

Making new farm technologies work



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► *The technologies should be applicable across agro-climatic zones and economic conditions.*

Improvements in technology-induced productivity changes are more perceptible in agriculture than in the other sectors. In the other sectors, productivity changes may alter the product itself. In agriculture, it is the inputs that change as we continue to get the same rice and wheat.

The growth in output of agriculture in recent years has been primarily on account of increases in productivity or output per acre of land. Output may be measured in monetary value or physical units. While the growth is slow, it is still remarkable that productivity improvements have been steady.

The investments in developing new seeds, new ways of operations and improvements in inputs have continued in the public and private sectors. Maintaining improvements in productivity at a rate better than 3 per cent per year has been a difficult challenge. This is indeed the target that has been set in recent years.

At a micro level, productivity improvements happen not uniformly, but by way of a significant jump. Once there is this significant jump, an effort is needed to maintain this new peak in productivity and spread the improvement, which may show up as a steady



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improvement for a while.

COTTON, MAIZE PRODUCTIVITY

The increase in productivity in the case of cotton and maize in recent times is a case in point. There has been a significant increase in the yield of these crops in the last 10 years, first as a sharp jump, and then steady improvement. These improvements have kept up the momentum of growth, however slowly, at the aggregate level. The development and availability of better seed material are the key drivers of productivity improvements in these cases.

On the other hand, the improvements in the case of wheat and rice are steady and may well be on account of improvements in the other factors, such as better use of inputs, increase in irrigation, and so on.

Undoubtedly, improvements in seeds are important in each of the crops to drive productivity initially. Availability of new varieties and seeds that raise the potential for higher output per hectare of land is the magic that changes agricultural pro-

spects dramatically. Translating this potential improvement into reality across different agro-climatic and economic conditions at the farm level has been the main hurdle in achieving better growth.

For instance, the recent *kharif* report of the Commission on Agricultural Costs and Prices points to the wide differences between the yields in the 'demonstration plots' and farmers' fields to the extent of 175 per cent in Bihar and 138 per cent in UP, both with considerable areas under rice. The differences in yields across States are equally large.

The same report also draws attention to the even-greater differences in yields across countries. In this sense, the potential to increase productivity of crops per acre of land is significant.

These facts are, of course, not unknown. Rain-fed conditions, small farms, want of capital and so on, have limited the application of better inputs and better techniques compared with the situation that prevails in irrigated and

more developed regions. Getting these less-advantaged regions and farms to adopt better technology has been the other front for agricultural policies.

TECH AVAILABILITY GAPS

The differences in productivity levels across countries are pointers to the gaps in availability of top-of-the-line technologies in agriculture today. Investments in bridging this gap need to be made, whether in the public or private sector. Public sector investments may need to focus more on making the new technologies, whoever develops them, more accessible to a much wider group of farmers.

Although the incentives remain strong for the private sector to achieve much wider adoption of its technologies, the case may be still there to reduce the cost of new technologies.

It is also likely that technology improvements may come from very small enterprises and not only the large multi-nationals. Policy incentives for local efforts to

improve productivity are also necessary. The case for public investments is even stronger when it comes to spreading more widely the already-available technologies. The diffusion of technologies appears to have as great hurdles as those in catching up with technologically advanced countries.

Food security and agricultural prosperity now depend on productivity improvements in agriculture. Incentives are needed both for creation of technologies that lead to quantum jumps in productivity, and for steps that lead to adoption of these technologies far more widely than seems to be the case now. Catching up with the leading regions and better yields is a goal that the other regions must pursue. For those who create new technologies, the global frontier remains distant. Food security will require investments in technology creation and adoption.

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