GATHERING INFORMATION
- On indicators, policies & plans from surveys, research documents, reports

ANALYSIS
- Of root causes & their linkages

Policy Decision
- Selection of areas of cooperation

Example Problem: Low school enrolment rates in border region

Evidence/data based Causal Analysis

From Theory, Hypothesis, Debate to Evidence-based Policy

Scientific process and research design
- Theory, design and measurement
  - theory → model → data
  - Measurement valUrbanity and reliability
- Causal inference procedure
  - Simple sequential inductive approach
  - Hypothesis testing, reject-confirm iterative approach
  - Causal modelling and path analysis of direct, indirect, conditional and interaction effects as well as spurious correlation
From Theory to EvUrbanence-based Explanation

Operationalization
- Data matrix/box – “data modeling”
  - Units of analysis
  - Variables (attributes & behavior)
  - Time-space
- Measurement, scaling, examples:
  - Learning achievement
  - “Parental love”
  - Child-centered T-L
- Data analysis: statistical models
  - Univariate scalability, centrality and distribution profile
  - Bivariate correlation/covariance, test of hypothesis
  - Multivariate analysis of co-variances,
  - Path analysis of causal models, fitness-test of theory
  - Etc.

Data collection
- Units, variables, time, relations

Model: concepts

From Theory to EvUrbanence-based Explanation

Operationalization

Theory

Generalization

Data analysis

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Education Issues and Information Needs for Policy & Management

Social Demand

Policies & resources

Access & Participation

Knowledge & Skills

Quality Standards

Efficiency

Social-Economic Impact

Indicators for Education Sub-sectors

Indicator areas

<table>
<thead>
<tr>
<th>Early childhood</th>
<th>Formal basic education</th>
<th>NFE Out-of-school youth &amp; adults, literacy, life skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demand for education and training</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Input of resources and policies</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quality of education delivery process</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Access and participation/coverage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Efficiency</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Output of knowledge and skills</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Impact on individual welfare &amp; health</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Impact on gender &amp; social disparities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Impact on community development</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Impact on socio-economic systems</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Education for whose needs? Cost Analysis of Sub-national of Disparities

Who are neglected? What knowledge, skills? How to increase access? How to increase disparities? Contextual analysis, e.g. gender disparity. Cost-effective delivery?

<table>
<thead>
<tr>
<th>Early childhood</th>
<th>Formal basic education</th>
<th>NFE Out-of-school youth &amp; adults</th>
</tr>
</thead>
<tbody>
<tr>
<td>?</td>
<td>?</td>
<td>?</td>
</tr>
</tbody>
</table>

- Out-of-school children
- Unemployed youth
- Minority language groups
- Learners with disability/special needs
- Remote isolated communities
- Urban poor & homeless
- Rehabilitation of prisoners
- Refugees & displaced population
- Etc. Not relevant neglected groups

NFE Out-of-school youth & adults
- Formal basic education
- Early childhood

Who are neglected? What knowledge, skills? How to increase access? How to increase disparities? Contextual analysis, e.g. gender disparity. Cost-effective delivery?

Monitoring
- Purpose: improve implementation/formative
- Aimed at: operations and management
- Focus: account of what has been implemented
- Information: inputs and process
- Indicators: resource input, efficiency, quality of delivery

Assessment
- Purpose: improve learning formative/sum
- Aimed at: curriculum design, teachers and course providers
- Focus: learning objectives, TL, methods and materials
- Information: Learning achievements per objectives, TL process
- Indicators: Learning results per method-materials

Evaluation
- Purpose: improve policies and strategies/formative/summative
- Aimed at: policymaking and leadership
- Focus: evaluation of policies and strategies vs goals & targets
- Information: outcomes and impact
- Indicators: learning achievements, socio-economic changes

EFA Mid Decade Assessment
Reaching the Un-reached

Analyze strategies for reaching the un-reached

- EFA strategy focus is, not only improving more of the same, but how to reach the non-achieved targets and neglected groups and to improve quality
- Increasing marginal cost for more inaccessible population targets (e.g. cost of providing education to 1000 in city versus linguistic minorities in remote regions)
- More of standard “success” formula will not be effective in non-standard environment
- Need innovative, non-conventional approach, cost-effective in the context of the target environment
Mission: delivering cost-effective quality education for all

Towards better quality: a holistic approach

Analysis of Equity/disparity in Quality of Education

- The major aspects of the EFA education reforms to be analyzed
  - Measure and assess inequalities in access, participation and benefits between
    - Sex and age
    - urban/rural, geographical location
    - economic zones,
    - ethno-linguistic, religious groups,
    - urban-rural migrants,
    - SES strata, castes, classes
    - indigenous sub-population,
    - people with disabilities,
    - extremely poor, remote inhabitants, etc.

Analyzing Implementation of EFA Policy and EFA Goals

<table>
<thead>
<tr>
<th>Policy Cycle/indicators</th>
<th>ECCE</th>
<th>UBE</th>
<th>Skills</th>
<th>Literacy</th>
<th>Gender</th>
<th>Quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Governance, policy, agencies coordination</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Resource mobilization</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Courses, programs, facilities</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quality &amp; Equity Outcomes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Impact Assessment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Hypothetical Causal Model

Z1 → X1 → X5

Z2 → X2 → X5

Enroll in school
Causal model
Explain differences in GER & NER

Conditioning factors: policy determined
- Legal requirement Compulsory/non-compulsory primary education
- Budgetary allocation for migrant workers
- Availability of schools, teachers and places
- Absence of clear authoritative directive
- Language of instruction
- Laws on citizenship, registration, work permit, residence permit

Immediate factors
- Birth certification
- Citizenship
- Residence permit
- Work permit
- Legal ID card
- Poverty – household income
- (Fear of deportation)
- Language barrier

Analyze disparities vis-à-vis
Target groups

- Religious, linguistic and ethnic groups
- Castes, classes and other social stratifications
- Residents of remote areas/border regions
- Undocumented, non-citizens, non-registered residents
- Migrants, refugees and their children
- The extremely poor

various phases in the process of policy implementation:
- Policy formulation and legislation
- Budgetary policy measures
- Administration and implementation
- Admissions by education provider institutions
- Teacher education for teaching the target groups

The assessment will further consider the following factors:
- Comparisons of quality and curriculum in minority/majority schools
- Comparisons of attitudes, aspirations and expectations of pupils, parents and community members in minority/majority districts
- Interest groups (NGOs, Government agencies, community organizations, etc)
- Education statistics on the target groups
MODAL PATTERNS OF TABULAR ANALYSIS

<table>
<thead>
<tr>
<th>Case</th>
<th>ZONE</th>
<th>% Enrolment</th>
<th>%diff</th>
</tr>
</thead>
<tbody>
<tr>
<td>Case 1</td>
<td>Boys</td>
<td>70</td>
<td>30</td>
</tr>
<tr>
<td>Case 1</td>
<td>Girls</td>
<td>40</td>
<td>70</td>
</tr>
<tr>
<td>Case 2</td>
<td>Boys</td>
<td>70</td>
<td>30</td>
</tr>
<tr>
<td>Case 2</td>
<td>Girls</td>
<td>40</td>
<td>70</td>
</tr>
</tbody>
</table>

Rural
Urban

The following are alternative interpretations of the role of a third analytical variable (zones):

Case 2: Irrelevant
Case 3: Concurrent
Case 4: Conditional / Interaction
Case 5: Intervening / common effect

Testing the effect of a third variable
Path Analysis using partial correlation or multiple regression

Case 1: starting point: a bivariate correlation

\[
\text{Sex} \rightarrow \text{Access}
\]

\[
\text{Access} = a + b \times \text{(Sex)} + u
\]

\[
\text{Access} = \beta \times \text{(Sex)} + \mu
\]

\[
R_{ac} \neq 0
\]
Case 3: Concurrent effect:

- The enrollment rate differs for both groups and zones—participation of Boys is greater than that of Girls, regardless of the environment, but for both groups respectively, participation is greater in the urban than the rural environment.

\[
\text{Sex} = \beta_{\text{Urban}} + \mu, \quad \text{where} \quad \beta = 0
\]

\[
\text{Access} = \beta_{1} \text{Sex} + \beta_{2} \text{Urban} + \mu
\]

Concurrent effect:

<table>
<thead>
<tr>
<th>Concurrent effect: difference between citizens and also between Urban-Rural residence; therefore, both are relevant</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Case 3</strong></td>
</tr>
<tr>
<td>Urban</td>
</tr>
<tr>
<td>Rural</td>
</tr>
<tr>
<td>%diff</td>
</tr>
</tbody>
</table>

Graphical displays for causal interpretation

**Case 4: Conditional/interaction effect**

- The graphical display shows the enrollment rate for both groups (Boys and Girls) in different urban and rural environments.
### Tabular Analysis

**Conditional effect:**

- Differences are accentuated by combined effects. Big advantage for boys in urban areas, where girls are more disadvantaged than boys and even girls in rural areas, resulting in opposite effects of Urban-rural residence on respective groups.

<table>
<thead>
<tr>
<th></th>
<th>Boys</th>
<th>Girls</th>
<th>%diff</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban</td>
<td>80</td>
<td>30</td>
<td>50</td>
</tr>
<tr>
<td>Rural</td>
<td>50</td>
<td>40</td>
<td>10</td>
</tr>
<tr>
<td>%diff</td>
<td>30</td>
<td>-10</td>
<td></td>
</tr>
</tbody>
</table>

**Case 4: Conditional/interaction effect:**

- The difference between Boys and Girls is magnified in the urban than in the rural areas. Among Boys, enrolment is higher in the urban areas; among Girls, it is higher in the rural areas; producing opposite effects. More likely the other way round?

\[
\begin{align*}
\text{Sex} &= \beta \text{Urban} + \mu, \text{ where } \beta = 0 \\
\text{Access} &= \beta_1 \text{Sex} + \beta_2 \text{Urban} + \beta_3 \text{UxC} + \mu
\end{align*}
\]

**Case 5: Intervening/common effect:**

- The difference is between the urban and rural areas, not between Boys and Girls (spurious effect), due either to the intervening or common effects of the environment.

\[
R_{\text{SexAccessUrban}} \neq 0
\]

- Access = \beta_1 \text{Sex} + \beta_2 \text{Urban} + \mu, \text{ where } \beta_1 \neq 0

**The End**