

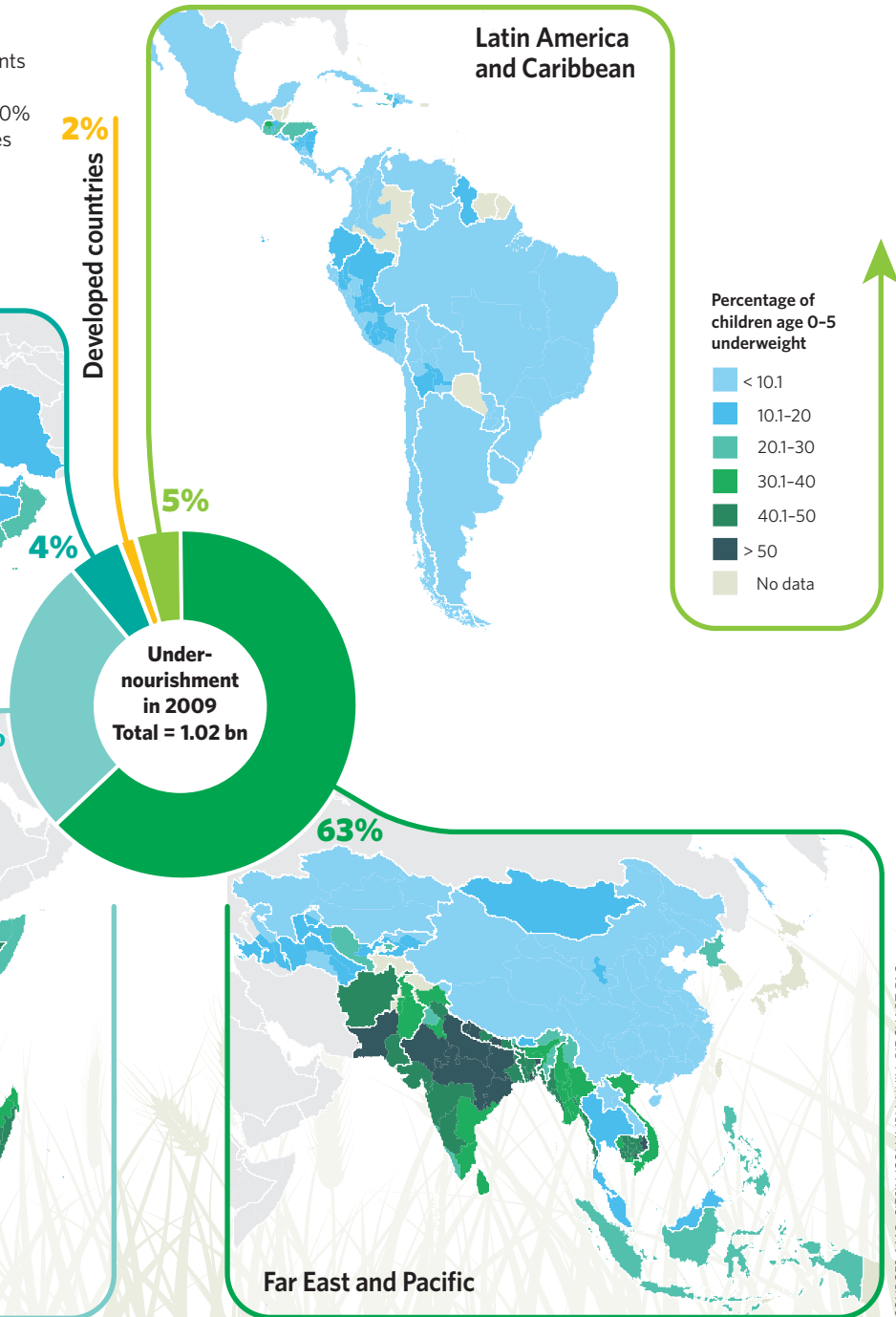


THE GROWING PROBLEM

World hunger remains a major problem, but not for the reasons many suspect. *Nature* analyses the trends and the challenges of feeding 9 billion by 2050.

1 WHERE THE HUNGRY PEOPLE ARE

In 2009, more than 1 billion people went undernourished — their food intake regularly providing less than minimum energy requirements — not because there isn't enough food, but because people are too poor to buy it. At least 30% of food goes to waste. Although the highest rates of hunger are in sub-Saharan Africa — tracking closely with poverty — most of the world's undernourished people are in Asia.

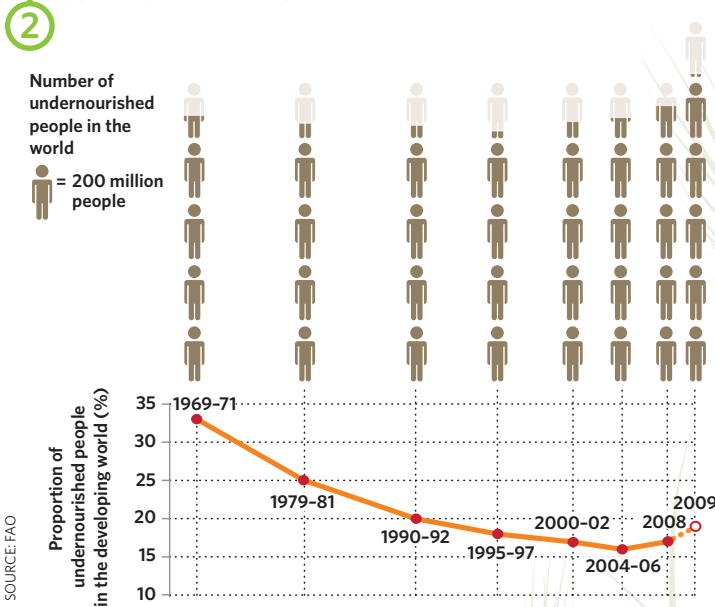


GRAPHICS BY NIK SPENCER; DATA COMPILED BY DECLAN BUTLER

SOURCES: MAP: GIESIN; COLUMBIA UNIV.; PIE CHART: FAO

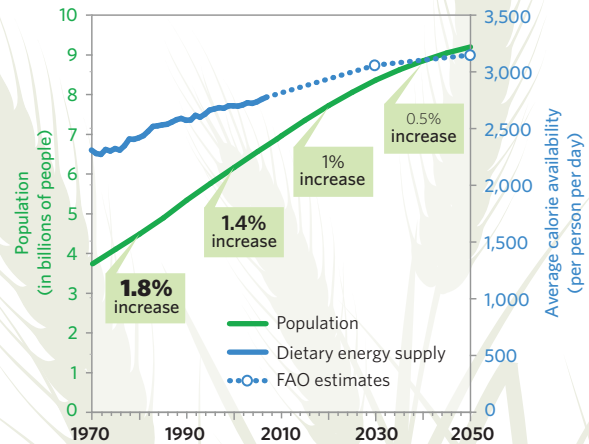
HUNGER ISN'T GOING AWAY

The percentage of hungry people in the developing world had been dropping for decades (bottom) even though the number of hungry worldwide barely dipped (top). But the food price crisis in 2008 reversed these decades of gains.



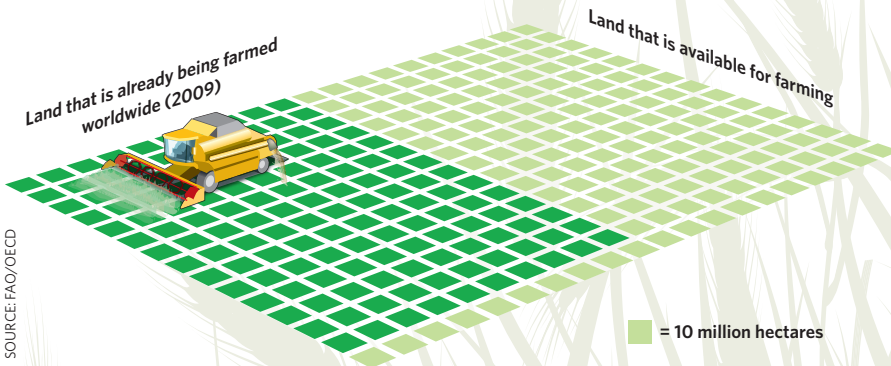
IT'S NOT ABOUT THE BOMB

Scientists long feared a great population boom that would stress food production, but population growth is slowing and should plateau by 2050 as family size in almost all poorer countries falls to roughly 2.2 children per family. Even as population has risen, the overall availability of calories per person has increased, not decreased. Producing enough food in the future is possible, but doing so without drastically sapping other resources, particularly water, will be difficult.



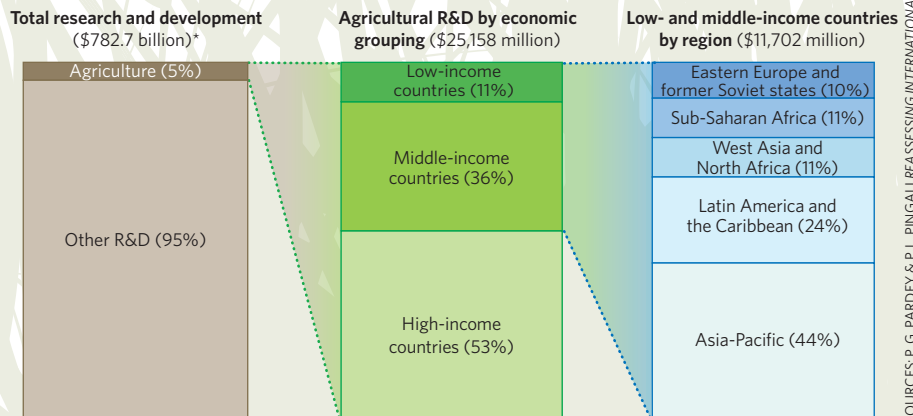
AND IT'S NOT ABOUT LAND

An outlook published in 2009 by the Food and Agriculture Organization of the United Nations and the Organisation for Economic Co-operation and Development (go.nature.com/DdNYvk) says that current cropland could be more than doubled by adding 1.6 billion hectares — mostly from Latin America and Africa — without impinging on land needed for forests, protected areas or urbanization. But Britain's Royal Society has advised against substantially increasing cultivated land, arguing that this would damage ecosystems and biodiversity (go.nature.com/YJ2jsB). Instead, it backs 'sustainable intensification', which has become the priority of many agricultural research agencies.



IT'S ABOUT DOING MORE WITH LESS

Many countries can make gains in productivity just by improving the use of existing technologies and practices. But sustainable intensification also means generating greater yields using less water, fertilizer and pesticides. Increased public investment in agricultural research will be crucial to doing this, say experts. Yet this investment makes up only 5% of total research and development spending on science. Worldwide public investment in agricultural research is increasing but at a much slower rate than in the 1970s during the green revolution. One exception is China, where funding has more than doubled over the past decade.



*Most recent global figures available are from 2000, listed in 2005 purchasing power parity dollars