Development is a controversial and multidimensional concept.

I. The UN Millennium Development Goals

Set by the UN in 2000 for 2015. Indicators + yardsticks to measure development progress.

Goal 1: Eradicate extreme poverty and hunger: Halve between 1990 and 2015 the proportion of people whose income is less than 1$/day.

Goal 2: Achieve universal primary education.


Goal 4: Reduce child mortality: Reduce by 2/3 the under-five mortality rate in 1990-2015.


Goal 6: Combat HIV/AIDS, malaria, and other diseases: Have halted by 2015 and begun to reverse the spread of HIV/AIDS.

Goal 7: Ensure environmental sustainability: Integrate the principles of sustainable development into policies and programs; halve the proportion of people without sustainable access to safe drinking water; achieve by 2020 a significant improvement in the lives of at least 100 million slum dwellers.

Goal 8 (mean): Develop a global partnership for development: Open trading and financial system; increase foreign aid; reduce debt.


II. The dimensions of development

While there is no single definition, development can be characterized by the following seven categories of indicators.

1. Income and income growth

\[ \text{GNP} = \text{GDP} + \text{Net factor income from abroad.} \]

Better to measure income than GDP.

\[ \text{GNI} = \text{GNP} – \text{depreciation} – \text{indirect business taxes. } \]

Best to measure income earned.

1.1. Comparisons over time: need adjust for inflation

\[ \text{Real GDP in prices of base year = (Nominal GDP)/(Price index = 1 in base year)} \]

Real GDP growth = Nominal GDP growth – Rate of inflation

1.2. Change over time: compounded growth rate formulas

If an initial value \( X_0 \) is compounded at the annual growth rate \( g \) for \( T \) years, the terminal value is:

\[ X_T = X_0 (1 + g)^T \]

Alternatively, the growth rate that has transformed \( X_0 \) into \( X_T \) over \( T \) years of compounded growth is:

\[ g = (X_T/X_0)^{1/T} - 1 \]

Taking logarithms, a useful approximation to the growth formula is:

\[ \ln X_T = \ln X_0 + T \ln (1 + g) \]

This allows to solve for \( T \), the time needed to get out of poverty, for a given initial level of income \( x \), a given poverty line \( z \), and a given growth rate in income:

\[ T = \frac{\ln z - \ln x}{g} \]

1.3. Comparisons across countries: need bring to single currency

1.3.1. At official exchange rate: \( \text{GDP}^e = \frac{1}{e} \cdot \text{GDP}^{pesos} \). e = Pesos / $ exchange rate

Hence, devaluation lowers \( \text{GDP}^e \) for a given \( \text{GDP}^{pesos} \). Overvaluation exaggerates \( \text{GDP}^e \).

1.3.2. At Purchasing Power Parity adjusted exchange rate (PPPe):

\[ \text{PPPGDP} = \frac{1}{\text{PPPe}} \cdot \text{GDP}^{pesos} \]

where PPPe is the number of Pesos required to buy the same amount of goods and services (quality adjusted) as 1 US$ in the U.S.

In low income countries, \( \text{PPPGDP} > \text{GDP}^e \) (e.g., India, 1999: $2,149 vs. 450)

In the US, \( \text{PPPGDP} = \text{GDP}^e \), by construction ($30,600)

In high income countries (Japan, Germany), \( \text{PPPGDP} < \text{GDP}^e \) (Japan: $24,041 vs. $32,230)

1.4. Genuine Progress Indicator (GPI): Green and social national accounting

\[ \text{GPI} = \text{GDP} + \text{Value of unpaid work} – \text{Costs of crime and social breakdown} – \text{Cost of ecological damage} \]

U.S.: \( \text{GPI} > \text{GDP} \)

2. Poverty

Measured as percentage of people with income below a poverty line (headcount ratio) = \( R_0 \) (we will see other indicators later in the course).

World poverty: 2.8 billion < 2$/day = 47% of humanity

World destitution: 1.2 billion < 1$/day = 20% of humanity

Note: special focus on rural poverty as 75% of the world poor are rural.

Note: special focus on employment as labor is the main asset of the poor.

3. Inequality and inequity

Equality (ex-post): e.g., share of income held by bottom X% relative to share of income held by top X% (we will see other indicators later in the course).

\[ \text{Gini coefficient (see later). } \]

E.g., share of poorest 40%/Share of richest 20%: India: 51%; Senegal: 19%; Brazil: 11%; U.S.: 34%; Japan: 42%

Equity (ex-ante): equality of opportunities.

Sen: equity = distribution of capabilities (assets) and freedoms (power).

Note: different dimensions of inequality of opportunities: gender, age, ethnic, regional, rural/urban.

Why is equality a relevant criterion for development?

Aggregate rate of saving may rise with greater inequality (Keynes). But poor can save if they have access to financial instruments for saving.

Incentives may rise with inequality (incentive wages, rewards for taking risks) but also decline with inequality (sense of fairness, sabotage).

Cost of social control may fall with equality.

Cost of welfare programs may fall with equality.

Solidarity and cooperation may rise with equality.

Participatory development and democracy may rise with equality.
4. Vulnerability

Vulnerability = Probability of falling in poverty.
E.g., food insecurity: Probability(Consumption < Minimum consumption requirement).
If poor have lower average consumption relative to minimum needed, they are more exposed to disaster, and
will have a higher level of risk aversion in their behavior, limiting their options.

Sources of risk:
- Natural disasters: drought, flooding, pests.
- Health: Illness, accidents, epidemics.
- Social: crime, war.
- Economic: international prices, unemployment, inflation, recession.
- Political: policy change, discontinuation of social programs.
- Environmental: pollution.

Types of risks:
- Economy-wide
- Region-wide
- Idiosyncratic (easier to insure as not covariates)

Categories of poor:
- (Non-poor: on average above poverty line and never in poverty)
- Transient poor: on average above poverty line, but sometimes in poverty.
- Chronic poor: on average below poverty line, but sometimes out of poverty.
- Persistent poor: always in poverty.

Means of reducing vulnerability:
- Risk reduction: actions to reduce the probability of a shock (preventive health, investment in irrigation)
- Risk management (ex-ante): actions to decrease the impact of a shock on income (portfolio diversification, insurance, investment in liquid assets as opposed to fixed assets)
- Risk coping (ex-post): actions to relieve the impact of an income shock on consumption (sell assets, take loans, receive transfers and social assistance).

Risks of irreversibility: take children out of school, malnutrition and stunting, fire sales of assets (land), move to refugee camps, homelessness.

Note: cost of globalization may be increasing vulnerability due to greater exposure to international prices fluctuations (e.g., coffee prices).

5. Basic needs (human development)

Includes: health, education, nutrition, social infrastructure.
Note: have a large public goods component as opposed to income poverty.

Include:

Health
- Life expectancy at birth: males, females
- Maternal mortality rate
- Infant mortality rate
- Reproductive health
- Access to health services
- Access to safe water and sanitation

Education
- Net enrollment ratio, primary
- Net enrollment ratio, secondary
- School attainment: completed years of education
- Literacy rate

Nutrition
- Prevalence of malnutrition and hunger: low birth weight, height and weight deficits.
- Micronutrient deficiencies: Iron (anemia), iodine (mental impairment), Vitamin A (blindness)

Indicators:

i) Health: z-scores
- Stunting: below 2 standard deviations in height-for-age ratio
- Wasting: below 2 standard deviations in weight-for-age ratio

ii) Global burden of disease (GBD): measured in DALY (disability-adjusted life years)
- GBD = Years of life lost due to premature death relative to life expectancy (80 for men, 83 for women) + Years of healthy life lost due to disability
- Example: Africa: 77% of GBD due to death, 23% due to disability
- China and Latin America: 56% of GBD due to death, 44% due to disability.

iii) Malnutrition: Food insecurity (FAO)
- Prevalence of hunger: % of population below nutritional norm (2,800 kcal/person/day for adult men; 2,000 kcal/person/day for adult women).
- Example: 75% Somalia, 31% Nicaragua
- China and Latin America: 56% of GBD due to death, 44% due to disability.

iv) UNDP Human Development Index (HDI):
- HDI = \(1 - \frac{1}{3} \sum H_{i} - H_{k} \) for country \(k\)
- \(H_{1} = \) life expectancy at birth (from 39 years in Sierra Leone to 80 in Japan)
- \(H_{2} = \) educational attainment index
- \(H_{3} = \) PPP-adjusted income from $458 in Sierra Leone to $29,605 in the U.S.

Example:
- Maximum life expectancy = 80
- Minimum life expectancy = 39
- Singapore life expectancy = 77.3; China life expectancy = 70.1
- \(H_{1, Singapore} = \frac{80 - 77.3}{80 - 39} = 0.7, \ H_{1, China} = \frac{80 - 70.1}{80 - 39} = 0.42\)
- Singapore remaining life expectancy gap = % of maximum gap.
- China remaining life expectancy gap = % of maximum gap.
Multidimensionality of poverty: who is poor?

6. Sustainability in use of natural resources

Negative externalities: environmental impact assessment to identify and internalize externalities.
Sustainability = inter-generational equity = welfare of future generations not inferior to welfare of current

generation as a consequence of behavior of current generation toward use of natural resources and the

environment (Brandtland Commission).
Welfare includes: income, option value, existence value, valuation of non-marketed resources, stock of

natural resource.
Strong sustainability: maintenance of resource flow from natural resources.
Weak sustainability: maintenance of income stream from natural resource including technical change and

substitutions in activities.
All inter-generational debts are symptoms of non-sustainability (Sen).

7. Quality of life

- Political freedoms: fair elections, community and local decision-making, participatory democracy.
- Empowerment: participation, social incorporation (Voices of the Poor, capacity to influence the state).
- Human rights: torture, disappearances, arbitrary detention, political prisoners.
- Freedom of expression: media censorship, freedom of speech.
- Rule of law: impartial tribunals, fair and public hearings, protection from corruption.
- Congeniality: social tensions, security, stability, belonging (attachment to place), cooperation, household

stability.

8. Conclusions

1. Development (welfare) is multidimensional (seven dimensions above)

Concept of development has been broadened beyond income or expenditures (per capita income or

consumption) to other dimensions of welfare.
No possible agreement on optimum weighting scheme of the dimensions of development to create a

universal development index: heterogeneity of situations and ideological differences (critique of UNDP

approach).
Potential agreement if:
   First order dominance: one situation (period, country) is better than another in all dimensions of

development.
   Win-win policy reforms or projects: Pareto optimum, possibly after compensation.
Otherwise, use array of indicators, without weighting of relative importance of criteria.
Income poor
Basic needs poor
Poor in both income and basic needs.
Agreement on the importance of some aspects of development may be strong, e.g. growth, poverty, basic

needs, and vulnerability. Agreement on other aspects may be weak: equality, sustainability, quality of life.

2. Normative approaches to development:

WDR 1990: Labor-intensive growth
Health and education for the poor
Safety nets

WDR 2000/01: Opportunities for all
Empowerment of the poor
Security