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Farm Inputs, Extension Services and the Adoption of New Farming Practices

The adoption of technology and other innovations is the basis of economic growth. This is true for all industries and nations. For example, during the 20th century in the UK, total GDP increased nearly eight times but total hours worked actually declined. There is no other way to explain this growth except through new technologies that increase productivity.

The famous economist and the founder of innovation economics, Joseph Schumpeter, considered several forms of innovation and these are highly relevant in the context of smallholder producers in Pakistan (Schumpeter, 1937). New products and services are commonly recognised as innovations but new production methods are also a form of innovation. In addition, Schumpeter considered selling to new markets or sourcing inputs from new supply channels as other forms of innovation. Importantly, innovation can be completely novel or simply new to the business (an adoption of innovation from elsewhere).

In this analysis of survey data from nearly 850 smallholder producers from Pakistan, we show that adoption of technology, new methods of production (grading) and accessing new markets through distribution channels are significantly correlated with higher levels of profitability.

While these innovations are most important for improving the profitability of farmers in and out of sample, there is a complication that farmers who don't deploy these methods are not readily able to access information about how to perform these practices. Our results show that the most profitable practices are those that farmers are least aware of.

The clear implication for policy is to focus on the diffusion of profitable practices.

What practices are associated with higher farm profitability?

In the survey, we asked farmers about the factors that affect the profitability of their farms. Energy cost, fertilizer prices and decrease in sale price of produce were cited as factors that have an important bearing on profitability.

We also asked farmers about how satisfied they are with the prices of inputs and unsurprisingly, most of them were dissatisfied.

Most of these factors are beyond the control of farmers and to recover the profit margin they need to find ways to reduce costs, improve farm productivity or to get higher prices for their produce.

When we subjected the survey data to econometric analysis to model the relationship between farming practices and profit per acre, the following relationships were discovered.

- Farmers who grade their fruit and vegetable produce earn significantly higher profit than those who do not grade them.
- Direct marketing strategies substantially increases profit of the farmers.
- Using improved seed varieties and efficient irrigation systems increases farm profits.

Our survey results also show that farmers are not frequently adopting the most profitable farming practices. The only exception is new seed varieties that are adopted by 53% of farmers. Grading of fruit and cereal was rare in the sample and new marketing practices were reported by only 7% of farmers. Surprisingly, the introduction of improved irrigation

methods was reported by a very low 8% of farmers.

These results show that practices with high profit potential are not being adopted and this can be the basis for an important policy initiative to rectify this situation.

How do farmers find out about better farming practices?

The diffusion of improved farming practices is a major topic of interest for agriculture policy makers. Typically, governments develop extension services to educate farmers on new farming methods but other sources of information such as media, input suppliers, buyers and other farmers are also significant. In the survey we asked farmers about their awareness of sources of information about improved methods.

About one-third of farmers were aware of programs on television or radio that provided information on farming practices. This indicates that these programs have good penetration into the smallholder farmer groups in Punjab. Many farmers have also visited demonstration farms and their proportion is similar to those who knew of farms in their area. When farmers are aware of demonstration farms that are nearby they tend to visit them.

Farmers rarely received advice on the high profitability practices that we identified in the survey. Information on seed gradation, produce gradation and irrigation methods was being received by less than 15% of the farmers.

It is possible that when farmers do receive advice, they do not receive it on the practices that have the most important influence on profitability. More analysis is required here but the clear implication is that information channels and extension services need to focus more on marketing and produce value adding. Improving productivity through better irrigation and seed input is also important.

Are extension services effective?

In addition to a mismatch between the information and training that farmers are given and the most profitable practices identified above, we also note that government extension services are not optimal from the point of view of farmers. In the survey we asked farmers about their satisfaction level with the extension services. In all the districts, over one-half of the sample respondents were dissatisfied or highly dissatisfied with the extension services.

Policy conclusions and new strategy for extension services

The analysis of the farm survey data shows that some farm practices are highly correlated with improved farm profit, but promotion of these practices to other farmers is less than desirable.

Farmers appear to have a preference for seeing new practices and technologies in action. If they are close to a demonstration farm then they use it and similarly if a neighbour uses modern practices they are also likely to adopt them.

The extension services in their present form are highly ineffective. However, many farmers are using electronic media to improve their knowledge base. It is recommended that a pilot project of using SMS, TV and radio may be initiated to direct farmers to the demonstration sites or 'lead adopter' farmers.

Given that adding new parts to the value chain (removing intermediaries) and other market orientated practices such as grading are associated with higher profit, there is also support for the development of farmer groups that can do this marketing on behalf of farmers.