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Philippine Agriculture to 2020: Threats and Opportunities from Global Trade

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Philippine Agriculture to 2020: Threats and Opportunities from Global Trade

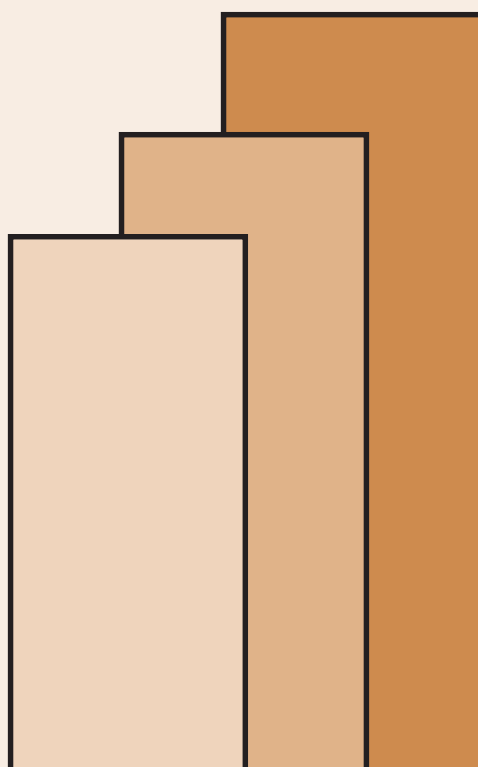
Roehlano M. Briones

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PHILIPPINE AGRICULTURE TO 2020: THREATS AND OPPORTUNITIES FROM GLOBAL TRADE

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11 January 2013

ABSTRACT

Agriculture confronts several challenges over the decade, i.e. meeting burgeoning food requirements with limited farm land, and balancing the need to import with the provision of livelihoods. The current policy regime leans heavily towards import substitution, with supply side interventions to boost production, combined with protectionism towards sensitive products (particularly rice). The study conducts a scenario analysis to examine the likely evolution of Philippine agriculture to 2020, as well as the implications of pursuing alternative policies.

The study finds that, under a business-as-usual scenario: Agricultural growth continues with dramatic increases for rice production in the offing. Likewise per capita consumption of most food items would continue increasing. Import growth is curtailed, with substantial price increases for meat products and rice.

The alternative scenario involves liberalization, and re-allocation of expenditure support towards export-oriented agricultural sub-sectors. Under this scenario, imports of rice, yellow maize, and poultry increase, with faster increases in per capita consumption than under business-as-usual, and lower retail prices. While consumers gain, producers of import-competing products face harsher competition and cut back on their production. Deepest cuts are expected for rice. Export-oriented commodities experience a production and export boost, with brightest prospects for other crops, banana, aquaculture products, and even coconut.

This study recommends the outward-oriented policy, with concomitant measures to compensate losers, ease the burden of adjustment, and facilitate the transition towards a more diversified and dynamic agricultural sector.

Keywords:

Agricultural development, expenditure support, trade policy, scenario analysis.

1. INTRODUCTION

The role of agriculture in the Philippine economy has undergone dramatic changes. Its contribution of agriculture to Gross Domestic Product (GDP) and exports of the Philippines is declining, consistent with the country's transition to middle income status. Structural change and population growth has caused a shift in its position from net food exporter to net food importer in the late 1980s. Nevertheless the country continues to source most of its food domestically; moreover, agriculture still accounts for a third of total employment, despite a GDP share of only one-eighth. This highlights the continuing importance of the sector for food security and inclusive growth.

Agriculture confronts several challenges over the decade. The country's burgeoning population shall require greater food supplies, whereas the scope for expansion of farm land has narrowed considerably.¹ For some commodities, imports offer an alternative food source, though recent world price spikes have troubling implications for food security. Moreover, exposure to global competition may pose threats to farm livelihoods. For this reason the Department of Agriculture (DA) has been implementing its flagship program, the Food Staples Sufficiency Program (FSSP), targeting among others 100% rice self-sufficiency this year (2013).

How would agriculture evolve over the next few decade in the face of these and other challenges? What are the implications of pursuing alternative policies? This study aims to answer these questions using the Agricultural multi-market *Model for Policy Evaluation* (AMPLE). The AMPLE is a numerical supply and demand model for evaluating alternative agricultural scenarios. It had been earlier applied for assessing productivity growth (Briones, 2010). For this study, AMPLE has been updated, revised to improve its representation of land use allocation, and applied over the horizon 2010 – 2020.

The rest of this report is organized as follows: Section 2 reviews the experience of Philippine agriculture over the past decade. Section 3 describes the policy environment and distinguishes important scenarios for Philippine agriculture: the business-as-usual scenario, based on the current policy regime emphasizing self-sufficiency and isolation of domestic markets; and an alternative scenario which represents openness to greater trade and diversification. Results of the scenario analysis are presented in Section 4. Section 5 concludes.

¹ Another important challenge is climate change, analysis of which is unfortunately outside the scope of this study.

2. PHILIPPINE AGRICULTURE: THE DECADE PAST

Production

In the 2000s, GDP growth has been fairly stable at about 4.7%. Growth rate of agriculture has averaged just under 3%. This is somewhat but not remarkably higher than growth rates in the 1980s and 1990s but far below those of the 1970s (averaging 5.4%).²

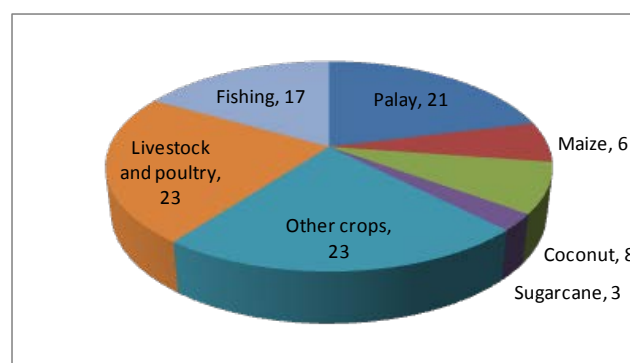
Table 1: Growth rates of gross value added in pesos (2000 prices)

	2001 – 2005	2006 - 2011	2001 - 2011
Agriculture	3.6	2.2	2.9
Industry	3.5	4.5	4.1
Services	5.6	5.5	5.6
TOTAL	4.6	4.8	4.7

Source: CountryStat.

Crops account for 60% of agricultural gross value added or GVA (Figure 1). Among the crops, the largest is rice, which by itself accounts for more than one-fifth of agricultural GVA, followed by other traditional crops: corn, coconut, sugarcane. The remainder is split between livestock and poultry as well as fisheries; the former accounts for nearly one-fourth of agricultural GDP. Meanwhile area harvested

Figure 1: Breakdown of agriculture GVA (in current prices) by commodity group, 2009-2011 (%)



Source: CountryStat.

by crop is shown in Figure 2. In 2011, rice has the biggest area harvested (more than one-third) followed by coconut; corn accounts for about a fifth of area harvested. Far behind are banana and sugarcane; miscellaneous other crops account for a little over one-tenth of area harvested. Contrary to diversification trends in other countries, area of traditional crops has been growing (Briones and Galang, 2012).

The large share of area and output going to rice production serves a food security purpose – rice being the primary Filipino staple. However it traps farmers into an inferior means of livelihood; there is a reason why alternatives are called "high value" crops. A

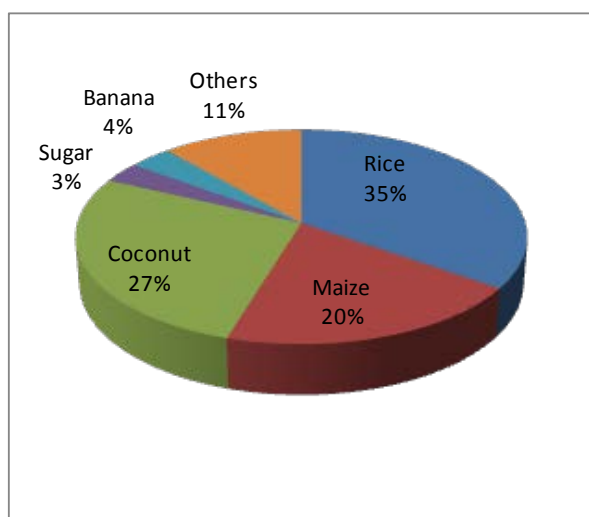
² Official data on real GDP for 1970s to 1990s relies on the old base year of 1985.

cursory look at DA data shows that palay and corn production have among the lowest net returns per ha (Table 2).

Comparisons of course should take into consideration that some of the high earning crops (mango, pineapple, coffee) are perennials, while the rest are temporary crops for which cropping intensity may exceed unity. Moreover vegetable production, which exhibits highest returns, also require the most inputs, are highly perishable, and exposed to high production risk. Nevertheless the reality that higher returns are available from successfully overcoming entry barriers to crops other than rice and corn should be evident.

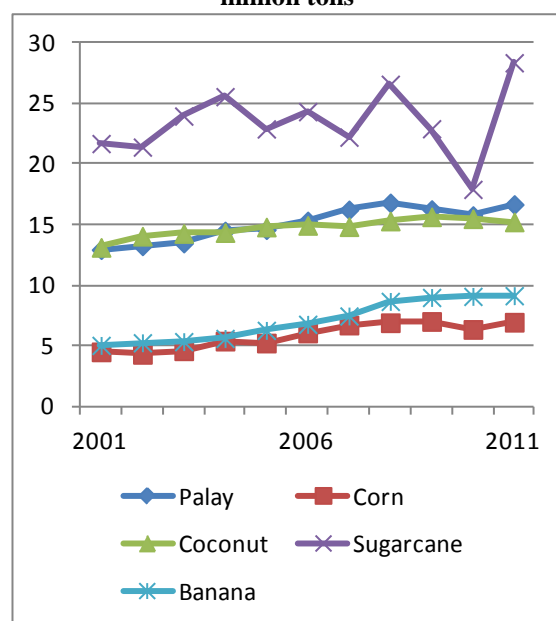
Production trends of the the five largest crops are shown in Figure 3. Palay production was mostly increasing in the 2000s, peaking in 2008 at 16.8 million t; this was succeeded by two years of decline owing to adverse weather. Similar movement is observed for corn and to some extent for coconut. The largest year-to-year gyrations are observed for sugarcane. The most consistent upward trend is shown by bananas.

Figure 2: Shares in area harvested, 2011 (%)



Source: CountryStat.

Figure 3: Output of largest crops, 2001 – 2011, in million tons



Source: CountryStat.

Among the other major crops, the steadiest increases are observed for root crops and other crops. Mango production peaked in 2007 at 1 million tons, followed by decline. Other fruits hit an output plateau in the late 2000s, as did vegetables (Figure 4).

Among the aquatic and animal products, aquaculture experienced the steepest output growth from 1.2 to 2.6 million tons (Figure 5). An upward trend is also seen for capture fisheries up to 2010, after which output dropped, due to resource depletion (and to some

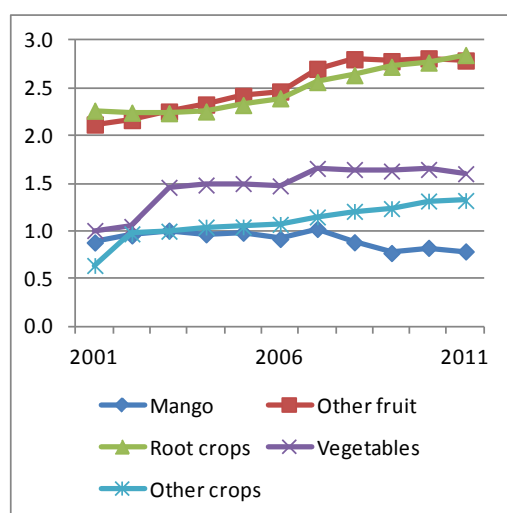
extent, conservation measures). Growth of poultry being more consistent over time than that of hogs, though the level of production of the latter remains higher, having started out with a higher base in 2001.

Table 2: Net returns per ha in pesos, average per cropping,

	2009	2010	2011
All Palay	12,608	14,891	14,616
Rainfed Palay	5,983	9,925	11,064
Irrigated Palay	15,781	16,912	16,251
All Corn	4,748	4,919	8,886
White Corn	2,645	474	4,663
Yellow Corn	7,559	8,535	10,717
Cassava	36,436	36,361	43,860
Vegetables			
Onion Bulb	194,896	125,580	302,070
Stringbeans	303,690	290,143	341,036
Fruits			
Mango	44,297	44,702	36,272
Pineapple	133,076	123,318	173,808
Watermelon	105,178	105,087	117,184
Coffee	16,903	16,975	16,341

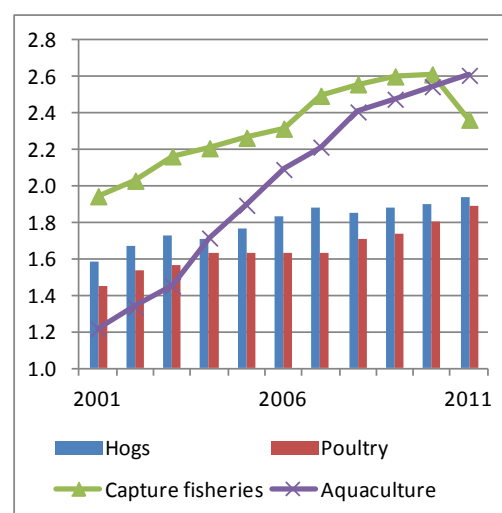
Source: CountrySTAT.

Figure 4: Production of other major crops, 2001 – 2011, in million tons



Source: CountryStat.

Figure 5: Production of other major agricultural commodities, 2001 – 2011, in million tons



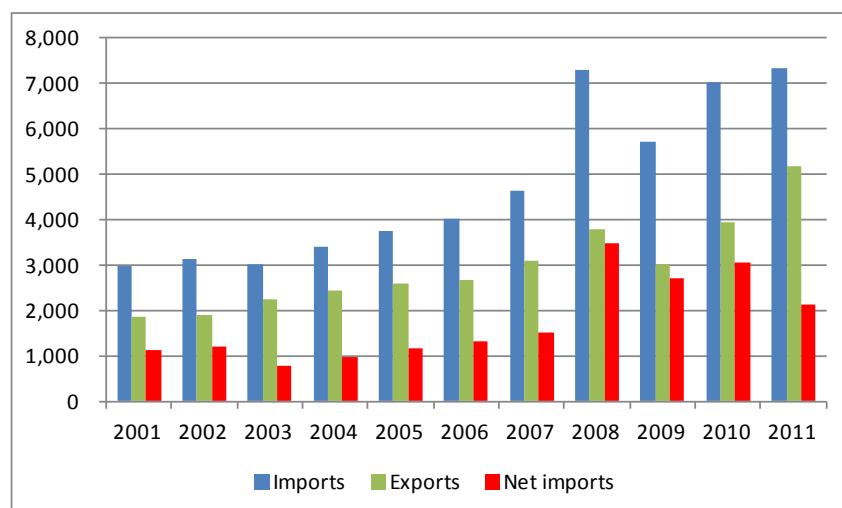
Source: CountryStat.

Trade

In the late 1980s the Philippines became a net agricultural importer, a status that has persisted up to the 2000s (Figure 6). While exports have been growing consistently, imports

have been growing even faster, resulting in a widening agriculture deficit. Imports, mostly driven by rice, soared in 2008, the year of the rice price crisis, and remains high consistent with elevated world prices.

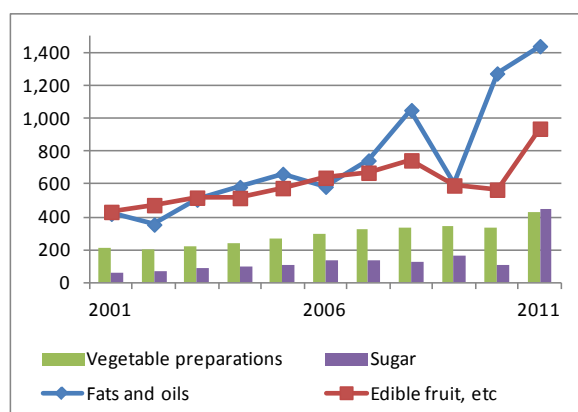
Figure 6: Agricultural imports, exports, and net imports



Source: CountrySTAT.

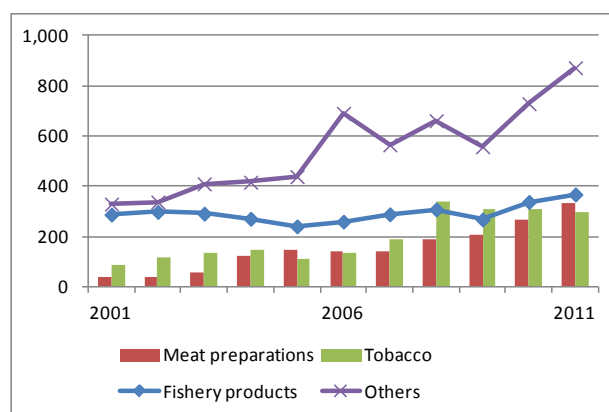
The non-traditional crops exhibit the most consistent export performance, with banana, mango, and other fruits leading the way performance (Figure 7). Exports of fishery products, spearheaded by aquaculture have likewise been robust. Coconut oil, the top export, has behaved very erratically since the late 2000s; similar volatility is exhibited by other commodities.

Figure 7: Exports of selected agricultural products 2001 – 2011 (in \$millions)



Source: CountryStat.

Figure 8: Exports of selected agricultural products, 2001 – 2011 (in \$millions)

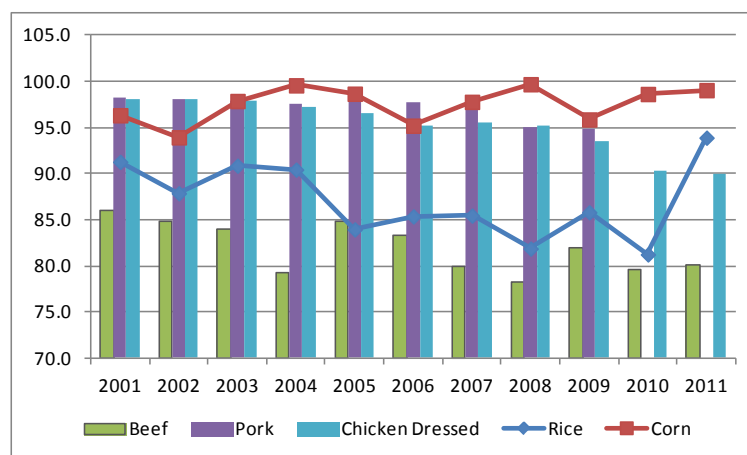


Source: CountryStat.

Import data is presented using self-sufficiency ratios or SSR (Figure 9). The country was over 90% self-sufficient in rice in the early 2000s but the the ratio deteriorated to about 80% in

2010, before recovering sharply to nearly 95% in 2011. SSR remains around 90% or better for pork and chicken, though SSR of beef can be quite low, dipping below 80%. Lower reliance on imports is observed for corn, which ranges from 95% – 100% SSR.

Figure 9: Self-sufficiency ratios for major imported commodities, 2001 – 2011 (%)

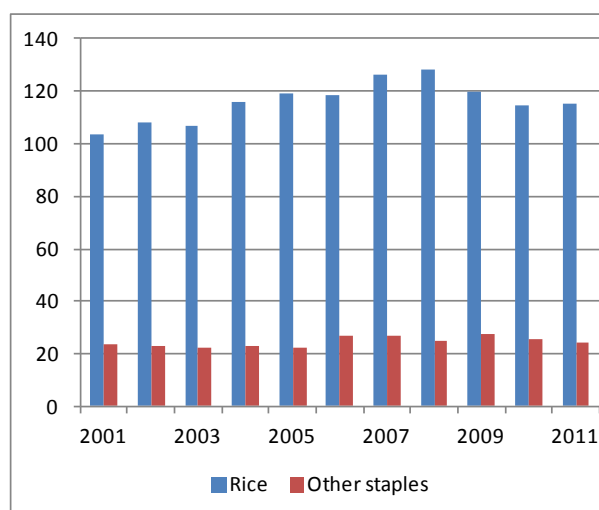


Note: Self-sufficiency ratio = production/(production + imports – exports).

Source: CountrySTAT

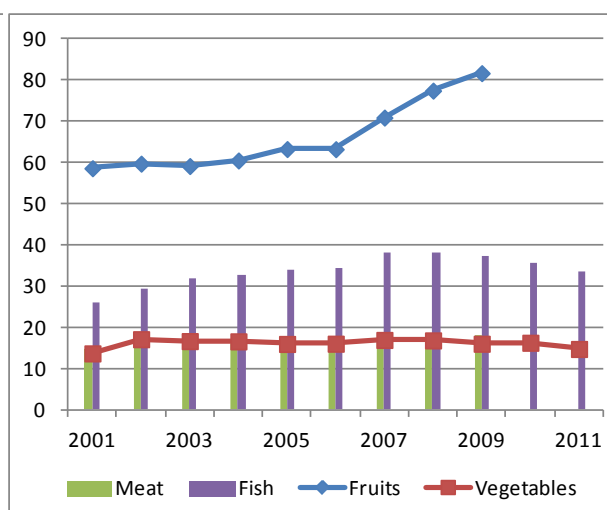
In sheer volume the highest consumption per capita belongs to rice (Figure 10). Per capita consumption peaked at 128 kg/year in 2008; this level is similar to Indonesia (127 kg/yr), higher than China (about 70 kg/yr) but lower than Vietnam (140 kg/yr). In contrast, other starchy staples (root crops, white corn) together account for just over 20 kg/yr.

Figure 10: Per capita consumption of starchy staples, 2001 – 2011 (kg/yr)



Source: CountryStat.

Figure 11: Per capita consumption of other food items, 2001 – 2011 (kg/yr)

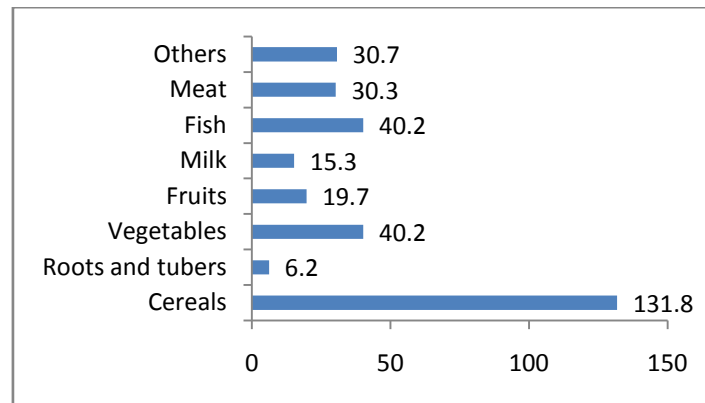


Source: CountryStat.

Per capita consumption of other food items is shown in Figure 11. Consumption of fruits has been rising rapidly since the mid-2000s. Consumption of vegetables and meat has been stagnant, while that of fish has risen slowly then went into a decline after 2007.

These consumption figures are derived via "disappearance" method, which regards food consumption as the residual that imposes the supply-demand accounting identity. Primary data on per capita consumption is collected by the Bureau of Agricultural Statistics (BAS) sporadically, the last one being in 2009. Primary data on consumption is also available from the Food Nutrition Research Institute of the Department of Science and Technology (Figure 12), which uses the one-day food intake measurement approach (whereas BAS uses the recall method). Consumption figures are typically higher than those derived from the disappearance method.

Figure 12: Per capita intake based on mean one day food consumption, Philippines 2008, in kg/cap/yr



Source: FNRI

3. SCENARIOS

Policy environment

The country's current strategy for agricultural development is highly conservative, prioritizing traditional crops, with production targets designed to close any domestic supply-demand gap. Self-sufficiency is defended as a form of insurance against world trade shocks, i.e. due to disasters or export restrictions in key exporting countries (FSSP, 2012). The policy is supported by trade measures to protect domestic markets with tariffs and non-tariff barriers. The regime may be characterized as "import substitution agricultural development", the agricultural counterpart to the country's earlier adoption of import substitution with regard to industry.

Protectionism is best exemplified by rice, for which the most-favored nation (MFN) rate is 50%. More importantly, rice is officially subject to quantitative restrictions, with continuation of special treatment now being considered by WTO (upon request of the Philippine government). Also conferred high tariff rates are sugar (65%), corn (50%), as well as pork, chicken, cassava, coffee, onion, cabbage, carrot, and potato (40%). Together these commodities account for about 61% of the value of agricultural output (excluding fisheries). Each of these commodities requires an import permit, supposedly for applying sanitary and phytosanitary standards; in practice these permits are used as non-tariff barriers (David et al, 2012).

The alternative would be to support the engagement of Philippine agriculture with the global market, through trade and specialization based on comparative advantage. This entails more liberal trade policies (lowering of tariffs and non-tariff barriers) as well as directing expenditure support on a more neutral basis, i.e. greater outlays towards products with lower support, which typically are the export-oriented commodities (i.e. products for which the Philippines has comparative advantage).

Analytical tool

The tool for scenario analysis is the Agricultural multi-market Model for PoLicy Evaluation (AMPLE), described in Briones (2010). As with similar studies, the numerical output of the model should not be seen as forecasts, but rather as projections of market movements as determined by supply-demand fundamentals. It is not designed to anticipate supply and demand shocks and cannot be expected to replicate variability of actual data. Its primary advantage is that it offers a systematic means of imposing internal consistency of

assumptions related to, among others, supply and demand responses, and trends of the variables external to the model (such world prices). Commodities for which production, consumption, imports, exports, and corresponding prices are variables of AMPLE are as follows:

Primary form/system	Final form
CROPS	
Palay Rainfed Irrigated	Milled rice
White maize	White maize
Yellow maize	Yellow maize
Coconut	Copra
Sugarcane	Raw sugar
Root crops	Root crops
Banana	Banana
Mango	Mango
Other fruits	Other fruits
Vegetables	Vegetables
Other crops	Other crops
LIVESTOCK	
Swine	Pork
Poultry	Poultry meat
Other livestock and dairy	Other meat and dairy
FISH	
Freshwater fish Freshwater fish, capture Freshwater fish, aquaculture	Freshwater fish
Brackishwater fish	Brackishwater fish
Seaweed	Processed seaweed
Marine fish Marine fish, capture Marine fish, aquaculture	Marine fish

Outline of the scenarios

Each of these policy regimes informs the scenario building. The **Reference scenario** continues past trends, including development strategies, to develop a future path of Philippine agriculture to 2020 (see Box). The alternative is the **Integration scenario**, which applies the same trends except those related to trade and competitiveness policy, namely:

- Exogenous growth of area harvested of palay is set to zero.
- Productivity growth in agricultural commodities is 1% higher than in reference scenario beginning 2016 onwards (except for rice, corn, and sugar); investment in productivity of these commodities uses savings from the rice self-sufficiency program.

- Tariff on sensitive products is reduced to 10% in installments of 10% beginning from 2013 (except rice, where the final tariff is kept at 30% due to a strong farmer lobby).

BOX
Exogenous variables for AMPLE

These treatment of exogenous variables are as follows:

- Area harvested (total): increases in area harvested are almost all due to increases in cropping intensity, as further expansion of arable land is almost nil. As a share of total area harvested, growth should be very small, i.e. one percent per year.
- Population: follows UN projections: 1.68% for 2010 – 15, and 1.58% for 2016 – 2020.
- GDP growth: actual rate in 2011 of 4.6%, applied to 2012, up to 5.6% in 2013 – 2014, and 6% thereafter. (Note: model uses per capita income growth = GDP growth – Population growth).
- Growth rates of world prices is based on the Commodity Price Forecast of World Bank (2012). Coconut oil and sugar are expected to decrease by an average of 2% per year, as correction to high levels at the baseline. For Other crops (which include commercial crops such as tobacco, rubber, and oil palm), an increase of 1% per year is assumed.
- Both scenarios incorporate the AFTA schedule for Philippine sugar tariffs (reaching 5% by 2015). Under the Reference scenario, tariff equivalent of Rice increases by 50 percentage points from 2013 to 2015.
- Price-independent productivity growth under the Reference scenario is set at 2% per year, except for Rice which grows at 1% per year. Rice however experiences a price-independent boost in area harvested of 2% to 3% over the period 2012 – 2016 in keeping with FSSP targets. Exogenous growth in area harvested for rice is set to zero under the Integration scenario.

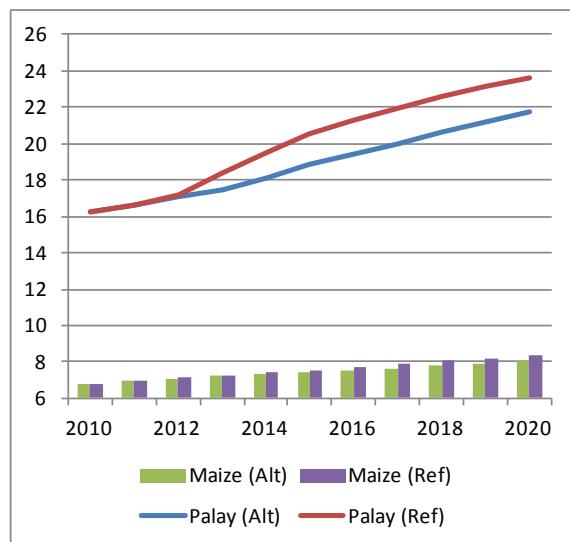
4. AGRICULTURE TO 2020

The following scenarios pertain to supply and demand outcomes ("market equilibrium") consistent with underlying fundamentals (e.g. household purchasing power, resource endowments, and technology). This is approximated by a three-year average of supply, demand, and prices, which is used to construct the baseline data set; in AMPLE, the 2010 baseline is the average of 2009 – 2011 annual data). Abbreviations for Reference and Integration scenarios are Ref and Alt (for "Alternative"), respectively.

Production

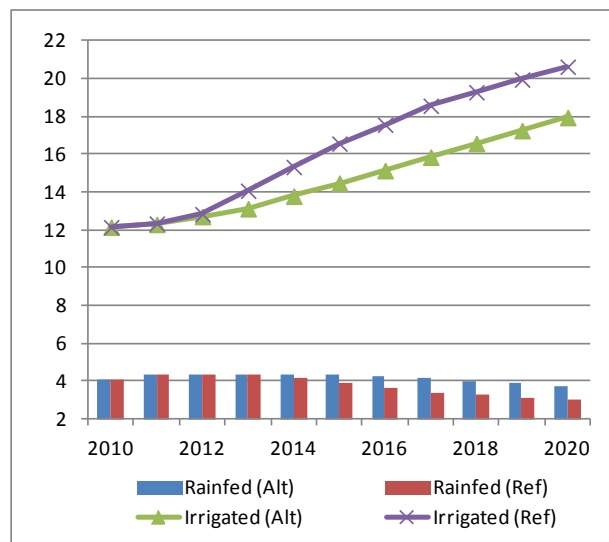
Under the reference scenario, production of Palay is projected to increase from 16.2 to 23.6 million tons. Maize production also increases, from 6.8 million to 8.4 million tons. Production is lower for these crops under the Integration scenario. By 2020, the difference in Palay output between scenarios is 1.9 million tons. For Maize the difference is just 0.3 million tons, which can be attributed to reduced import barriers under Integration.

Figure 13: Palay and Maize production scenarios, in million tons



Source: Author's computation.

Figure 14: Palay production scenarios by system, in million tons

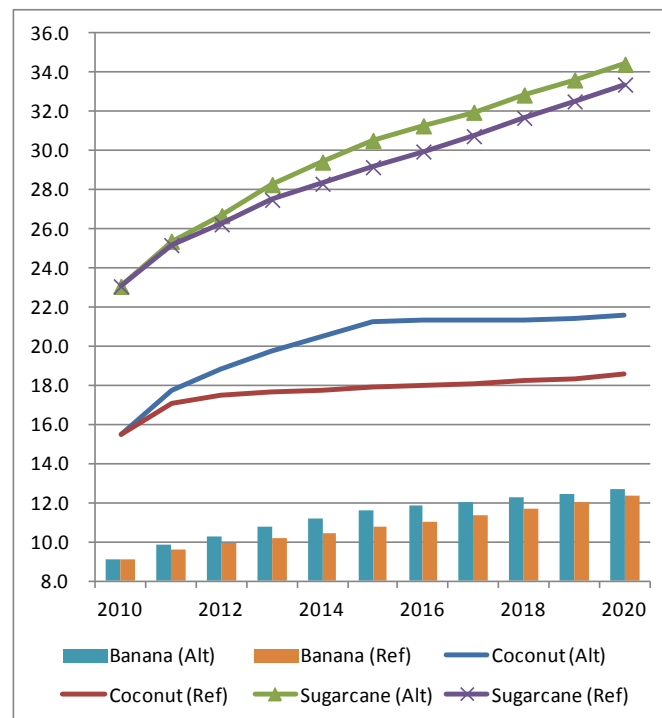


Source: Author's computation.

The difference in Palay production can be broken down by system. Under the Integration scenario, rainfed Palay production is actually higher, by about 0.7 million tons in 2020 (Figure 14). The problem is irrigated Palay, for which is 2.5 million tons lower under the Integration scenario. This is mostly due to to elimination of exogenous growth of area harvested (due to hypothetical realignment of the expenditure support for irrigation).

For the other traditional crops, output is increasing but the relationship between scenarios is reversed - output under the Integration scenario is higher (Figure 15). Banana production adds 3.3 million tons annual output over the decade from 9.1 million tons in 2010 under the Reference scenario. Under the Integration scenario, the additional output is 3.6 million tons. Likewise, despite declining export prices, Coconut output is expected to rise to 18.5 million tons even under the Reference scenario, up from 15.5 million in 2010; under the Integration scenario the 2020 output can go as high as 21.6 million tons.

Figure 15: Production scenarios for Banana, Coconut, and Sugarcane, in million tons



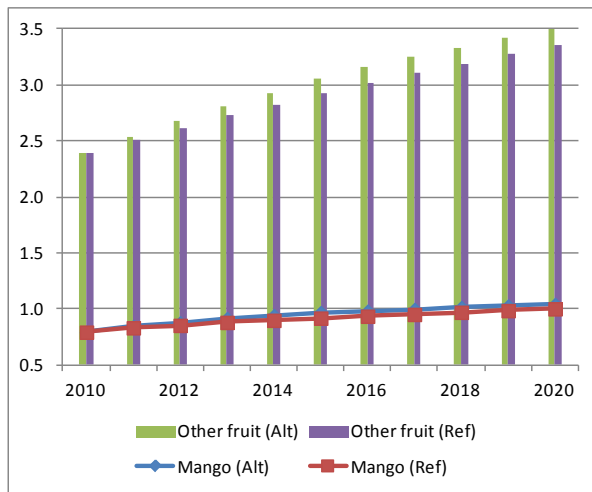
Source: Author's computation.

Sugarcane production is expected to rise despite intensified competition from imports even under the Reference scenario; output may undergo up to a 50% increase over the decade mainly because of rising domestic demand. The output advantage of the Integration scenario is rather surprising in the case of Sugarcane (discrepancy by 2020 is about 1 million tons), as there is no additional productivity growth assumed for this scenario (unlike for the export-oriented crops).

Production of Mango and Other fruit are expected to rise (Figure 16). From a baseline of 0.8 million tons, Mango hits 1 million tons under the Reference scenario, equal to its peak in 2007 achieved with favorable weather. Other fruit also rises to 3.5 million tons – a much faster rate of increase over the period (46%, versus 25% for mango). However differences in output trends across scenarios is minimal, despite the faster productivity

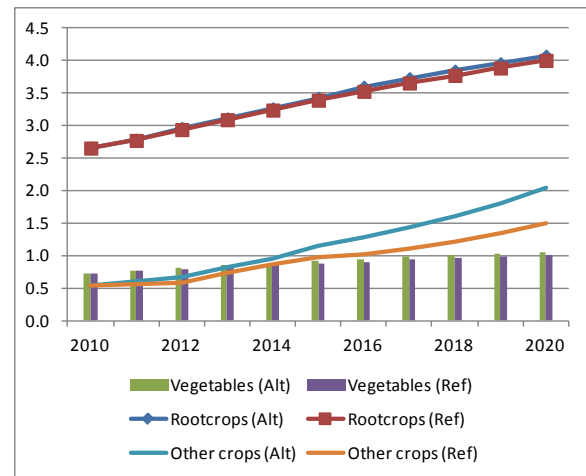
growth under the Integration scenario for both crops.

Figure 16: Production scenarios for Mango and Other fruit, in million tons



Source: Author's computation.

Figure 17: Production scenarios for Vegetables, Rootcrops, Other crops, in million tons



Source: Author's computation.

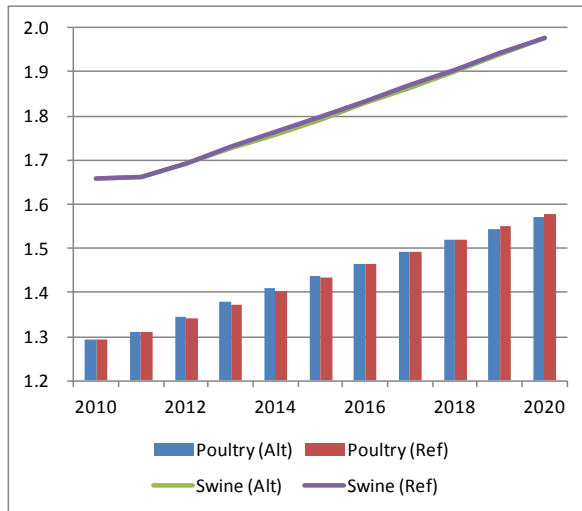
For the rest of the crops, fastest production growth is expected for the aggregated category Other crops, from 0.5 million (baseline) to 1.5 million tons (2020) – a three-fold increase (Figure 19). This is driven largely by export price growth. Also exhibiting impressive growth are Rootcrops (up to 4.5 million tons) and Vegetables (up to 1 million tons). However only the Other crops exhibits a sizable difference between scenarios. Production of Other crops under the Integrated scenario hits 2.0 million tons by 2020, i.e. a four-fold increase, due to the faster productivity growth associated with this scenario.

For the livestock and poultry sectors, output rises to meet domestic demand (Figure 19). Under the Reference scenario, Poultry production goes up to 1.6 million tons, adding 0.3 million tons from the baseline; meanwhile Swine production goes up to 2.0 million tons for a similar amount of increase. (Not shown in the chart is Other livestock, for which output expansion is miniscule at just 2% over the decade). Interestingly, the difference in output trends between Integration and Reference scenario is minimal, despite reduced protection for Swine and Poultry. The offsetting factor is reduced protection on Yellow maize, a critical production input.

Lastly, among aquatic products, Seaweed and Brackishwater fish would post strong growth, equivalent to a 14% increase over the horizon under the Reference scenario. Both are cultured products. The total increase is even larger, at 20% under the Integration scenario, owing to faster productivity growth. However marine and freshwater fish (mostly produced under capture system) exhibit fairly flat trends, given the absence of productivity growth

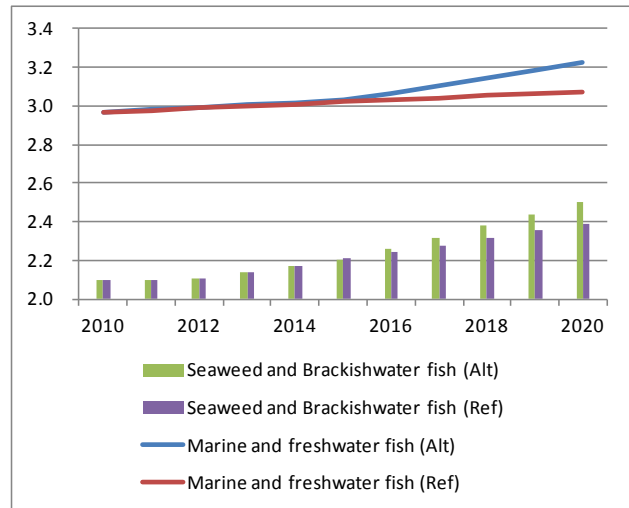
under the Reference scenario for capture marine fisheries. Faster productivity growth in marine fisheries under the Integration scenario provides a moderate lift for marine and freshwater fish (an additional 0.2 million tons by 2020).

Figure 18: Production scenarios for Livestock and Poultry, 2010 – 2020, in million tons



Source: Author's computation.

Figure 19: Production scenarios for aquatic products, 2010 – 2020, in million tons

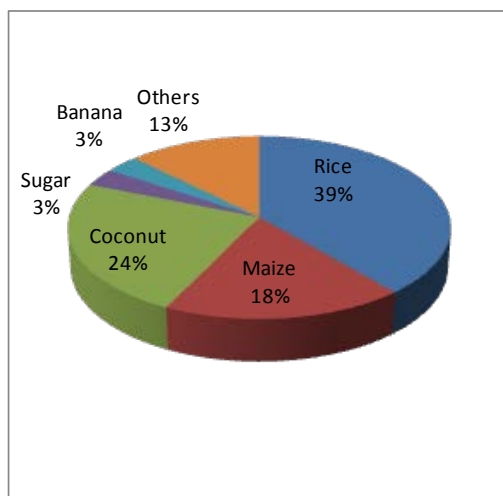


Source: Author's computation.

Area harvested

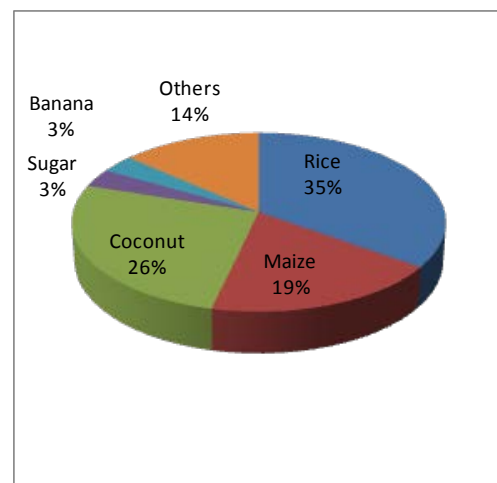
Under the Reference scenario, As for area harvested, by 2020 rice enjoys the largest jump in area share (four percentage points), compared to baseline values in 2010 (Figure 20 and Figure 2).

Figure 20: Shares in area harvested by crop, Reference scenario, 2020



Source: Author's computation.

Figure 21: Shares in area harvested by crop, Integration scenario, 2020



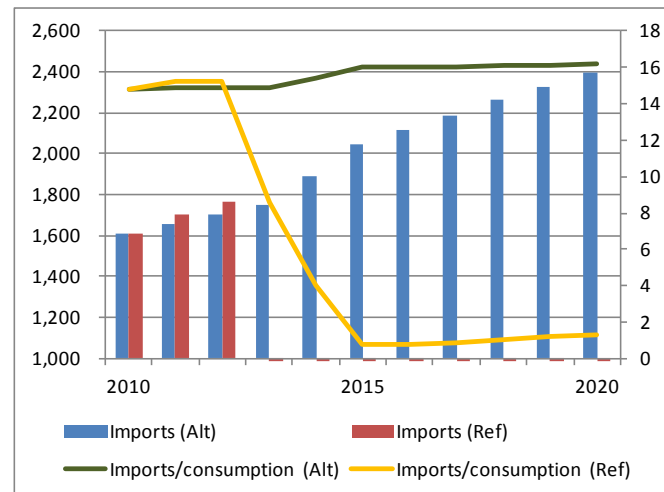
Source: Author's computation.

This reinforces its dominance over other crops in terms of area share. A smaller increase is projected for Other crops, while area shares of Coconut and Maize decline. In contrast, under the Integration scenario the area share of Rice in 2020 is the same as in the baseline; it is Others that experiences the biggest increase in area share (three percentage points), whereas the others experience a moderate shrinkage in share (except Sugarcane). The Integration scenario corresponds to a more diversified composition of crop output.

Trade

How would government's target of 100% rice self-sufficiency fare? It turns out to be largely successful, at least by 2015 (Figure 22). Imports fall to practically zero, together with the import-consumption ratio (a measure similar to the import-dependency ratio).

Figure 22: Scenarios for import quantity (in '000 t) and import-consumption ratio of rice (in %), 2010 – 2020



Source: Author's computation.

However this is achieved in the Reference scenario only because of the increasing protection i.e. raising the tariff-equivalent trade barrier more than two-fold. Instead, under the Integration scenario, relaxing trade barriers leads to a mild uptick in the import-consumption ratio, from 15% (2010) to 16% (2020). Due to rising demand this implies imports increase steadily from 1.6 million to 2.4 million tons by 2020. That is the historic peak of rice importation (in 2010) may become the norm under a more liberalized policy. Note that global volume of rice exports was already 37 million tons in 2011 (FAO, 2012), and shows every sign of deepening further over the decade. Hence consistently sourcing this magnitude of rice abroad is not farfetched.

For the other imported crops, purchases from abroad are projected to rise even under

the Reference scenario (Figure 23). The most dramatic increase belongs to Sugar due to the AFTA commitment, with imports approaching 600 thousand tons in 2020, more than a five-fold increase from the 2010 baseline of just 113 thousand tons. Much smaller increases in annual imports are expected for Yellow maize and Vegetables, up to 255 thousand and 176 thousand tons, respectively by 2020. The Integration scenario though leads to a sharp increase for Yellow maize, where imports exceed 600 thousand tons by 2020, a four-fold increase over its baseline of 152 thousand tons. Less drastic but still sizable increases in import volumes are expected for Sugar (also to exceed 600 thousand tons by 2020) and Vegetables (180 thousand tons by 2020, up from 124 thousand tons in 2010).

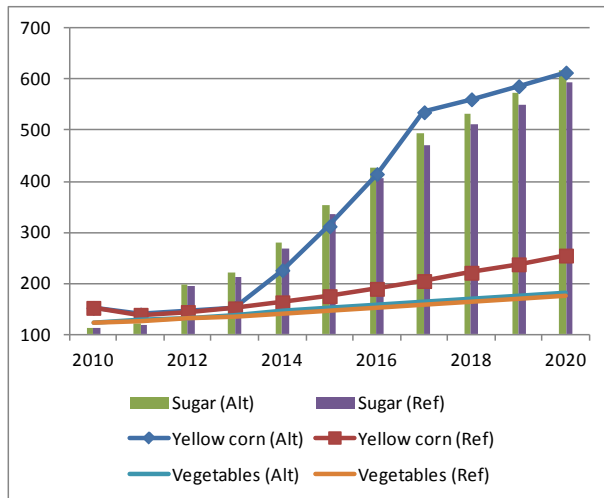
Among meat products (Figure 24), under the Reference scenario, Other livestock (mostly beef) doubles annual imports to 90 thousand tons. Poultry imports rise from 90 thousand tons in 2010 to nearly 50% higher by 2020; from a similar baseline import quantity, Swine imports are higher in 2020 by about 28%.

Meanwhile under the Integration scenario, the imports of Poultry and Swine are greater than under the Reference scenario, owing to lower trade barriers compared to the Reference scenario. By 2020 Poultry imports are 80% higher than in 2010, while Swine imports are about 43% higher; Other livestock imports are however lower compared to the Reference scenario due to substitution with other meat products.

Exports of mango, already low at the baseline (26 thousand tons) grow by only 14% by 2020 under the Reference scenario. Even with faster productivity growth under Integration, export volume of Mango does not exceed 50 thousand tons by 2020.

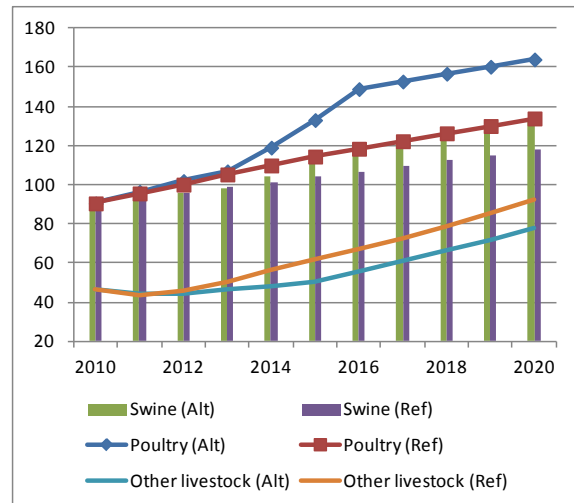
Exports of Banana and Coconut under the Reference scenario are expected to experience rising exports initially, before declining year on year until 2020 (Figure 25). These are the crops for which world prices are seen to decline over the decade. Coconut exports begin to fall from 2011 onwards, while Banana exports peak at 2012 at about 2.0 million tons before falling gradually to 1.9 million tons by 2020. Meanwhile under the Integration scenario, the projection undergoes a similar inverse-U pattern but peaks at a much higher level of exports and much later: Banana exports hit 2.4 million tons in 2015 before falling back to 2.2 million tons; Coconut exports hit 2.5 million tons before retreating to 2.2 million tons by 2020. Faster productivity growth is able to offset some of the effect of falling world prices.

Figure 23: Scenarios for imports of crops (except rice), 2010 – 2020, in thousand tons



Source: Author's computation.

Figure 24: Scenarios for imports of meat products, 2010 – 2020, in thousand tons

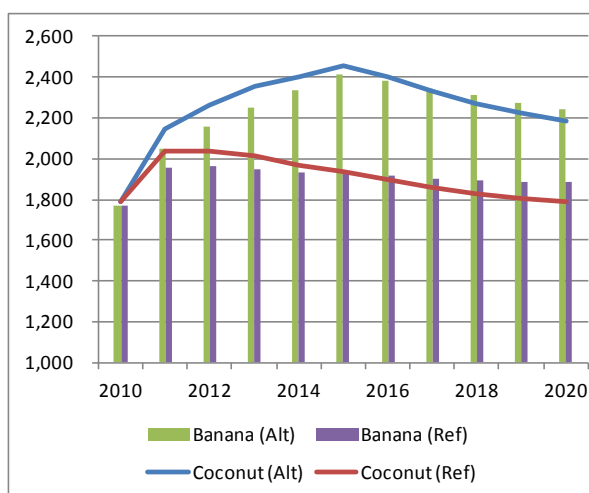


Source: Author's computation.

Consumption

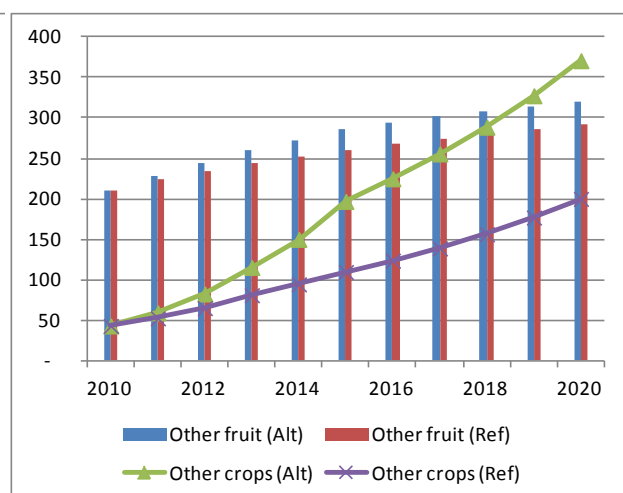
Moving now to the demand side: under the Reference scenario, per capita consumption of staple foods is seen to be fairly flat (Figure 27). This holds for both Rice and other starchy staples (White corn and Cassava). Likewise per capita consumption of fruits is seen to be only moderately increasing from 20 kg/yr to about 24 kg/yr (Figure 28).

Figure 25: Scenarios for exports of Banana and Coconut, 2010 – 2020, in thousand tons



Source: Author's computation.

Figure 26: Scenarios for exports of Other fruit and Other crops, 2010 – 2020, in thousand tons

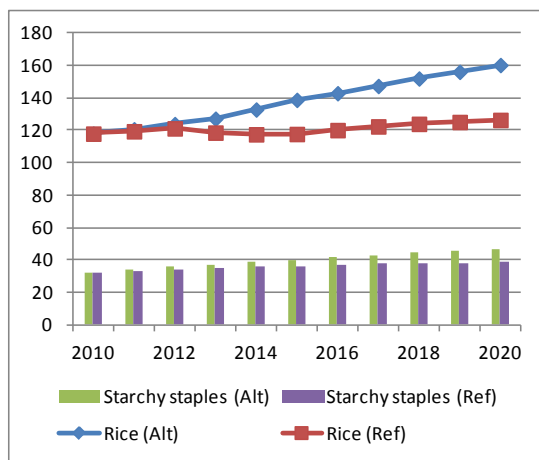


Source: Author's computation.

The baseline level of Vegetables in the Figure uses the average of the BAS estimate and the FNRI estimate of 2009. The change in consumption is largest for this product, from a baseline of 25 kg/yr to 34 kg/yr by 2020, an increase of 39%.

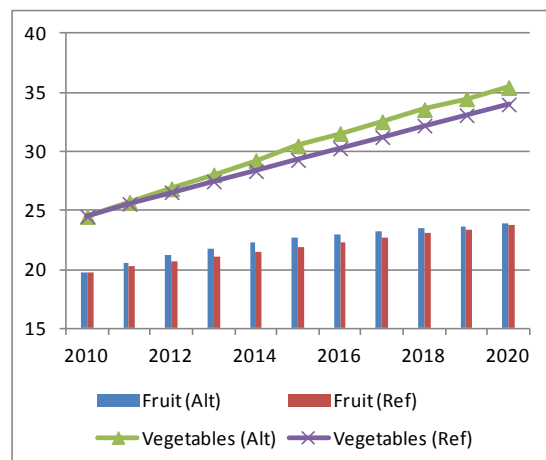
The Integration scenario introduces larger increments in per capita consumption of crops. For rice, per capita consumption rises from 120 kg/yr to 160 kg/yr – a sharp divergence from the Reference scenario. The reason for the increased consumption is of course the liberalization of imports and therefore greater access to cheaper food; this more than offsets the effect of re-alignment of the FSSP expenditure outlay.

Figure 27: Per capita consumption of staple foods, 2010 – 2020, in kg/yr



Source: Author's computation.

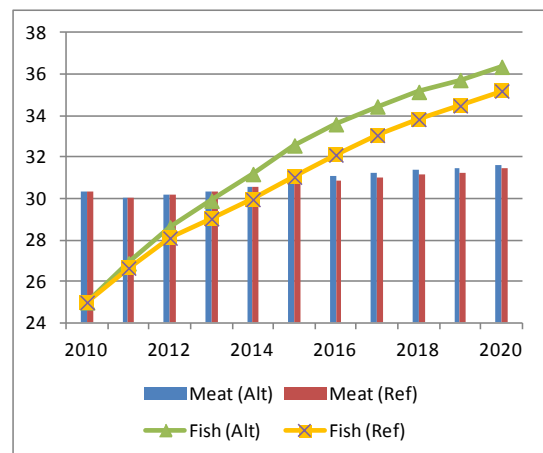
Figure 28: Per capita consumption of fruits and vegetables, 2010 – 2020, in kg/yr



Source: Author's computation.

The Reference scenario for meat products (Figure 29) shows a sharp increase in per capita consumption of fish, from a baseline 24 kg/yr up to 34 kg/yr by 2020. Increases are observed for meat consumption, but much milder, to 32 kg/yr from 30 kg/yr. As with the crops, access to lower priced imports allows per capita consumption to increase for both products – however the difference across scenarios is quite small in the case of meat products (contrary to warnings of alarmists). For fish the increment in per capita consumption is higher across scenarios.

Figure 29: Per capita consumption of meat and fish products, 2010 – 2020, in kg/yr



Source: Author's computation.

Prices

In the following, projections hold base year prices fixed, i.e. the projections are not adjusted for inflation. Scenarios for retail prices are summarized in Table 3. Rice prices are slated to increase under the Reference scenario, despite rapid domestic supply expansion, due to the accompanying increase in barriers to rice imports. Likewise increases in retail prices are in store for meat and marine fish, with sharp increases in the former over the horizon. Note that there is no increase in protection for these products, implying that demand expansion outpaces that of supply leading to higher prices. The price outlook for the other products is stable to declining.

Table 3: Scenarios for retail prices of agricultural commodities, in pesos per kg

	2010 Baseline	2020 Reference	2020 Integrated	Difference 2013 – 2020 (%)
Rice	36.6	39.2	37.3	-4.5
White maize	19.9	19.8	19.9	0.2
Sugar	45.1	41.3	41.4	0.3
Banana	15.8	14.4	13.6	-4.9
Mango	62.9	63.7	60.5	-4.6
Other fruit	65.9	66.7	63.6	-4.4
Rootcrops	14.9	14.1	13.4	-4.6
Vegetable	50.0	50.7	48.4	-4.3
Other Crop	50.4	49.8	47.7	-3.5
Poultry	119.7	146.0	142.0	-0.9
Swine	170.4	197.8	195.5	-1.1
Other livestock	220.4	250.1	266.1	1.3
Freshwater fish	88.3	88.2	81.4	-5.1
Brackishwater fish	147.5	118.2	110.0	-5.0
Marine fish	92.0	108.5	111.1	2.3

Source: Author's computation.

Under the Integration scenario, prices are lower owing to reduced barriers to cheaper imports for most of the commodities. The exceptions are White maize, for which imports are negligible; Sugar, for which trade liberalization is already undertaken under the Reference scenario; as well as Other livestock and marine fish. In the case of rice the percentage difference in price is sizable, averaging 4.5% from 2013 onward; similar percentage differences are found for fruits, Rootcrops, and Vegetables.

Finally for producer prices, the Reference scenario also in general finds that increases are in the offing, but lower (proportionately) than for retail prices (Table 4). Hence producer prices for Poultry, Swine, and Other livestock are increasing fastest.

The rest of the commodities are fairly stable – even rice posts only a small increase.

Meanwhile under the Integrated scenario, producer prices tend to be lower, though again with smaller changes compared to the difference between scenarios in the case of retail prices. Surprisingly, Rice registers a small increase in producer price compared to the Reference scenario. Whereas import liberalization tends to reduce producer price, withdrawal of large supply-side interventions tends to raise it. Rice farmers are not necessarily better-off without the interventions; nevertheless the positive impact of supply-side interventions is partly offset by its market-level effects.

Table 4: Scenarios for producer prices of agricultural commodities, in pesos per kg

	2010 Baseline	2020 Reference	2020 Integrated	Difference 2010 – 2020 (%)
Rice	14.8	15.3	15.6	1.3
White maize	11.4	11.3	11.4	0.2
Yellow maize	11.4	11.2	11.2	-0.1
Coconut	5.8	5.5	5.3	-3.9
Sugar	27.5	27.1	27.1	0.3
Banana	10.9	9.8	9.4	-4.1
Mango	22.9	23.2	22.1	-4.2
Other fruit	6.5	6.6	6.3	-4.2
Rootcrops	6.8	6.5	6.2	-4.4
Vegetable	19.3	19.6	18.7	-4.3
Other Crop	57.6	60.3	58.6	-3.0
Poultry	113.2	138.9	136.2	-0.2
Swine	103.8	120.6	119.6	-0.8
Other livestock	105.0	124.2	133.8	1.5
Freshwater fish	55.7	55.6	51.3	-5.1
Brackishwater fish	409.0	334.7	315.4	-4.3
Seaweed	146.5	138.4	138.4	0.0
Marine fish	56.6	68.5	70.0	2.3

Source: Author's computation.

5. CONCLUSION

According to the scenario analysis, under business-as-usual, agricultural output continues to grow to meet the burgeoning requirements of domestic as well as foreign markets. Rice production is expected to increase dramatically and account for an even greater share of the country's agricultural area. Sugarcane, Banana, Other fruit, Rootcrops, and especially Other crops exhibit robust output trends. This enables per capita consumption of most food items to continue increasing, despite simultaneous growth in population. Resource limitations such as scarcity of land present significant yet surmountable challenges for agriculture.

Given inward-orientation of the policy regime, the strategy of meeting domestic demand using imports would be curtailed. This results in substantial price increases for meat products. Rice prices would also increase despite significant expenditure support for this crop, due to the closure of the domestic market in pursuit of self-sufficiency in the short-run. Middle and upper class consumers are able to afford these increases, but they present a substantial burden to the poor. The only commodity for which increases in imports are rapid is Sugar, for which liberalization is already a commitment under current policy.

The alternative is to move away from an import substitution stance towards one that openly embraces international trade. Investments are re-allocated towards export-oriented commodities to accelerate productivity growth in the medium-term, while tariff and non-tariff barriers are reduced. Under this alternative scenario, imports do shoot up dramatically, particularly for Rice, Yellow maize, and to some extent Poultry. This allows per capita consumption to rise much faster for Rice, and also to some extent meat products. This also promotes food affordability, with lower prices at the retail level for rice and meat products.

While consumers gain, producers face harsher competition and cut back on their production. Production shortfall (relative to business-as-usual) is sharpest for Rice, owing to the double whammy of reduced expenditure support and reduced protection. On the other hand, export-oriented commodities experience a production and export boost, primarily Other crops, Banana, aquaculture products, and even Coconut.

Deepening globalization of Philippine agriculture is beneficial to consumers. Expanded trade promotes specialization, which in the Philippine setting leads to diversification given structural bias towards traditional commodities. Land and other resources are expected to move towards sub-sectors with brighter income opportunities for farmers. Such re-allocation though entails adjustment which imposes costs on agriculture.

This study recommends closer engagement with global agricultural trade, with concomitant measures to compensate losers, ease the burden of adjustment, and facilitate the transition to a more dynamic and competitive agriculture.

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