Travelling facts: A perspective from Indian agriculture

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2013-1-7

Studying the Tamil Nadu Precision Farming Project, Peter Howlett and Aashish Velkar find that technology transfer occurs when facts associated with the process travel well.

Our recent book chapter "Technology Transfer and Travelling Facts: A Perspective from Indian Agriculture", was motivated by two broad questions: how is knowledge transferred from academia to non-academic spheres and how well do the technical facts travel? To assess these questions we studied a particular extension education programme in Tamil Nadu, south India. The 'Precision Farming Project' (TNPFP) was sponsored by the state Government of Tamil Nadu and the Tamil Nadu Agricultural University (TNAU) and operated between 2004 and 2007. The programme involved scientists from TNAU providing 400 farmers, from two impoverished districts, with drip-irrigation and associated technologies, plus instruction on how best to use the technology and monitoring of its use by the farmers in the scheme. The technologies revolved around water- and labour-saving drip-irrigation methods, but crucially also involved fertigation methods (using water soluble fertilizers), community nurseries and reduction in pesticide use, and were complimented by the formation of farmer associations, the grading and classification of produce, etc.

Our focus was on evaluating the effectiveness of travel and in particular in establishing how well and to what extent the agri-technologies traveled. The empirical base of the study involved a large primary data collection component involving over 50 in-depth face-to-face interviews. These were conducted in 2007 among both participating farmers, who were beneficiaries of this extension effort, as well as non-participating farmers, who rapidly became aware of these technologies once they were introduced. About one-third of the farmers interviewed had knowledge of precision farming before they heard about the TNPFP, either through existing demonstration schemes in other states or from newspapers and television. Some of the non-participating farmers have since adopted these technologies, either entirely or selectively. Thus, although the main part of our study concerns the farmers in the programme we will also provide some analysis of farmers outside the scheme, both those who adopted the technology and those who did not do so. The fieldwork was conducted in August 2007 and was supplemented by additional information from published statistics and other primary sources such as harvest records, sales records of fertigation equipment, etc.

We examined how specific technical facts travel directly from university scientists to the agricultural community. We also asked how the modified extension mechanism being used (of direct scientist-farmer and farmer-farmer interactions) assisted in the travelling of technical facts.

We found that initial barriers to travel had to be overcome by extensive financial assistance (80-100 per cent of initial investment). It was clear from the general tenor of the interviews that most, if not all, beneficiary farmers would not have joined the project without the generous subsidy that accompanied it. Hence, it was important that the facts that precision farming techniques came bundled with a generous subsidy and that the full benefit of the subsidy would reach the farmers did travel to the farmers.

Also, whilst a combination of the high credibility of the TNAU scientists and rigorous training and supervision ensured that there was little deviation from TNAU recommendations by farmers within the programme, subsequent travel, when it occurred to the non-participating farmers, was dependent upon demonstrable results in terms of productivity and income. Almost all of the farmers interviewed reported a significant labour and water savings as a result of adopting precision farming techniques. These savings are manifested not only in the reduced quantum of labour or water used, but also the reduced effort applied for irrigation, weeding and other soil preparation activities. Precision farming increased output obtained by the farmers by several-fold, and the average yield obtained by the beneficiary farmers was also several times that of the national average.

Considering adoption of fertigation technologies the ultimate sign of successful travel, we found that more than half of the beneficiary farmers we interviewed had already extended or were in the process of extending precision farming techniques to their non-TNFPF land at their own cost, even where it involved buying another fertigation tank. Several non-beneficiary farmers had also adopted some of the precision farming techniques, primarily owing to their positive interaction with beneficiary farmers.

This study thus shows how a successful technology transfer occurred because facts associated with the process traveled well. We found that technologies and facts about technologies travel in bundles or packages. Technical bits (i.e. scientific claims and procedures) are usually bundled with technological bits (i.e. material objects) both of which are, in turn, bundled with social and institutional bits (i.e. access to finance, supervision and support of those more knowledgeable, access to markets, etc.). Apart from the demonstration effects of 'this technology works' (a technical fact), there needed to be a transition to 'this technology works for me' (an experiential and institutional bundle of facts).

Our study further revealed the importance of trust for the travel of facts: trust in the technology being promoted, but also in the promoters of the technology. Finally, our study highlighted another institutional dimension: the importance of cooperative behaviour amongst farmers and its significance for the travel of both facts about technologies and technologies. This aspect manifests itself in institutions such as the farmer associations, which were crucial for the success of the TNPFP.

For more information on this topic, see Peter Howlett and Aashish Velkar, "Technology Transfer and Travelling Facts: A Perspective from Indian Agriculture", How Well Do Facts Travel: The Dissemination of Reliable Knowledge, Eds. Peter Howlett and Mary S. Morgan (Cambridge University Press: New York, 2011).

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