Population, Education and the Sustainable Development Goals

AAAS 2016

Wolfgang Lutz
Director, World Population Program, IIASA
Founding Director, Wittgenstein Centre
World Population from the year 1000 to 2100

Source of historical data: UN 2001
World Population Growth

… is sometimes called the elephant in the room because it is not explicitly mentioned in the SDGs although it matter greatly …

• … through the number of consumers and their impact on the environment (at given levels of per capita consumption),
• … through making it more difficult to expand education, improve health and reduce poverty,
• … through more people with higher vulnerability being exposed to natural disasters and other environmental change,
• … through possibly increasing the likelihood of conflict and uncontrolled mass migration...
Some SDG Targets are directly relevant to Population Trends

- Reproductive health
- Child mortality
- Universal primary and secondary education
Probabilistic world population projections:
Lutz, Sanderson & Scherbov (IIASA)

Chart 1. Historical trend and projections according to the medium scenario (SSP2) for the world population by six levels of educational attainment (see color coding). The additional lines superimposed
Education as an important goal in its own right

In a global survey by the United Nations respondents consistently ranked “a good education” as the most important issue that would make a difference in their life, ahead of better healthcare and job opportunities.

This is true for both women and men, all age groups, at all levels of national development, and all levels of individual education.
Adding education to age and sex in population analysis

Education is the most important source of observable population heterogeneity after age and sex.

This matters because:

• Almost universally during demographic transition more educated women have fewer children, have lower child mortality, and more educated adults live longer. Changing education composition changes population forecasts.

• Education is a crucial determinant of individual empowerment and human capital, is a key driver of socio-economic development (public health, economic growth, quality of institutions and democracy, and adaptive capacity to climate change).
Singapore - 1970 BP

2.3 Millions

Males

Females

Age (in Years)

Population in Thousands

- No Education
- Primary
- Secondary
- Tertiary
Singapore - 2000 BP

3.9 Millions

Males

Females

Age (in Years)

Population in Thousands

- No Education
- Primary
- Secondary
- Tertiary
Assuming identical education-specific fertility trends, different education scenarios make a difference of more than 1 billion people by 2050.

- CEN gives the world population trend according to the most pessimistic scenario assuming that no new schools will be built.
- FT gives the most optimistic scenario assuming that countries can achieve the rapid education expansion that South Korea achieved.
Adding Education to Age and Sex:
What is the education effect?

We have good reasons to assume “functional causality” from education to health, fertility and behavior. Education is not just a proxy for SES (Socio-Economic Status).

- Every learning experience builds new synapses in our brains and makes us “physiologically different” (Eric Kandel)
- Enhancement of cognitive skills
  - change risky behavior
  - extend personal planning horizon
  - learn from past damage
- Better access to relevant information
- Higher income at the individual and household level
2015: Sustainable Development Goal 4:

…. quality primary and secondary education for all girls and boys …. .

Complementing primary education with secondary education in broad segments of the population is likely to give a strong boost to economic growth.
Global Climate Change

Regional effects on:
- temperature
- humidity
- extreme events (storms)
- sea-level rise

Differential vulnerability

GHG emissions
Consumption
Technology
Innovation

Livelihood
Health/Mortality
Migration

Human Population
By age, sex, level of education, place of residence, and household structure

Closing the full circle of population and climate change
Universal education is key to enhanced climate adaptation

Fund more educators rather than just engineers

By Wolfgang Lutz, Raya Muttarak, Erich Striessnig*

Over the coming years, enormous amounts of money will likely be spent on adaptation to climate change. The international community recently made pledges of up to $100 billion per year by 2020 for the Green Climate Fund. Judging from such climate finance to date, funding for large proj-

the best available information on the number of disasters and reported fatalities from around the world (5).

EDUCATE FEMALES, REDUCE FATALITIES. Because the literature on disaster vulnerability has conventionally emphasized economic growth while disregarding education, our statistical analysis focuses on the relative assessment of these two factors as measured by Gross Domestic Product (GDP)
Shared Socioeconomic Pathways (SSP) Logic

- **SSP 1**: (Low Challenges) Sustainability
- **SSP 2**: (Intermediate Challenges) Middle of the Road
- **SSP 3**: (High Challenges) Fragmentation
- **SSP 4**: (Adapt. Challenges Dominate) Inequality
- **SSP 5**: (Mit. Challenges Dominate) Conventional Development
Toward Constructing a SDG Population Scenario

- Translating the health and education targets into fertility and mortality assumptions
- Child mortality targets
- Reproductive health targets
- Effect of education targets on mortality and fertility
World Population: UN2015 probabilistic projections (dotted lines) and SDG scenarios

![Graph showing world population projections from 1950 to 2100. The graph includes estimates, median, SDG Light, Lower80, Upper80, Lower95, Upper95, SDG Strong, and SDG Strong e4 lines.](attachment:image.png)