Agricultural Productivity Seminar: Notes

Original seminar delivered by Professor Peter Hazell and Professor Amir Kassam, with further discussion led by Professor Stefan Dercon

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Introduction

This session, the second in a series of professional development seminars on the role of agriculture in development – organised through Evidence on Demand and delivered at DFID – saw agricultural economist Professor Peter Hazell and agroecologist Professor Amir Kassam tackle differing aspects of agricultural productivity. Further discussion was led by DFID's Chief Economist, Professor Stefan Dercon.

Peter Hazell is a distinguished agriculturalist and agricultural economist. Currently independent, he spent much of his career as a research economist at the World Bank and the International Food Policy Research Institute (IFPRI), before becoming a visiting professor at Imperial College and the School of Oriental and African Studies (SOAS).

Amir Kassam is a Visiting Professor in the School of Agriculture, Policy and Development at the University of Reading. He was awarded an OBE in the Queen's Honours List in 2005 for services to tropical agriculture and to rural development, and is an adviser in sustainable agriculture intensification with Food and Agriculture Organization (FAO), Rome, and with The Aga Khan Foundation.

Stefan Dercon is the Chief Economist of DFID and Professor of Development Economics at Oxford University. His research interests include risk and poverty, the foundations of growth in poor societies, agriculture and rural institutions, migration, political economy, social and geographic mobility, and measurement issues related to poverty and vulnerability.

Targeting Agricultural Productivity

Professor Peter Hazell

Professor Hazell opened with the assertion that agriculture is back on the development agenda. One reason for this return to prominence is that for many poor countries, particularly in Africa, the alternatives have not worked. Rather, poverty remains widespread and the vast majority of people remain trapped in low-productivity agriculture. The recent surge in food prices has not helped poor people either; but raised prices seem sufficiently entrenched that they have turned agriculture into an international business proposition. While some donors may still be debating the relative merits of investing in agriculture, private industry is piling in.

According to Hazell, we currently have two competing agendas with regard to agriculture. On the one hand, donors and many countries have signed up to a New Alliance for Food Security and Nutrition that focuses on the poor and food insecure. This food security agenda is focused on smallholders who are typically net buyers of food. At the same time, however, agribusiness is investing large amounts in the development of agricultural value chains, and to a far smaller extent, in farming itself. This business agenda is linked to commercially oriented farms of all sizes.

Hazell suggests that these competing agendas could prove compatible provided that the business agenda links to lots of commercially oriented small farms, pulling them out of poverty; and provided that the food security agenda also targets commercially oriented small farms. The diversity of small farms today means the landscape is very different to that of the Green Revolution era. Hazell presented his typology of small farms – broken down into three types:

- **Market-oriented small farms** which are either successfully linked to commercial value chains already, or which could be if they had some targeted assistance. These tend to be the bigger small farms – more like the small farms of the Green Revolution era (that were more than twice as large as the small farms of today), and they tend to be located in areas with better market access.
- **Smallholders in transition** who have diversified already into off-farm income, and who are at various stages of moving out of farming. Most of these farmers will leave farming; it is just a question of how and when.
- **Subsistence-oriented small farmers** who are marginalised people, trapped in low productivity farming and poverty because of things like ethnic discrimination or being located in areas with very limited agricultural potential and limited access to markets.

The relative importance of these groups varies widely from region to region. In a lagging region in a lagging country – the worst of all possible worlds, and a situation all too prevalent in Africa – the number of market-oriented farms is very low; there are a lot of transitional farmers trying to get out while lack of off-farm opportunities prevents them from doing so; and an even greater number of subsistence farmers trapped in low productivity farming. At the other extreme, in a dynamic region in a dynamic country – such as some of the coastal areas in China – there is a great number of market-oriented small farms producing lots of high value yields for the cities; there are also a lot of transition farmers being pulled out of agriculture into much better-paid opportunities in the industrial areas; and only a very small group of subsistence farmers – often the elderly or the infirm. There are lots of other regions, of course, that fall somewhere between these two extremes.

Each of these three groups needs different forms of assistance. Market-oriented farms need support with farming as a business. This means assistance with: access to better

technologies and natural resource management practices; organising them into groups that can better access markets, seeds, fertiliser, finance and insurance; incentivising large agribusiness to link with small farms (e.g. through contract farming); securing land rights and development of efficient land markets; building resilient farming systems; encouraging entrepreneurship; empowering women farmers; and safety nets.

Meanwhile, transitional farmers need support with stepping out of farming. This means assistance with: training and support for non-farm activity, including development of small businesses; access to better technologies and natural resource management practices; securing land rights and development of efficient land markets; encouraging entrepreneurship; empowering women; empowering vulnerable groups; and safety nets.

And subsistence farmers need what can essentially be termed social protection. This means safety nets and transfers plus subsidised inputs for their own food crops, alongside assistance with: access to better technologies and natural resource management practices; securing land rights; building resilient farming systems; empowering women; empowering vulnerable groups; and support for non-farm diversification. Hazell argued that investing in improving on-farm productivity for subsistence oriented farms may be more cost effective and sustainable than regular cash transfers, but that needed to be determined on a case by case basis.

Hazell concluded by asking what all of this means for the livelihoods approach, arguing that it is still a very useful paradigm for looking at subsistence farms and transition-oriented farmers. However, it is not in his opinion, such a useful paradigm for looking at market-oriented small farms though. Here, a much more focused business support agenda is needed. More funds must be directed at improving value chains; helping small farmers to link to those value chains; and incentivising bigger farms and agribusineses to link to them.

Sustainable Production Intensification: The Role of Conservation Agriculture

Professor Amir Kassam

Professor Kassam began by introducing the topic of conservation agriculture, a movement which has been growing over the last 20 years in response to a set of commonly agreed challenges we're facing at both local and international levels. In essence, this response is to move away from the productivity approach, which has been promoted since the Second World War, towards a more sustainable approach to intensification. Intensification must be our goal, he says, but we must make it happen sustainably, while also rehabilitating the resource base we have already damaged.

One example of this kind of response to food security and related challenges is FAO's Save and Grow – a new paradigm of sustainable production intensification. This approach does not reject everything that is known from the past, but rather organises the engine of production differently in order to achieve a better performance. Furthermore, this approach and the architects behind it – including Kassam – accept that there is no single solution, but that all productivity solutions need to be based on ecologically sustainable production intensification principles. The key is to harness the whole ecosystem and enhance the natural capital and the flow of ecosystem services, rather than fighting or degrading nature.

According to Kassam we have been aware of the negative externalities of the productivity approach since at least 1979, but we now have a paradigm that allows us to do it better. Increasing land productivity is still at the core of this approach, but we want it to be done

efficiently – both financially and in terms of natural capital. Resilience is also integral to the conservation agriculture approach, especially against climate change. Understanding the new approach begins with understanding that what we've been accepting as best practice is not necessarily so. The conventional productivity approach – involving regular tillage – has led to loss in soil organic matter; destruction of biological life and processes; and soil compaction and resultant erosion.

In response to this, the conservation agriculture approach recognises that agriculture must, literally, return to its roots by rediscovering the importance of healthy soil, and rehabilitating its ecosystem services. Indeed, a healthy productive soil is a complex biological system, which must be managed as such. This is true also of ecosystem health if it is to function normally and deliver the flow of ecosystem services.

Empirical and scientific evidence has shown that we've been driving our intensification on tracks that are disturbing the soil and ecosystem; and that this disturbance is getting progressively greater as farming technology develops – ploughs, for example, are now being pulled by 250 horsepower tractors, creating very high disturbance. According to Kassam, we need to be working towards no or minimum mechanical soil disturbance by seeding or planting directly into untilled soil. We also need to focus on maintenance of organic matter cover on the soil surface – using crop residues and cover crops to build soil health; and finally on diversification of species – both annuals and perennials – in associations, sequences and rotations.

Kassam stressed that conservation agriculture does not solve all problems and shouldn't be regarded as a panacea. Rather, its key principles of minimum soil disturbance, soil cover and crop diversity can be regarded as ecological foundations that, when complemented with other practices, allow for high production intensity and sustainable agriculture in all production systems. While every situation is different there is a pattern in the impacts of conservation agriculture. These can be summarised as increased yields, production and profit; less fertiliser and pesticide use; less machinery use and fuel consumption; more stable yields; climate change mitigation; and lower environmental cost. There are currently around 124 million hectares of land farmed using processes grounded in the conservation agriculture approach. Around half of this area is in the developing world while the other half in more developed countries; and the whole area is growing at a rate of around 10 million hectares per year.

Smallholder farmers in the developing world, contends Kassam, benefit from conservation agriculture through several means. These include a labour saving of around 50%; less drudgery; improved food security; better livelihood and income; as well as more stable and increased yields. Mechanised farmers also benefit through less machinery meaning a 70% fuel saving; better livelihood and income; and more stable and increased yields.

Further Discussion

Professor Stefan Dercon

Starting by reiterating that agriculture is once again high on the development agenda, Professor Dercon made the point that while 20 years of advocacy couldn't bring it back to prominence, high food prices made it happen. He then stressed that there are huge opportunities but also challenges in agriculture; and that while increased productivity is the ultimate goal – the nuances of what is meant by productivity in relation to poverty reduction and food security must be teased out.

Qualifying his next point as intentionally extreme, Dercon suggested that the scientific approach to agricultural productivity taken by Kassam risked being so focused on the land that it was blind to the actors. That is, when the resource base or the ecosystem is regarded as the most important actor, the people who need to act upon this base are often ignored – Dercon terms this the land productivity lens. He agrees with Kassam that land should be used productively and efficiently, but argues that new ways of thinking and new technologies will only lead to productive and efficient land use where they are successfully adopted by farmers. As a result, we must not forget about the economic incentives that drive such adoption.

When it comes to understanding food security, looking at agriculture through the land productivity lens is not enough, says Dercon. What matters is whether people have earnings potential or purchasing power; whether they have the entitlement to the food that is there. Put simply, we should never mix up the productivity that is necessary to increase production – land productivity – with the productivity that drives poverty reduction – labour productivity.

Dercon agrees with Hazell that recognising the heterogeneity of smallholders is essential to thinking about agricultural productivity in relation to both land productivity and poverty reduction. It is one group of smallholders – not all of them – who will drive the land productivity gains. For other groups, agriculture may act as a way of transitioning people out of poverty, or indeed as a form of social protection. With these latter groups it is simply not appropriate to focus on their contribution to global production.

What is more, says Dercon, the length of time it takes for land productivity methods to be adopted deserves attention. In the United States, it takes 30 years from the development of a high-yielding corn variety to the full capture of the economic benefit, for example. While if we look at the data from the Green Revolution: many of the gains were in place in the early 60s, but it took almost until the 90s for that benefit to feed through. Such evidence backs up the principle that what's important is not simply what these technologies are, but how we can get farmers to use them; and Dercon suggests that using an economic lens will help us understand what drives successful adoption.

In essence, a farmer is concerned with his or her livelihood. Yield is only a small part of what constitutes value to a smallholder – returns to labour and profitability are essential, too. Whether a farmer adopts a new approach or technology depends on whether it's profitable to do so. In terms of policy, Dercon concludes, this may mean that making improvements higher up the value chain – engaging in interventions to stimulate growth in the consumer base – could improve profitability for smallholders and ultimately encourage adoption of more productive and efficient land use.