



## Abstracts: Population and Environmental Change

**Professor Leiwen Jiang**, Population Council, USA and Shanghai University, China.

**Title:**

Population dynamics, carbon emission, and climate change.

**Abstract:**

Increasing research evidence suggests that growing population and its associated production and consumption are extremely likely the dominant causes of the increasing greenhouse gas concentration and global warming since the mid-20th century. The population-environment-climate change research communities have achieved important progress over the past decades in understanding how population dynamics influence the environment and climate systems. We know better than ever that population size, growth rate, changes in age, gender, education compositions, household structure, as well spatial distribution across rural-urban and socio-geographic settings can all generate significant impacts on carbon emission. Although the global population growth rate has declined in recent years, many countries will still experience growing population for years due to population momentum. And most of the population growth will occur in the countries which have low emissions today but may expect rapidly increasing emissions in the next decades along with their demographic and socioeconomic transitions. Moreover, other demographic megatrends will also play key roles in affecting population-climate interactions. For instance, urbanization affects productivity and consumption patterns of population and lead to more energy use and higher emission. Aging may lead to lower economic growth and therefore lower emission, while shrinking household size reduces economy of scale and increases per capita energy use and carbon emission. Investment in education can lead to lower fertility but higher economic growth in the developing world, resulting in slightly more emissions in the short run.

However, improved education will substantially enhance socioeconomic development level and adaptive capacity of population of less developed countries in meeting the challenges of climate change.



**Professor Eric Lambin**, Stanford University , USA and University of Louvain, Belgium.

**Title:**

Population and land use: from coupled to telecoupled systems.

**Abstract:**

With economic development and globalization, the scale of interactions between population and land use has changed dramatically over the last couple of centuries. In traditional rural societies, agro-ecological constraints were setting stringent limits to the “carrying capacity” of a place. Yet, as illustrated by Netting’s classic study of a Swiss mountain community “Balancing on an Alp” (1981), population was the cause, not the effect of land use change. Other studies, including Boserup’s “The conditions of agricultural growth” (1965), have shown that, under certain conditions, agricultural intensification and land conservation can be spurred by increases in population. The growth of global trade in land-based commodities in the last decades has reshaped the relationship between population and land use. The highest rates of deforestation in Latin America and South-East Asia are observed in regions with low population densities and large farms or plantations growing commodity crops. “Hollow deforestation frontiers” are defined as places that depopulate when pioneers move away and cattle pastures replace subsistence plots. Conversely, several countries have experienced a recovery of their forest cover while their population was growing. These forest transitions were associated with a geographic redistribution of land use via trade, at the national scale in the 19th century, and at the global scale in the second half of the 20th century. The local-scale coupling between population and land use has been replaced by today’s global-scale telecoupling between consumption and land use.

**Professor Lori Hunter**, University of Colorado, USA.

**Title:**

Climate change and migration.

**Abstract:**

Environmental factors have shaped human movement throughout human history. Yet, the intensified environmental stress of the Anthropocene has forcibly displaced millions across the globe as well as negatively impacting myriad livelihoods, fueling additional migration particularly within the Global South. Adding further complication, these migration-environment connections are taking place within a complex global political economy that dramatically shapes human migration through political boundaries, immigration policies, economic pushes and pulls, as well as cultural distinctions.



This presentation offers a concise overview of current research on the environmental dimensions of human migration providing general lessons learned, as well as illustrative case studies within particularly vulnerable global regions. Grounded in the scientific literature, the presentation pushes back against alarmist projections that fuel fear and, instead, offers opportunities to think more carefully about the complexities inherent within migration-environment linkages. Attention is also paid to pathways for enhancing resilience and supporting those most vulnerable to the impacts of human-induced climate change.

**Professor Karen Seto, Yale University, USA**

**Title:**

From Food Systems to Climate Change: How Urbanization is Reshaping Humanity's Imprint on the Planet.

**Abstract:**

The scale and the speed of contemporary urbanization is unprecedented. Each week, the urban population increases by 1.3 million. Every day an area the size of about 20,000 soccer fields is converted to urban uses. How will urbanization affect the planet? This talk will address some of the key impacts of urbanization on climate change, food systems, land and biodiversity. It lays out both challenges and opportunities that urbanization offers for transitioning to sustainability.

**Professor Wolfgang Lutz, Wittgenstein Centre for Demography and Global Human Capital (IIASA, OeAW, University of Vienna), Austria.**

**Title:**

Population and human capital scenarios for the 21st century in the context of environmental change.

**Abstract:**

This presentation will take a long-term global perspective on demographic trends. It is based on a multi-dimensional approach to demography based on the classic definition of demography as the scientific study of changing population size and structures (plural) which goes beyond the frequent narrow focus on age structure and includes changing structures by level of education, labor force participation, place of birth and place of residence and other demographic characteristics.



It will explore the historical roots of the demographic transition, the process that brings birth and death rates from high and essentially uncontrolled levels to low and mostly controlled levels, with different societies being at different stages of this universal process. I will discuss the determinants of this transition and introduce the concept of cognition driven demographic transition. In addition to this demographic theory with predictive power I will highlight two further demographic theories: demographic metabolism (intergenerational replacement) and demographic dividend.

These demographic concepts will be applied to developing alternative population scenarios for the 21st century – based on the SSPs (Shared Socioeconomic Pathways, which are widely used in the field of climate change analysis). They have been defined on the basis of an extensive global expert inquiry and give alternative scenario for all countries by age, sex, level of education and place of residence with respect to different socioeconomic capacities for climate change mitigation and adaptation. I will also highlight how education turns out to be a key determinant of future adaptive capacity to environmental change. I will also address the implications for these trends on future human wellbeing in different parts of the world and different sub-populations – discussing the new indicator of “Years of Good Life” – and show how demography can importantly contribute to the broader field of sustainability science.