The onset of the COVID-19 pandemic has presented a unique challenge to governments across the globe, reinforcing the need to improve understanding of domestic and international trade trends to provide more informed options for policy response. PNG’s growth in international agri-food (including agricultural food and livestock products) trade will continue to be important to overall food security outcomes among rural and urban households. Rural households that produce key export cash-crops (e.g. coffee, cocoa, palm oil) depend on the cash economy to supplement overall food consumption, while urban households depend on rice and other agri-food imports (as well as domestic goods) for consumption.

This project note focuses on agri-food import and export trends during the last two decades to better evaluate potential changes in related import demand and export potential in PNG. In doing so, it informs an upcoming economy-wide multi market model analysis that will evaluate a variety of potential shocks to household welfare to identify policies to manage potential food security threats. The COVID-19 pandemic is one of many diverse shocks that may affect the economy of PNG.
over the next decade. A greater portfolio of organized databases, analytical tools and policy resources are warranted to facilitate real-time policy analysis that can inform key development investments and initiatives.

Agri-food imports in PNG have expanded both healthy and unhealthy food consumption patterns. For example, agri-food imports of protein-rich, animal-sourced foods have grown by 8 percent per capita per year since 2001. This is a positive transition given that PNG has a limited livestock sector and low levels of protein consumption across poor and non-poor households (Schmidt et al., 2019). However, agri-food imports of sugary soft drinks have increased by almost 12 percent per capita per year since 2001, representing the largest growth in processed agri-food imports over the analysis period.

**Real Exchange Rate Appreciation and Incentives for PNG’s Agricultural Trade**

Although a large share of economic growth in PNG has been through the extractive industries sector, agriculture remains an important sector for 80 percent of the total population that lives in rural areas. PNG continues to develop its agri-food export potential through investments in cocoa, coffee and palm oil crops, resulting in PNG being a net exporter of agricultural goods. Within this trade environment, macro-economic policies are important to incentivizing export-oriented farmers to maintain and increase agricultural output growth.

To a large extent, PNG has avoided major movements in the real exchange rate through careful management of macro-economic policy. Nonetheless, the real exchange rate has appreciated by about 20 percent between 2010 and 2019, reducing the real (macro-inflation adjusted) price of agricultural exports by that amount. During this period, the nominal exchange rate depreciated from 2.72 to 3.39 PNG Kina / US dollar (a 24.6 percent depreciation). Thus, the Consumer Price Index in PNG (a measure of domestic inflation) rose by 56.0 percent. Apart from changes in world prices of tradable goods, the price of tradables relative to the price of non-tradables (the real exchange rate) would have fallen by 20.1 percent. In other words, export-oriented agriculture has tended to become less profitable (per unit) in real terms over the last decade. If not managed properly, farmer incentive to produce export-oriented crops may decrease, resulting in decreased total production (and export) volumes. On average, world prices (in US dollar terms) rose by less than 1 percent. Thus, the real exchange rate, as measured by the IMF also appreciated by a similar amount (19.8 percent) (Figure 1).

**Figure 1: PNG Nominal and Real Exchange Rates, 2010-2020**
Appropriate non-price distorting PNG government interventions such as investments in roads, electricity and ports can help address the disincentives faced by agricultural tradable sectors. Notwithstanding, PNG has experienced growth in its agri-food trade, with agri-food exports increasing by 8 percent, and agri-food imports increasing by 13 percent between 2001-2016.

**Overview of PNG agri-food exports**

Overall, PNG is a net exporter of agri-food amounting to 1.26 billion USD$ of exports compared to 0.81 billion USD$ of imports in agri-food trade in 2016-2017. Agri-food trade continues to increase and comprises over 10 percent of total export earnings. In terms of overall value, palm oil exports experienced the largest increase, growing on average 9 percent per year (real 2014 USD) from 2001 to 2016 (Figure 2). Coffee and cocoa bean export value grew by 4 percent per year on average between 2001-2016. This increase in cash-crop exports is reflected in agricultural production patterns across the country.

![Figure 2](image)

*Figure 2: Real value of largest agri-food exports in 2012-2016 (Real 2014 USD)*

Source: Authors’ calculations using BACI International trade database at the product level (2019)

The shift towards export-oriented agri-food production has benefitted not only large commercial farming operations, but smallholder farming as well. According to Aipi (2012), smallholder farmers accounted for over 85 percent of coffee production in PNG in 2012. Approximately 20 percent of the labor force is engaged in smallholder cocoa production, which comprises 90 percent of total output (World Bank, 2014).

Maintaining market functionality along each link in the domestic logistics chain is critical to ensuring food security among farmers that depend on the cash economy for their livelihood. Although social distancing and quarantine policies are important for containing virus spread (policy regulations with regards to COVID-19 and African Swine Flu have significantly affected domestic trade and person / goods movement within rural areas), mechanisms to maintain unhindered marketing of agri-food goods from rural to urban areas is necessary to maintain economic buoyancy in areas focused on cash-crop production.

**Overview of PNG agri-food imports**

Agri-food imports comprised 14 percent of total imports between 2012-2016, and are important to maintaining food security and supporting dietary diversity. Rice and wheat (flour) combined comprised 22 percent of total agri-food imports between 2012-2016, with rice imports making up the largest share (15 percent) of overall agri-food imports on average between 2012-16.
Growth in other agri-food imports reflects a shift in demand towards increased consumption of protein-rich foods. Poultry imports (primarily from Australia) increased, from a low base, more than 30-fold (Real 2014 USD) on average between 2001-05 and 2012-16 (Figure 3 and Table 1). Preserved and prepared fish imports also increased substantially by 21 percent per capita per year between 2001 and 2016 with Thailand supplying the largest share of demand in the form of tinned mackerel for domestic consumption, which is less expensive than the tinned tuna that PNG directs towards the export market.

Import data also suggest that domestic availability of animal-sourced protein is increasing given that the total quantity of animal feed preparations increased from 18,185 tons on average in 2001-05 to 50,289 tons in 2012-16. The total imported value of animal feed increased 11 percent per year (on average) over the same period.

<table>
<thead>
<tr>
<th>Agri-food imports</th>
<th>2001/05</th>
<th>2012/16</th>
<th>% annual growth rate per capita</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rice</td>
<td>76,237</td>
<td>119,513</td>
<td>1.9%</td>
</tr>
<tr>
<td>Sheep / goat meat</td>
<td>30,837</td>
<td>60,232</td>
<td>3.9%</td>
</tr>
<tr>
<td>Bottled waters</td>
<td>2,529</td>
<td>58,838</td>
<td>30.2%</td>
</tr>
<tr>
<td>Wheat / meslin</td>
<td>11,307</td>
<td>57,463</td>
<td>13.4%</td>
</tr>
<tr>
<td>Food preparations**</td>
<td>10,669</td>
<td>56,838</td>
<td>13.9%</td>
</tr>
<tr>
<td>Preserved / prepared fish</td>
<td>2,967</td>
<td>30,198</td>
<td>20.8%</td>
</tr>
<tr>
<td>Palm oil</td>
<td>2,807</td>
<td>23,018</td>
<td>18.4%</td>
</tr>
<tr>
<td>Animal feed preparations</td>
<td>7,168</td>
<td>21,886</td>
<td>8.3%</td>
</tr>
<tr>
<td>Pasta</td>
<td>1,080</td>
<td>20,793</td>
<td>28.0%</td>
</tr>
<tr>
<td>Poultry</td>
<td>649</td>
<td>20,593</td>
<td>33.9%</td>
</tr>
</tbody>
</table>

Sub-total of top 10                  146,250  469,348  8.7%
Total value of agri-food imports   268,373  798,370  8.0%
Top 10 commodities share of agri-food imports | 54.5%  58.8% |

Source: Authors’ calculations using BACI International trade database at the product level

Given that PNG has a small livestock sector largely void of bovine and small ruminants (higher concentrations of pig husbandry exist in the highland region of the country), increases in animal-sourced food imports (with 7 percent growth per capita in non- or minimally-processed meat imports) are a welcome change. Recent analysis from the IFPRI Rural household survey on food systems in PNG suggest that the protein content of poor and non-poor household diets is seri-
ously deficient (Schmidt et al., 2019). A variety of studies evaluating protein consumption and dietary diversity have linked stunting rates to protein deficiency and lack of essential amino acids in young children (Ghosh, 2016).

**Trade in processed foods**

We disaggregate agri-food imports into 4 categories following Monteiro (2019) that uses the NOVA classification system to classify agri-food process levels:

1) minimal processed or unprocessed;
2) processed culinary ingredients (e.g. oil, sugar);
3) processed food (e.g. preserved vegetable, fruit, fish, meat);
4) ultra-processed foods (e.g. pasta, sausages).

Minimally processed foods in level 1 are treated to ensure stability for transport. We consider processed food imports to include levels 2 – 4 defined above. Processed foods accounted for 50 percent of total agri-food imports on average between 2012-2016 in PNG.

Increases in demand for processed food has positive and negative externalities. For example, purchasing foodstuff in a processed form often saves time and labor in food production and preparation (particularly of female household members). However, greater access to ultra-processed food can introduce unhealthy over-consumption of high-fat, salt and sugar content foods, leading to associated nutritional challenges and higher prevalence of obesity and non-communicable diseases (e.g. diabetes). Ultra-processed imports comprised almost 64 percent of processed imports and increased by 14 percent per capita per year from 2001-2016, representing the largest growth among processed goods, albeit from a low base.

The largest growth in processed foods in terms of value imported occurred in non-alcoholic drinks, growing 30 percent per capita per year between 2001-05 and 2012-16. Within the non-alcoholic drink category, sugary soft drinks (i.e. cola, etc.) experienced the largest growth. While in 2001-05, sugary soft drinks comprised about 33 percent of value of non-alcoholic imports, by 2012-16, sugary soft drinks comprised more than half of the value of non-alcoholic drinks, and 8 % of total processed imports (Figure 4).

**Figure 4: Increase in non-alcoholic drink import by drink type (2001-05 – 2012-16)**

![Figure 4](image)

*Source: Authors’ calculations using BACI International trade database at the product level*

Based on the detailed 6-digit Harmonized System (HS) codes in the BACI dataset, we further disaggregate ultra-processed foods into sweet foods, high-saturated fat foods, and alcohol. Figure 5 shows that the value of PNG imports of processed foods increased substantially from under 100 thousand (Real
2014) US$ to over 400 thousand (Real 2014) US$ between 2001 and 2016. Within the ultra-processed food categories, the value of sugary food imports increased by 18 percent per capita per year, while high-saturated, fatty foods increased 12 percent per capita per year.

Comparing PNG’s ultra-processed agri-food imports to other countries in the Pacific, using the same food category types suggests that greater education on dietary consumption choices may be necessary, especially for peri-urban and urban populations. Of the 14 countries evaluated in the Pacific region, PNG is 6th in largest value of processed imports of ultra-processed foods. Overall, approximately 32 percent of the value of PNG’s processed agri-food imports were ultra-processed.

**Figure 5: Value of processed food imports in 1000 USD (Real 2014)**

![Graph showing processed food imports](source)

*Source: Authors’ calculations using BACI International trade database at the product level. Note: *Other ultra-processed includes tobacco products, pasta, packaged soups/sauces, etc. *Other is equivalent to processed culinary ingredients imports (level 2, e.g. oil, sugar), and basic processed foods imports (level 3, e.g. preserved vegetable/fruit)

Within the ultra-processed agri-food group, PNG imports the greatest share of sugary foods, comprising 38 percent of total ultra-processed agri-food imports. A variety of studies have associated soft drink consumption with increased obesity rates among children and adults, including a recent study by Kessaram et al. (2015) focusing on Pacific Island youth. Benjamin (2007) and Pus et al. (2016) echoed Kessarem’s work reporting that overweight and obesity prevalence is becoming a health concern in urban areas of PNG.

**Conclusion**

Over time, PNG has increased overall agri-food imports and exports by approximately 10 and 6 percent per year, respectively, between 2001 and 2016. Agriculture remains an important sector of the economy, with agri-food exports comprising over 10 percent of total export earnings. However, the COVID-19 pandemic and associated domestic and international policies are disrupting trade flows within and between countries, respectively.

To maintain agricultural output among export-oriented farmers and to ensure food security among rural and urban populations within PNG, it is important that domestic trade, marketing and trader / foodstuff mobility is secured and facilitated within appropriate social distancing measures to reduce virus spread. Outside of the COVID-19 pandemic, macro-economic (e.g. exchange rate) policies should be reviewed to ensure that export-oriented agricultural production of smallholder farmers remains economically vibrant in order to incentivize yield-enhancing investments.

Previous studies have found that increases in household income among develop-
ing countries is often associated with increases in demand for higher-value food items, particularly for more protein-dense and processed foods. The analysis presented here suggests that the demand for a more diversified diet is increasing in PNG, potentially bringing greater access to animal-sourced foods via imports and greater domestic livestock production. However, potential gains in dietary diversity could be diminished if goods are unable to reach markets in a timely manner or price shocks due to market inefficiencies and trader immobility cause domestic and imported goods to be financially infeasible for rural or urban household consumption.

Although PNG’s agri-food import data suggest a greater demand for a diversified consumption basket, with increases in protein-rich foods, there are signs that these improvements in dietary diversity could be sidetracked by greater demand for high sugar- and saturated fat- foods (among peri-urban and urban populations with greater access to markets, in particular). The largest increase in value of overall processed imports between 2001-05 and 2012-16 was dominated by increases in imports of sugary soft drinks (increasing by 12 percent per capita per year between 2001-2016).

Garcia-Dorado et al. (2019) argue that improved terms of trade do not fully explain the increase in ultra-processed foods, but rather foreign direct investment and its links to poor food marketing are also driving unhealthy food consumption in lower middle-income countries. Thow (2009) argues for greater participation of public health nutritionists to inform trade policy decisions to prevent and control diet-related chronic diseases such as diabetes related to obesity and poor diet choices.

Education programs that integrate nutrition and diet information will be important to curb the growing incidence rate of obesity and diabetes in urban areas evaluated in recent studies. These education programs should not only be targeted at children in primary and secondary school, but also caretakers and adult populations, female and male, who are often the primary decision-makers on household food expenditure and meal preparation. Finally, Snowdon et al. (2013) identify the need for legislation and enforcement of good quality food safety and nutrition labelling throughout the Pacific Islands to curb the increasing incidence of non-communicable diseases related to obesity and over-nutrition.
References


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ACKNOWLEDGMENTS

We thank the Department of Foreign Affairs and Trade of the government of Australia and the CGIAR Research Program on Policies, Institutions and Markets for funding and facilitating the work undertaken to produce this report. We also would like to acknowledge the comments and suggestions received from the Australia High Commission in Port Moresby to improve earlier versions of this note.

Funding for this work was provided by the Department of Foreign Affairs and Trade (DFAT) of the government of Australia and the CGIAR Research Program on Policies, Institutions and Markets (PIM). Any opinions expressed here belong to the author(s) and are not necessarily representative of or endorsed by IFPRI, DFAT, PIM, or CGIAR.