Conference: Agricultural Productivity and the Environment

1:00 – 1:30 pm, Wednesday, March 11

Welcoming Remarks: Mary Bohman

Welcome…

I'd like to extend a warm welcome to all of you who are attending this conference on agricultural productivity and the environment. We are especially grateful to those of you who travelled from out of town, including the several participants from overseas. I think **Eric Sheng** from **Canberra, Australia**, gets the 'award' for having travelled the farthest.

The purpose of the conference…

We are holding this conference in order to improve our understanding of how technological change in agriculture is affecting natural resources and the environment.

- This conference brings together a multi-disciplinary group of researchers and scholars who are studying the interactions between agriculture and the environment and how to quantitatively measure and value them.
- We hope the conference will stimulate fruitful discussion around these multi-disciplinary perspectives.

Economists typically measure technological change through some kind of productivity index, like crop yield or total factor productivity. From these measures it is abundantly clear that agricultural technological change has produced large welfare gains the world over – from higher returns to farm labor and assets to lower food prices for consumers.

But such gains in productivity also have implications for environment resources, and there is considerably more uncertainty as to whether these effects are, on net, positive or negative.

Take land use changes, for example. Conversion of forest and grassland to cropland has been associated with large emissions of greenhouse gasses and losses in biodiversity.

- Improving productivity on existing agricultural land is seen as a way of reducing pressure to convert new lands to agriculture. But if the technologies that led to this higher agricultural productivity could also be applied to land currently in forest, it could tilt the profit balance in favor of using that land for crops instead of trees, and lead to further deforestation.
- This is a point raised by Derek Byerlee in this morning's Forum discussion and will be revisited tomorrow in this conference.

Evidence is accumulating that in many cases productivity growth in agriculture has been associated with savings of environmental resources.

- In many countries, especially high-income ones, rates of growth in agricultural production have exceeded rates of growth in use of natural or environmental resources in agriculture, like greenhouse gas emissions, water withdrawals, and indeed land use itself.
- In other words, the resource-intensity (amount of resources per unit of output) of agricultural production has been declining.
- This may not be true everywhere and for all resources; nor does it mean that resource intensities are declining fast enough to assure a sustainable future. There is where valuation of these tradeoffs between agricultural and environmental good and services comes into play.
- Since the market doesn't usually value environmental services fully, if at all, there are few incentives for producers or consumers

to conserve them. Valuing environmental resources is essential for rational policy discussion, but is difficult to do in agriculture, as these values may vary widely over space and time. Steve Polasky, in this morning's Forum, described some of the exciting work he and his colleagues have been doing to merge economic and ecological perspectives in accounting for ecosystems services in agricultural production systems. I'm looking forward to his further remarks on this issue this afternoon.

This conference is timely. There is growing interest (in economist's parlance, 'demand') for robust, scientifically-sound, and easy-to-measure indicators of agricultural sustainability. Sustainability, of course, is a rather loaded term that contains not only environmental but also social dimensions of food and agriculture. But the environmental issues are large and complex enough to warrant the focus of this conference.

In the international development arena, this demand has been on vigorous display in the debates surrounding the UN "sustainable development goals."

- There is also considerable interest among corporate agri-business. Many food companies are actively engaged in setting sustainability targets not only for their own internal operations but also for how they source their agricultural commodities -- Jerry Flint from Dupont described some of the these initiatives in his remarks at the Forum this morning.
- Environmental sustainability is also a priority in U.S. agricultural policy. USDA policies and programs to conserve environmental resources date back to the Dust Bowl of the 1930s, and extend to present-day to concerns with water quality and greenhouse gas emissions. But as I think the discussions over the next couple of days will make clear, this issue of sustainability is hard to separate from productivity.

- And here economic models can make a major contribution. They show how imposing or tightening a resource constraint on one part of the agricultural system, if associated with lower productivity, can exacerbate resource degradation in other parts of the system, even in other continents. We live in an inter-connected world.

About the conference sponsors…

The issues taken up by this conference are important for the Economic Research Service. As the conference brochure states, ERS *is charged with informing and enhancing public and private decision making on economic and policy issues related to agriculture, food, the environment, and rural development.* Clearly a scientifically sound understanding of the potential interactions between technological and structural changes in agricultural and the use of environmental resources is essential to this mission.

I would also like acknowledge and thank our co-sponsors of this conference, Farm Foundation and the Global Harvest Initiative. Like ERS, Farm Foundation strives to *provide objective information and foster a deeper understanding of issues critical to the future of agriculture, food systems and rural communities*. I'd like in particular to thank Farm Foundation President Neil Conklin and his colleagues for helping to arrange much of the logistics for the conference, including travel arrangements for out-of-town participants. The Global Harvest Initiative brings a private-sector voice to how *policies can improve global food and nutrition security by accelerating agricultural productivity gains while conserving natural resources*. I'd like to thank GHI Executive Director Margaret Zeigler and her colleagues for their support for this conference. Finally, I'd like to thank Keith Fuglie and all the other ERS employees – I see several are on the conference program - who have worked to make this conference happen.

I wish you a successful and fruitful conference.