Infrastructure Prioritization Framework: A tool to support infrastructure planning processes

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Introduction
Governments face challenges for infrastructure planning:

- Investment needs in all sectors
- Limited public resources and fiscal restrictions
- How to optimize the use of public resources?
- How to compare different investment options?

Need for an objective system to prioritize infrastructure investments.
Common challenges at the project level

- Limited / inconsistent project data availability & quality
- Limited technical and institutional capacity
- High costs and extensive time required to do SCBA appraisal across large sets of projects
- Problems in data comparability
- Reversion to political selection
Infrastructure Prioritization Framework (IPF)
**IPF as a Stepping Stone**

**Ad-Hoc project selection**
- **Limited** project-level information available
- Inconsistent use of information
- Decisions frequently based on non-technical or political considerations
- Subjective assessment common

**Selection by IPF**
- Limited institutional and/or technical capacity
- Partial project-level information available
- Project costs known
- Some information on social, environmental, other economic effects
- Decisions based on minimum relevant information

**Selection informed by full SCBA**
- High technical and institutional capacity
- Detailed project-level information available
- Extensive quantified and monetized social, environmental, financial and economic effects known
- Selection using NPVs or ERPs
Advantages of the IPF

The IPF is a multi-criteria approach to project prioritization.

1. Can be adapted to account for policy goals*
2. Combines social-environmental and financial-economic variables
3. Accommodate data and resource limitations
4. Includes the sector budget constraint
5. Displays information in a simple visual interface
6. Informs discussion of rebalancing sector allocations
7. Improves data collection processes*
I. Define Criteria
Consensus between decision makers, experts, and key stakeholders

II. Prepare Data
Source project data (CBA elements incorporated when available)

III. Construct Performance Indices
Includes statistical / mathematical methods to combine selected variables into two dimensions

IV. IPF Matrix
Combine SEI, FEI, and budget constraint to create a four-quadrant matrix

V. Select Projects
Based on informed deliberation
Two-Dimensional Structure

Social-Environmental Indicators (SEI) (example)
- Beneficiaries*
- Affected population*
- Environmental effects*
- Poverty levels*

Financial-Economic Indicators (FEI) (example)
- Benefit-cost ratio*
- Multiplier effects*
- Externalities*
- Implementation risks*

Fundable projects given the budget constraint

Survey Name
10
IV. IPF Matrix

• \((x, y)\) coordinates are defined by the (FEI,SEI) score pair
1. Principal Component Analysis (PCA) to combine criteria
   - Maximization problem with one constraint*
   - Maximization problem with two constraints*

2. Sensitivity analysis to compare results with other weighting methods
   - Subjective weighting (AHP)
   - Simple average
Pilots:

Argentina (irrigation)
Sri Lanka (Roads)
Vietnam (Transport, Urban)
• 45 irrigation projects pre-identified by the government
• The goal is to prioritize and explore PPP scheme options
• The process included experts / decision-makers from Ministry of Public Works, FAO-UN*, WB experts*.
Argentina: Irrigation (2/3)

Social-Environmental Indicators (SEI)
- Beneficiaries*
- Direct Jobs*
- NBI: Unsatisfied Basic Needs*
- Environmental impact*
- Hydraulic stress*

Financial-Economic Indicators (FEI)
- IRR*
- Implementation risks
  - Institutional factors*
  - Water supply*
  - Soil productivity*

**Sensitivity analysis** to compare results with other weighting methods
- PCA
- PCA with two constraints (2 scenarios)
- Simple average
- Subjective weighting (defined by FAO, MOP)
• Identification of potential PPPs from high priority projects
Sri Lanka: National Roads

• XX transport projects (national roads) pre-identified by the National Planning Department (NPD)*
• Existing multi-criteria approach to prioritization at NPD
• Discussion on existing criteria to prioritize investments

Social-Environmental Indicators (SEI)
• Beneficiaries*
• Jobs created*
• Resettlement*
• Environmental impact*
• Safety*
• Surface condition

Financial-Economic Indicators (FEI)
• Benefit-Cost ratio*
• Connectivity*
Vietnam: Sector Re-allocation

Rebalancing sectors toward high SEI urban projects would allow the government to reach 600,000 additional beneficiaries and create 1600 new jobs.
Next Steps and Conclusions
Next steps

✔ Conclude comparison with Chile prioritization system*
  - 2 Sectors; transport and water reservoirs
  - CBA is requirement for project to be eligible for funds (IRR>6%)

✔ Prioritization of projects including infra-resilience indicators (Japan pilot)*
  - Initial discussions with Tokyo University*

✔ Platform to prioritize investments in Indonesia*
Conclusions

The IPF tool is a simple and practical system for objective prioritization of infrastructure projects.

- Allows for better use of public funds
- Combines social/environmental with financial/economic indicators
- Allows comparisons of projects within each sector
- Offers a mechanism for sector re-allocation
- Provides decision makers with a visual interface
- Improves data collection systems
Thank you