# 50 years of changing diversity in global food supplies

By Sara Kammlade, Colin K. Khoury and Carlos Navarro-Racines

CIAT 1967-2017

Newly released infographics show how the so-called "globalized diet" has emerged. It's the story of massive change over the past 50 years in the foods people eat, of crop winners and losers, and most of all, of increasing similarity in the food supplies of countries worldwide. Here are five graphs that together describe some of the the most important changes in food diversity over the past five decades:

## Almost everybody eats a lot more than their grandparents did, and it's more diverse

Global food supplies are on average more than 500 calories per day, per person, larger than they were 50 years ago. They are also more diverse, with both a longer list of different food crops, and a more equal contribution to food supplies from each of those crops. Food supplies that were primarily based on single staples a half century ago, for instance rice in Southeast Asia, diversified over time to include other staples such as wheat and maize. The same was true for sorghum- and millet-based diets in sub-Saharan Africa, and maize-based diets in Latin America. Nicaragua *(Figure 1)*, for example, reported a 52% increase from 1961 to 2009 in the number of crops contributing to calories in the national food supply, diversifying in particular by incorporating more rice, wheat, soybean, palm oil, and other oil crops.

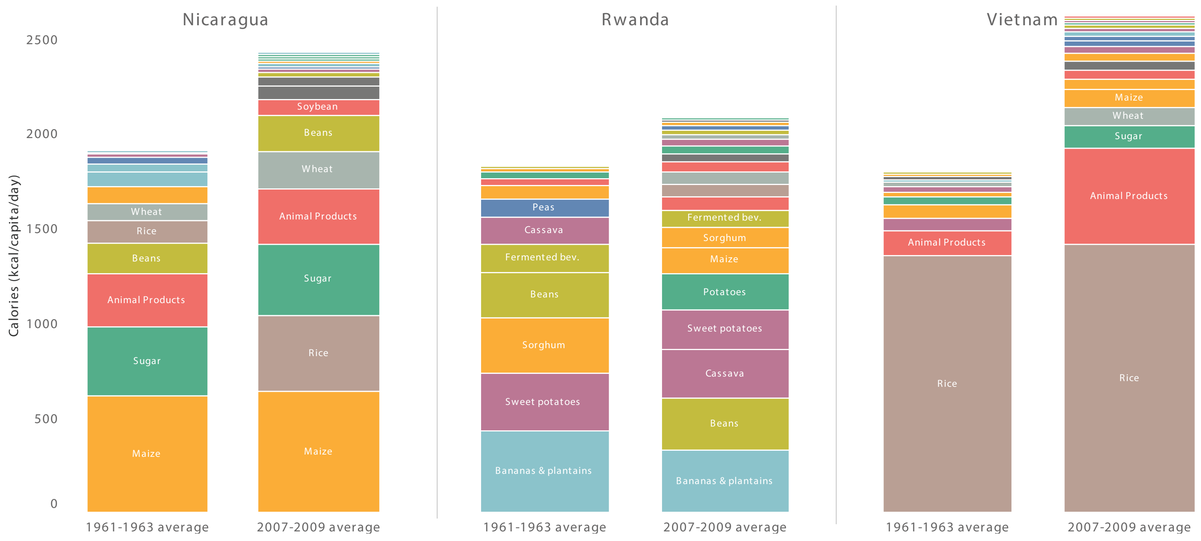



Figure 1: Change in the diversity of food supplies of Nicaragua, Rwanda, and Vietnam from 1961 to 2009.

One big caveat- we were only able to assess crops reported in FAO national food supply data, which are limited to measuring 52 crop-specific foods. While these include the most important crops globally, they certainly don't cover all the plants that people eat. Crops not explicitly listed are either thrown into general categories such as "cereals, other" or aren't measured at all, especially if they are only produced on a small scale, for local markets or in home gardens. We need better statistics about what people eat around the world, especially since studies have shown that many locally relevant crops that are invisible in global statistics are disappearing from diets.

## African, Asian, and small island countries have both the world's most and least diverse diets

Comparing countries' current food supplies, we found that both the most and the least diverse were largely nations in Africa and Asia, and on small islands. Looking both at the number and the relative contribution of each of the plants listed in each nation's food supply, Cameroon *(Figure 2)*, Nigeria and Grenada had the world's most diverse food supplies with regard to calories. Afghanistan, Bangladesh, and Cambodia, meanwhile, had the least, with Afghanistan listing only 30 plants, and with 74% of these calories from wheat alone.

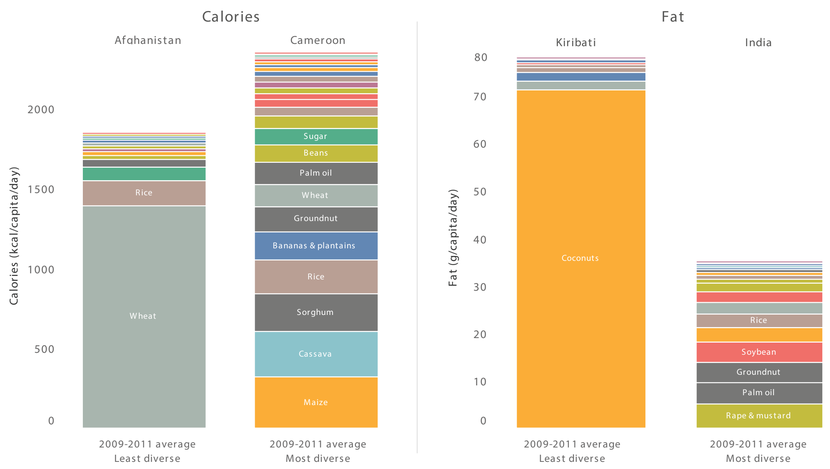
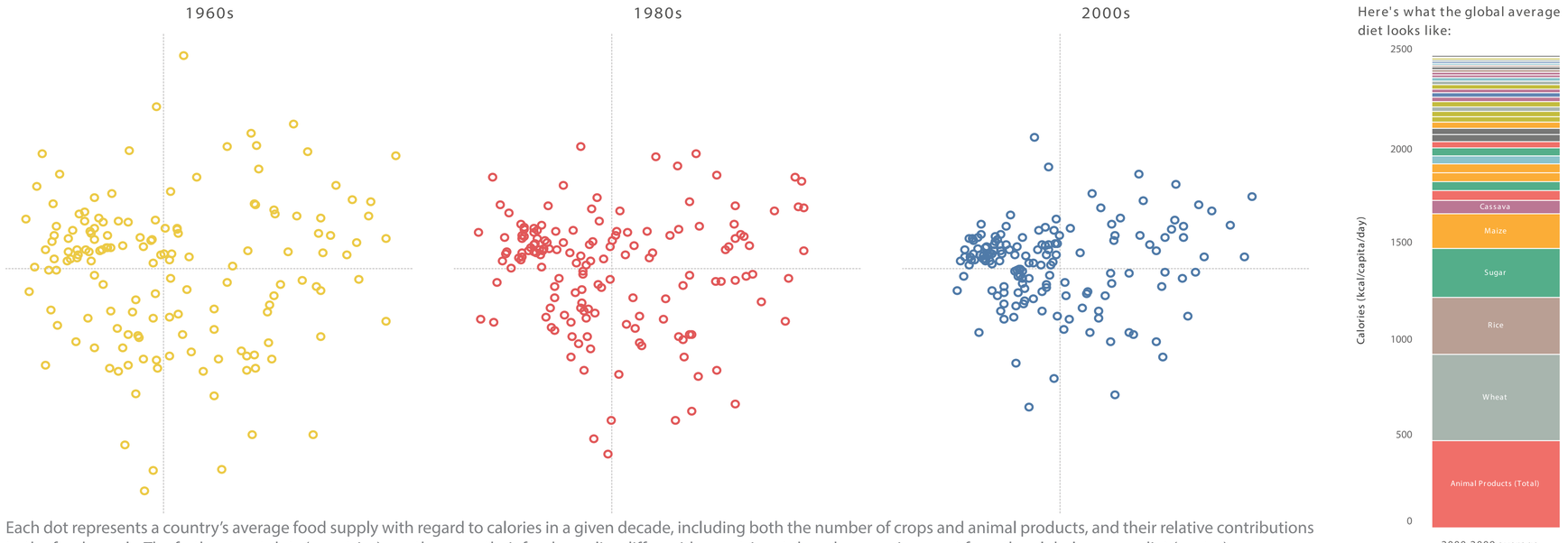



Figure 2: African, Asian, and small island countries have the world's most diverse food supplies. Also the least.

## Countries' food supplies have become much more similar

As countries' food supplies became more diverse, particularly by increasing the consumption of exotic crops that originated in distant regions of the planet, the global food supply became much more similar. African, Asian, and Pacific Island countries remain the furthest distance from this convergence, and pull the current global average diet (center) a small distance away from the main cluster *(Figure 5)*. In the current decade, the nations that most closely reflect the global average diet include Cape Verde, Colombia, and Peru. While the figure clearly shows that there is no such thing, in reality, as a global average diet, the movement of countries over time closer to this center bolsters the argument that a global average diet has more validity now that it did 50 years ago.




Each dot represents a country's average food supply with regard to calories in a given decade, including both the number of crops and animal products, and their relative contributions to the food supply. The farther apart dots (countries) are, the more their food supplies differ, with countries at the edges varying most from the global average diet (center).

Figure 5: Increasing similarity in national food supplies from 1961 to 2009.

## Crop immigrants are key to increasing dietary diversity

If there were crop "winners" over the past 50 years, among these would be the "mega-crops" (wheat, rice, maize and sugar), which maintained their global importance. The biggest winners, though, were oils such as soybean, palm, sunflower and rapeseed, which progressed from regional significance to global dominance as contributors to calories and fat over five decades *(Figure 3)*. As the winners came to take more precedence in food supplies around the world, traditional cereals such as sorghum, millets, and rye, and starchy roots such as cassava, sweet potatoes, and yam, were marginalized.

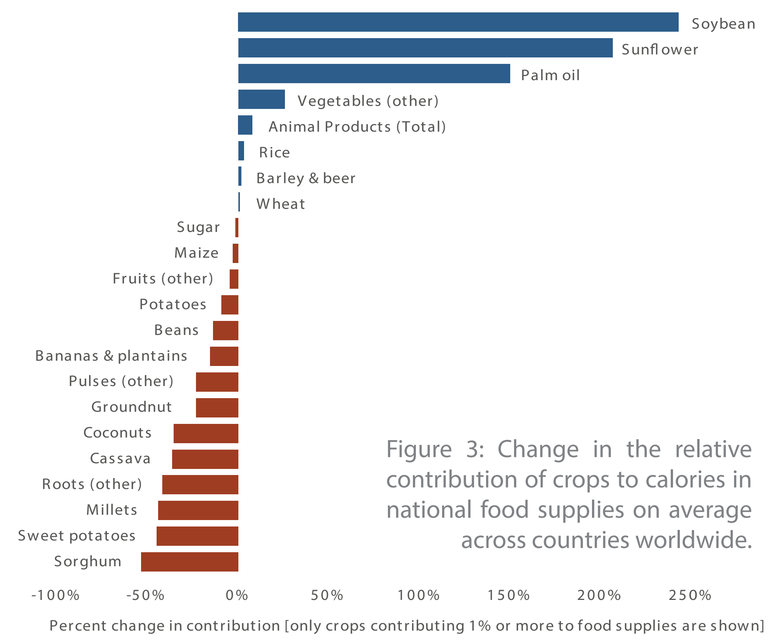
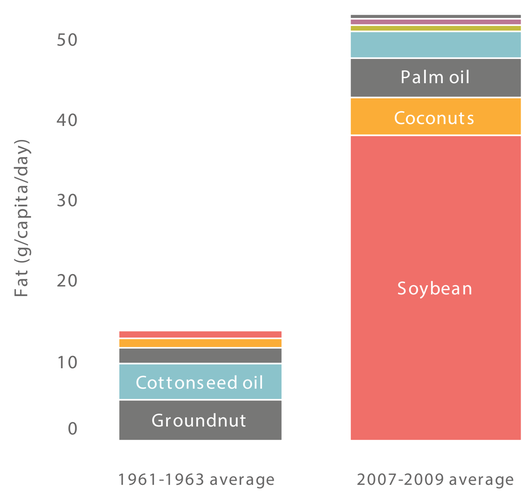



Figure 3: Change in the relative contribution of crops to calories in national food supplies on average across countries worldwide.

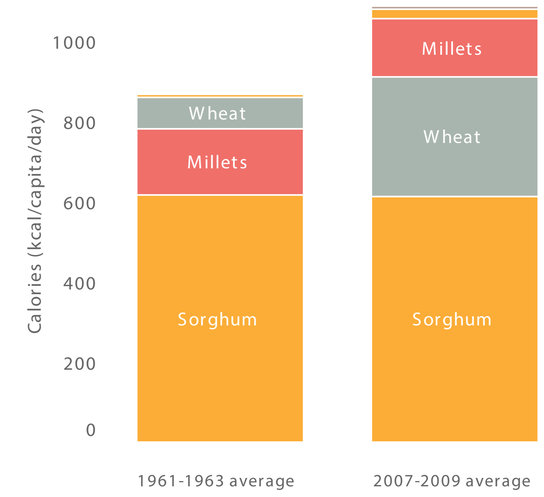
The diversification of countries' food supplies over the past 50 years seems to have largely come about by introducing exotic plants that were originally domesticated in far flung regions of the world. For example, traditional rice-based diets in Southeast Asia diversified to include more non-traditional staples such as wheat (originally from West Asia) and maize (Mesoamerica). In related research on the origins of food crops, we found that about 69% of plants consumed around the world are "foreign" in the sense that they originated elsewhere. Countries' consumption of crop "immigrants" significantly increased over the past five decades, especially in nations that developed new agricultural production industries based on these exotic plants. Brazil's investment in the cultivation of soybean, a crop with origins in East Asia, massively increased the availability of the crop - and of vegetable oil in general - in the country's food supply, while marginalizing traditional plant fats such as groundnut/peanut *(Figure 4)*.

In **Brazil** the native groundnut has been replaced by soybean as the primary source of fat from plants.




Composition of Brazilian food supply with regard to contribution to fat from vegetable oils.

Global staples such as wheat and rice became more important in **Sudan**. Many sub-Saharan African countries with sorghum- and millet-based diets followed the same trend.




Composition of the Sudanese food supply with regard to contribution to calories from grains.

Figure 4: Increasing importance of "foreign" crops in national food supplies.

The comprehensive study of changing diversity in national food supplies encompassed more than 50 crops and over 150 countries (accounting for 98 percent of the world's population) during the period 1961-2009. A collaboration between CIAT, the Crop Trust, Wageningen University, and the University of British Columbia, the project was funded by the Crop Trust. The work was originally published in PNAS: Khoury et al. 2014. Increasing homogeneity in global food supplies and the implications for food security. PNAS 111(11): 4001-4006. doi: 10.1073/pnas.1313490111.

For a deeper exploration of change in the diversity of plant foods that people have eaten around the world over the past 50 years, check out the Changing Global Diet website at http://ciat.cgiar.org/the-changing-global-diet/. We'd love to hear from you about interesting patterns you find #changingglobaldiet

Visit the Changing Global Diet website