# Comments on Dr. Minhaj Mahmud

## Yasuyuki Sawada

# Outline

1.  "Revolution" in development economics

2.  Field experiments as the core instrument in modern development policy
    - "Trust and social distance": social capital
    - "Safe water product": the last mile problem
    - "Chicken game and traffic accidents": experiments as a powerful policy tool

# 1. "Revolution"
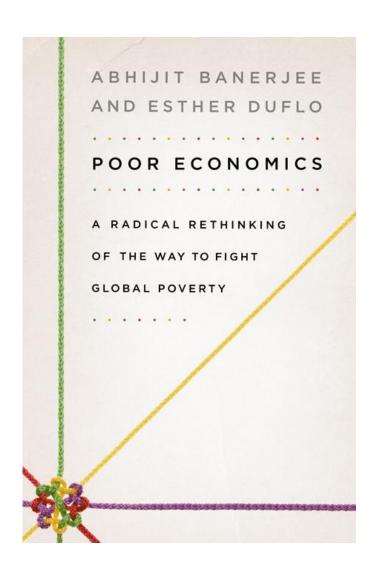# in Development Economics

# Development Economics until 2000
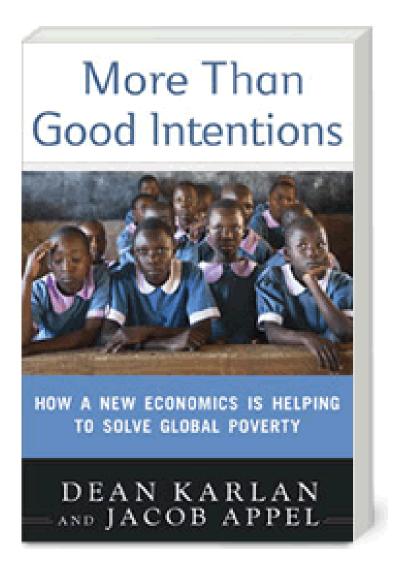
- "Once upon a time there was a field called development economics"                    ─Paul Krugman

  "Towards a Counter-Counterrevolution in Development Theory," Proceedings of the World Bank Annual Conference on Development Economics, 15-38, 1993.

- Leijonfhufvud (1973) "Life among the Econ" :
  - The Devlops just as definitely rank lower. The low rank of the Devlops is due to the fact that this caste, in recent times, as not strictly enforced the taboos against association with the Polscis, So ciogs, and other tribes. Other Econ look on this with considerable apprehension as endangering the moral fiber of the tribe and suspect the Devlops even of relinquishing modl-making.

# 2000～

- Esther Duflo (MIT), 37
  - John Bates Clark medal 2010
  - "Distinguished herself through definitive contributions to the field of development economics"

- Development economics as one of the leading fields in economics
  - Many papers published in top journals (*Econometrica*, *AER*, *JPE*, *RES*, as well as *Science*)
  - Many PhD job candidates at MIT, Yale, and Harvard engage in development economics (in 2013, 6 out 18 at MIT and 5 out of 15 at Yale)

# New Development Economics



ABHIJIT BANERJEE AND ESTHER DUFLO

POOR ECONOMICS

A RADICAL RETHINKING OF THE WAY TO FIGHT GLOBAL POVERTY



More Than Good Intentions

HOW A NEW ECONOMICS IS HELPING TO SOLVE GLOBAL POVERTY

DEAN KARLAN AND JACOB APPEL

# What happened?

# What happened?

Development economics generated <span style="color:red">significant contribution to economics</span>

## Examples)

1. Imperfect information paradigm (Stiglitz)
2. Pecuniary externalities and multiple equilibria (Krugman)
3. Micro econometrics (Deaton, Ravallion, and Rosenzweig)
4. <span style="color:red">Field experiments (J-PAL, Duflo, Banerjee, Karlan)</span>

# Field Experiments
# (and Traditional Econometics)

S.D. Levitt, J.A. List / European Economic Review 53 (2009) 1–18

| | Controlled Data | | | Naturally-Occurring Data |
|---|---|---|---|---|
| Lab | AFE | FFE | NFE | NE, PSM, IV, STR |

- Lab: Lab experiment
- AFE: Artefactual field experiment
- FFE: Framed field experiment
- NFE: Natural field experiment
- NE: Natural experiment
- PSM: Propensity score estimation
- IV: Instrumental variables estimation
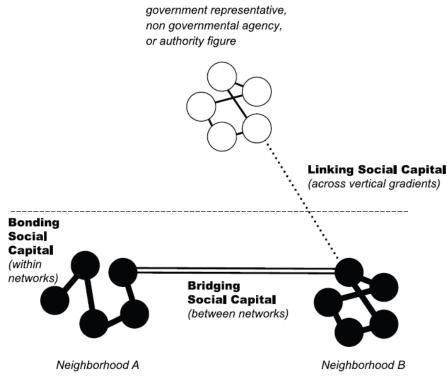- STR: Structural modeling

Fig. 1. A field experiment bridge.

# 2. Field Experiments
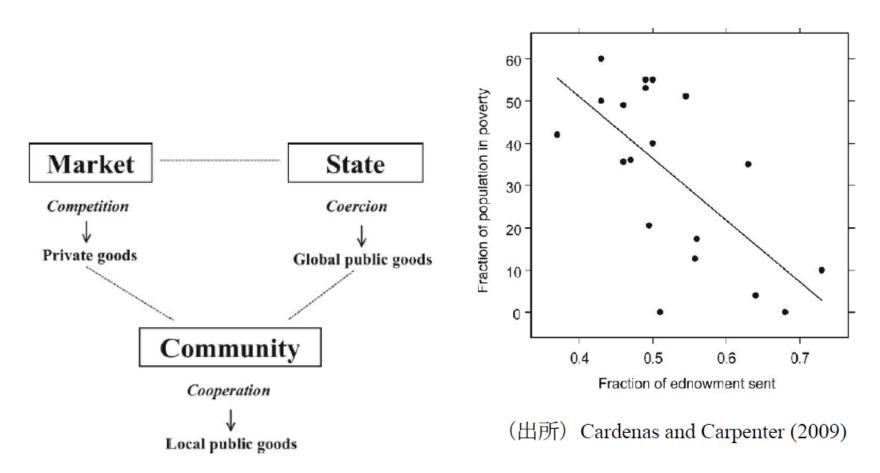# as the Core Policy Instrument

1) **Trust**

2) **Safe Water Products**

3) **Traffic Accidents**

# Social Capital (SC)

- The informal forms of institutions and organizations based on social relationships, networks and associations that create shared knowledge, mutual trust, social norms, and unwritten rules [Durlauf and Fafchamps (2004)]

- Network in rural communities and firms as well as SNS (facebook etc)

- Three modes:
  - Bonding SC
  - Bridging SC
  - Linking SC

government representative, non governmental agency, or authority figure

**Linking Social Capital** (across vertical gradients)

**Bonding Social Capital** (within networks)

**Bridging Social Capital** (between networks)

Neighborhood A

Neighborhood B

Source) Daniel Aldrich (2012) *Building Resilience*, University of Chicago press

# **SC complements** market transactions and state public goods provisions (Hayami, 2009)



The community, the market, and the state in the economic system

(出所) Cardenas and Carpenter (2009)

# Role of SC in Microfinance

- Karlan (2005): Test whether social capital can mitigate market failures arising from enforcement problems.
  - Trustees identified as more trustworthy in the game are more likely to repay their loans one year later.
  - Trustors identified as more "trusting" save less and have higher repayment problems.

TABLE 4—PREDICTING INDIVIDUAL FINANCIAL OUTCOMES
(OLS, Probit)

| Dependent variable: | Default | | | Dropped out due to default or discipline | | | Total voluntary savings contributions | | |
|---|---|---|---|---|---|---|---|---|---|
| Control variables included: | No | Yes | Yes | No | Yes | Yes | No | Yes | Yes |
| | OLS | OLS | OLS | Probit | Probit | Probit | OLS | OLS | OLS |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
| **Panel A** | | | | | | | | | |
| Player A: Proportion passed in Trust Game | 4.253 (16.451) | −4.640 (16.645) | −35.873 (23.759) | 0.117* (0.064) | 0.145** (0.067) | 0.166* (0.096) | −39.630*** (12.402) | −46.625*** (15.736) | −93.969** (40.161) |
| Proportion passed in Trust Game × partner in same group | | | 41.030 (33.360) | | | −0.015 (0.111) | | | 63.425 (42.102) |
| Observations | 397 | 397 | 397 | 397 | 397 | 397 | 397 | 397 | 397 |
| **Panel B** | | | | | | | | | |
| Player B: Proportion returned in Trust Game | −61.985** (27.264) | −69.081** (33.484) | −70.481* (38.643) | −0.253** (0.104) | −0.246** (0.102) | −0.241 (0.199) | 57.781** (25.347) | 55.680** (24.107) | 91.451 (72.149) |
| Proportion passed in Trust Game × partner in same group | | | 1.314 (53.025) | | | 0.006 (0.216) | | | −48.852 (79.901) |
| Observations | 307 | 307 | 307 | 307 | 307 | 307 | 307 | 307 | 307 |
| **Panel C** | | | | | | | | | |
| Public goods game behavior, individual | −7.898 (16.274) | −7.820 (14.849) | | −0.014 (0.034) | −0.023 (0.040) | | −3.180 (8.768) | 3.154 (10.111) | |
| Observations | 864 | 864 | | 864 | 864 | | 864 | 864 | |
| **Panel D** | | | | | | | | | |
| GSS survey questions, relative to society | −16.431*** (5.702) | −16.881*** (4.790) | | −0.051** (0.021) | −0.055*** (0.018) | | 5.345 (6.401) | 6.388 (7.068) | |
| Observations | 794 | 794 | | 794 | 794 | | 794 | 794 | |
| **Panel E** | | | | | | | | | |
| GSS survey questions, relative to group | −3.366 (5.220) | −3.567 (5.672) | | −0.011 (0.019) | −0.010 (0.020) | | 5.508 (7.721) | 4.482 (7.642) | |
| $n = 794$ | | | | | | | | | |
| Observations | 794 | 794 | | 794 | 794 | | 794 | 794 | |

*Notes:* *** 99-percent significance; ** 95-percent significance; * 90-percent significance. Columns 1, 2, and 3 examine whether behavior in the Trust Game (panels A and B), the Public Goods Game (panel C), and the GSS questions (panels D and E) predict default one year later. The GSS questions are as follows: the trust question, "Generally speaking, would you say that most people can be trusted or that you can't be too careful in dealing with people?"; the fairness question, "Do you think most people would try to take advantage of you if they got a chance, or would they try to be fair?"; and the helpful question, "Would you say that most of the time people try to be helpful, or that they are mostly just looking out for themselves?" Default is defined as the amount unpaid by the borrower on her loan to FINCA one year after playing the game. Columns 4, 5, and 6 predict being dropped from the program due to default or discipline. This is considered a perhaps less noisy measure of "bad" default, since some default can be observed by group members as acceptable and hence forgiven. Columns 7, 8, and 9 examine predictors of voluntary savings. Columns 3, 6, and 9 examine whether behavior in the Trust Game predicts the bank outcome differently for individuals who are in the same lending group as their partner in the Trust Game. Specifications with control variables include all variables included in Table 3. Marginal values reported for probit in columns 4, 5, and 6. Standard errors corrected for clustering at the group level (41 groups).

# SC measurements

- Attitudinal measures
  - *GSS* (trust, fair, and help)
- Behavioral measures
- Participation measures

| Participation measures | Mean |
| --- | --- |
| Hours volunteering in an average week | 5.598 |
| Hours volunteering in the last week | 1.792 |
| Number of voluntary groups | 2.479 |
| Attend religious services (times per month) | 1.77 |
| Ever volunteer for a political campaign | 0.149 |
| Voted in 2002 | 0.521 |
| Number of friends | 6.304 |

| Survey question | Mean |
| --- | --- |
| *Attitudinal Measures of Trust:* | |
| Most people can be trusted | 0.313 |
| Most people try to be fair | 0.333 |
| Most people try to be helpful | 0.313 |
| You can't trust strangers anymore | 0.521 |
| I am trustworthy | 0.917 |
| *Behavioral Measures of Trust:* | |
| Often leave door unlocked | 0.438 |
| Ever loan money to strangers | 0.188 |
| Often loan money to friends | 0.646 |
| Ever victim of a crime | 0.313 |
| Never lie to parents, friends, etc. | 0.596 |

Source) Anderson et al. (2004)
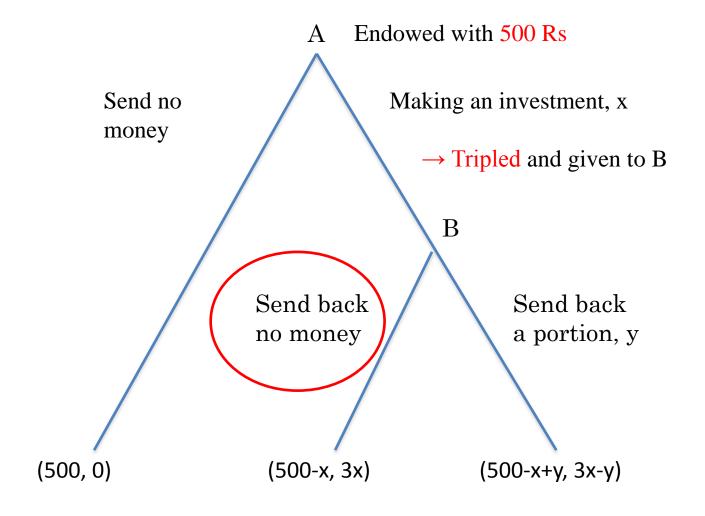
# SC measurements

- Glaeser et al. (2000) experiments with 189 Harvard undergrads who took "Introductory Economics" class

  - GSS is unrelated with trust game results

  - Rosenberg scale ("Trust strangers") and Interpersonal Trust Scale ("Trusting behavior index") are strongly correlated with trust game results

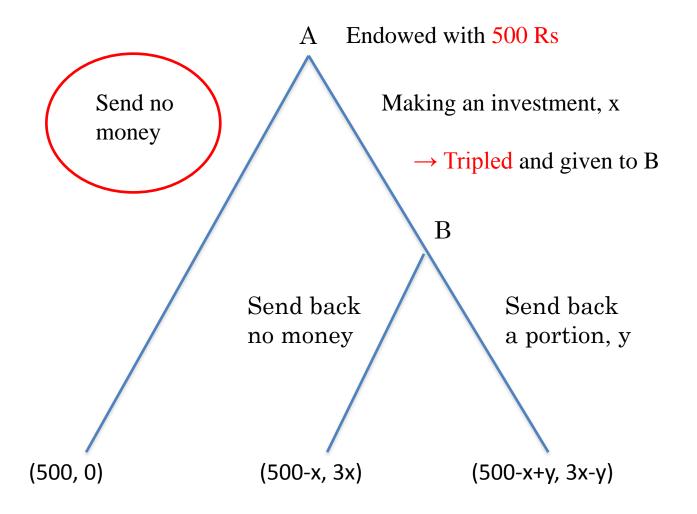TABLE III
AMOUNT SENT AS A FUNCTION OF SENDER CHARACTERISTICS

|  | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| Different sexes | −0.670 | −0.128 | −1.043 | −0.358 | −0.643 |
|  | (1.130) | (1.112) | (1.120) | (1.106) | (1.082) |
| Promise | 0.043 | −0.097 | 0.440 | −0.038 | −0.153 |
|  | (1.024) | (1.015) | (1.040) | (.992) | (0.995) |
| Male | 0.147 | 0.623 | −0.028 | 0.457 | −0.013 |
|  | (1.197) | (1.174) | (1.148) | (1.149) | (1.138) |
| White | −0.330 | −0.640 | 0.055 | −0.227 | −0.329 |
|  | (1.030) | (1.025) | (1.031) | (1.003) | (1.006) |
| Freshman | −0.205 | −0.434 | −0.254 | −0.970 | −0.305 |
|  | (1.136) | (1.125) | (1.092) | (1.081) | (1.086) |
| Only child | −1.620 | −1.724 | −1.555 | −1.775 | −1.569 |
|  | (1.53) | (1.474) | (1.496) | (1.530) | (1.492) |
| GSS trust | 0.220 |  |  |  |  |
|  | (1.022) |  |  |  |  |
| Trust index |  | −0.094 |  |  |  |
|  |  | (0.222) |  |  |  |
| Trust strangers |  |  | 2.209 |  |  |
|  |  |  | (1.060) |  |  |
| Trusting behavior index |  |  |  | 0.403 |  |
|  |  |  |  | (0.214) |  |
| Mean reservation value |  |  |  |  | 0.417 |
|  |  |  |  |  | (0.312) |
| Constant | 13.361 | 13.009 | 9.836 | 12.707 | 13.336 |
|  | (2.448) | (1.735) | (2.272) | (1.648) | (1.639) |
| Adj. $R^2$ | −0.059 | −0.050 | −0.009 | −0.007 | −0.034 |
| Observations | 93 | 90 | 92 | 93 | 95 |

Standard errors are in parentheses. All regressions are ordinary least squares.

# Trust Game

A    Endowed with 500 Rs

Send no money

Making an investment, x

→ Tripled and given to B

B

Send back no money

Send back a portion, y

(500, 0)    (500-x, 3x)    (500-x+y, 3x-y)

# Trust Game

A    Endowed with 500 Rs

Send no money

Making an investment, x

→ Tripled and given to B

B

Send back no money

Send back a portion, y

(500, 0)

(500-x, 3x)

(500-x+y, 3x-y)

# Trust Game

☐ B: Egoistic y*=0 :

y*> 0 represents trustworthiness to A

☐ A: Expecting y*=0 , x*=0 :

x*> 0 represents trust to B

| Study | Location | Students | Fraction sent | Fraction returned | Return ratio |
|---|---|---|---|---|---|
| Berg et al. (1995) | United States | Yes | 0.52 | 0.30 | 0.90 |
| Burks et al. (2003) | United States | Yes | 0.65 | 0.40 | 1.31 |
| Ashraf et al. (2005a) | United States | Yes | 0.41 | 0.23 | 0.58 |
| | Russia | Yes | 0.49 | 0.29 | 0.80 |
| | South Africa | Yes | 0.43 | 0.27 | 0.73 |
| Barr (2003a) | Zimbabwe | No | 0.43 | 0.43 | 1.28 |
| Buchan et al. (2003) | United States | Yes | 0.65 | 0.45[a] | 1.35 |
| | China | Yes | 0.73 | 0.50[a] | 1.51 |
| | Japan | Yes | 0.68 | 0.50[a] | 1.51 |
| | South Korea | Yes | 0.64 | 0.49[a] | 1.47 |
| Burns (2004b) | South Africa | Yes | 0.33 | 0.23 | 0.70 |
| Cardenas (2003b) | Colombia | Yes | 0.50 | 0.41 | 1.22 |
| Carter and Castillo (2002) | South Africa | No | 0.53 | 0.38 | 1.14 |
| Castillo and Carter (2003) | Honduras | No | 0.49 | 0.42 | 1.26 |
| Holm and Danielson (2005) | Tanzania | Yes | 0.53 | 0.37 | 1.17 |
| | Sweden | Yes | 0.51 | 0.35 | 1.05 |
| Danielson and Holm (2003) | Tanzania | No | 0.56 | 0.46 | 1.40 |
| Ensminger (2000) | Kenya | No | 0.44 | 0.18 | 0.54 |
| Fehr and List (2004) | Costa Rica | Yes | 0.40 | 0.32 | 0.96 |
| | Costa Rica | No | 0.59 | 0.44 | 1.32 |
| Greig and Bohnet (2005) | Kenya | No | 0.30 | 0.41 | 0.82 |
| Johansson-Stenman et al. (2004) | Bangladesh | No | 0.46 | 0.46 | 1.38 |
| Karlan (2005) | Peru | No | 0.46 | 0.43 | 1.12 |
| Koford (2001) | Bulgaria | Yes | 0.63 | 0.46 | 1.34 |
| Lazzarini, et al. (2004) | Brazil | Yes | 0.56 | 0.34 | 0.80 |
| Mosley and Verschoor (2003) | Uganda | No | 0.49 | 0.33 | 0.99 |
| Schechter (2004) | Paraguay | No | 0.47 | 0.44 | 1.31 |
| Wilson and Bahry (2002) | Russia | No | 0.51 | 0.38 | 1.15 |

Source) Cardenas and Carpenter (2008)

# Trust in Bangladesh (and WB)

- People are <span style="color:red">trusting and trustworthy</span>
  - High level of SC, likely amending mkt imperfection
- No role of religion but <span style="color:red">minority/majority status</span> matter
  - Informal (egalitarian) insurance network?
- <span style="color:red">High stakes</span> matter
  - As private benefits increase, SC will decrease

# Trust in Bangladesh (and WB) Comments

- What are policy implications?

- Possible <span style="color:red">crowding out</span> of informal mechanisms by formal mechanisms?
  - High level of SC, likely amending mkt imperfection
  - Informal (egalitarian) insurance network?
  - As private benefits increase, SC will decrease

- Interventions should be designed very carefully?
  - Community participation
  - Capacity development

# Olsonian SC in Development?

- Individually profitable but socially damaging SC will be more widespread as development?

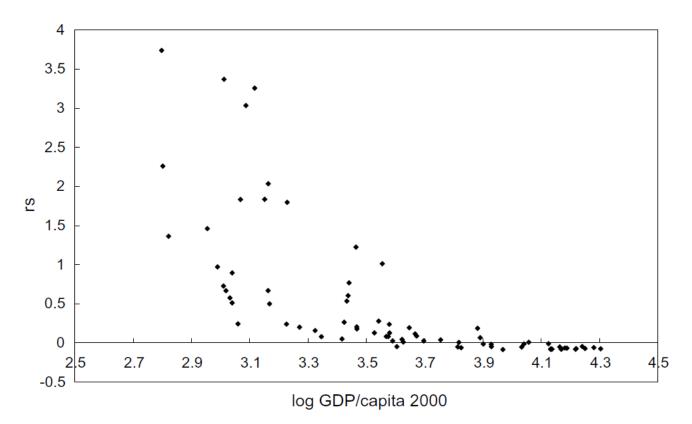H. Ishise, Y. Sawada / Journal of Macroeconomics 31 (2009) 376–393



**Fig. 6.** Log of GDP per capita (2000) and return to social capital (*NEWS*).

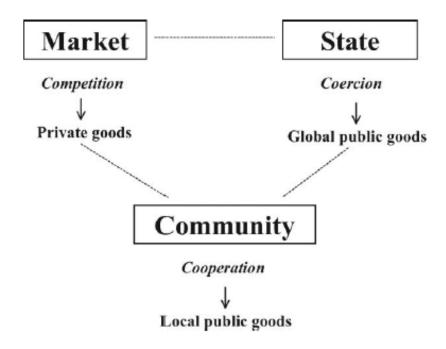# **SC complements** market transactions and state public goods provisions (Hayami, 2009)
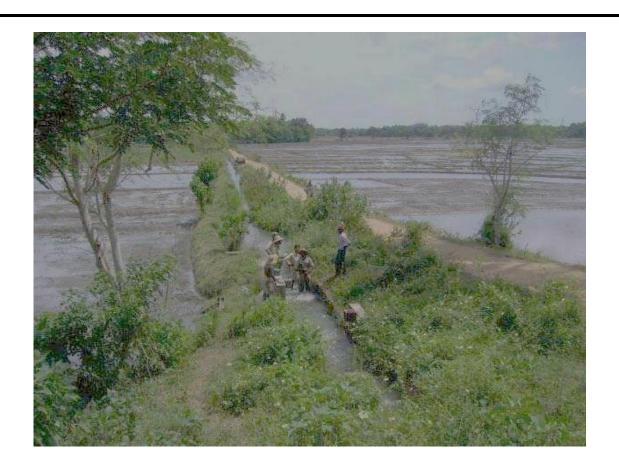


**Figure 2.** The community, the market, and the state in the economic system

# WLB Irrigation project in Sri Lanka

Shoji et al. (2012) WD; Sawada et al. (2013) ADR

**Irrigation** → **SC** → Socio-economic outcomes

# "School for All (COGES)" in Burkina Faso
## Sawada and Ishii (2012); Sawada, Kozuka, et al. (2013)

# SMPP Project in Bangladesh

Kamiya and Aoyagi (2012)

- Safe Motherhood Promotion Project: SMPP
  - "Narsingdi  Model": First phase July 2006-June 2011
  - Community Support System：CmSS

1) **Trust**

2) **<span style="color:red">Safe Water Products</span>**

3) **Traffic Accidents**

# "Safe Water Product"

- Effective (chemical) safe water products gets insufficient WTP/usage
  - Preference, choices, and aspirations matters
  - Carefully designed marketing efforts/information sharing will be very important

- "The Last Mile Problem": Superiority of a technology/knowledge cannot guarantee automatic penetration/diffusion (ex: ORS)

- "O-Ring Theory": a very small problem can ruin the whole thing

1) **Trust**

2) **Safe Water Products**

3) **Traffic Accidents**

# Traffic Accidents

- Traffic accidents in Bangladesh (and other LDCs) happen due to <span style="color:red">unsafe driving, a behavioral outcome</span>

# Traffic Accidents

- With <span style="color:red">"Chicken game (Hawk-Dove game)"</span> experiments, assess strategic risk taking behavior of different vehicle drivers

- In laboratory setting, <span style="color:red">policy effects</span> can be investigated closely.

# Policy Implications

- Based on experimental approach, some important findings emerged already but need further validation

  - In communities with insufficient market development and govt enforcement, "Trust or SC" improve outcomes of programs (Education, Public Health, MFI)

- People in LDCs are NOT automaton. They are Humans making decisions and responding to policies. It will be indispensable to adopt experimental approaches which can handle behavioral consequences of interventions

  - "The last mile" and "O-ring" problems can be approached by experiments

# Policy Implications

- Variants of experiments can be combined for:
  - prospective evaluation
  - performance improvements of projects


- Need to uncover "mechanisms" of policy effects
  - Structural estimation combined with experiments