

# An Overview of Ongoing Energy and Water Projects in Zambia

IGC & IPA

# The projects

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## Energy

- ▶ Stopping Power: Electricity Shortages and Economic Activity

## Water

- ▶ Water, Health, and Wealth: Water Outages in Lusaka, Zambia
- ▶ Improving Sanitation in Urban Areas in Zambia
- ▶ Household Characteristics and the Elasticity of Demand for Water



# Stopping Power: Electricity Shortages and Economic Activity

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- ▶ Research question: What is the impact of the sudden onset and continued electricity rationing in Lusaka on economic activity?
- ▶ Researchers: Abe Holland (Harvard)
- ▶ Methods: Regression based analysis
- ▶ Study partners: ZESCO, Zoono, and the ZRA
- ▶ Status: At a relatively early stage, initial dataset construction and analysis are ongoing



# Water, Health, and Wealth: Water Outages in Lusaka, Zambia

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- ▶ Research question: What is the impact of municipal water outages on local economic activity, health outcomes and school test scores?
- ▶ Researchers: Nava Ashraf (LSE), Ed Glaeser (Harvard), Bryce Steinberg (Brown), Abe Holland (Harvard)
- ▶ Methods: Regression based analysis
- ▶ Study partners: LWSC, ZoonA, MCDMH, and DOE
- ▶ Status: Expect initial report to partners by December 2016



# Improving Sanitation in Urban Areas in Zambia

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- ▶ **Research questions:**
  - ▶ How much do households value a sanitation upgrade that is readily available?
  - ▶ Do households give up on sanitation because of credit constraints?
  - ▶ Could tenants and landlords coordinate about these decisions?
- ▶ **Researchers:** Mũthoni Ngatia (Tufts), William Parienté (Louvain), Roland Rathelot (Warwick)
- ▶ **Methods:** Field experiment to vary subsidies, credit and information to encourage take-up of sanitation upgrades
- ▶ **Study partners:** MCA-Z, BFC, LWSC
- ▶ **Status:** Design stage (funding secured)



# Household Characteristics and the Elasticity of Demand for Water

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Kelsey Jack | Tufts University

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In partnership with the Southern Water and Sewerage Company



# Research Settings

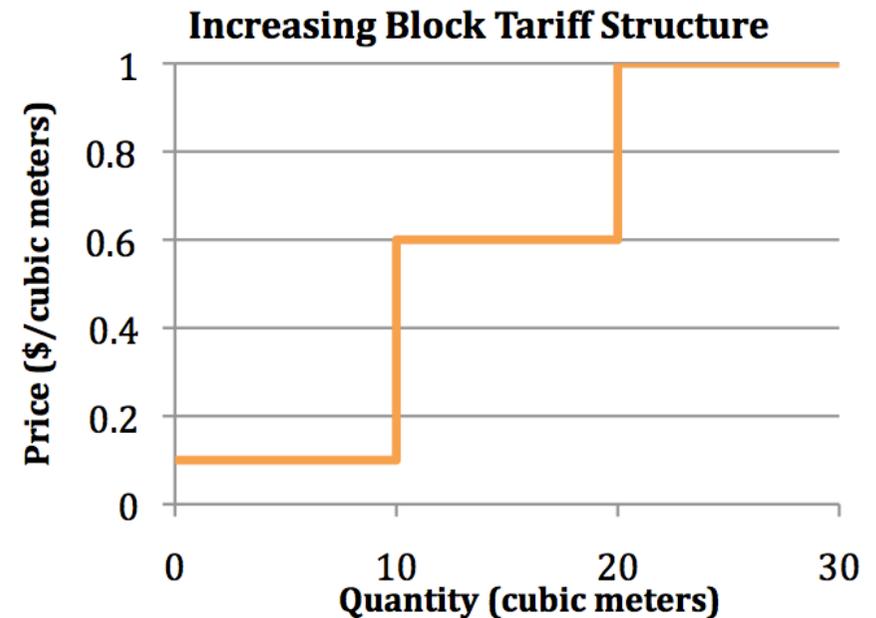
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- ▶ Livingstone - Southern Province, Zambia
  - ▶ Population: 136,000
  - ▶ Rapid growth in the past 5-10 years
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## ▶ Local Water Tariff

### Increasing Block Tariff:

The price per unit consumed of water increases nonlinearly with usage.



# Research Objective

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Better understanding of the barriers to better water management by residential consumers in Livingstone

▶ **Questions:**

- ▶ How price sensitive is water usage by households in Livingstone?
- ▶ How does greater awareness of prices affects water consumption?
- ▶ How do attitudes toward the water provider affect use?



# Study Design – Randomized Control Trial

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## Treatment Arms

### 1. K. 300 lottery each month

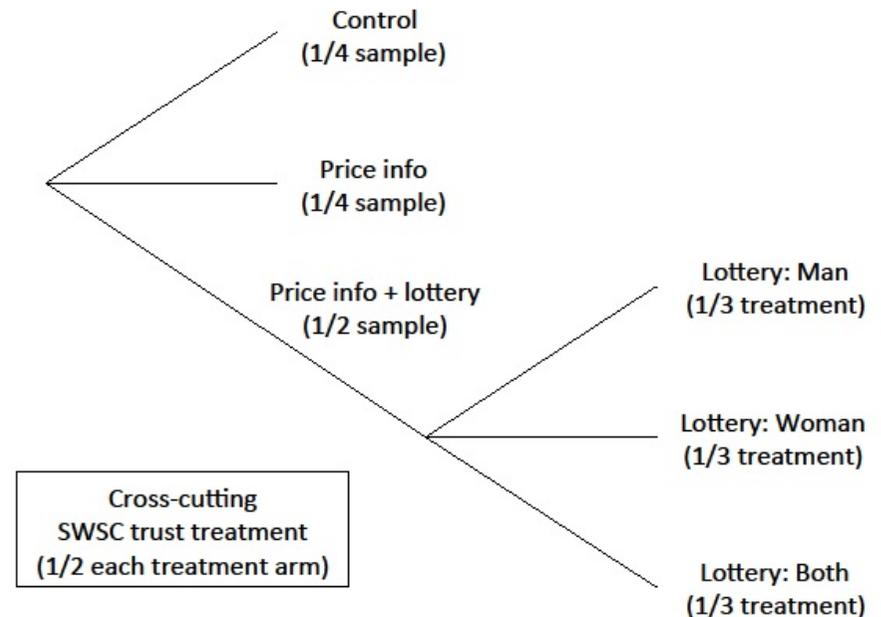
- ▶ If the household reduces monthly consumption by 30% below past bills

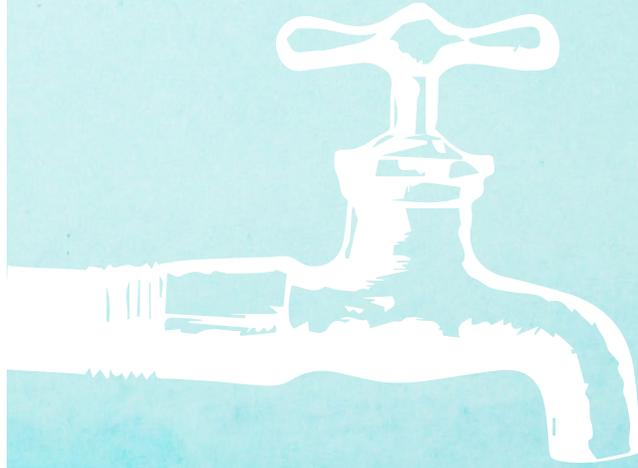
### 2. Price Information Handout

- ▶ “20 min reduction on tap use per day saves K.20 on your monthly bill”

### 3. SWSC Credibility Boost

- ▶ Explanation about SWSC’s billing system





**WANT TO SAVE MONEY ON YOUR MONTHLY WATER BILL?**

**NANGA MUFUNA KUCHEPESA NDALAMA ZIMENE MUMA LIPILA  
BILL YANU YA MANZI YAPA MWEZI?**

**TURN OFF THE TAP!  
VALANI POPI YANU!**

**Save 10 Kwacha per month with 10 minutes less tap use per day.**

**Sungani K10 pamwezi paku chepesako 10 minetisi yosebenzesa tap yamanzi pa siku imodzi.**

**Save 20 Kwacha per month with 20 minutes less tap use per day.**

**Sungani K20 pamwezi paku chepesako 20 minetisi yosebenzesa tap yamanzi pa siku imodzi.**

**These reductions are for your entire household, not any particular individual.** These are typical savings. Depending on your water pressure, your situation may be slightly different.

**Uku kuchepesa nikwa nyumba yanu yonse osati muntu umodzi.** Aka kachepesedwe nikapindu. Kulingana na mphamvu yakachokedwe ka manzi yanu, mbali yanu ingakale yosianako.

# Data collection

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## Multiple data collection stages:

1. Household screening
2. Household survey
  - ▶ Basic household information
  - ▶ Understanding of bills and prices
  - ▶ Separate surveys for husband and wife on water use and cooperation measures
3. SWSC monthly billing records (2012 – 2016)



# Study Sample

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- ▶ 6,000+ HHs visited
  - ▶ SWSC's clients on a metered billing system
- ▶ 1,281 HHs surveyed
  - ▶ Participant HHs need to meet the following criteria
    - ▶ A functioning, not-shared meter
    - ▶ Both spouses have lived together in the same house for at least the past 6 months and are not planning to move out in the next 3 months
    - ▶ One or both spouses responsible for paying the water bill



# Preliminary findings

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- ▶ Water use responds to price:
  - ▶ Lottery incentive leads to a 6.5-10% reduction in monthly consumption
  - ▶ Price elasticity of demand: -0.32 to -0.49
    - ▶ 10 percent increase in price leads to a 3 to 5 percent decrease in use
  - ▶ Greater price sensitivity among households that are most skeptical of SWSC bills → least incentive to cut back otherwise?
- ▶ Use also decreases following surveying regardless of treatment
  - ▶ Reminder effect?
  - ▶ Or an increase in bill payment?



# Preliminary findings

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- ▶ **Information on prices does not affect use on average**
  - ▶ Further work needed to determine whether some groups are responsive
- ▶ **Information on SWSC does not affect use on average**
  - ▶ Higher consumers tend to be more satisfied with SWSC overall
  - ▶ Understanding of the bill and satisfaction with the information SWSC provides are not correlated with overall satisfaction



# Policy Implications

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- ▶ To provide a more complete understanding of the barriers to and determinants of consumer responses to water prices.
- ▶ With such understanding, policy-makers can elaborate more inclusive, efficient, and evidence-based tariffs and resource conservation incentives for society.

