UNLOCKING RENEWABLE ENERGY DEVELOPMENT TO ADDRESS CLIMATE CHANGE: Exploration of Causal Links Through QCA

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EXAMPLE FROM THE POWER TO RENEW
AGENDA

1. QCA Method
2. Process for Applying QCA
3. Renewable Energy Evaluation
4. Theory of Change
5. Country Case Studies
6. Developing & Scoring Factors
7. Results and Interpretation
8. Some validation of conclusions
QUALITATIVE COMPARATIVE ANALYSIS

QCA is based on two primary assumptions:

1) change is often the result of different combinations of factors, rather than on any one individual factor; and

2) different combinations of factors can produce similar changes

Charles Ragin
who is credited with developing QCA
METHOD: QUALITATIVE COMPARATIVE ANALYSIS (QCA)

• Developed in the 70’s, relatively ‘new’ in application in evaluation

• Analytical technique used for qualitative study of macro social phenomena

• An akin method to quantitative model testing (such as, structural equation modeling)

• Case-Oriented and set-theory method

• Helps identify causal patterns across multiple cases using Boolean algebra

Where can QCA add value?

• Analysis of multiple cases in complex situations

• Identify causal links and explain conditions under which change happens

• Allows for generalization across a group of case studies

• Valuable for small N evaluations (e.g. 5 to 50)
QCA uses both quantitative and qualitative analysis

- **In-depth QUALITATIVE** understanding of cases and subject matter
- **QUANTITATIVE** generation of findings generalizable across wider population

1. Develop or use a detailed Theory of Change
2. Identify cases of interest
3. Develop a set of factors
4. Score the factors
5. Analyse the dataset
6. Interpret the findings and revise the Theory of Change

SOURCE: Intrac
RE EVALUATION: WBG SUPPORT TO RENEWABLE ENERGY

WHY QCA?

1) Validate Theory of Change

2) Identify pathways for scaling-up RE investments

• Renewable Energy (RE) can help meet energy demand and environmental sustainability

• SDGs and Paris Agreement stress RE as a key solution, with momentous scale-up envisaged

• Dynamically evolving sector expected to continue to disrupt energy sector

• Presently over 25% of global electricity is produced from RE
RE EVALUATION: MULTI-METHOD APPROACH

- **Structured Literature Review**
  - RE Market Review
  - SLR Barriers to RE
  - SLR Benefits/Impacts of RE

- **Portfolio Review & Analysis**
  - 546 RE Projects/Investments
  - 245 ASA/AS
  - CAS/CPF Strategies
  - CBA/In-Depth Hydro Review

- **Comparative Case Studies**
  - In-Depth Country Studies
  - QCA Causal Analysis
  - 19 PPARs

- **Semi Structured Interviews**
  - Public & Private WBG Clients
  - WBG Staff Survey/Interviews
  - Other Partners

- **Global Expert Panel**
  - Delphi Panel of Global Experts on RE

**EVALUATION QUESTIONS**
**RE EVALUATION: THEORY OF CHANGE**

**INPUTS**

- **Financing**
- **Global Knowledge**
- **Partnerships**

**KEY TYPES OF BARRIERS ADDRESSED**

1. Inadequate Policies & Regulations
2. Inability to Integrate RE to Power System
3. Insufficient Design & Technical Standards
4. Inadequate Institutional Capacity
5. Significant Investment Risks
6. Constraints to Mobilizing Financing

**DEVELOPMENT OF RE**

- Increased RE Capacity & Generation

**ENERGY & ENVIRONMENT BENEFITS**

- Increase Electricity Supply to Grid
  - Improve access to electricity
  - Reduce energy insecurity
- Avoid Global Pollution
  - Avoid local pollution

**CONTRIBUTION TO BROADER DEVELOPMENT IMPACTS**

- Contributes to economic **growth**
- Supports improvements to quality of life, including for **poor**
- Helps protect local & global **environment**

**Assumed contributions from interrelated sectors**
RE EVALUATION: COUNTRY CASE STUDIES IN EMERGING MARKETS

9 COUNTRIES

Morocco, Turkey, Jordan, China, India, Mexico, Nicaragua, Kenya, Sri Lanka
EXAMPLE: Policy and Regulatory Framework

Substantial & adequate legal & policy framework is adopted and being enforced, w/ policy measures and regulations in place, including funding, where required to incentivize

Significant legal framework in place but w/ noticeable shortcomings in regulations & enforcement, & despite lack of policy clarity, there are some policy-based incentives available

While legal framework exists there is little clarity in implementing polices and regulations, lack of enforcement, and limited or no incentives to invest in RE

Insufficient legal & policy framework with critical shortcomings, and inadequate incentives to mobilize investments in RE
## RE EVALUATION: SCORING AND CALIBRATION

### PROCESS OF DEVELOPING MARIX

1) Specialists assess and score barriers during case preparation

2) Debrief w/ case specialists

3) Calibration workshop for final alignment

### BARRIERS

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RE EVALUATION: ANALYSIS AND INTERPRETATION #1

KEY TYPES OF BARRIERS ADDRESSED

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6. Constraints to Mobilizing Financing

TOC Validated. All six barriers have causal link with energy & environment outcomes;

Given validation, further adjustments to ToC was not necessary.
Countries that successfully addressed all six barriers scaled-up RE as a result.

Observed in China; India; Mexico; Sri Lanka; Turkey.
Policy & Integration were found to be essential (necessary conditions) under all successful reform scenarios

Observed in Nicaragua and Morocco

WB experienced w/ policy reforms; major challenge for IFC/private, Helped identify gap w/ Integration where WBG has more limited experience.
RE EVALUATION: ANALYSIS AND INTERPRETATION #4

**KEY TYPES OF BARRIERS ADDRESSED**

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**Policy & Integration + Risk Mitigation was additional pathway to scaling-up RE**

Observed in Jordan and Morocco

Especially mobilizing private sector investments
Renewable electricity growth still needs to accelerate significantly to meet long-term to sustainable energy goals.

This growth is possible if governments address the three main challenges to faster deployment: policy and regulatory uncertainty; high investment risks in many developing countries; and system integration of wind and solar PV in some countries.
• A scale-up in RE did not lead to a corresponding increase in the avoidance of CO2
• It reflects the displacement of hydropower by geothermal
• Displacement of one renewable for another would have less incremental environmental impact!