The Shared Socioeconomic Pathways (SSPs)

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Descriptions of plausible alternative evolutions of society at the global level

To eventually be combined with assumptions about climate change and policy responses to evaluate climate change impacts, adaptation, and mitigation

**Shared:** to be used by a wide range of studies to provide common assumptions

**Socioeconomic:** i.e., societal (social, demographic, economic, technologic, policy, governance, etc.)

**Pathways:** not end states but also paths to them; not full integrated scenarios, but one component of them
What’s in an SSP

**Narrative**
- Qualitative description of broad patterns of development
- Logic relating elements of narrative to each other

**Quantitative elements**
- Population
- Education
- Urbanization
- Income
- Spatial population
- Income distribution
- Etc.

Hypothetical “reference” development pathway

**Reference:**
- No effects of climate change
- No climate policy (mitigation or adaptation)

**Development pathway:**
- Does not include typical model output (emissions, land use, etc.)
Relevant range of uncertainty spanned:
challenges to adaptation, mitigation

Socio-economic challenges for adaptation

Socio-economic challenges for mitigation

★ SSP 1: (Low Challenges)
  Sustainability

★ SSP 2: (Intermediate Challenges)
  Middle of the Road

★ SSP 3: (High Challenges)
  Regional Rivalry

★ SSP 4: (Adapt. Challenges Dominate)
  Inequality

★ SSP 5: (Mit. Challenges Dominate)
  Rapid Growth

SSP Logic
Adaptation challenges
- Exposure
- Sensitivity
- Adaptive Capacity

Mitigation challenges
- Baseline (no-policy) emissions
- Mitigation capacity

- Population
- Carbon Intensity
- Agricultural Productivity
- Energy Intensity
- Energy-related Tech. Change
- CCS availability
- ... Effectiveness of Policy Institutions
- Energy Tech. Transfer
- Diet

SSP3: Fragmentation
Growing interest in regional identity and concerns about competitiveness and security push countries to increasingly focus on domestic or, at most, regional issues. This trend is reinforced by the limited number of comparatively weak global institutions, with uneven coordination and cooperation for addressing environmental concerns. Policies are oriented towards security, including barriers to trade, particularly in the energy resource and agricultural markets. Countries focus on achieving energy and food security goals within their own region, at the expense of broader-based development. A low international priority for addressing environmental concerns leads to strong environmental degradation in some regions. The combination of impeded development and limited environmental concern results in poor progress towards sustainability. … etc.

O’Neill et al., in prep.
Summary of SSP Status

Conceptual framework established
  – Special issue of *Climatic Change* published
Narratives and quantification of key drivers completed
  – Special issue of *Global Environmental Change* in progress
Global Spatial Population Projections

NCAR Projection, 2100


Projected Population Density
SSP3: Thailand, 2100

Jones & O’Neill, in prep.
Next Steps

Emissions and land use scenarios based on SSPs to be completed

Looking for ways to carry out extensions of SSPs: regional, sectoral, additional global information

Research based on framework!

Continue to re-evaluate current SSPs, possibly develop new versions (or variants of existing ones)
The Parallel Process

O’Neill & Schweizer, 2011; based on Moss et al. (2010).