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## **Higher Education, Research and Extension Systems in the United States and Chinese Taipei**

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## **Abstract**

The higher education systems in both the United States and Chinese Taipei function similarly in teaching, research and extension. The higher education system offers not only baccalaureate degree but also post graduate Master's and Doctor of Philosophy degrees. The land-grant system in the United States was created in 1862 for research in the experiment stations under the Morrill Act and in 1914 for the extension service under the Smith-Lever Act. Agriculture-related research in Chinese Taipei is carried out by Taiwan Agricultural Research Institute, District Agricultural Research and Extension Stations, and academic and private institutions. The extension service in Chinese Taipei, however, is primarily provided by District Agricultural Research and Extension Stations and farmers' associations. Despite the differences in the systems of higher education, research and extension service in the United States and Chinese Taipei, both systems function adequately in assisting farmers in their respective country. The challenges that both systems are facing are discussed.

Keywords: higher education, research, extension service, Morrill Act, Smith-Lever Act, farmers' associations

## **Introduction**

The higher education systems in both the United States and Chinese Taipei function similarly in teaching, research and extension. The systems offer not only baccalaureate degree but also post graduate Master's and Doctor of Philosophy degrees. These degrees may be offered by private or public institutions. Despite the similarities, there are differences in the systems of the United States and Chinese Taipei, particularly in the way the systems established, administered and regulated.

The purpose of this paper is to discuss the higher education systems in the United States and Chinese Taipei and to compare their differences in the activities carried out by the private and public institutions in teaching, research and extension.

## **The higher education system in the U.S.**

The responsibility of providing higher education in the U.S. lies with Universities or colleges in each state. These academic institutions are either public or private funded. Public institutions are primarily funded by states and each usually governed by an institution's Board of Regents. The Board of Regents addresses policy issues relating to the institution and appoints the institution's president to represent the institution and to carry out daily institution-related activities. Private institutions are primarily funded by donations received and tuition collected. Similarly, each private institution is also governed by its own Board of Regents or Directors. The responsibility of the Board is no different from that of a public institution.

### 1. Roles of U.S. Department of Agriculture (USDA)

USDA is delegated with the responsibility of providing oversight to the higher education, research and extension programs. In early 1990s, the programs were consolidated under the Coordinated State Research, Education and Extension Service (CSREES), which provides funding to states for conducting research, education and extension related activities. USDA implements agriculture-related programs mandated by U.S. Congress. To effectively carry out the mandated programs, USDA establishes partnership with land-grant colleges or universities.

### 2. Research programs in the U.S.

Agriculture-related research is primarily carried out by land-grant colleges or universities in the U.S. These colleges or universities are parts of the land-grant system, which was established by the U.S. Congress in 1862 under the Morrill Act. Under the act, at least a tract of federal land per state was set aside for conducting agriculturally related experiments. Therefore, there is at least one land-grant college or university per state. Results of the experiments were then transferred to farmers for use in producing agricultural crops. Also under the mandates of the act, federal funds are provided to land-grant colleges or universities for carrying out the experiments.

Since the establishment of the land-grant system, research conducted at the experiment stations has contributed much to the advancement of agricultural technology. However, some deficiencies have also been discovered as a result of 1)

inability of researchers to communicate effectively the research findings to their end users, which are farmers; 2) researchers' unawareness of the problems associating with farming; 3) inability of researchers to properly address farmers' needs; and 4) negative attitudes of some researchers toward farmers' requests for solutions to the problems encountered by farmers in producing agricultural crops. Knowing these deficiencies legislators began to search for suitable solutions to address the needs of farmers.

### 3. Extension service programs in the U.S.

The extension service system was established by U.S. Congress in 1914 under the Smith-Lever Act. The programs associated with the system are assigned to the land-grant colleges or universities. A county office is established in each county; under which, a number of county agents and extension specialists are hired to 1) digest research data; 2) transform data to language(s) understood by farmers; 3) transfer the information, free of charge, to farmers; and 4) if necessary, conduct applied research aiming at solving problems encountered by farmers in the process of producing agricultural crops. Therefore, the extension service is created to fill the gaps between researchers and farmers. Under the extension service, county agents function as an conduit for channeling information to farmers as county agents are supposed to 1) be able to communicate with farmers in their language(s); 2) understand farmers' needs or problems; and 3) be capable of effectively transmitting information to extension specialists. Extension specialists are hired to work with farmers, county agents and researchers to 1) digest research data and transform them into readable language(s); 2) coordinate problem solving with researchers and county agents; and 3) conduct applied research targeted toward problem solving.

Selected examples of the programs mandated by U.S. Congress and carried out by land-grant colleges or universities

A few selected examples of the programs mandated by U.S. Congress and carried out by land-grant colleges or universities are listed as follows:

Clean water programs, sustainable agriculture research and extension (SARE) programs, integrated pest management, 4-H programs and community leadership development programs.

4. Over the years, the land-grant system is known for its success in 1) providing education in agriculture-related fields, offering undergraduate and post-graduate degrees; 2) training students to meet job market needs; and 3) providing new and cutting edge information and technology to its clients. The success of the system has led the public to have the misconceptions that 1) agricultural products are

grown in supermarkets; hence, are easily available; 2) fruits and vegetables should all be perfect and unblemished; and 3) free service provided by the system is an entitlement; thus not taken it seriously or become overly dependent on the information provided free of charge.

## **The higher education, research and extension system in Chinese Taipei**

### 1. Roles of the Council of Agriculture,

The Council of Agriculture provides funding for conducting research and extension services at research institutions including TARI, DARES, and various academic institutions and farmers' associations. Unlike USDA, it does not provide direct oversight of the programs. Partnership is, however, established between the Council of Agriculture and the institutions mentioned above enabling it to carry out the programs mandated by the legislature through funding of projects.

### 2. Higher education system in Chinese Taipei

The higher education in Chinese Taipei is provided by over 160 different universities, colleges and polytechnic institutes. There are currently 6 universities involved in providing agriculture-related higher education, covering all of agriculture-related fields and offering undergraduate and post-graduate degrees.

### 3. Research programs in Chinese Taipei

Agriculture-related research in Chinese Taipei is conducted in Taiwan Agriculture Research Institute (TARI), Districts Agricultural Research and Extension Stations (DARES), and various academic institutions and private institutions. Funding for research is from various sources, such as institutional budgets, grants from government agencies, and joint programs between public institutions and private industries.

### 4. Extension programs in Chinese Taipei

The extension system in Chinese Taipei involves TARI, DARES, and various academic institutions and farmers' associations. DARES and farmers' associations serve as the major conduit for the flow of information or technology from government agencies and research institutions to farmers. Undesignated researchers at TARI and extension professors at academic institutions carry out, to a lesser extent, extension related activities to serve farmers.

### 5. Functions and roles of farmers' associations

The farmers' association system was established while Taiwan was under the Japanese control. This system is consisted of three tier organizations, provincial,

county and township. There is one farmers' association per township; therefore, they are considered an important grass-root, non-governmental organization. Representatives are selected to represent a township farmers' association at the county farmers' association. In turn, representatives of a county farmers' association are selected to represent a county farmers' association to the provincial farmers' association. Functions of a farmers' association include providing services to assist farmers in processing and marketing agricultural products, credits and loans, insurances, and other extension related services.

## **Conclusion**

In spite of the differences in the systems of higher education, research and extension service in the U.S. and Chinese Taipei, both systems function adequately in assisting farmers in their respective country. County agents in the U.S. and employees of DARES and farmers' associations in Chinese Taipei served farmers at the grass-root level. Extension professors in Chinese Taipei serve their clients on a part time basis; therefore, their accomplishments may not be as prominent as extension specialists in the U.S. The systems in the U.S. and , however, face a similar challenge in fighting for adequate resources in order to be more effective in serving their clientele due to the dwindling resources, which force the cut back of personnel in research and extension programs in both countries. In addition, difficulty also exists in the systems in both countries as to how to effectively carry out research and extension service activities in a coordinated effort to help solve agricultural problems.

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