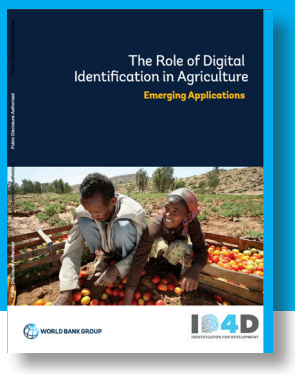
WORLD BANK GROUP

RESEARCH SUMMARY

THE ROLE OF DIGITAL IDENTIFICATION IN AGRICULTURE: EMERGING APPLICATIONS



BACKGROUND

Agricultural development is one of the most powerful tools to end extreme poverty. **Agriculture accounts for nearly one-third of global gross domestic product (GDP).** Most of the world's poor live in rural areas and make a living through agriculture. To end extreme poverty by 2030, most of the income gains will need to come from activities in rural areas, allowing smallholder farmers to earn additional income from farming and off-farm activities. **Increasing the ability of such smallholders to professionalize, generate income, and increase their profits is therefore critical to both alleviate rural poverty and increase food security.**

Smallholder families have complex livelihoods. They typically rely on income from a variety of sources, including government safety nets, subsidies, and off-farm enterprises. Lifting these families out of poverty will require solutions that address the complexities of these needs. Providing farmers with an official proof of identity, linked to a robust and responsible digital identification system, can help tackle many of the challenges they face by enabling them to **access services and subsidies, register land and other assets, and access financial services.** Identification can help smallholder farmers to transition away from informal livelihoods, allowing them to work, sell, and save. Formalizing informal farms, with the support of robust, verifiable identification, is an important starting point for achieving Sustainable Development Goal 2: *End hunger, achieve food security and improved nutrition and promote sustainable agriculture.*

In turn, governments can use digital ID systems to effectively **target input and cash subsidies to farmers;** establish reliable **systems that record asset ownership;** and **create digital farmer profiles** to improve service delivery and open up new economic opportunities for the poor.

At the same time, there are many challenges, especially as ID systems increasingly rely on digital infrastructure for identification and identity verification. Rural areas in many cases still lack the reliable mobile and Internet connectivity that is often required to support the use of digital IDs. Rural households are also less likely to have the digital literacy required to navigate mobile-based ID systems or to understand the implications of data sharing to provide genuine informed consent.

OBJECTIVES

This paper synthesizes available evidence on the role of digital ID systems in improving agricultural outcomes. It looks at various country experiences to understand how foundational identification systems can help increase the productivity and incomes of smallholder farmers.

POTENTIAL BENEFITS OF ID IN AGRICULTURE

Foundational identification systems can help tackle problems facing smallholder farmers through a number of channels, including by:

1. **INCREASING ACCESS TO FINANCIAL SERVICES:** Smallholder farmers require access to a robust set of financial services, including credit, savings, and insurance, if they are to professionalize and grow their business. Having an official proof of identity is a prerequisite for accessing financial services and can expand the number and type of financial products available to poor farmers.

2 • **INCREASING SUPPLY-CHAIN TRACEABILITY:** There is growing global interest in agricultural supply-chain traceability and transparency required to ensure food safety. Being able to trace produce back to a single farm of origin, and in the case of smallholder farmers, to a single farmer, is becoming increasingly important and can be greatly supported by robust, digital identification.

3 • **EMPOWERING FEMALE FARMERS:** Women, who are estimated to account for 43 percent of the agricultural workforce in developing countries, often face additional challenges in accessing formal services. If women farmers were to have the same access to productive resources as men, they could increase yields on their farms by 20-30 percent, lifting an estimated 100-150 million people out of hunger. Identification is instrumental for empowering women: with an ID, a female farmer can register for her own SIM card, which can provide many benefits, including the ability to open her own mobile money account.

LEADING APPLICATIONS OF FOUNDATIONAL ID SYSTEMS IN AGRICULTURE

To understand the role of digital identification in increasing the productivity of smallholder farmers, the paper examines several country experiences across various areas related to agriculture, which have generated substantial benefits through leveraging foundational ID systems (see table below).

It should be noted that practical examples of agriculture-related applications are still limited, and many existing applications remain at a nascent stage. Much additional research, piloting, and rigorous impact evaluations are needed to improve our understanding of the opportunities and challenges for leveraging digital identification in agriculture.

Applications for Foundational ID in Agriculture

AREA	BENEFITS	COUNTRY EXAMPLES
Subsidy Distribution	More accurate targeting of eligible for subsidies Reduction of fraud and ghost recipients Bridge to financial services	Estonia India Nigeria
Land and Asset Registration	Land registration Livestock registration Traceability/Food security Access to financial services	Estonia Uruguay Malaysia
Unique, Data-Driven Farmer Profiles	Access to targeted agricultural extension information Traceability/Food security Access to financial services	India Sri Lanka Thailand Malaysia

LOOKING FORWARD

By serving as a key platform for the effective implementation of subsidy schemes, asset registration, and digital farmer profiles, digital ID systems can help farmers and countries overcome critical challenges in agriculture. However, it will be important to better understand how safeguarding data privacy and informed consent translate to rural contexts, particularly as new digital technologies are being introduced. Another area which requires further attention is how to enable people in areas with poor or no connectivity to authenticate themselves in a secure and cost-effective way when accessing financial and other services that require a relatively high level of identity assurance. ID systems and their applications should be designed to maximize opportunities for smallholder farmers, while minimizing the risks and barriers that are often unique to rural areas and poor, marginalized populations.