
**Supplementary information to:
US–China trade war imperils Amazon rainforest**

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SUPPLEMENTARY INFORMATION: METHODS

1. Data

1.1. Data on soybean harvests, yields, production and trade

Harvested areas, yields, production and trade data were obtained from FAOSTAT database hosted by FAO¹. In our analysis, we used the latest available year, 2016. For the trade analysis we used the trade matrix of the FAO considering the following soy products: 'soybeans', 'oil, soybean', 'cake, soybean', 'soya sauce', 'soya paste'.

1.2. Data on fertilizer use for soybean

We used fertilizer data (N+P+K) for soybeans from the report 'Assessment of Fertilizer Use by Crop at the Global Level' published by the International Fertilizer Association (IFA), an International Plant Nutrition Institute (IPNI)². This report contains fertilizer data specifically for soybean from 2014 for the US, Brazil, Canada, Russia and Argentina.

2. Calculation of additional soybean demand due to shortfall of US exports to China

We deducted a variable proportion of the 'US soy exports to China' from the 'total soybean imports to China'. For the 'Brazil only' scenario, we redistributed the missing US exports to Brazilian production. For the 'shared responsibility' case, we redistributed the US shortfall amongst all soybean producers, including China. In this case, the fractional additional demand for the producers was calculated on the basis of each producer's share of global total soybean production. Production demands were converted into area demands by dividing total required production by the current yield of each country.

3. Calculation of annual yield increases of Brazil

In order to estimate the average future yield increases of soybeans in Brazil, we calculated an average annual yield increase for the last 20 years, based on FAO data. We decided to take this long period because soybean yields in Brazil tend to be very volatile due to climate effects (El Nino and El Nina) and global market prices.

4. Separation of crop uses into food, feed, biofuel

We used FAO food balance sheets to separate domestic production of soybean into food, feed, biofuel and other¹. Note, we only considered domestic crop production independent from where it is used. While the food and feed fraction was given by the food balance sheets, the biofuel fraction had to be obtained by independent sources³. We calculated the oil content of soybeans usable as biofuel (ca. 20%) based on Cassidy et al. 2013 (Table S1)⁴, the remaining soy-cake after oil extraction (ca. 80%) we accounted as feed. We summarized all remaining categories of the food balance sheets in the category "other". In order to estimate the domestic crop production we adjusted crop uses for imports, stocks and exports.

References

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