Rice self-sufficiency: is it feasible?

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The end of rice imports?
Rice self-sufficiency has long captivated public imagination in the Philippines. “Bilang isang bansa, tila ikinahihiya natin ang pagsangkat ng bigas.” Under the Food Staples Sufficiency Program (FSSP), the current administration targets 100 percent rice self-sufficiency or zero imports by 2013.

This Policy Notes assesses whether the rice self-sufficiency target can be attained and sustained at reasonable cost. The assessment is based on two approaches: first is comparison with past trends; second is comparison with projections of demand and supply. Both are concerned with the capacity and performance of the Philippine rice sector; the latter though is more comprehensive as it takes into account the underlying economic drivers.

The FSSP
To its credit, the Department of Agriculture (DA) has crafted a coherent plan toward achieving rice self-sufficiency. From the 2010 baseline of 15.8 million tons of palay, targets for yield, area harvested, and production are identified each year up to 2016 (Table 1).

Targets are also stated for supply and utilization. The 2010 baseline involves the following from the Bureau of Agricultural Statistics (BAS):

- Total supply: 15.3 million tons
  - Production: 10.3 million tons
  - Imports: 2.4 million tons
  - Beginning stocks: 2.6 million tons
- Total demand: 15.3 million tons
  - Food consumption: 10.6 million tons
  - Other use: 1.3 million tons
  - Ending stocks: 3.4 million tons

Source: countrySTAT (http://countrystat.bas.gov.ph)
The various strategies identified in the FSSP to achieve these targets include:

- Sustaining research and development (R&D) in new varieties and crop management
- Promoting mechanization of on-farm and postharvest operations
- Enhancing effectiveness and strengthening the delivery of extension services
- Boosting yield growth in rainfed areas
- Harnessing the potential of high-elevation and upland rice ecosystems
- Enhancing economic incentives and enabling mechanisms
- Managing food staples consumption toward a more diversified diet.

The priority intervention by far, however, is expansion of area harvested and improvement in yield by investing in irrigation. Table 3
Table 3. FSSP projections for irrigation service area and cropping intensity, 2011–2016

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<tbody>
<tr>
<td>Beginning service area (ha)</td>
<td>1,536,135</td>
<td>1,577,607</td>
<td>1,676,790</td>
<td>1,727,011</td>
<td>1,752,743</td>
<td>1,752,743</td>
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<tr>
<td>Cropping intensity</td>
<td>1.44</td>
<td>1.47</td>
<td>1.50</td>
<td>1.53</td>
<td>1.56</td>
<td>1.60</td>
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<tr>
<td>Harvest area (ha)</td>
<td>2,212,030</td>
<td>2,319,080</td>
<td>2,515,180</td>
<td>2,642,330</td>
<td>2,734,280</td>
<td>2,804,390</td>
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</table>

Source: DA (2012)

Table 4. Government appropriations for agriculture, selected accounts, 2011–2013 (in P'000)

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<tr>
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<th>2011</th>
<th>2012</th>
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<tr>
<td>Department of Agriculture</td>
<td>32,905,017</td>
<td>49,978,492</td>
<td>55,287,340</td>
</tr>
<tr>
<td>Irrigation</td>
<td>12,790,659</td>
<td>24,765,052</td>
<td>27,329,295</td>
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<tr>
<td>National Rice Program</td>
<td>5,217,216</td>
<td>6,181,166</td>
<td>7,434,081</td>
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Source: DA (2012)

Table 5. Projected and historical growth rates for palay yield, area harvested, and production

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<tr>
<td><strong>All palay</strong></td>
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<tr>
<td>Yield</td>
<td>3.8</td>
<td>1.5</td>
</tr>
<tr>
<td>Area</td>
<td>2.4</td>
<td>1.4</td>
</tr>
<tr>
<td>Production</td>
<td>6.3</td>
<td>3.2</td>
</tr>
<tr>
<td><strong>Irrigated palay</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yield</td>
<td>3.6</td>
<td>1.1</td>
</tr>
<tr>
<td>Area</td>
<td>4.1</td>
<td>2.1</td>
</tr>
<tr>
<td>Production</td>
<td>7.9</td>
<td>3.4</td>
</tr>
<tr>
<td><strong>Rainfed palay</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yield</td>
<td>2.3</td>
<td>2.1</td>
</tr>
<tr>
<td>Area</td>
<td>-2.1</td>
<td>0.8</td>
</tr>
<tr>
<td>Production</td>
<td>0.2</td>
<td>3.4</td>
</tr>
</tbody>
</table>

Source: DA (2012)

presents projections for irrigation service area under FSSP. Through this strategy, DA hopes to increase cropping intensity and area harvested.

Table 4 meanwhile presents the budgetary implications to date. The DA budget is set to increase to 55.3 billion pesos in 2013, compared to 33 billion at the start of the current administration. Much of the DA budget is intended for irrigation, followed by the national rice program.

Rice self-sufficiency targeting induces the largest increases in public expenditures for agriculture. Sharp increases in outlays were also observed in 2009–2010, following the 2008 rice crisis, and in pursuit of FIELDS (Fertilizers, Information and Education, Loans, Driers and other postharvest, and Seeds), the rice self-sufficiency program of the previous administration.

Assessing feasibility
To assess the feasibility of FSSP targets, we first take the simple approach of comparing these with historical trends (Table 5). It is clear that FSSP targets are very ambitious, and in fact unlikely to be met. The DA has however insisted that such targets are attainable with enough commitment and funding for its programs and projects.

Second, we delve more deeply into the feasibility debate using supply-demand...
Box 1. Overview of AMPLE

AMPLE is an annual model with a data set constructed mainly from BAS data. It has 18 commodity categories, one of which is rice. Its base year is 2009, representing a three-year average of 2008–2010. Its projections pertain to mid-term averages based on economic fundamentals; it does not incorporate year-to-year shocks. Hence AMPLE may project zero imports for a certain year; however due to unforeseen crop failure, the country ends up importing. On the other hand, AMPLE may project positive imports for a certain year, but due to a bumper crop, the country ends up exporting. Hence, such projections should not be interpreted as forecasts of actual movements in the market; rather, AMPLE is more suited as a tool to evaluate medium- to long-term trends in supply and demand.

Figure 1. Production of palay Reference scenario and FSSP targets (in ’000 t)

Source: DA (2012) for FSSP; Author’s calculation for Reference scenario.

Figure 2. Area harvested and yield of palay, Reference scenario and FSSP targets (in ’000 t)

Source: DA (2012) for FSSP; Author’s calculation for Reference scenario.

scenario analysis by applying the Agricultural Multimarket model for Policy Evaluation or AMPLE (Briones 2010). The advantage of using a numerical model such as AMPLE is that it provides a systematic way to incorporate economic behavior of producers, consumers, and markets into the assessment (Box 1).

AMPLE runs scenarios for 2009–2020. The initial run, called the Reference scenario, is based on the following:

i) Productivity growth of 1 percent per year for rainfed rice and 3 percent per year for irrigated rice;
ii) Area harvested reaching FSSP targets by 2016 (5 million ha);
iii) No change in world price of rice;
iv) Household income, population, and other variables to grow according to historical trend.

Note that assumptions i) to iii) incorporate targets and assumptions of the FSSP. The Reference scenario for production is presented in Figure 1. Results show that palay production falls short of the FSSP targets. By
2013, the Reference scenario finds a palay harvest of 18.7 million tons, 6.5 percent short of the FSSP target of 20.0 million tons. By 2020, palay production is projected to reach 23.7 million tons under the Reference scenario. The difference arises not because of divergence in area harvested, but rather divergence in yield projections (Figure 2). In the Reference scenario yield growth is only 2.1 percent—much faster than historical average of 1.5 percent, but far short of the FSSP target of 3.8 percent.

Not surprisingly, imports under the Reference scenario are projected to remain at around 2 million tons (Figure 3). Consumption continues to rise from 11.2 to 15.1 million tons; hence, the import-to-consumption ratio falls, from 0.20 to 0.14. However, the ratio does not fall to zero. Consumption rises in part owing to population growth, but the growth in demand also reflects increase in per capita consumption (Figure 4). According to AMPLE, the FSSP assumption of a fixed consumption per capita is simply untenable. Rather, increased supply due to FSSP interventions makes rice cheaper, thereby stimulating per capita consumption. The increase is biased toward domestically produced rice (hence the decline in import-to-consumption ratio); but one-for-one displacement of foreign rice is unrealistic.

FSSP is anchored on faster production growth. This brings us to the first alternative scenario, which is faster productivity growth. All assumptions are the same as in the

According to Agricultural Multimarket model for Policy Evaluation (AMPLE), the Food Staples Sufficiency Program (FSSP) assumption of a fixed consumption per capita is simply untenable. Rather, increased supply due to FSSP interventions makes rice cheaper, thereby stimulating per capita consumption.
Reference scenario, except that we double productivity growth of both rainfed and irrigated rice. Import projections are shown in Figure 5. Consumption grows at a faster pace than in the Reference scenario, rising to 16.4 million tons by 2020. This is not surprising given what we had learned earlier, i.e., increased supply leading to increased quantity demanded (through reduction in the price). Imports fall to less than 1.5 million tons; despite higher consumption, demand shifts toward domestically produced rice, as the import-to-consumption ratio falls to 0.09. Nevertheless, as in the previous scenario, the ratio does not fall to zero; hence, the country continues to import significant quantities of rice.

Domestic productivity growth is an indirect means to reduce imports. Perhaps a direct approach of restricting imports may be needed to achieve rice self-sufficiency. This brings us to the second alternative scenario, which is additional protection. For this scenario, the tariff equivalent, which is the wedge between domestic and world price of an importable, is increased from a baseline of 50 percent up to 100 percent by 2015.

Import projections are shown in Figure 6. This time imports do fall to zero by 2015. Consumption grows at a slower pace than under the Reference scenario, rising to only 13.5 million tons.

The reason for lower consumption is higher retail price of rice due to the increased domestic price of foreign rice. Figure 7 summarizes retail price trends across the three scenarios. Under the Reference scenario the retail price of rice falls from PHP 36/kg to just under PHP 34/kg. The decline is sharper for the faster productivity growth scenario,
where price falls to under PHP 32/kg. However, retail price under the additional protection scenario—the only scenario consistent with rice self-sufficiency—is higher than that of the Reference scenario by an average of about 6.4 percent.

**Conclusion and recommendations**

To summarize, our assessment finds that rice self-sufficiency is unlikely to be achieved. The FSSP yield and area growth targets are too ambitious, compared with historical trends. The supply-demand analysis reinforces this assessment. The rice self-sufficiency target is unlikely to be achieved, whether in 2013 or even over the course of the decade (to 2020). At most, FSSP area targets are attainable and yield growth will likely surpass historical trends, but FSSP yield targets are unrealistic. Moreover, the FSSP assumption of fixed consumption per capita is untenable. Rather, per capita consumption would rise, as supply abounds and rice price falls, precisely because of the FSSP package of interventions.

The supply-demand analysis furthermore shows that simply raising productivity growth even higher would still fail to eliminate imports. The only way to make self-sufficiency feasible is to raise barriers to rice imports. However, this makes rice substantially more expensive—an outcome that is inimical to food security. *Sa madaling sabi: makakamit ang sariling kasapatan sa bigas, kapalit ng lalong pagmahal nito sa pamilihan.*

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...The goal of "self-sufficiency" should not be equated to zero imports. Rather the goal should be interpreted based on a broader set of criteria. For one, policy should target nutritional norms for rice consumption, rather than accommodation of consumer choices...A country should not be seen as "self-sufficient" in rice, if its price prevents poor households from achieving nutritional norms in food intake.

This disturbing finding suggests a few implications regarding the country's self-sufficiency program:

First, the goal of "self-sufficiency" should not be equated to zero imports. Rather the goal should be interpreted based on a broader set of criteria. For one, policy should target nutritional norms for rice consumption, rather than accommodation of consumer choices (which on average may reflect some consumer's bias toward excessive rice intake). Moreover, self-sufficiency should be qualified by affordability; a country should not be seen as "self-sufficient" in rice, if its price prevents poor households from achieving nutritional norms in food intake.

Second, as a corollary, intensifying protectionist measures against rice imports should be discouraged.

Third, investments for rice (particularly irrigation) should not be dictated by simplistic production/consumption imperatives. Rather, traditional measures of project worth, such as internal rate of return, should be reinstated as part of the budget allocation process. This way the government can avoid cost escalation and restore fiscal sustainability in the self-sufficiency program.

References