Agricultural Trade

Authors: Charlie Parker, Franziska Haupt, Bronwen Tucker, Lauren Stanley

With increasing supply chain integration and globalization in modern agriculture, greenhouse gas emissions from production and land-use change along with other sustainability concerns have increasingly become an international problem. During the last decades, a number of market-sensitive countries such as Brazil and Indonesia quickly joined leading producers and exporters of agricultural commodities, providing a significant proportion of growing demand. At the same time, consumers, especially those with higher living standards in developed countries have become more concerned about the environmental and social footprints of products imported from such countries due to weaker governance systems and high risks for negative impacts, such as deforestation. As a result, down-stream, consumer-facing companies have been under increasing pressure to improve the sustainability of supply chains. Understanding the flows of agricultural commodities can assist in identifying leverage points and partners along the value chain – in particular demand-side interventions - to help introduce agricultural mitigation options.

Table 1 below shows the major traded commodities and their country of export. Figure 1 illustrates major commodity flows for beef, dairy, soy, rice, maize and palm oil. 1

<table>
<thead>
<tr>
<th>Producer Country</th>
<th>Commodity</th>
<th>Production 1000 tons²</th>
<th>% global production</th>
<th>Exports 1000 tons</th>
<th>% national production</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States</td>
<td>Maize</td>
<td>359173</td>
<td>37%</td>
<td>33022</td>
<td>9%</td>
</tr>
<tr>
<td>United States</td>
<td>Soy</td>
<td>82055</td>
<td>30%</td>
<td>36741</td>
<td>45%</td>
</tr>
<tr>
<td>Brazil</td>
<td>Soy</td>
<td>83500</td>
<td>31%</td>
<td>36350</td>
<td>44%</td>
</tr>
<tr>
<td>Indonesia</td>
<td>Palm oil</td>
<td>28500</td>
<td>52%</td>
<td>20100</td>
<td>71%</td>
</tr>
<tr>
<td>Argentina</td>
<td>Maize</td>
<td>27000</td>
<td>3%</td>
<td>18500</td>
<td>69%</td>
</tr>
<tr>
<td>EU</td>
<td>Maize</td>
<td>63802</td>
<td>7%</td>
<td>17549</td>
<td>4%</td>
</tr>
<tr>
<td>Malaysia</td>
<td>Palm oil</td>
<td>19000</td>
<td>34%</td>
<td>17200</td>
<td>91%</td>
</tr>
<tr>
<td>Argentina</td>
<td>Soy</td>
<td>51000</td>
<td>19%</td>
<td>9100</td>
<td>18%</td>
</tr>
<tr>
<td>New Zealand</td>
<td>Dairy</td>
<td>22793</td>
<td>4%</td>
<td>2460</td>
<td>11%</td>
</tr>
<tr>
<td>India</td>
<td>Beef⁴</td>
<td>3800</td>
<td>5%</td>
<td>1700</td>
<td>45%</td>
</tr>
<tr>
<td>Brazil</td>
<td>Beef</td>
<td>9500</td>
<td>17%</td>
<td>1600</td>
<td>17%</td>
</tr>
<tr>
<td>United States</td>
<td>Beef</td>
<td>11386</td>
<td>20%</td>
<td>1100</td>
<td>10%</td>
</tr>
<tr>
<td>Australia</td>
<td>Dairy</td>
<td>10901</td>
<td>2%</td>
<td>581</td>
<td>5%</td>
</tr>
</tbody>
</table>

Table 1: Major producers and exporters of selected agricultural commodities.⁴

² Metric tons; Beef is measured in Carcass Weight Equivalent, i.e. the weight of an animal after slaughter and removal of most internal organs, head, and skin.
³ India is a major producer and exporter of buffalo meat.
The commodity with the largest share of traded emissions from direct production is by far beef - followed by rice, soy, palm oil and dairy; in particular oil palm and to a lesser extent beef and soy cause emissions from deforestation (see Figure 2).

Beef represents the largest share of globally traded agricultural emissions, equivalent to approximately 350 Million tons (Mt) CO₂e per year. Two thirds of global beef production comes from just five countries: Brazil, China, EU-27, India and the United States. Beef in these countries, however, with the exception of India, is primarily for domestic consumption, with only 12 percent of beef being exported globally. Brazil’s export market is primarily to Russia (26% of total exports), Iran (18%), Egypt (10%) and China (6%), whereas India exports mostly buffalo meat to predominantly lower-income countries, including Vietnam (14%), Malaysia (12%), and Egypt (11%).

Dairy, rice and maize collectively account for a relatively small proportion of globally traded agricultural emissions (approximately 50Mt CO₂e per year), primarily because these crops are consumed domestically. The largest global dairy producers are the EU (27%) and the United States (17%), but both of these countries only export around 1% of their total dairy production. China and India are responsible for over half of global rice production, but less than 5% is traded internationally. The major global producers of maize include the United States (37%), China (22%), Brazil (7%) and the EU (7%). Brazil and Argentina have a fairly robust export market, and major importers of maize are Japan, Korea, Mexico, China and EU.

---

Figure 1: Major trade flows of the top six globally traded commodities (in billion USD). Scale of arrows represent the size of commodity flows.5

5 Food and Agriculture Organisation of the United Nations FAOSTAT. 2013. Available at: http://faostat.fao.org/ (accessed 2013); Flows within the EU are not accounted for.
The following graphs (Figures 3-8) illustrate production and major trade flows of agricultural commodities.

---

Figure 3: Beef production and major trade flows by quantity, 2010.\footnote{Data includes buffalo meat. India’s production has increased rapidly in the last 5 years and would play a more central role if more recent statistics were available. In 2010, India was already the 5\textsuperscript{th} largest exporter overall.}
Figure 4: Dairy production and major trade flows by value, 2010.  

Production data is based on milk. Trade flows organized by value due to large inconsistencies in commodity weight. Dairy trade categories include: dried whole milk, evaporated whole milk, condensed whole milk, butter of cow milk, cheese of whole cow milk, processed cheese, yoghurt, dried skim milk, condensed skim milk, and skim milk. Buffalo dairy products are omitted, as information is not available in FAOSTAT detailed trade statistics.
Figure 5: Soy production and major trade flows by quantity, 2010.⁹

⁹ Includes soybean and oil.
Figure 6: Rice production and major trade flows by quantity, 2010.\textsuperscript{10}

\begin{table}
\begin{tabular}{|c|c|c|c|}
\hline
Export & Importer & Quantity (1000 T) & Value (1000 USD) \\
\hline
Vietnam* & Philippines & 1475 & 947379 \\
Thailand & Nigeria & 1330 & 629886 \\
USA & Mexico & 823 & 315222 \\
Vietnam* & Indonesia & 687 & 346017 \\
Thailand & Benin & 680 & 239993 \\
India & United Arab Emirates & 661 & 642875 \\
India & Saudi Arabia & 622 & 686784 \\
Thailand & South Africa & 583 & 303033 \\
Thailand & Iraq & 565 & 227401 \\
Benin & Nigeria & 552 & 91245 \\
\hline
\end{tabular}
\end{table}

\textsuperscript{10} Vietnam values from UNCOMTRADE are unavailable in FAOSTAT.
Figure 7: Maize production and major trade flows by quantity, 2010.
Figure 8: Palm oil production and major trade flows by quantity, 2010.