Carl Pray: Notes for Panel Presentation on U.S. Benefits Study August 8, 2018

One important pathway from USAID investments to benefits for U.S. farmers and consumers is knowledge and germplasm developed by USAID funded research programs in CGIAR institutes and National Agricultural Research Systems leads to the development of improved crop varieties for U.S. farmers from multinational seed companies. I will illustrate this pathway with two examples: Hybrid rice and drought tolerant corn.

Hybrid rice

Ricetec was founded in 1988 based on hybrid rice technology developed in China by Dr. Yuan Longping

First hybrids introduced 2000; 13% of US rice farmers outside of California used hybrids and hybrids that also include herbicide tolerance in 2006 and 34% of US farmers according to USDA
[https://ageconsearch.umn.edu/bitstream/205458/2/AAEA%20presentation%202015%20RMB2.pdf](https://ageconsearch.umn.edu/bitstream/205458/2/AAEA%20presentation%202015%20RMB2.pdf)

Benefitted from long informal connections with IRRI hybrid rice program. Have been part of IRRI’s hybrid rice consortium at least since 2009. Current consultant to CEO worked in IRRI and with IRRI during his career in the Chinese research system.

Drought tolerance/water use efficiency – Pioneer

Pioneer Optimum Aquamax  2011 release – 10 million acres 2014

Main research programs on drought were in US but research stations in Chile, Mexico and Zimbabwe also contributed to their drought tolerance program. Pioneer’s Harare Zimbabwe research station started in 1988.

CIMMYT’s drought tolerant research is just down the road from Pioneer’s research program. There was informal collaboration with CIMMYT’s drought tolerance program that had been going on for 30 years

The research consisted of selection for improved root systems and improved silk emergence under stress. Trait was not developed through genetic engineering but it is one characteristics of Pioneer’s GMO corn package that is sold in the U.S.
[https://www.pioneer.com/CMRoot/Pioneer/US/products/seed_trait_technology/see_the_difference/corn_drought.pdf](https://www.pioneer.com/CMRoot/Pioneer/US/products/seed_trait_technology/see_the_difference/corn_drought.pdf)

In addition, Pioneer has had and continues to have many collaborations with CIMMYT in Mexico and elsewhere for basic research as well as traits like nitrogen use efficiency.

Drought tolerance Monsanto – developed trait for Genuity DroughtGuard through genetic engineering. It was first sold in 2013 it was sold commercially

Monsanto wanted to give this trait to African farmers. CIMMYT and five African government research programs, Monsanto worked together under the Africa Agricultural Technology Fund (AATF) to develop drought tolerance hybrid maize for African farmers. The project was called Water Efficient Maize for Africa (WEMA) and financed by Gates Foundation and USAID.
Monsanto provided their trait and elite maize germplasm, CIMMYT provided its drought tolerant lines and the African governments provided their germplasm scientists and research stations. AATF owns the property rights on the DT trait and manages the consortium.

The benefit for U.S. farmers will be improved maize hybrids for regions increasing prometon water shortages. Monsanto gets knowledge of how their DT trait works and new information about the value of Monsanto’s elite germplasm and CIMMYT’s germplasm works under different drought, soil and ecological conditions and then can use this in their breeding and biotech programs to improve their maize hybrids for US farmers.

Caveats. It will be difficult to get numbers. Information about role of different sources of germplasm that were used in commercial varieties is proprietary.