

## **Grand Challenge #3: Environmental Protection & Sustainability: What's Our Role?**

In the first half of this century, the world's population will grow to around nine billion. Global demand for food, feed and fiber will nearly double while, increasingly, crops may also be used for bioenergy and other industrial purposes. New and traditional demand for agricultural products will thus put growing pressure on already scarce agricultural resources. While agriculture will be forced to compete for land and water with sprawling urban settlements, it will also be required to serve on other major fronts: adapting to and contributing to the mitigation of climate change, helping preserve natural habitats, protecting endangered species and maintaining a high level of biodiversity. As if this were not challenging enough, in most regions fewer people will be living in rural areas and even fewer will be farmers. They will need new technologies to grow more from less land, with fewer hands.

Climate change is expected to affect agriculture and forestry systems through higher temperatures, elevated carbon dioxide concentration, changes in rainfall, and increased weeds, pests and diseases. In the short term, the frequency of extreme events such as droughts, heat waves, floods and severe storms is expected to increase. Agricultural and food production in many developing countries are likely to be adversely affected. This will be especially true in countries that have low incomes and a high incidence of hunger and poverty and are already highly vulnerable to drought, flooding and cyclone.

Many of the water systems that keep ecosystems thriving and feed a growing human population have become stressed. Rivers, lakes and aquifers are drying up or becoming too polluted to use. More than half the world's wetlands have disappeared. Agriculture consumes more water than any other source and wastes much of that through inefficiencies. Climate change is altering patterns of weather and water around the world, causing shortages and droughts in some areas and floods in others.

Meanwhile, public consensus on the steps forward are illusive. Nearly half of Americans (48%) say the U.S. government is doing "too little" to protect the environment, while 16% say it is doing "too much" and about a third (34%) say it is doing "about the right amount."<sup>1</sup> There is deep disagreement on defining the problems, let alone solutions. Even using the words "environment" and "sustainability" have become politically and ideologically loaded. The incoming U.S. administration has promised to cut environmental safeguards and regulations in favor of business interests, and many states are implementing similar policies.

Land-grant universities are strategically positioned to explore and implement innovations for our environmental problems that can help move society closer to viable solutions. Land-grants can provide expertise and capacity that will complement and improve the outcomes from the work of governmental agencies, the private sector, and stakeholder groups. Bold, concerted action is required to galvanize approaches that generate meaningful progress in solving our nation's and the world's environmental challenges.

### **How will the land-grant system respond to this challenge?**

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<sup>1</sup> McCarthy, Justin. April 9, 2015. "About Half in U.S. Say Environmental Protection Falls Short." Gallup.