

Meta-analysis of the impact of ICT-enabled farm advisory services in developing countries

Language: English or German

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Background: Digital technologies are an important pillar of agricultural transformation towards food security and sustainability. Information and Communication Technologies (ICT) in particular have received increasing attention for their potential to disseminate information to farmers in developing countries. The availability and use of ICT is increasing rapidly across the globe, raising questions on potential impacts. ICTs can act on different levels, from digital platforms for input procurement and capital access to digital advisory services and marketing channels. Within the agricultural advisory services targeting farmers, there are different communication channels including videos, interactive voice recordings, smartphone apps for extension agents, and SMS. Empirical studies found positive impacts of the provision of digital advice via ICTs on farmer's knowledge, recommended practice adoption and yields (Fabregas et al. 2019). A recent evidence gap map¹ indicates availability of substantial evidence on the impact of various digital technologies on multiple outcome dimensions. However, depending on the local conditions such as reliability on electricity and network coverage, literacy of the target group and available end-user devices, the effectiveness of different communication tools is expected to be heterogeneous. In addition, the emerging evidence assessing impacts on selected outcomes uses different methods and is always embedded in specific contexts. Therefore, it remains to be studied which factors (e.g. intervention-design/study-context) help to disentangle the heterogeneity in observed impacts.

Goal: the objective of this study is to systematically take stock of the ICT impact literature and derive more generalizable conclusions regarding the effectiveness of different digital farm advisory services. As an outcome, the study should compare the effectiveness of ICT across different interventions and across different contexts quantitatively. The decision on which concrete ICT(s) and outcome(s) to focus on is made by the student.

Approach: To synthesize the evidence of previous studies in a systematic way, the student should conduct a quantitative meta-analysis guided by state of the art procedures (Havránek et al. 2020). This entails at the minimum: 1) formulation and delineation of research focus; 2) Development of a strategy to identify relevant literature; 3) Eligibility assessment and data extraction of identified publications; 4) Quantitative synthesis of research findings using appropriate statistical models.

Expected skills and interests:

- Interest to learn methods of quantitative meta-analysis
- Previous experience with statistical software (e.g. R) is beneficial but not required

References:

Fabregas, R., Kremer, M., & Schilbach, F. (2019). Realizing the potential of digital development: The case of agricultural advice. In *Science* (Vol. 366, Issue 6471). American Association for the Advancement of Science (AAAS). <https://doi.org/10.1126/science.aay3038>

Havránek, Tomáš; Stanley, T. D.; Doucouliagos, Hristos; Bom, Pedro; Geyer-Klingeborg, Jerome; Iwasaki, Ichiro et al. (2020): Reporting guidelines for meta-analysis in economics. In *Journal of Economic Surveys* 34 (3), pp. 469–475. <https://doi.org/10.1111/joes.12363>

¹ <https://agricultureinthedigitalage.org/evidence-gap-map/>