Mobile-phone interventions for improving economic and productive outcomes for farm and non-farm rural enterprises and households in low and middle-income countries

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IDRC CRDI

Canada

UKaid
from the British people

LIRNEasia
Pro-poor. Pro-market.

Systematic review

Transparent and replicable review of literature on a narrow research topic

- ‣ Search protocols are specified

- ‣ Exclusion and inclusion criteria defined

- ‣ Initial selection based on title and abstract

- ‣ Next level selection based on full papers

- ‣ Data for included papers is extracted and synthesised

MOBILE INTERVENTIONS:
COVERAGE
HANDSET
APPS & SERVICES
IMPROVING ECONOMIC AND PRODUCTIVE OUTCOMES

QUANTITATIVE | QUALITATIVE

LOWER INCOME COUNTRIES | **LOWER MIDDLE INCOME COUNTRIES** | HIGHER MIDDLE INCOME COUNTRIES | HIGHER INCOME COUNTRIES

MICRO STUDIES | MACRO STUDIES

RURAL | URBAN

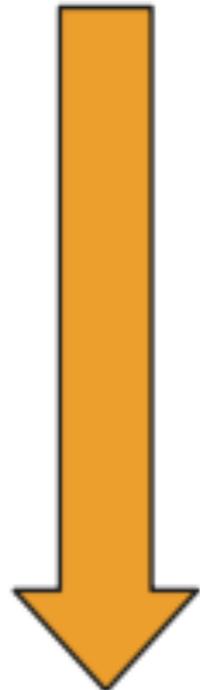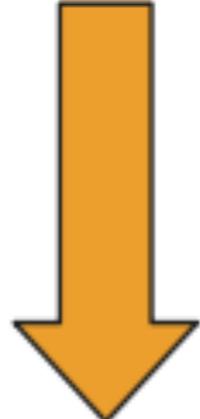**HOUSEHOLDS** | **INDIVIDUALS** | **BUSINESSES** | **MARKETS** | PUBLIC INSTITUTIONS

8,981 TITTLE & ABSTRACT SCREENING

43 CRITICALLY APPRAISED

14 REVIEWED

Intervention 1: Mobile Coverage

Author	Dependent variable		Type of Study
Jensen (2007)	Max-Min spread of fish prices between market		Natural Experiment
	Coefficient of variation of price spread of fish		
	Fish waste reduction		
Klonner & Nolen (2008)	Additional likelihood of a person being employed one year after coverage		Natural Experiment
Megumi (2009)	Banana and maize market participation		Natural Experiment
	Proportion of production sold		
	Relative price of bananas and maize		
Aker (2010)	Price dispersion for millet: absolute value of the price differences between market pairs for each month		Natural Experiment
Aker & Fafchamps (2011)	Price dispersion for cowpea measured as absolute value of the differences between in logs of producer prices of two markets		Natural Experiment
	Price dispersion for cowpea measured as difference in Max-Min spread of prices between two markets		
	Price dispersion for cowpea measured as difference in coefficient of variation between two markets		
Beuermann, et al. (2012)	Effect sizes for 6 years of coverage compared to no	wage income (log)	Natural Experiment
		expenditure (log)	

Mobile Coverage Evidence

‣ All natural experiments (coverage provide not in control of researcher)

‣ Endogenity / Causality addressed by instrumental variables or fixed/random effect models

‣ Dependent variable across included studies differed even when measuring the same product

Jensen (2007)

- Jensen (2007) documents the impact of mobile coverage introduced between 1997 and 2001 in Northern Kerala, India, on price dispersion and waste in the fishing industry

- Fishermen were able to choose the market to sell to on the way back to shore by asking for current prices from multiple harbours or even agree on a sale

- Price dispersion in terms of minimum-maximum spread between markets in the same region dropped by 38 %

- Waste, unsold fish, was reduced by 4.8 %

Effect sizes of other coverage studies

‣ Klonner & Nolen (2008): if a municipality goes from 0% to 100% coverage employment increases by 33.7% the following year

‣ Megumi (2009): Coverage leads higher market participation of farmers that produce perishable crops

‣ Aker (2010): Coverage leads to a price dispersion reduction of 10-16% for millet markets in Niger

‣ Aker & Fafchamps (2011): Coverage reduced price dispersion for cowpeas by 6.3% in Niger

‣ Beuermann, et al. (2012):

 ‣ Coverage leads to increase in wage income of 15% after two years of coverage and 34 % after six years of coverage

 ‣ Coverage leads to value of household assets increased by 23% after two years and 54% after six years of coverage

Intervention 2: Mobile Phone Ownership

Author	Dependent variable	Type of Study
Labonne & Chase (2009)	Per capita monthly consumption	Observational study
Lee & Bellemare (2012)	Price for onions in philipines	Observational study
Zanello, et al. (2012)	Dichotomous variable: Selling at the farmgate (0) or at the market (1) Choosing the marketplace: community (C), district (D), or regional market (R)	Observational study

Mobile Ownership Evidence

‣ **Labonne and Chase (2009):**

  ‣ mobile phone adoption leads to an 11-17 % higher growth rate of per-capita consumption

  ‣ This was he only study that produced reliable results for the treatment category mobile phone

‣ **The findings cannot be generalised due to small sample size and absence of representative sampling**

  ‣ **Lee and Bellemare (2012)**

  ‣ **Zanello, et al. (2012)**

Intervention 3: Mobile Apps & Services

Treatment	Author	Dependent variable	Type of Study
Price and weather information using text messages **(Colombia)**	Camacho & Conover (2011)	Higher sale price	Experiment - RCT
		Farmers' revenues	
		Household expenditures	
		Crop loss	
Free one- year subscription to the Reuters Market Light service, market and weather information delivered SM **(India)**	Fafchamps & Minten (2011)	Price dispersion	Experiment - RCT
		Price received by farmers	
		Crop loss due to rainstorms	
		Likelihood of changing crop varieties and cultivation practices	
Ban on bulk SMS for 12 days **(India)**	Parker et al. (2012)	Standard deviation of geographic price dispersion for crops for each state	**Natural Experiment**
Having made use of ICT assisted agricultural extension services **(India)**	Fu and Akter (2012)	Quality Index (QI)	Observational study

Reuters Market Light (RML) data for India

‣ Parker et al. (2012)

- Natural experiment

- Analyse the impact of access to information on geographic price dispersion in rural India using, an SMS based information service

- During the period of investigation bulk text messages were banned unexpectedly for 12 days across India allowing to identify the difference information availability on crop prices

- The average spatial price dispersion for 170 crops across 13 states increased by 5.2% during the time of the ban

‣ Fafchamps and Minten (2011):

  ‣ RCT

  ‣ Do not find significant differences between control and treatment group

Conclusion

- Mobile coverage enhances economic activities, leads to more price transparency and more efficient markets and benefits businesses, households and individuals.

- Mobile phones:

  - The impacts of mobile coverage are linked to mobile phone ownership

  - Only the study by Labonne and Chase (2009) provides credible quantitative results for the impact of mobile adoption

  - Enough qualitative research that is not part of this review supports impact but does not quantify it

- Mobile apps and services:

  - Not having found significant differences between control and treatment groups does not mean that there are no benefits

  - It just means that is difficult to demonstrate impacts empirically or that not sufficient research has been conducted in this field

  - Success of quantitative assessment of apps and services also depend on content quality, which cannot be assessed by reading studies

Government intervention?

Addressing coverage has the highest leverage for the lowest effort (roll out obligation linked to licence and spectrum e.g.)

Leverage

Effort

mApps & services

Mobile handset

Mobile Coverage