

DEPARTMENT OF GEOGRAPHY

Arthur H. Robinson Colloquium Public Lecture

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Future Urban Expansion and Implications for Building Energy Demand and Global Croplands

This talk will draw on recent research that examines the implications of future urban expansion on global croplands and energy demand by buildings. Using both top-down and bottom-up approaches and scenarios, we examine operational building energy use, specifically, for heating and cooling. Globally, the energy use for heating and cooling by mid-century will reach anywhere from about 45 EJ/yr to 59 EJ/yr (respectively, increases of 5% to 40% over the 2010 estimate). Most of this variability is due to the uncertainty in future urban densities of rapidly growing cities in Asia and, particularly, in China. A surprising finding is that waiting to retrofit of the existing built environment until markets are ready to widely deploy the most advanced renovation technologies, leads to more savings in building energy use and avoids lock-in.

The results also show that urban expansion will result in a 1.8-2.4% loss of global croplands by 2030, with substantial regional disparities. About 80% of global cropland loss from urban expansion will take place in Asia and Africa, where much of the cropland that will be lost is more than twice as productive as national averages. Asia will experience the highest absolute loss in cropland while African countries will experience the highest percentage loss of cropland. Globally, the croplands that are likely to be lost were responsible for 3-4% of worldwide crop production in 2000. Prime agricultural lands are especially vulnerable to conversion in mega-urban regions, where multi-nodal urban centers are enveloping croplands to create a continuous urban fabric. Governance of urban area expansion is critical for securing livelihoods in the agrarian economies of the Global South.

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3:30-5:00 p.m.
Derby Hall 1080



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