

Impact Evaluation of Development Projects: Conceptual Framework and Some Implications for PIRE

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OUTLINE

1. INTRODUCTION
2. PROJECTS AND DEVELOPMENT
3. CREATING THE COUNTERFACTUAL
4. METHODOLOGIES
5. SOME ISSUES RELATED TO PIRE

The Millennium Development Goals Report 2015



Goal 1: Eradicate extreme poverty & hunger

Goal 2: Achieve universal primary education

Goal 3: Promote gender equality & empower women

Goal 4: Reduce child mortality

Goal 5: Improve maternal health

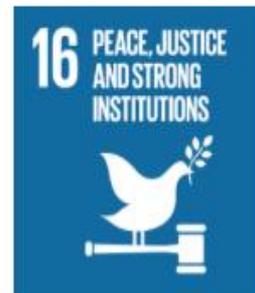
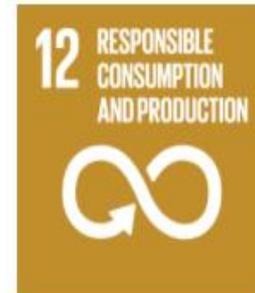
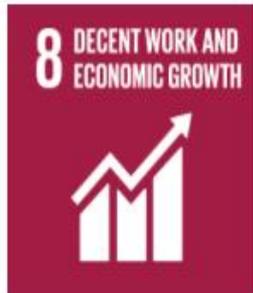
Goal 6: Combat HIV/AIDS, malaria & other diseases

Goal 7: Ensure environmental sustainability

Goal 8: Develop a global partnership for development



SUSTAINABLE DEVELOPMENT GOALS



Why Should Governments/Donors Sponsor Ag. Development Projects?

- Ag. continues to be **critical** to development efforts in many LDCs. **All 8 MDGs linked** to the performance of Ag. Sector (World Bank 2005).
- LDCs severely **underfund** their National **Ag. Research and Extension** Systems (World Bank 2008).
- Underfunding at odds with large body of work that reveals **high rates of return** for investment in both research and extension in developing as well as in rich countries (Alston, *et al.*, 2000).

Why Should Governments/Donors Sponsor Ag. Development Projects?

- Many studies suggests **considerable productivity gains** attainable by improvements in farm **efficiency** → need for sustained support of extension services (Bravo-Ureta *et al*, 2016; Bravo-Ureta *et al*, 2007; Battese, 1992).
- In many LDCs, lack of public support for research and extension is in a context of significant **poverty**, **deteriorating resource base** (soil, water, biodiversity), and **rising population** pressure (e.g., McElhinny, 2007; Pender and Scherr 2002; Oldeman *et al.*, 1990; Barbier, 2000).

Why Should **Governments/Donors Sponsor** **Ag. Development Projects?**(WB 2008)

- “**Agriculture** continues to be a **fundamental** instrument for sustainable development and poverty reduction.”
- “Using agriculture as the basis for economic growth in the agriculture-based countries requires a **productivity revolution** in smallholder farming.”
- “Farming and pastoral activities are often the main drivers of **degradation.**”

Interventions in Farming

- **Poor farmers face many obstacles that limit/preclude their ability to adopt technologies** even if expected profitability is high (Feder and Umali, 1993; Feder, Just and Zilberman, 1985).
- **Risk aversion** (Lee, 2005; Ellis 1988; Hiebert, 1974; de Janvry, 1972).
- **Inability to secure adequate credit** at reasonable cost (Conning and Udry, 2007). Farmers in developing economies willing to borrow more if additional credit was available at a given interest rate → **credit rationing**.
- **Peasants can have high risk of default** on loans → High costs to lenders, thus low returns (Foster and Rosenzweig, 2010).

Interventions in Farming

- **Information** key in improving agricultural productivity, managerial skills, enhancing awareness of new technologies and adoption (Solis, Bravo-Ureta and Quiroga, 2009; Anderson and Feder, 2007; Lee, 2005).
 - **Education** important role in acquisition and processing of **new information** → pervasive finding: more educated farmers **adopt** new technologies **first**. (Foster and Rosenzweig 2010).
 - **Only early adopters** benefit from innovations and these are likely **larger farmers** who are less risk averse, have better access to credit and information (Sunding and Zilberman, 2001). A PARADOX!!!
- **Development Projects: VERY IMPORTANT**

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Development Programs *are complex*

1. Development involves uncertainty. **Lessons should be learned** from previous programs; each case is unique. *No perfect formulas for success.*
2. Information on both theory and practice of development has **expanded** dramatically. *The depth of information available can be overwhelming.*
3. Prerequisites for program design are expanding. *Requires different types of expertise.*

IMPACT EVALUATION critical to generate information needed to enhance project preparation and implementation.

Theory of Change & Program Logic

(Gertler et al, 2011)

- ✓ A description of **how** an intervention is supposed to bring about desired results.
- ✓ Provides the **causal logic** of why the **activities** undertaken will lead to intended **outcomes**.
- ✓ **Theory of change** is the basis for the **program logic or results chain**.
- ✓ Helps **identify KEY QUESTIONS** that need to be answered, or the **hypotheses** that need to be tested.

Results Chain/Matrix or Log Frame

END RESULT of discussions with stakeholders on the theory of change, the evaluation questions, intended and unintended impacts and spillover effects, should give a **clear idea of the INDICATORS** to assess the effects of the program.

RESULTS CHAIN can be presented as:



Indicators

- ✓ Have a **Vertical Logic** i.e., **inputs** lead to **activities** that are part of the work plan and should lead to **outputs**, which should lead to **intermediate results/outcomes** and ultimately to (longer-term) **impacts**.
- ✓ Must have a **clear definition** and/or formula for calculation, including the level at which they will be measured.
- ✓ Must be **SMART:**

Specific **M**easurable **A**chievable **R**ealistic **T**ime-bound **UConn**

Source of Information for Indicators

Source depends on whether the indicator is intended to capture the **factual** or the **counterfactual**.

FACTUAL information: Collected as part of the M&E system and refers to **facts about the program**. It includes:

- ✓ **Resources/inputs** and activities that are part of the planned work of the program (e.g. cost of a study on training needs)
- ✓ **Outputs** and some short-term or **intermediate outcomes** (e.g. number of participants trained on business skills for micro-enterprises)

COUNTERFACTUAL: changes that can be **attributed** to the **program**; requires **comparison group**.

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Must define/find a Counterfactual

- **COUNTERFACTUAL** key to isolate the effect of the program from other factors and potential biases → **ATTRIBUTION**.
- Counterfactual outcome: **what would have happened** to a subject had he/she not been exposed to the program.
- An individual can **only exist in one state** (with or without the intervention). Need **create the counterfactual**.
- **2 primary Methods used in Evaluations:**
 - Randomized Control Trials (RCT) or Experimental
 - Non Experimental or Quasi-Experimental

Challenges to Impact Evaluation

1. Contamination

- (a) Internal Contamination from **spillover effects**
- (b) External Contamination from **similar interventions**

2. Selection Bias in Quasi-Exp. designs:

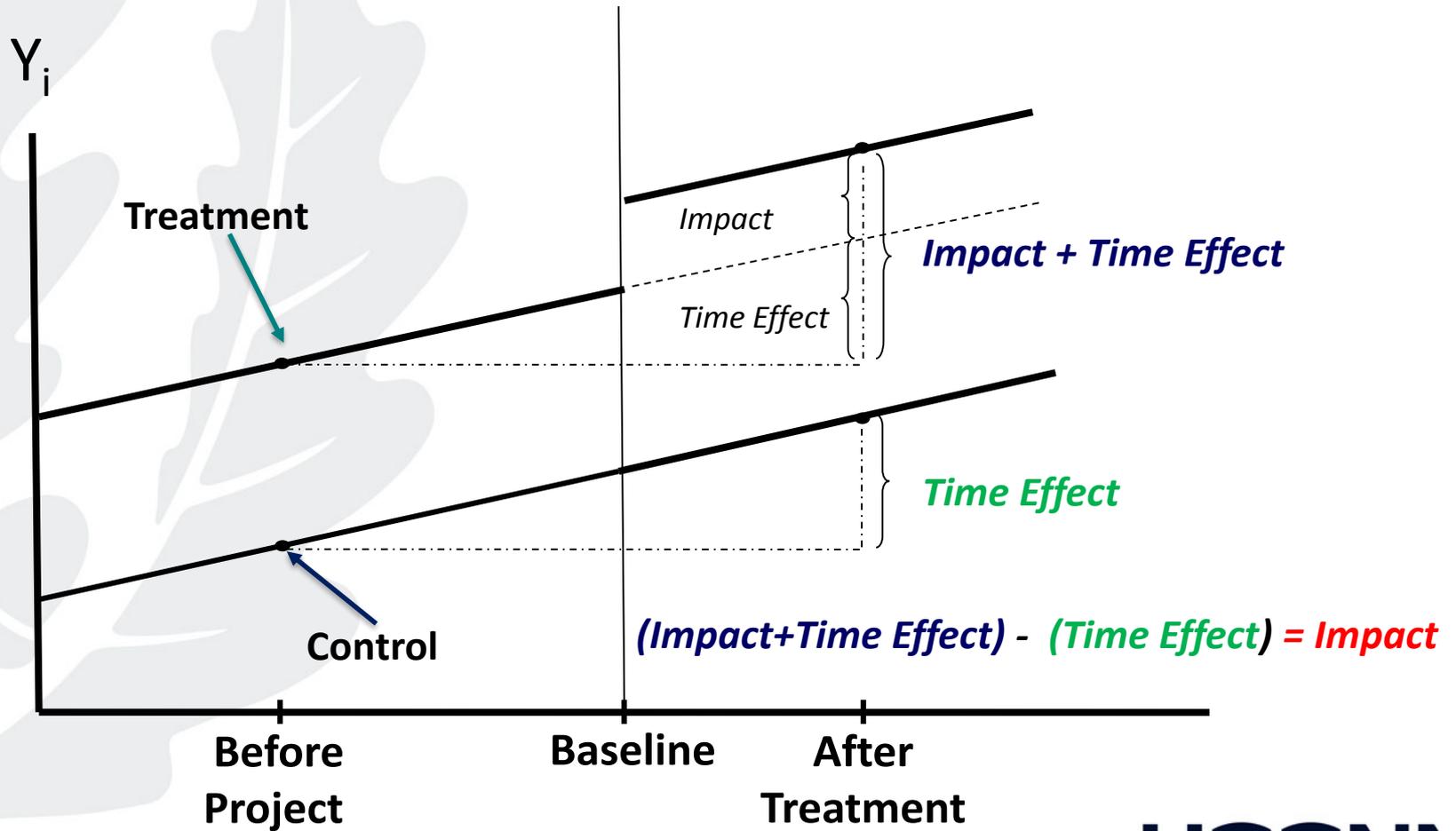
- (a) Observables
- (b) Unobservables

Appropriate methodologies are needed.

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Difference-in-Difference (DID or DD)



Double Difference

- Difference between **before & after** for **control** = changes due to trend & other variables (single difference).
- Difference between **before & after** for **treated** = changes due to trend, other variables & the intervention.
- Difference between the two former ones, **a double difference**, makes it possible to isolate the impact of the intervention.
- Double Difference analysis can be done based on simple comparisons across indicators or in a regression context.

Propensity Score Matching (PSM):

Non-Observables

- Gov. Connections
- Motivation
- Managerial Skills

Observables

- Education
- Family Information
- Income Level
- Technology

Matched individuals that are as similar as possible based on **observables** except for treatment status.

Use econometric models, mainly Logit or Probit to do the matching.

Need data on variables that are related to eligibility requirements (and other covariates) but that are not affected by the intervention

Difference-in-Difference & PSM

Propensity Score Matching (PSM) and **Double Difference (DD)** or **Diff in Diff (DID)** can be used together to correct for biases on observables and unobservables.

- **PSM** mitigates bias associated with **observable** characteristics at the baseline
- **DID** removes bias associated with **time-invariant unobservable characteristics**

COMBINING **PSM** & **DID** improves the estimates

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SOME ISSUES RELATED TO PIRE

- One of the **key activities** is to **develop and provide** high quality seasonal climatic/weather information to farmers
- **Hypothesis:** generating and then providing this **information** along with **training** on how to use improves farmer's options and decisions
- **Expected Impact:** **profits/value of output** for **treated farmers** compared to **controls** improved

PIRE PROJECT DATA & INDICATORS

What data is currently available?

Do we have data that can be used as a baseline?

Do we/can we collect primary data?

Indicators

- Weather/climatic information and training provided
- Change Area under cultivation
- Change in cropping patterns
- Change in input quantity and type used
- Change in yields/production/quantity sold
- Improved food security/Value of production

PIRE PROJECT EVALUATION

- Ability to conduct econometric work is contingent on having **appropriate data** in terms of quality and quantity
- We propose **DID with PSM** methods. **Matching** treated with non-treated **communities** first and then treated with non-treated **farmers**
- Approach depends on availability of baseline data including suitable indicators, and obtaining additional resources for program implementation and endline data collection



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THANK YOU

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