

Thinking Globally About Universities and Extension: The Convergence of University-Based and Centralized Extension Systems in China

Abstract

The U.S. university-based extension system model has been successful nationally, but not adopted globally. Various historical factors rendered the U.S. system a less attractive option for emerging post-WWII nations. However, current changes in education and extension landscapes are creating new opportunities for the globalization of U.S. Extension. Specifically, both the U.S. and Chinese extension systems now face the common challenge of delivering meaningful university-based extension under shifting conditions. This commonality creates opportunities for exploring long-term, synergistic university-based extension systems and potentially achieving associated benefits worldwide.

Keywords: [international](#), [China](#), [centralized extension systems](#), [university-based extension](#)

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Introduction

The U.S. Cooperative Extension System has been widely credited as a primary facilitator of broad technological, managerial, and social innovations in the United States since World War II (Rasmussen, 1989; Warner & Christenson, 1984/2019). In the 1960s and 1970s, the U.S. Agency for International Development (USAID) incorporated the land-grant university (LGU) system, with its embedded extension system, as a policy centerpiece for creating U.S.-style agricultural higher education institutions in the new postwar nations (Rasmussen, 1989; Ratchford, 1996). However, by the early 1980s, USAID had shifted priorities away from broad university-focused institution building, and U.S. Extension's participation in international development receded (Ratchford, 1996, p. 146). Although the U.S. university-based extension system model has been successful in development and technology transfer efforts throughout the United States, it has not been adopted globally. Instead, research has indicated that "80 percent of the extension services [internationally] are publicly funded and delivered by civil servants" (Feder, Willett, & Zijp, 1999, p. 2). Emergent post-WWII nations, such as China, Ethiopia, and India, overwhelmingly chose to embed their extension services in centralized national ministries of agriculture (MoAs), not in university structures (Purcell & Anderson, 1997). This apparent anomaly raises questions as to why such a successful domestic system in the United States was

not adopted abroad. Herein we explore the historical factors that rendered the United States' solely university-based Extension system a less attractive, and even inappropriate, model for the developing world. We end by illustrating how current conditions in China and other modern states may support a convergence of university-based and centralized extension systems, making the U.S. model increasingly globally relevant.

In the sections that follow, we provide a review of the historical contingencies that shaped the U.S. university-based extension system and the Soviet-inspired extension system followed by a brief overview of the functional similarities and structural differences of the two models. We then provide an analysis of the development and limitations of the current centralized extension system in China. We conclude with a discussion of the potential benefits of engagement by U.S. LGUs with the emerging university-based extension system in China. The last two decades have been characterized by a renewed interest in "internationalization" within U.S. Extension; most initiatives, however, are individual one-off programs built around the interests and initiatives of particular Extension staff (Lockett, Moore, & Wingenbach, 2014; Sellers, 2008). To explore international partnership opportunities more systematically, the Extension Committee on Organization and Policy of the Association of Public and Land-grant Universities recently formed a Committee on International Extension. With this article, we contribute to this effort by examining one current example of U.S.–China multiinstitutional international collaboration.

The Post-WWII Emergence of Two Extension Models

There are currently two distinct extension systems globally: the U.S. system, which incorporates university-based extension units, and the Soviet-inspired centralized system. These two systems have similarities, including the recognition that stable, secure national food production and distribution systems are cultural imperatives for all scales of society (Busch & Lacy, 1984; Eitzen & Baca-Zinn, 2001). Functionally, both systems serve similar institutional imperatives. Structurally, they reflect their respective societal structures and distinct historical stories. The U.S. Department of Agriculture (USDA) is the earliest national agricultural ministry (established in 1862) and is the only modern such entity without an extension system in its administrative apparatus (Fiske, 1989). The centralized system was established in the Soviet Union in the 1920s and was partially modeled on the emerging U.S. system. It particularly drew from the need for locally specific educational programs for improving agricultural production (Kuraev, 2014). For all societies, food production and distribution requires national bureaucracies with local offices that deliver programs and articulate locality-specific educational programs for improving agricultural production (Kuraev, 2014). This institutional imperative has been realized through centralized MoAs in many nations throughout the world, persisting even after the collapse of the Soviet Union in 1991 (Maguire, 2000). Both systems also support basic and applied research, with applied research occurring locally at research stations and through on-farm trials.

Functional Similarities and Structural Differences in the U.S. and Centralized Extension Systems

The U.S. and centralized extension systems are functionally similar, but they have significant structural bureaucratic differences with regard to their establishment, reporting lines, and funding. In the Soviet Union and the new post-WWII nations, MoAs were established within the first years of national existence (Purcell & Anderson, 1997). By contrast, the U.S. Extension system emerged gradually within fledgling state agricultural and mechanical colleges rather than through the federal government. These colleges were established by the

Morrill Act in 1862 and comprised the first set of colleges and universities of today's U.S. LGU system. Recognizing the value of the emerging LGU extension systems and their importance for national agriculture and food security, the U.S. Congress passed the 1914 Smith-Lever Act to provide modest federal support and establish a partnership between the USDA and the LGUs (Fiske, 1989).

Another important structural difference is the relationship of higher education and the national government. As was the case with production agriculture, newly created postwar nations chose centralized systems of higher education similar to the Soviet Union's. Institutions of public higher education, including agricultural colleges, were placed in ministries of education. Consequently, agricultural enterprises and higher education were administered through very different bureaucratic silos (Dalrymple, 1960). Today, there is still a political and bureaucratic segregation of national agricultural extension systems, run by MoAs, from agricultural universities, administered by ministries of education (Feder et al., 1999). The partnership model of the USDA and the U.S. LGUs is qualitatively different, as the U.S. Department of Education has no direct authority over public higher education. Oversight occurs within states and through regional accreditation organizations.

The final difference is budgetary. In centralized systems, funding is contained within the MoA (Purcell & Anderson, 1997). In the United States, Congress supports agricultural research and extension through the allocation of the USDA's budget, which grants farm program funding through the state-based Farm Service Agency and Natural Resources Conservation Service. These agencies provide policy guidance and distribute federal funds, with mandated participation by state and local boards. The U.S. Congress also shapes national agricultural and food research priorities by setting the budgets of the Agricultural Research Service (ARS) and the National Institute of Food and Agriculture (NIFA). The ARS is the USDA's research agency, whereas NIFA manages a competitive grant system and sets federal research priorities. NIFA also administers capacity funding to the LGUs, as established in the Hatch Act and Smith-Lever Act. Moreover, the 50 states and the U.S. territories heavily fund agricultural research and extension through their LGUs. This decentralized USDA-LGU system has a remarkable record for creating wealth and new knowledge (Rasmussen, 1989).

Barriers to U.S. Model Adoption in the Developing World

Famine was a major threat to post-WWII recovery in Europe and Asia. Globally, the Soviet-inspired model of embedding extension systems in MoAs was widely adopted among the new post-WWII nations because planning for agricultural and rural development was a cultural imperative for national independence, political legitimacy, and stability (Schmalzer, 2016). However, the colleges of agriculture in these fledgling nations were often as underdeveloped as their economies (Maguire, 2000).

As the previous discussion on structure indicates, the U.S. model depends on universities with strong teaching and research capacities and locally based Extension offices. In addition, the USDA has a high-functioning partnership with the U.S. LGU system, which the post-WWII MoAs did not have with their colleges of agriculture. During the decades following WWII, the U.S. model was simply not relevant or achievable for most emerging nations (Purcell & Anderson, 1997). The value of local extension created by the U.S. LGUs was deeply relevant for the United States. But the new nations' agricultural colleges did not have the talent, mission, or funding to sustain their own extension systems in the shadow of associated MoA extension systems. This situation is exemplified in the case study of modern China's extension system creation presented in the next section.

Global Adoption of Extension Systems 1940–1980: The Case of China

Post-1949 China is an excellent example of the mismatch between cultural imperatives and institutional capabilities. Like most new post-WWII countries, the People's Republic of China (PRC) had to quickly stabilize food production by reestablishing an extension system at the local level to maintain public support. Surprisingly, the extension system the communist government inherited from the nationalist government "bore clear resemblance to that of the United States" (Schmalzer, 2016, p. 32). The similarity to the U.S. model was because China's modern agricultural extension system was founded in the 1920s by United States-trained Chinese agronomists and agricultural economists (Schmalzer, 2016). These influential scholars were inspired by the U.S. LGU system and therefore championed close collaboration between university scholars and the local community (Schmalzer, 2016). According to Chen (2013), the Republican government formed the National Agricultural Production Development Commission in 1938 to expand agricultural production during the Japanese invasion period (1931–1945). This maneuver initiated the establishment of farmers' associations and demonstration farms at the county level to facilitate agricultural technology diffusion and rural community development. By 1944, more than half of the Kuomintang-controlled counties (592) had agricultural extension stations supported by universities or provincial governments, and 228 grassroots farmers' associations had been formed at the township level (Chen, 2013). WWII and the ensuing Chinese civil war decimated the Chinese universities and stopped the expansion of the U.S.-style extension system in China (Schmalzer, 2016).

Leading a new nation in 1949, the communist Chinese government continued to establish national agricultural extension, but instead of relying on collaboration between the agricultural colleges and the local communities, the new system was embedded in the top-down administrative structure of the country's MoA. From 1953 to 1955, the Chinese MoA promulgated a series of guidelines that aimed to build an agricultural technology and extension system that extended from the central state to township/town governments (Yang, 1993). Nevertheless, the chaotic Great Leap Forward movement that began in 1958 and the ensuing famine led to the abolishment of one third of the country's extension stations and the firing of two thirds of extension agents (Zhang, 2013). In 1962, the moderates in the Chinese State Council attempted to amend the Great Leap Forward policies and emphasized the institutionalization of agricultural extension as the primary means of promoting modernization in food production (Guo, Zhao, & Li, 2014). However, by that time, Chinese agricultural colleges had been severely weakened by the country's higher education reforms of the mid-1950s. These reforms separated them from larger universities and reduced their capacity to produce qualified extension specialists (Liu, Chen, & Dong, 2002).

Political purges during China's Cultural Revolution incapacitated the top-down extension system and agricultural colleges in 1966, further exacerbating the lack of professional personnel in the extension system (Zhang, 2013). During this period, the PRC promoted grassroots extension to stabilize agricultural production and counter the political effects of the U.S.-led green revolution. The "three-in-one" model combined ideological control of local state agents, the knowledge of farmers, and the expertise of "send-down" specialists and urban youths to disseminate information about the latest technological advancements and best practices (Schmalzer, 2016, p. 41). Starting in 1969, extension agents trained in village night schools began to be stationed in counties, communes (townships), production brigades (administrative villages), and production teams (natural villages). By 1975, around 11 million rural peasants were covered by the grassroots

extension system (Zhang, 2013). But the introduction of a market economy in China in 1979 brought an abrupt end to the grassroots extension system, as the central state began treating extension as a for-profit enterprise (Yang, 1993). Village extension positions were abolished, and the county-level extension stations were reorganized into five units, each being governed by different bureaus in the MoA and the local governments (Guo et al., 2014). The fragmented bureaucracy directly caused the disintegration of the top-down extension system, as the local extension stations had to fulfill numerous administrative tasks from multiple governing entities without budgetary support (Rong, Wang, Shi, & Wang, 2012). The underfunding of the extension system in China has prevented extension specialists from providing service to the public and academics in agricultural universities from conducting service-oriented research that might benefit rural development. Consequently, since the 1990s, the centralized extension system in China has encountered severe challenges in delivering effective and relevant services to rural communities, a situation that has directly hindered food security, rural development, and natural resources conservation in China (Guo et al., 2014).

Convergence of the University-Based and Centralized Extension Systems in China

Today, most nations have established regionally focused agricultural extension systems, experiment stations designed to ensure stable, sustainable food production and distribution (Judd, Boyce, & Evenson, 1986). Extension has been a common institutional structure for mitigating and stabilizing the many threats to food production and distribution. Globally, internal and external threats associated with political and social instability, food insecurity, natural resources depletion, environmental degradation, and rapid climate change make these threats increasingly challenging. In recent years both the U.S. university-based system and centralized systems have been subjected to criticism, with discussion of their diminishing relevance as platforms for education and the diffusion of knowledge to address food production and distribution necessities (Feder et al., 1999; Leeuwis, 2013; Purcell & Anderson, 1997).

The institutional context of university-based extension has changed significantly since WWII. In the United States, LGUs have morphed qualitatively into comprehensive universities. Colleges of agricultural sciences, which were once dominant, have witnessed their proportion of the university's students and faculty shrink (Rasmussen, 1989). Yet at the great majority of U.S. LGUs, Extension continues to be in colleges of agricultural sciences. The U.S. Cooperative Extension System has been challenged to incorporate researchers from other disciplinary backgrounds in response to the diverse role of Extension in the 21st century (Leeuwis, 2013; Warner & Christenson, 1984/2019).

Over the past two decades, China's agricultural universities also have become comprehensive, with improved research capacities. To improve extension service delivery and incorporate locality-specific educational programs for expanding agricultural production, the Chinese central government has stipulated a series of policies aimed at establishing a campus-wide university-based extension system (Ministry of Education of PRC, 2018). The implementation challenge has been to scale the engagement programs of the Chinese agricultural universities by integrating their extension activities with those of the centralized extension system. This integration requires collaboration between two large and entrenched ministerial bureaucracies, the Ministry of Agricultural and Rural Affairs (formerly the Ministry of Agriculture) and the Ministry of Education. Consequently, both the U.S. and Chinese extension systems face the common challenge of delivering meaningful and campus-wide university-based extension during a time when global food security is under

threat. This commonality creates long-term opportunities to collaborate on implementing successful university-based extension systems.

To promote a university-based extension system, the Chinese central government has directed most provinces to create New Rural Development Institutes (NRDIs) as part of the country's 13th Five-Year Plan for agriculture and rural development (Ministry of Education and Ministry of Science & Technology of PRC, 2012). The NRDIs are designed to be platforms for technology transfer such as what occurs through U.S. Extension and experiment station offices. All agriculturally oriented universities in China are expected to create university-based extension structures on campus and to participate in the management of these local institutes. The NRDIs include dorms, higher end laboratories, e-classrooms, and demonstration fields to facilitate collaboration between agricultural universities and county governments. In December 2017, the Chinese central government directed the Ministry of Agricultural and Rural Affairs and all subnational governments to support the operation of the university-based extension system (Ministry of Education of PRC, 2018). The establishment of NRDIs, therefore, represents one point of convergence between the U.S. extension system and the centralized extension system in China.

In 2017, 10 Chinese agricultural universities and six U.S. LGUs created the China–U.S. University-Based Agricultural Extension Alliance. Another 29 Chinese universities became members of the alliance in 2018. The purpose of the alliance is to create long-term, sustainable university-to-university collaboration. This emerging Sino-U.S. initiative is qualitatively different from short-term, single programs. Instead, the alliance is premised on cocreative capacity building to resolve significant challenges to the global food system that may threaten the well-being of both U.S. and Chinese communities. Though in very different historical and contemporary contexts, the United States and China are both grappling with similar changes in the relationships across state, economy, and society; across scientific knowledge, policies, and technology; and between agricultural production and natural resources conservation. The collaboration between U.S. LGU and Chinese agricultural universities may help U.S. Extension experts think critically about the global dimensions of the issues U.S. Extension faces. Given China's enormous impact on U.S. farm sectors and the global environment, the alliance may also enhance U.S. public interests by developing an integrated extension system that is more suitable to providing timely and effective responses to global food security and rural development issues. Most importantly, the experiences gained may inform additional LGU collaborations with other rapidly transforming centralized extension systems in countries such as Ethiopia, India, and Kenya.

Concluding Remarks

Food systems, including their production and distribution supply chains, are a part of society's historical answers to fundamental cultural imperatives. Extension systems exist in some form in every nation, suggesting that extension institutions are an almost universal national response to demands for food security, political stability, and wealth creation. We recognize that global engagement is not a priority for many U.S. Extension programs, particularly those primarily focused on state and local engagement. For those U.S. Extension programs seeking to deepen their global outreach, however, there are qualitatively new opportunities. The U.S. Cooperative Extension System, perhaps for the first time since the end of WWII, may be expected to play a central role as nations with centralized extension systems seek to incorporate the emerging talents of their agricultural universities. The China–U.S. University-Based Agricultural Extension Alliance is creating a foundation for university-to-university collaboration based on mutual benefits. During the coming decades, other countries with centralized extension systems likely will consider bringing their

agricultural universities fully into partnership with their national extension systems. China's experiences may shape the trajectory of this global trend, given the country's political and economic influence in the developing world. This is a window of opportunity for interested U.S. Extension systems to significantly increase their globalization objectives and share their more than a century of engagement expertise internationally.

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