ABSTRACT

Of the many technology-based solutions proposed to overcome the various problems and challenges facing Indian agriculture, the adoption of smartphones and smartphone-based agricultural mobile phone applications (MPA) holds significant promise. Smartphones and MPA can provide credible, relevant, timely information to farmers, integrate the farm supply chain, enable farmers to connect with buyers directly, and help overcome the failure of government-organised agriculture extension services. Despite the growing penetration of the internet and smartphone in India, the usage of smartphones and MPA for agricultural purposes amongst Indian farmers has been very limited. Hence, there is a need for studies examining the adoption and impact of smartphones and MPA among farmers in India. This study is an attempt to examine the impact of (a) social networks on the adoption of smartphones among farmers, (b) an intervention of sending text messages to nudge the farmer into adopting and using an agricultural MPA, and (c) information services provided through MPA on farmers' price realisation and expenditure on farm inputs in the context of Pulivendula Mandal in the Kadapa district of Andhra Pradesh state in India. The empirical methodologies used for analysis are IV probit regression, randomised control trial and instrumental variable two-stage least squares regression. The data for empirical analysis were collected from 1006 farmers through a primary survey and collaboration with an agri-tech start-up.

The results show that social networks have an impact on the adoption of smartphones among farmers. Higher smartphone adoption among farmers' connections would reduce the chances of smartphone adoption by that farmer. Further, if a farmer is more central to a network, he/she would have a higher chance of smartphone adoption. Other key factors that impacted smartphone adoption are farmers' age and social status, the number of people in the farmers' households and owned land. Sending mobile phone text messages proved to be

effective in nudging the farmer into adopting and using agricultural MPA but not in sustaining the usage of MPA. As regards the impact of MPA usage, the results reveal a reduction of expenditure on pesticides and fertilizers incurred by the study farmers and an increase in farmers' price realisation. This implies that the inputs and price advisory service available in the smartphone based agricultural MPA was effective in reducing the input expenses of farmers and improving their price realisation.

JEL classification: Q160, Q180

Keywords: Technology adoption, Smartphone, Mobile Phone Application, Social Network Analysis, Text Messages, Andhra Pradesh, India