

UNIVERSITY OF ARIZONA

Arid Lands Town Hall Summary

October 6, 2015

The prominence of arid land research at the University of Arizona (UA) has diminished over the past 10 years for a variety of reasons. To reemphasize the UA's considerable past and on-going achievements in research centered on the world's arid environments, the UA Office of Global Initiatives (OGI) and the non-profit International Arid Lands Consortium (IALC) housed in OGI, organized the first in a series of Town Halls to address this topic (Appendix 1). The ultimate objective is to reconnect and energize the "arid lands" research community at UA, and to foster interdisciplinary collaboration that addresses the challenges which confront drylands and promotes cooperation with other research institutions in the US and Middle East.

An Arid Lands Town Hall was convened on October 6. After lunch and introductory comments, a group of 32 participants (Appendix 2) broke into three working groups to identify the major challenges that confront the world's arid lands. The following is a summary of those discussions.

Basic Conditions

Resource Scarcity. The arid lands are defined by a general paucity of rainfall and a consequent temporal and geographic scarcity of resources to support ecosystem function, agriculture, and human habitation. Inter-annual climatic variability further complicates arid lands management: arid climates have the most extreme rainfall patterns of any other.

Pressures

Climate Change. Projected climate changes do not favor most parts of the world's arid lands. While some places may experience some increases in rainfall, decreased rainfall and increased temperatures and rainfall variability will pose serious challenges in most arid regions.

Population Growth and Migration. Global human population is expected to double over the next 30 years. This will result in severe pressure on the productive capacity of existing agricultural lands in all regions and likely push production into marginal areas, including arid lands. Declining economic opportunities in arid lands are already driving the migration of rural populations to urban areas. Moreover, the political unrest that seems to be endemic to the arid parts of the arid Middle East is creating very large numbers of refugees seeking asylum in neighboring areas that are poorly suited to accommodate them socially, economically, environmentally, or politically.

Globalization. Extension of the global economy into every corner of the world fuels the impetus to exploit land, water, and mineral resources wherever they can be found. National and international differentials in political and economic power make it difficult for the citizens of marginal arid lands to protect their livelihoods, cultural heritage, natural resource base, and economic integrity.

Research Issues

A primary set of research challenges must seek to better understand the forces suggested above. Their scope, dimensions and their potential impact compel basic research that will help us understand what our challenges might be.

Beyond understanding the nature of these basic forces, we know that they will unfold at different rates and intensities over time, shaped by local and regional conditions – biophysical, economic, political and cultural – suggested below. These conditions all reflect and are constrained by the underlying character of the arid environment: general resource scarcity, as well as temporal and geographic variability.

Biophysical Limits. Ecosystems function within biophysical “envelopes” that are defined by water, vegetation, and soil resources that can be disrupted by climate variability, human use intensity, and periodic natural catastrophes (e.g., fire, flood). Changes in any of these can push an ecosystem beyond a threshold or “tipping point” into another ecosystem “state” that presents a whole new set of opportunities and constraints. Another physical factor which determines the ability of land to sustain wildlife is landscape connectivity, or the spatial contiguity of uninterrupted landscape. Discovering these thresholds permits an understanding of the resilience of systems – their ability to resist and recover from change – which is critical to developing sound management strategies to avoid long-term resource degradation.

Human Livelihoods. Human livelihood systems in arid lands are also constrained by resource scarcity and variability. Food and water security, public health, and access to energy define the “envelope” within which livelihoods must operate to meet basic needs. Because the individual strategies that might be pursued to satisfy these needs – cropping, livestock grazing, fishing, resource extraction (e.g., fuelwood production, mining) – are temporally and spatially variable, livelihoods in arid lands tend to be more diverse and interlinked than other regions. The degree to which these livelihood systems can adapt to variability and change is the measure of their resilience and likelihood of long term stability and success. Understanding the nature and complexity of livelihood systems is essential in determining approaches to strengthen them.

Socio-Political Dimensions. Beyond biophysical constraints, livelihood systems operate in a nested hierarchy of social, economic, and political environments. Livelihood systems and communities in arid lands are perhaps more sensitive to these considerations than other environments. Economic and political power is likely to be concentrated in locations that are more favored in access to resources or transportation – such as river valleys, oases, or coastal settings. This may leave more remote areas at a disadvantage with respect to political and economic equity and justice. Moreover, as a consequence of the reliance on a scarce and variable resource base, individual and community governance over resources is a universal concern. Because livelihood systems may extend over multiple political jurisdictions, boundaries and scale of political control may also be considerations in maintaining viable livelihood systems. People living in these regions have learned to navigate their inherent biophysical limits, developed viable livelihood technologies, and operate within their peculiar socio-political constraints. The resulting indigenous knowledge is often overlooked or undervalued. Capturing existing

knowledge that has evolved over time is, of course, prudent and forward thinking, but also essential to developing an understanding of how resources are perceived and the goals that are pursued in their management. This outlines a pathway on which to proceed to improve local conditions that build on tradition and further local goals.

Each of the broad “issues” outlined above describe general research domains, in their own right. The ways in which they relate constitute interdisciplinary research areas, all of which have been pursued in various ways at the UA, in various settings around the world. The ways in which all of these will respond to the pressures identified – climate change, population growth and migration, globalization – provide a rich arena for interdisciplinary, international research in the future.

University of Arizona Strengths

Beyond its disciplinary strengths – particularly in water, climate and anthropological studies – the UA has well-documented advantages to address these issues. It is located in an arid region and has devoted more than a century of effort to understand and manage these resources in support of its Land Grant mission. In addition to the rich and varied natural systems in which it is situated, UA has strong ties to native peoples in the US and Mexico. Because it is located along an international border – with all its attendant complexities – it has a long experience in dealing with issues associated with migration. The UA has long standing relationships with other arid lands research institutions in the US and around the world (e.g., IALC).

UNIVERSITY OF ARIZONA
ARID LANDS TOWN HALL
Rincon Room, Memorial Student Union
12 noon - 2:30PM, October 6, 2015

As a land-grant institution located in Arizona, the use and management of arid lands has been a key element of the University of Arizona's mission from its founding in 1885. Almost 60 years ago, in response to increasing world-wide interest in the development of arid lands, the University of Arizona created an interdisciplinary Committee on Arid Lands Studies to harness the diversity of experience that existed across campus to deal with the problems of arid lands regionally. In 1964, the success of this informal group led to the creation of the Office of Arid Lands Studies as an organized, interdisciplinary research unit to characterize the arid lands of the world. To address growing academic interest in this general area, the interdisciplinary doctoral program in Arid Lands Resource Sciences was established in 1968.

The community of "arid lands" students and researchers at the University of Arizona has always been large, diverse, and active. Over the past decade, the institutional focus for the community has dissipated as a consequence of predictable departures of individual faculty and students, the inevitable forces of social entropy, but also as the fallout of budget cuts and administrative reorganization. Yet, there are still many students and faculty who have concentrated their energies and attention on arid lands in Arizona, the desert landscapes of North America, and comparable regions around the world.

Given the high level of interest and expertise in arid lands within the University of Arizona, and the increasingly large role that arid lands will be called on to serve in the global economy in the immediate future, it is time to bring together the "arid lands" community at the University of Arizona so that we might (1) build a collective identity, (2) identify the major challenges that confront global arid lands, (3) define our individual roles relative to these challenges, (4) foster collaborative connections among us, and (5) clearly articulate our expertise and objectives so that we might more successfully pursue research and education opportunities that may arise.

To this end, we will host a half-day town hall sponsored by the International Arid Lands Consortium¹ to allow our community to deliberate these issues. The outcome would be (1) an introduction to the legacy of arid lands research and training that belongs to the University of Arizona, (2) a statement of commitment and the areas in which we wish to focus in the future, (3) a renewed sense of the

¹ Established in 1990, the IALC is a non-profit 501(c) (3) organization created to foster collaborative arid lands research and demonstration projects between the U.S. and countries of the Middle East. Housed at the University of Arizona, it consists of six US universities and institutes (University of Arizona, Desert Research Institute-Nevada, University of Illinois Urbana-Champaign, New Mexico State University, South Dakota State University, Texas A&M University-Kingsville), The Robert B. Daugherty Water for Food Institute at the University of Nebraska, and management agencies from Israel, and Jordan (Jewish National Fund, Higher Council for Science and Technology – Jordan).

community and the members who compose it, and (4) proposed actions that we will pursue in the near-term (over the next three years) and over the long-term (from three to ten years out).

Name	Title	Department
Jeremey Weiss	Climate and Geospatial Extension Scientist	School of Natural Resources and the Environment
Laura Lopez Hoffman	Associate Professor	Udall Center for Studies in Public Policy
Chris Scott	Professor and Distinguished Scholar	Udall Center for Studies in Public Policy and School of Geography & Development
Kamel Didan	Research Associate Professor	ECE & ABE
Abd salam El Vilaly	Alumnus	Arid Lands Resource Science program
Katherine Morrissey	Associate Professor	Department of History
Greg Barron-Gafford	Assistant Professor	School of Geography & Development
Diane Austin	Professor and Director	School of Anthropology
Valerie Trouet	Associate Professor	Laboratory of Tree-Ring Research
Stuart Marsh	Director	School of Natural Resources and the Environment
Stefanie Herrmann	Associate Research Scientist	Office of Arid Land Studies
Craig Rasmussen	Associate Professor	Department of Soil, Water and Environmental Science
Thomas Meixner	Professor & Department Head	Hydrology and Water Research
Gregg Garfin	Associate Professor & Associate Extension Specialist	Climate Science, Policy & Natural Resources
Larry Fisher	Research Professor	School of Natural Resources and the Environment
David Breshears	Professor	School of Natural Resources and the Environment
Audra Elisabeth El Vilaly	PhD Candidate	School of Geography & Development
Kevin Fitzsimmons	Director, International Initiatives	Department of Soil, Water and Environmental Science
Randy Burd	Assistant Vice President, Program Innovation	Global Initiatives
Justine Schluntz	Project Manager	Global Initiatives
Ash Scheder Black	Director, Technology	Global Initiatives
Chuck Hutchinson	International Arid Lands Consortium	School of Natural Resources and the Environment
Andrew Comrie	Senior Vice President and Provost	Academic Affairs
Barbara Hutchinson	Managing Director, Global Rangelands Initiatives	School of Natural Resources and the Environment
Istvan Molnar	Associate Professor	School of Natural Resources and the Environment
Mike Proctor	Vice President	Global Initiatives
Jennifer Columbus	Program Development Associate	Global Initiates
Joel L. Cuello	Professor, Biosystems Engineering	Global Institute for Strategic Agriculture in Drylands
Donald Slack	Professor	Agricultural and Biosystems Engineering
Kim Patten	Associate	Research and Discovery

Ivy Pike
Mamadou Baro
Christine Scheer
Mulunett Yitayew
Cecile McKee
Karletta Chief
Jonathan Overpeck

Associate Professor
Associate Research Anthropologist

School of Anthropology
School of Anthropology

Key:

Pre-Registered and Attended
Pre-Registered and No Showed
Walk in

Total # Guests at the Event: 32

At 2pm Session: 14