

**How can public policy more effectively level out inequality and in what ways can evidence be used to inform this process?**

**The application of the CGE Model**

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**What types of policy decisions is CGE model findings most useful for**

- What type of policy decisions: large, economy-wide
  - Social protection spending
  - Public expenditure on education
  - Public expenditure on health
  - Growth differential between sectors
  - Productivity improvement



## To see the impact on

- Overall economic growth
- Sectoral growth
- Poverty... inequality
- Hunger
- Employment
- Gender



## Why do we emphasis on CGE modeling ?

- Theoretically consistent
- A clear policy orientation
- Capture both direct and indirect inter-sectoral, inter-regional, and inter-temporal effects induced by policy changes.
- Able to analyze large, discrete, policy changes that are far away from the baseline.
- Very useful to build a bridge between economists and policy makers, and provide them with a base for dialogue.



## What is CGE?

- Computable : Solved numerically
- General: Economy wide
- Equilibrium:
  - optimizing agents have found their best solutions subject to their budget constraints
  - quantities demanded = quantities supplied in factor and commodity markets
  - Macroeconomic balance

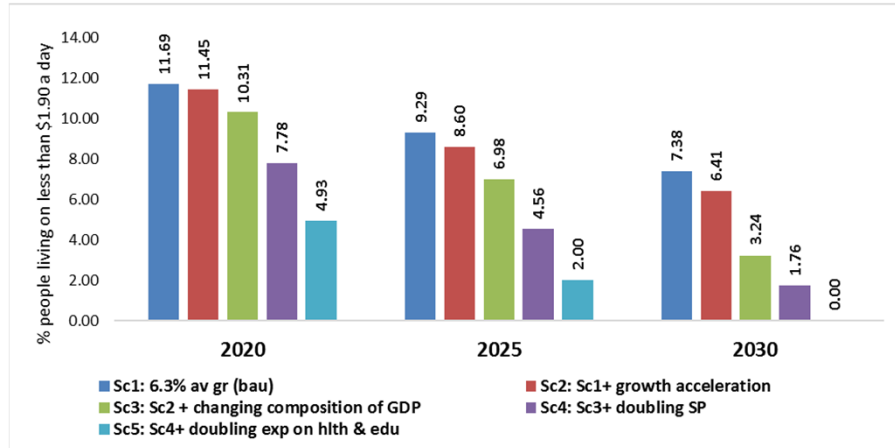


## Some examples: CGE application on SDGs

- **Sc1:** Business-as-usual scenario of average GDP growth rate.
- **Sc2: Sc1+ growth acceleration:** Growth increased by 2% points (1% in the first 5 years and by 2% after 2020).
- **Sc3: Sc2 + changing composition of GDP:** Changing composition of GDP as per the SDG 9 (double the share of manufacturing in GDP by 2030). This is done in phased manner.
- **Sc4: Sc3+ doubling Social protection expenditure**
- **Sc5: Sc4+ Doubling the ratios of public expenditure of education and health to GDP**



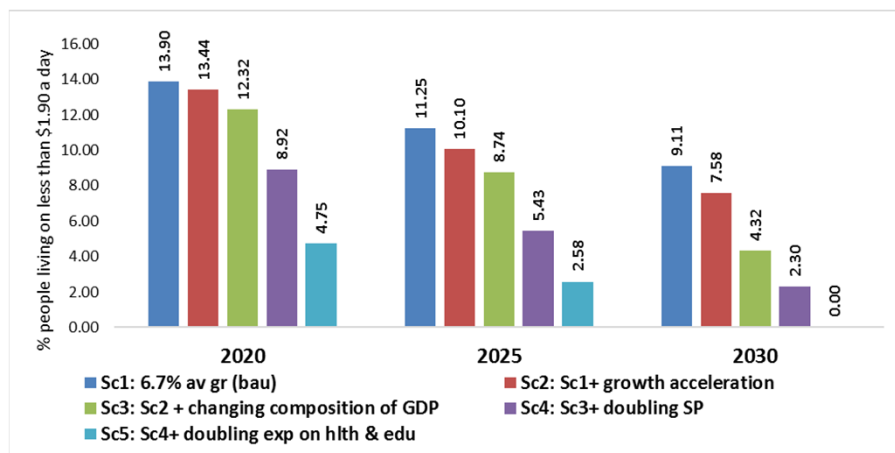
## Impact on head-count poverty: Bangladesh



Source: ESCAP-SANEM model

Note: SP = social protection; edu = public expenditure on education; hlth = public expenditure on health.

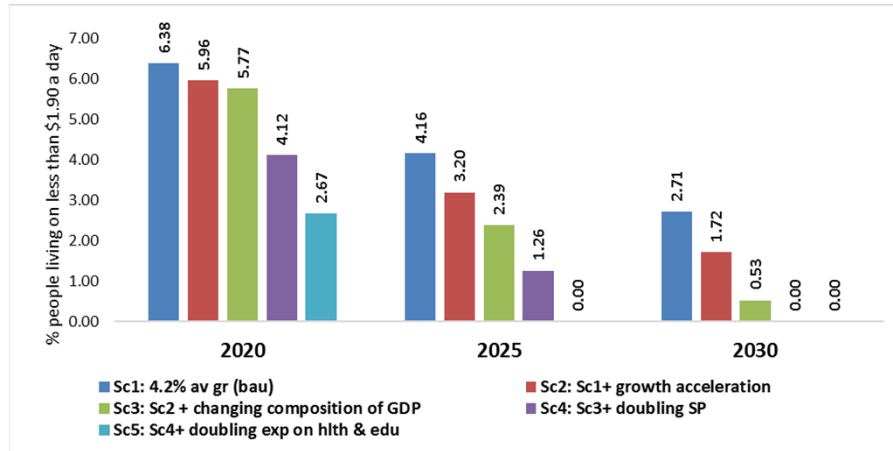
## Impact on head-count poverty: India



Source: ESCAP-SANEM model

Note: SP = social protection; edu = public expenditure on education; hlth = public expenditure on health.

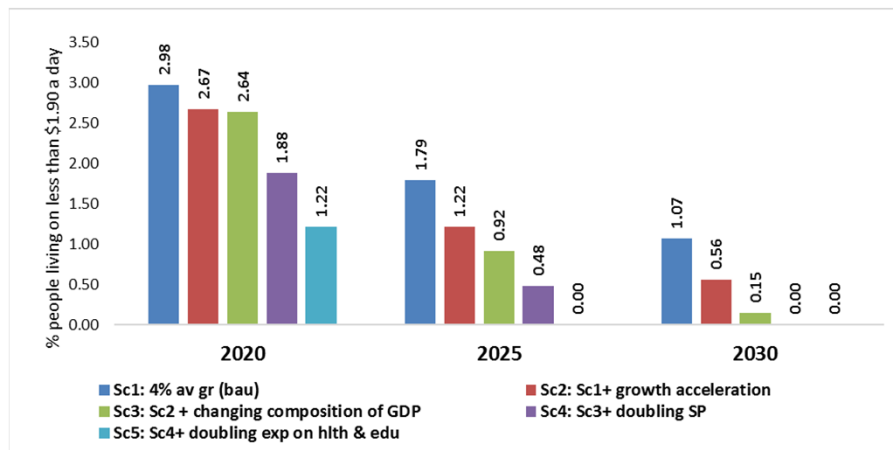
## Impact on head-count poverty: Nepal



Source: ESCAP-SANEM model

Note: SP = social protection; edu = public expenditure on education; hlth = public expenditure on health.

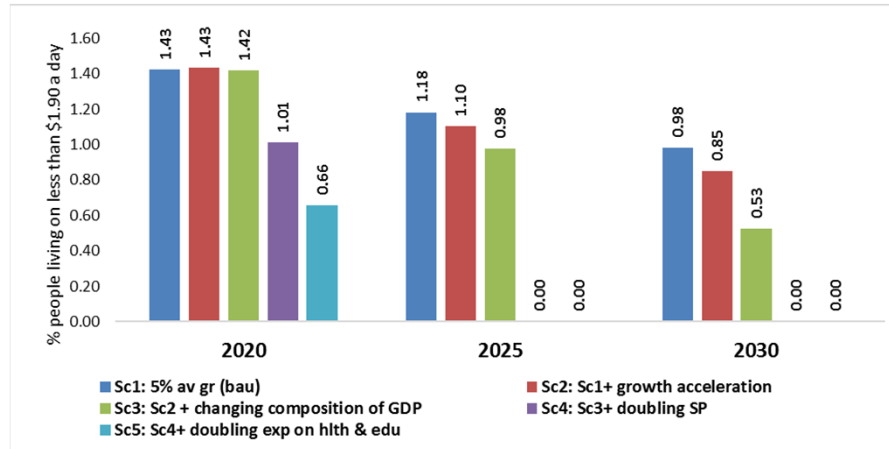
## Impact on head-count poverty: Pakistan



Source: ESCAP-SANEM model

Note: SP = social protection; edu = public expenditure on education; hlth = public expenditure on health.

## Impact on head-count poverty: Sri Lanka



Source: ESCAP-SANEM model

Note: SP = social protection; edu = public expenditure on education; hlth = public expenditure on health.

## Knowledge required for CGE Analysis

- Basic Micro and Macroeconomics
- Knowledge of general equilibrium theory
- Knowledge of real world data. Be able to manipulate and convert it into a model admissible form
- Knowledge of computer programming. Be able to implement the model in computer
- Knowledge of policy issues and institutional structure



## Steps in CGE Modeling

1. define the issue to be studied
2. construct a consistent mathematical model
3. data collection – construct the benchmark that will be used for calibration
4. code the model, usually using GAMS
5. replicate the benchmark -- consistency
6. conduct policy experiments
7. analysis of results – compare the counterfactual solution with the benchmark



## Programming to Solve CGE Models

- GAMS
- GEMPACK



## Data requirement and parameters

- The data requirements used to construct a CGE model are small when compared to the number of model parameters -- calibration.
- A SAM (i.e., a picture of the economy) is used to infer the value of model parameters.
- The SAM is combined with elasticities
  - own estimations, literature review, estimations for similar countries, guesstimates.