Impact Evaluation of Land and Property Rights Interventions (PhD)
Introduction and Basic Issues of Evaluation

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- Introduction
  - Land and Property Rights Interventions
  - Basic Issues of Evaluation
- Regression Basics & Randomization
  - Regression Basics
  - Randomized Controlled Trials
    *Lisher 2018; Khandker et al. 2010, Ch 2-3.; Ali et al. 2016
- Quasi-experimental Approaches I
  - Instrumental Variables Methods
  - Propensity Score Matching
    *Khandker et al. 2010, Ch. 4, 6; Basley, 1995; Holden et al. 2009

- Quasi-experimental Approaches II
  - Difference-in-differences
    *Khandker et al. 2010, Ch. 5; Ali et al. 2015; Field 2007;
- Quasi-experimental Approaches III
  - Regression Discontinuity Designs
    *Khandker et al. 2010, Ch. 7; Ali et al. 2014; Ali et al. 2018

Land Tenure and Governance Interventions: Overview

Reference

- Lisher J. W. 2018. Guidelines for Impact Evaluation of Land Tenure and Governance. Working Draft Produced in Support of GLTN, IFAD and UN Habitat.

Land Tenure and Governance Interventions: Overview

Key Concepts and Definitions

- Land: "refers to land and all related property and natural resources associated with the land (e.g., water, forests, and minerals)"
- Land Governance: "the rules, processes and structure through which decisions are made about access to land and its use, the manner in which the decisions are implemented and enforced, the way that competing interests in land are managed"
- Land Tenure: "the relationship, whether legally or customarily defined, among people, as individuals or groups, with respect to land (it is an institution , i.e., rules invented by societies to regulate behaviour)
- Perception of Tenure Security: "The level of certainty a person has that their land rights will be recognised and protected, especially against encroachment or loss of use rights over the land"

- Impact Evaluation: A study assessing expected project impacts through use of a counterfactual, or without project scenario, which allows the evaluation to attribute outcomes to the intervention"
- Outputs: "the direct result of an intervention"
- Outcomes: "a result or group of results linked to an outcome"

Land Tenure and Governance Interventions: Overview

Existing Evidence and Gaps - Lawry et al. (2014)

- The literature on land tenure and governance is still limited
  - Increased substantially in the last decade
- Lawry et al. (2014) conduct a systematic review of the effects of land and property rights interventions on agr. investment and productivity
  - Survey 20 quantitative and 9 qualitative studies produced 1982-2012
- Lawry et al. (2014), key findings:
  - Provision of a land title affected productivity and income/consumption in Asia and Latin America
  - Evidence lacks to support similar effects for recognition of customary land rights, which are common in Africa
  - The wealthier or those with bigger farms benefit more
  - No clear evidence to support links to credit or improved land markets

Land Tenure and Governance Interventions: Overview

Existing Evidence and Gaps - Lawry et al. (2014)

- Lawry et al. (2014), key findings cont.:
  - Potential negative effects on women's access to land
  - Lack of quantitative evidence on communal land raights
  - Lack of evidence on dynamics of land environment like conflicts and off-farm effects
- These issues require further research!

Existing Evidence and Gaps - MCC (2016)

- Millennium Challenge Corporation (MCC) 2016 also reviews the literature on land research and updates the related "logic model" (discussed shortly)
- Key gaps identified by MCC (2016):
  1. Lack of clarity of the necessary timelines to obtain key outcomes
  2. Lack of evidence of interlinkages among outcomes
  3. Weak understanding of distributions of benefit streams among different types of beneficiaries, including women

Land Tenure and Governance Interventions: Overview

MCC (2016) - Reasons for the gaps

- Early impact evaluations' narrow focus on household effects of titling, particularly credit and investment
- Few assessed the effects from land interventions around other ways of strengthening tenure security, public awareness/knowledge, institution strengthening, land use planning/natural resource management and legislative and regulatory reform
- Few studies investigated the effects on conflict, perception of tenure, environment, or transaction costs
- Few studies augmented with non-household level data such as land administrative data, environmental data, imagery or bank/financial data and qualitative data to shed light on contextual factors

Land Tenure and Governance Interventions: Overview

MCC (2016) - Reasons for the gaps

- Experimental studies lacked sufficient exposure periods (IE 1-2 years after interventions)
- Few non-natural experiments with longer-term exposure periods
- Lack of studies examining the added benefits of land interventions within larger interventions (confounding factors)

Land Tenure and Governance Interventions: Overview

Existing Evidence and Gaps - IFAD (2017)

- Extended Lawry et al. (2014) and reviewed the effect of land tenure interventions in rural areas
  - 60 studies in total (37 quantitative and 23 qualitative)
  - Most are ex-post quasi-experimental designs with 15 instrumental variable designs, and only 2 RCTs
  - 4 focused on female empowerment (document positive effects)
    - However, limited scope: 3 are from India, 2 are from the same intervention
- Positive effect on agr. investment
- Mixed or lack of evidence on links with agr. productivity, access to credit and income
  - Possible reason 1: lack of longer-term research
  - Possible reason 2: contextual factors (such as historical conflict or corrupt land institutions effecting perceptions of tenure and related investments

Land Tenure and Governance Interventions: Overview

Existing Evidence and Gaps - Meinzen-Dick et al. (2017)

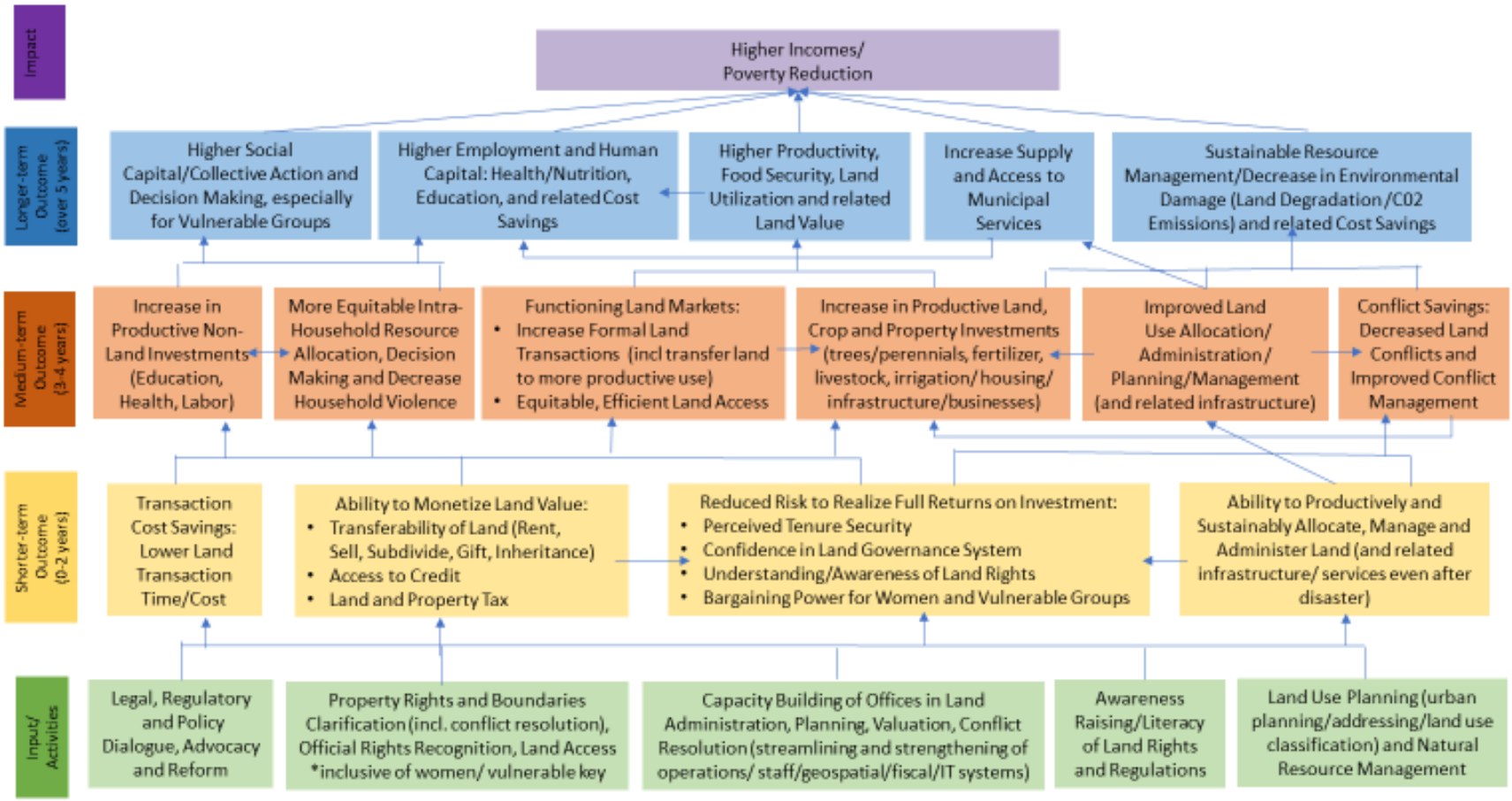
- Reviews the literature on women's land rights, largely from observational and qualitative studies
- Information on women's land right is very limited due to
  - Reliance on household surveys, (focus on heads -males)
  - Compare male vs female-headed households, not intra-household inequalities and different relationships to land
- Key suggestion from the review: the household should not be considered unitary (pooling resources)
  - Women (who have limited resources) should be surveyed separately to investigate the women-tenure relationship
- Women's land right $\longrightarrow$ improvd bargaining power and decision-making, but weaker evidence on other outcomes (e.g., natural res. mgt., violence)
- More studies identifying causal relationships between women and land tenure!

Land Tenure and Governance Interventions: Overview

The Logic Model

- "Illustrates the theory of change, reflecting the pathways by which an intervention is expected to lead to changes in the short-term and long-term outcomes for a select group of beneficiaries and related assumptions that must hold true"
- "Used as a framework to establish key research questions, performance indicators, a sampling framework, survey instruments to assess whether the expected outputs and outcomes listed in the project logic occurred and whether the assumptions held"
- Presents the results chain from the interventions through impact relying the causal chain through arrows connecting inputs, outputs, outcomes together in the way they drive impact

Land Tenure and Governance Interventions: Logic Model



Land Tenure and Governance Interventions: Overview

The Logic Model - Key Concepts

- Inputs/Activities
  1. Legal, Regulatory and Policy Dialogue, Advocacy and Reform
  2. Property Rights and Boundaries Clarification, Official Rights Recognition and Access to Land
  3. Capacity Building of Land Administration and of Conflict Resolution Offices
  4. Awareness Raising/Literacy of Land Rights and Regulations
  5. Land Use Planning and Natural Resource Management

The Logic Model - Key Concepts

- Outcomes, Short-term
  1. Transaction Cost Savings
  2. Ability to Monetize Land Value
  3. Reduced Risk to Realize Full Returns on Investment
  4. Ability to Productively and Sustainably Allocate, Manage and Administer Land

Land Tenure and Governance Interventions: Overview

The Logic Model - Key Concepts

- Outcomes - Medium-term
  1. Increase in Productive Non-Land Investments
  2. More Equitable Intra-Household Resource Allocation, Decision Making and Decrease Household Violence
  3. Functioning Land Markets
  4. Increase in Productive Land, Crop and Property Investments
  5. Improved Land Use Allocation/Administration/Planning/Management
  6. Conflict Savings

Land Tenure and Governance Interventions: Overview

The Logic Model - Key Concepts

- Longer-term Outcomes
  1. Higher Social Capital/Collective Action and Decision Making
  2. Higher Employment and Human Capital
  3. Higher Productivity, Food Security, Land Utilization and related land Value
  4. Increase Supply and Access to Municipal Services
  5. Sustainable Resource Management/Decrease in Environmental Degradation
- Impact: Higher Incomes /Poverty Reduction

Land Tenure and Governance Interventions: Overview

The Logic Model Guiding Principles

- There are multiple paths within the model
- The intervention must address a binding constraint to the predicted outcome
- Interdependence of linked boxes
- Applicability to a myriad of tenure situations and levels of analysis
- Importance of women and differentiating beneficiary impacts and pathways
- Logic model requires supporting materials detailing timing of inputs, and outcomes in each intervention area, as well as related assumptions in order to validate effects
- Timelines are notional only
- Update models with New Findings

Land Tenure and Governance Interventions

Useful Sources

- The World Bank's Land and Poverty Conference:
- Millennium Challenge Corporation, USA; Land and Property Rights Program: "https://www.mcc.gov/sectors/sector/property-rights-and-land-policy"
- The program "Strengthening Advisory Capacities for Land Governance in Africa (SLGA)",
- The Network of Excellence on Land Governance in Africa (NELGA):
- A PhD course in Land Governance offered every spring at the University of Cape Town, School of Economics
  - Contact person: Prof. Edwin Muchapondwa, email: "edwin.muchapondwa@uct.ac.za

Reference

- Khandker, S. R., Koolwal, G. B., and Samad, H. A. (2010). Handbook on Impact Evaluation: Quantitative Methods and Practices. World Bank. Chapter 2.

Basic Issues of Evaluation

Monitoring Vs Evaluation

- Monitoring: setting goals, indicators, and targets of a program
  - Used to assess the performance of program interventions (e.g., poverty reduction strategies)
  - Comparing targets with program outcomes:
    - Helps improve policy design and implementation
    - Promotes accountability and dialogue among policy makers and stakeholders
- Evaluation: A systematic and objective assessment of the results achieved by the program
  - Seeks to establish that changes in targets are due only to the specific policies undertaken

Basic Issues of Evaluation

Monitoring & Evaluation (M&E) together can include

- Process Evaluation: examines how programs operate and focuses on problems of service delivery
- Cost-Benefit Analysis: compares program costs against the benefits they deliver, and
- Impact Evaluation: quantifies the effects of programs on individuals, households and communities
- All of these aspects are part of a good M&E system and are usually carried out by the implementing agency
- Our focus in this course is Impact Evaluation!

Basic Issues of Evaluation

Quantitative Vs Qualitative Impact Evaluations

- The impact of interventions may address far-reaching goals
- This course focuses on quantitative IE methods
- Qualitative information on the local sociocultural and institutional context, as well as program participant details, is however important for a complete quantitative IE
  - For e.g., in identifying the mechanisms through which the program has an effect
  - Identification of local policy makers or individuals who determine program implementation
- Qualitative assessment however cannot assess outcomes against alternatives (counterfactual outcomes)
- A mixture of both methods can very often be useful to evaluate the overall impact of a certain intervention

Ex Ante IE

- Attempts to measure the intended impacts of future programs and policies
  - May involve simulations based on assumptions about how the economy works
  - Often based on structural models of the economic environment facing potential participants
- Structural models:
  - Identify the main economic agents in the development of the program (individuals, communities, local or national governments),
  - The links between the agents and the different markets in determining outcomes from the program
  - Predict the program impacts

Ex Post IE

- Measure actual impacts accrued by program participants
- Have immediate benefits and reflect reality
- Key Limitations
  - Sometimes miss the mechanisms underlying the program's impact on the population, which are important and, which structural models aim to capture
  - Can be very expensive compared to ex ante evaluations because of their requirement for data collection
  - The program may fail, a phenomenon which adds to the cost, and which might have been predicted by an ex ante IE
- One useful approach would be to combine both analysis and compare ex post estimates with ex ante predictions

The Counterfactual

- Key challenges of Impact Evaluation
  - Knowing the counterfactual, i.e., what would have happened to program participants if the program had not existed
  - Determining if the change in the outcome variable of interest is directly attributable to the program
- The impact of any program can be truly assessed only by comparing actual and counterfactual outcomes
  - However, the counterfactual for program participants is not observed
    - A household or an individual cannot be in the treated and the control groups at the same time
  - Any IE should therefore create a convincing and reasonable comparison group for program participants
- We'll see the different options for creating an appropriate counterfactual

Looking for the Counterfactual - Two Options

1. Simply take the non-program participant group as the counterfactual for program participants
   - Looks straightforward, but likely to be problematic!
   - Treatment and control groups may have systematic difference, unless under special cases (e.g., randomization) - we'll discuss this shortly
   - You may be able to create a counterfactual group using some techniques (e.g., PSM - Lecture 3)
2. Take data on program participants before and after the program to determine the change in the outcome variable
   - Problematic as well! It is difficult to attribute all the changes in the outcome variable to the program! I.e., difficult to disentangle the effect of time from the program

IE - the Problem of Missing Data

- We can't observe the outcomes of program participants had they not been beneficieries
  - Next best alternative $\Longrightarrow$ compare outcomes treated and non-treated households/individuals
  - Pick a comparison group that has not been treated, but very similar with the treated group
- Two broad approaches to create a counterfactual group of the treated group
  1. Through statistical design
  2. Through modifying the targeting strategy of the program itself to eliminate differences that would have existed b/n treated and control groups

IE - the Problem of Missing Data

- Consider a regression equation for an outcome variable Y across treated and nontreated individuals i

$$Y_i = \alpha X_i + \beta T_i + \varepsilon_i \tag{1}$$

- Where $T = 1$ for treated individuals 0 for those who're nontreated, $X =$ observable characteristics; ε_i is an error term reflecting unobserved characteristics that also affect Y
- Eq 1 is run to measure the direct effect of the program
  - Indirect effects are also important, e.g., the program's effect on prices within program areas, but we don't discuss them in this lecture

IE - treatment assignment is often not random!

1. Purposive program placement: programs are placed according to the need of the communities and individuals
2. Self-selection into the program: program participants may self-select into the program based on observable or unobservable characteristics or both

- Self-selection based on unobservables $\Longrightarrow cov(T, \varepsilon) \neq 0 \Longrightarrow$ a clear violation of one of the Guss-Makov conditions for the OLS estimator!
  - The parameter estimates, including β will be biased and inconsistent

Non-random assignment - example

- Consider a credit intervention aiming at improving household income
- Let Y_i income/capita of hh i for participants $T_i = 1$, and the value of Y_i under treatment is given by $Y_i(1)$
- For nonparticipants, $T_i = 0$, and Y_i is given by $Y_i(0)$
- If $Y_i(0)$ is used across nonparticipating households as a comparison outcome for participant outcomes $Y_i(1)$, the average treatment effect of the program might be represented by

$$D = E(Y_i(1) \mid T_i = 1) - E(Y_i(0) \mid T_i = 0) \qquad (2)$$

- However, treated and nontreated groups may not be the same prior to the intervention

Non-random assignment - example

- $\Longrightarrow$ expected difference between those groups may not be due to entirely to program intervention!
- Add and subtract the expected outcome for nonparticipants had they participated in the program - $E(Y_i(0) \mid T_i = 1) \Longrightarrow$

$$D = E(Y_i(1) \mid T_i = 1) - E(Y_i(0) \mid T_i = 0) + [E(Y_i(0) \mid T_i = 1) - E(Y_i(0) \mid T_i = 1)] \quad (3)$$

$$\Longrightarrow D = ATE + [E(Y_i(0) \mid T_i = 1) - E(Y_i(0) \mid T_i = 0)] \quad (4)$$

$$\Longrightarrow D = ATE + B \quad (5)$$

Non-random assignment - example

- ATE =the average treatment effect
  $E(Y_i(1) \mid T_i = 1) - E(Y_i(0) \mid T_i = 1)$
  - The average gain in outcomes of participants relative to nonparticipants, as if nonparticipating households were also treated
  - It corresponds to a situation in which a randomly chosen household from the population is assigned to participate in the program
- $B, [E(Y_i(0) \mid T_i = 1) - E(Y_i(0) \mid T_i = 0)]$ in eq. 5 represents the extent of selection bias that comes up in using D as an estimate of the ATE
- Difficult to calculate the magnitude of the selection bias as we don't know $E(Y_i(0) \mid T_i = 1)$
- $\Longrightarrow$ We'll never know the exact difference in Y_i between treatment and control groups

Non-random assignment

- Finding a convincing way to get rid of (or account for) selection bias B is the key objective of a sound IE initiative
- Possible approaches to address selection bias:
  1. Randomization: assign program participants randomly to program
  2. Conditional independence (unconfoundedness) assumption: if one could assume that whether or not households or individuals who receive treatment (conditional on a set of covariates, X) were independent of the outcomes that they have

$$(Y_i(1), Y_i(0)) \perp T_i \mid X_i \tag{6}$$

  3. Conditional exogeneity of program placement:
- These assumptions must be defendable depending on how exogenous the program targeting is

Different Evaluation Approaches

1. Randomized Evaluations
2. Propensity Score Matching (PSM)
3. Difference-in-differences (Diff-in-dif) or Double Difference (DD) method
4. Instrumental Variables (IV) Methods
5. Regression Discontinuity (RD) design and Pipeline Methods
6. Distributional Impacts
7. Structural and Other Modeling Approaches

Several steps for effective and useful IEs

- Project identification and preparation - state clear IE objectives
- Time interventions correctly - isolate the effect of confounding factors
- Data (beneficiary and community level) availability and quality - qualitative? quantitative? ex ante? ex post? Appropriate sampling design, and survey instruments, ample pilot surveys
- Hiring and training field work personnel, consistent approach to managing and providing access to data, accurate reporting of data and results, transparency in implementation
- Proper analysis and IE to provide valuable feedback, which will help guide future policy

- End of Lecture