burdens, and opportunity costs that discourage collaboration. Institutional leaders can reduce the activation energy needed for inter-institutional collaboration by addressing these issues. One way to achieve this might be through the development of broad agreements between institutions that describe a common vision of needs, aspirations, perceived benefits of collaboration, and mechanisms to support participation. Establishing such agreements would require negotiation and a commitment of time, but the results could produce trust, awareness, and insight into the partner institutions' culture, norms, breadth of expertise, and administrative practices. Such agreements send a signal to faculty that there is buy-in from leadership to support collaboration.

Section 4: Amplifying and Communicating the Impacts and Outcomes of Collaboration

Impact is the powerful effect that an activity or project, especially something new, can have on a situation, person, or policy. Amplifying impact means to intensify or expand that effect. The panel observed the potential for amplifying outcomes on several levels.

Preliminary observation #14: The size and complexity of a collaboration should be expected to change over time and take on new goals and partners. The goals of a project would dictate whether a national scale, multi-faceted, multi-sector effort must be built from the start of a collaboration, or whether a pilot phase or regional effort could be useful in providing proof of concept. Alternatively, a project may be organized with multiple phases and with different kinds of activities planned for early versus more mature stages of a partnership. It may be possible to broaden impact by building on top of an existing collaboration by, for example, using competitive extension funds to bring knowledge or practices identified in the first phase of a collaboration to a broader audience of users, or simply to support the dissemination of information in new formats and tools.

Preliminary observation #15: Some key issues and questions in agriculture may require large, multi-disciplinary collaborations and sustained research over time in multiple locations. NSF provides sustained long-term funding through its LTER and LTAR sites that supplements individual projects, and the National Institutes of Health supports Cancer Centers and numerous other multicomponent projects. The potential for this type of mechanism to create longer and more sustained success in agricultural research needs exploration. Funding from agencies like NSF, NIH, NASA, DOE, and EPA might be leveraged to broaden collaboration across the country.

Preliminary observation #16: Collaborations lead to a diversity of outcomes, including some for which impacts are not easily recognizable or require more time to achieve. Greater thought on how to measure and communicate the value of those outcomes would increase their visibility. Anticipating expected outcomes and how to communicate them, defining what success looks like, and creating metrics for impacts could increase the effectiveness of communication efforts. To strengthen the ability to capture and communicate impacts, NIFA might provide additional support for post-collaboration assessments.

Preliminary observation # 17: Stakeholders, including producers, policymakers, and the public, are more likely to recognize the impacts and benefits of collaborative activities among land-grant institutions if communication strategies are tailored to them. Documenting the economic, environmental, and societal impacts and benefits of collaboration could raise the profile of the land-grant system to stakeholders. Infographics and other visualization methods, such as graphs and graphics, and using different media types, formats, and information portals for disseminating information would make communication more effective.

NIFA has a communication unit that collects, writes and transmits to the public the impacts of work that it supports (<https://nifa.usda.gov/impacts>). The NIFA staff also provide workshops on recognizing and effectively communicating impacts. NIFA's "Share Your Science" campaign (<https://nifa.usda.gov/share-your-science>) is designed to highlight research outcomes and accomplishments on a national level. It is aimed at spotlighting the achievements being made by NIFA's partners in addressing societal challenges, such as increasing food security and decreasing hunger, and addressing climate change, food safety, childhood obesity, and sustainable energy. This effort is critically dependent on submissions from the LGU system and USDA communications staff, and could benefit greatly from ready access to institutional impact stories. Another successful model is the Multistate Research Fund Impact Project (<https://www.mrfimpacts.org/>) created in 2010 by the Experiment Station Section on Organization and Policy (ESCOP). It works with multistate committees to develop impact statements as their projects terminate. Project staff provide workshops on recognizing and communicating impacts for project participants, faculty, and staff. ESCOP maintains a social media presence and is also linked to the USDA Communications Office. A complete listing of impact statements is available on the project website.

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