Using a Smartphone App to Collect Data on Smallholder Farming Systems in Zambia

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Abstract

The collection of data on time use is very challenging in smallholder agriculture, considering the diversity of farm activities and the fact that they are subject to an intra-household division of labour. Yet, accurate time use data are important, for example, to measure labour productivity. The standard approach to collect time use data are recall questions in farm household surveys. There is evidence that this approach involves considerable inaccuracies. For example, a recent study has shown that smallholder farmers in Tanzania largely overestimate their working time when asked trough post-harvest household surveys as compared to when asked on a weekly basis. Recall biases can be reduced by increasing the frequency of data collection, but this involves major costs. The use of smartphone apps can considerably reduce these costs and increase the accuracy of data collection, because an app can allow farm household members to enter data in real time. Yet, such an app needs to be simple to use, considering the high levels of illiteracy in rural areas. To meet this challenge, we developed a picture-based smartphone app called "Time Tracker." After intensive pre-testing, we applied the app with 62 households in rural Zambia. In each household, the head of the household, one spouse and one child received a smartphone for three days to record their time use and nutrition. This application was repeated five times during the farming season to capture seasonality. Altogether, approximately 2790 days of data were collected. We discuss the experience of using this app for analysing the effects of agricultural mechanisation on intra-household time use and on food consumption. In addition, we compare the time use data recorded with the app with data collected through 24-hours-recall-questions. Based on this experience, we discuss the potentials of using smartphone apps to collect socioeconomic and agronomic data on smallholder-farming systems in real time. We also suggest ways to combine data recorded by respondents through the "Time Tracker" app with built-in sensors of smartphones and external sensors, which will allow agricultural economists to use fascinating new ways of data collection in the digital age.

Keywords: Gender, labour division, labour productivity, mechanisation, nutrition, smallholder farming, smartphone app, time use, Zambia

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