

**Simposio Internacional
sobre al Aumento de la
Producción de Alimentos
en Zonas Aridas**

**International Symposium
on Increasing
Food Production
in Arid Lands**

Monterrey, Nuevo León, México

Abril 22-25, 1968

MEMORIAS

PATROCINADAS POR:

PROCEEDINGS

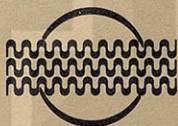
SPONSORED BY:

Instituto Mexicano de Zonas Aridas
Instituto Tecnológico y de Estudios Superiores de Monterrey
International Center for Arid and Semi-Arid Land Studies
U. S. Agency for International Development
Universidad de Nuevo León

EDITORES:

EDITORS:

Thadis W. Box (English)
Paulino Rojas-Mendoza (Español)



ICASALS PUBLICATION NO. 3

TEXAS TECHNOLOGICAL COLLEGE
LUBBOCK, TEXAS

1969

Sesión I
Apertura
Presidente:

Session I
Opening
Presiding Officer:

Ing. Alfredo Jaime de la Cerda
Presidente Ejecutivo
Instituto Mexicano de Zonas Áridas
México, D.F.

The Role of Higher Education in the Study of Arid and Semi-Arid Lands

GROVER E. MURRAY
President
Texas Technological College
Lubbock, Texas, U.S.A.

RESUMEN

Las funciones básicas de todas las universidades pueden clasificarse en: enseñanza, investigación y servicio público.

Para aquellas instituciones interesadas particularmente en zonas áridas y semiáridas, debe ponerse un énfasis especial en el desarrollo, documentación, transmisión y aplicación del conocimiento en esas zonas, así como en sus problemas, sus gentes, etc.

Algunos ejemplos del tipo de actividades que cada universidad puede adoptar son: El desarrollo de (1) líneas resistentes a la sequía de cultivos alimenticios. (2) un sistema de obtención y conservación del conocimiento existente respecto a estas tierras, incluyendo a las personas expertas en estos temas. (3) un entendimiento de los problemas socio-económico y de los modelos sociológicos. (4) un inventario de la música, del arte y de la arquitectura de esas regiones. (5) información respecto al papel de las zonas áridas en la evolución del hombre y de sus diferentes culturas y religiones.

Las universidades y los colegios deben tomar el liderazgo en reunir e interpretar los datos e información sobre las tierras áridas del mundo, en desarrollar nuevos conocimientos, en aplicar todos los tipos de conocimiento al mejora-

miento y utilización de estas tierras y en el entrenamiento de las personas que tienen experiencia en esos estudios.



The basic function of all universities can be summarized as teaching, research, and public service. Stated in other words, the functions of a university consist of the development, the expansion, the documentation, and the transmittal of knowledge. The interrelated functions are performed in universities and colleges in many ways at various levels of quality and quantity.

The modern era of the world is one of exploding knowledge and activity. The total volume of knowledge is developing at an incredible rate. The sheer bulk of knowledge now extant poses ever greater problems of analyses and appraisal. It is commonly known that knowledge doubled from 1750 to 1900; it doubled again from 1900 to 1950; and once again from 1950 to 1960. In all probability the total volume of knowledge will double twice from 1960 to 1970. Ninety per cent of the research scientists who ever lived are still alive today.

The world's population is estimated to reach 6 billion by the year 2000 A.D. This tremendous increase poses ever greater problems of living space, of food production, of recreational areas, and so on.

The arid and semi-arid lands of the world, consisting of roughly fifty per cent of the exposed land area of the earth, constitute the greatest unused natural terrain resources left for expansion for living, for farming, and for recreational areas.

History records well—in the Middle East, in North Africa, in Southwestern United States and Northern Mexico, for example—many of the dry lands of the world supported, in the past, extensive colonies of man. In fact, history records these lands were probably the birthplace of man.

The Romans, the Greeks, the Persians, the Carthaginians, and the Phoenicians, for example, made extensive use of these lands through control of the water in them. Remnants of extensive irrigation systems in the Middle East, and in the northern half of the Sahara, clearly record the ability of earlier cultures to control and to utilize effectively

and efficiently the sparse water resources of these areas in support of extensive colonization. North American Indians of an early age also exhibited an analogous—though less efficient—capacity to exist in similarly hostile lands of Southwestern United States and northern Mexico.

History also records well that many of the major empires and religions of the world originated in, or were profoundly influenced by, arid and semi-arid environments. Among these may be listed the empires created by the Persians, the Mongolians, the Greeks, the Egyptians, the Phoenicians, the Carthaginians, and the Romans.

In theory, at least, universities are involved in activities and studies relating to the full spectrum of human knowledge. They are, therefore, ideally and uniquely suited for exploration of the multi-faceted data and information relating to man's past, present, and future existence in the earth and in the universe. Universities are uniquely fitted to conduct and to coordinate studies involving the dry lands of the world, to develop, to document, to transmit and to apply knowledge relating to these lands. Though the problems are complex, the potential humanitarian benefits not only warrant, but demand, that universities assume a primary role in the collection, recording, appraisal, synthesis, development, transmittal and application of knowledge about the dry lands of our earth.

The question may well be posed as to how universities and higher education can and should participate in such efforts. The answers are many, but I shall speak only of a few examples.

One obvious area of activity is the field of agricultural sciences. In terms of food production alone, the university has a special obligation to (1) conduct research directed toward a better understanding of our total environment and to examine all avenues of approach to food production; (2) develop new and superior plants and animals adapted to arid and semi-arid environments; (3) intensify the search for better and safer agricultural chemicals including fertilizers, insecticides, and weed control agents; (4) improve the techniques for mechanization and the adaptation of new technology; (5) improve the knowledge of the basic resources—land and water—and the understanding of so-

cial, political and economic systems as they relate to food production; and (6) intensify the search for alternative sources of food, such as the sea, micro-organism production from petroleum, and better use of the total biomass.

In the broad area of social, political, economic, and humanitarian sciences, for example, great contributions can be made through investigations of (1) sociological behavior of humans in dry lands and the various factors influencing such behavior; (2) the effects of dry lands in the evolutionary development of man, various human cultures, modern and ancient religions, nomadism, territorial attitudes and behavior; (3) economic and business elements of the world's dry lands, labor forces, utilitarian natural resources of these lands, including ways that they may contribute to the economy and development of regions, nations, the world; (4) ethnographic and ethnological patterns; and (5) learning patterns and related factors affecting man.

Examples of activities which might be pursued in the arts and humanities include: (1) the documentation and appraisal of the total categories of dry land art; (2) comparison of the similarities and the differences of these artistic works; (3) investigations as to whether these regions have yielded special art forms or distinctive music and why; (4) study the linguistic patterns and language capabilities of the inhabitants of the world's dry lands; and (5) research into the existence of possible exotic philosophies of the people inhabiting these lands and the reasons for these philosophies.

Students of the natural sciences and engineering should apply themselves to the investigations and studies of (1) the natural resources of such regions, including ways and means of utilizing them humanitarily; (2) natural arid and semi-arid biota, their characteristics, their utilization, and their improvement; (3) conservation, restoration, improvement, and utilization of the lands themselves; (4) animal behaviors and their applications to man's utilization of dry lands; (5) conservation and utilization of water; and (6) factors controlling climate and possible means of modification.

Medical and paramedical sciences could, for example, emphasize studies of (1) the physiology of animals adapted

to arid or semi-arid climates and the application of this knowledge for the benefit of mankind; (2) medical aspects and problems of living in dry lands; (3) diseases exotic to these lands and their control; and (4) survival methods.

Another major role of the universities is to educate properly young people to cope with the complicated problems of the world—today and tomorrow. Our responsibility here is not only to educate the best students for sophisticated jobs in science, industry, business, and education, but to plan and participate in certain activities of technical and vocational training. Universities must do a better job of assessing the needs of the developing countries and shaping a portion of our educational programs specifically to meet those needs.

A third major role of our universities is that of public service, including continuing education. This means increasing involvement in adult education with attendant short courses to update technical personnel and to exchange programs with universities of other countries.

Universities have the responsibility of insuring careful coordination and integration of these and a multitude of other activities for the benefit of mankind. Because of the importance of the arid and semi-arid lands to mankind, past, present, and future—universities have a particular responsibility for developing, documenting, transmitting and applying knowledge regarding the arid and semi-arid environments of the world.

Texas Tech has dedicated itself to these objectives in dealing with the problems of arid and semi-arid regions of the world.