

Proposal for Master Thesis:
Off-Farm Employment and Labour-Saving Technologies in Agriculture in Mali

Labour-saving agricultural technologies, including machinery and animal traction, can increase labour productivity and provide benefits to farming households, such as reducing workloads and freeing up time for education, leisure, or other economic activities. Despite these potential benefits, their adoption across much of sub-Saharan Africa remains low.

Induced innovation theory offers one possible explanation for technology adoption. It suggests that changes in the relative scarcity and cost of production factors shape the development and adoption of new technologies. When agricultural labour becomes scarcer or more costly, farmers may therefore have stronger incentives to invest in labour-saving technologies.

Building on this theory, the thesis will examine whether off-farm employment opportunities in Mali's gold mining sector affect the adoption of labour-saving agricultural technologies. Mining employment may reduce the availability of household labour for farming, raise the opportunity cost of agricultural work, and increase local agricultural wages, thereby incentivizing agricultural households to adopt labour-saving technologies. In addition, income from mining may help households overcome financial constraints and invest in new technologies.

For this thesis, the student will use nationally representative household survey datasets from 2015 and 2018 and combine it with geospatial data on gold mining activities to assess whether the proximity to gold mining site affects the adoption of agricultural labour-saving technologies. Mali provides an interesting setting because agriculture remains a major source of rural livelihoods, while gold mining offers important alternative employment and income opportunities.

Related literature

Pingali, P. (2007). Agricultural mechanization: adoption patterns and economic impact. *Handbook of agricultural economics*, 3, 2779-2805.

Poignant, A. (2023). Small-scale mining and agriculture: Evidence from northwestern Tanzania. *Resources Policy*, 83, 103694.

Requirements

- Background in agricultural economics, development economics, rural studies, or a related field.
- Prior experience using statistical software, such as Stata or R, and an interest in further developing coding skills necessary to prepare the data, as well as analyze it.
- An interest in working with and analysing geospatial data is required.

Interested students should send an email to Marlene Wätzold (mwatzold@uni-bonn.de), including a brief statement of motivation and a current transcript of records from their bachelor's programme.