

The Role of Mineral Fertilizers in Transforming Philippine Agriculture

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Introduction

The Philippines is an island nation, comprised of 7,107 islands that are split into 3 geographical divisions: Luzon, Visayas, and Mindanao. In 2013, agriculture contributed 10.45 percent to GDP (PSA-NSCB, 2014) and 31 percent to employment (PSA-BLES, 2014). More importantly, its contribution to national and household food security is significant. Cereal production increased from 7.6 million tons in 1970 to 22.1 million tons in 2010. During the same period, fertilizer use increased from 201,000 nutrient tons to 771,000 nutrient tons (FAOSTAT). In promoting cereal production, especially rice production, increased fertilizer use, along with improved seeds and other agronomic practices, played a key role.

Government intervention in the fertilizer market has lessened since 1986 by phasing out pricing policies and subsidies. The government has instead moved towards a more market-orientated approach which focuses on standard-setting, quality regulation, and training. Fertilizer imports are the main source of fertilizers since domestic fertilizer production has decreased. Deregulation has resulted in the entrance of private sector actors into the distribution market, however, profit margins are low and there are large price disparities across regions.

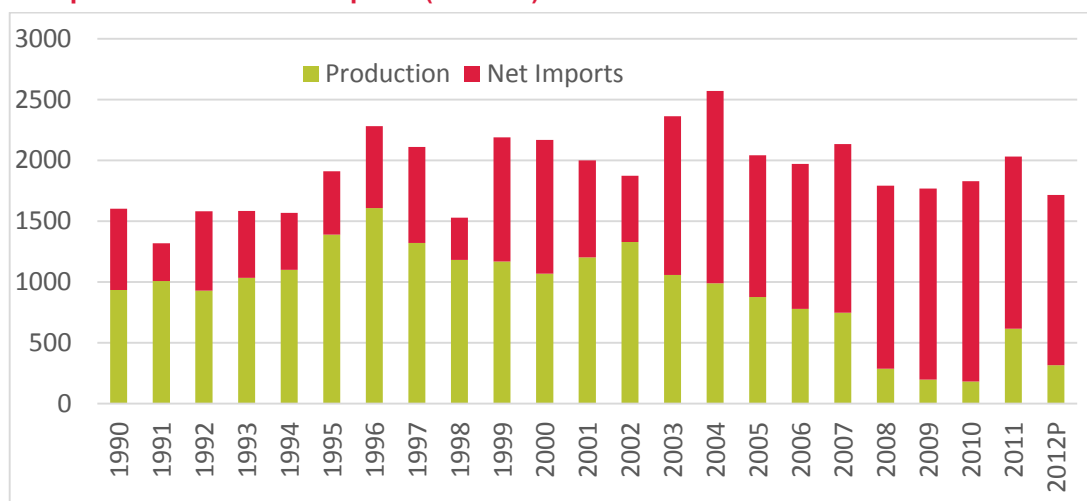
Policy Regimes

Phase I 1950s-1972:	Fertilizer industry is exempted from taxes and custom duties. Government controls and tariffs on fertilizer imports raise domestic fertilizer prices. Government provides subsidies to distributors and cooperatives.
Phase II 1972-1986:	Government intervenes in fertilizer market to regulate prices, imports, production, and marketing. The Fertilizer and Pesticide Authority (FPA) is created and is given the authority to set wholesale and retail prices of fertilizer and fertilizer inputs.
Phase III 1986-present:	Fertilizer industry becomes liberalized. Import quotas are abandoned and import duties and tariffs are reduced. A zero subsidy regime was instituted; sale and import of fertilizers are tax exempt.

Fertilizer Use and Efficiency

Fertilizer consumption has been, for the most part, increasing since its introduction to the Philippines in the 1950s. Demand was initially met by imports, but in the 1950s three fertilizer plants were established. After the launch of the fertilizer plants fertilizer imports decreased from 100 percent in 1950 to 41 percent by the end of the 1960s. Fertilizer imports increased again in the 1970s and by the 1980s were close to 75 percent of total fertilizer supply. During this time the composition of fertilizer shifted from ammonium sulfate and NPKs to urea, reflecting increased use of fertilizer for rice production (David & Balisacan, 1981).

Figure 1—Fertilizer production and net imports ('000 MT)



Source: CountryStat – PSA-BAS <http://countrystat.bas.gov.ph>

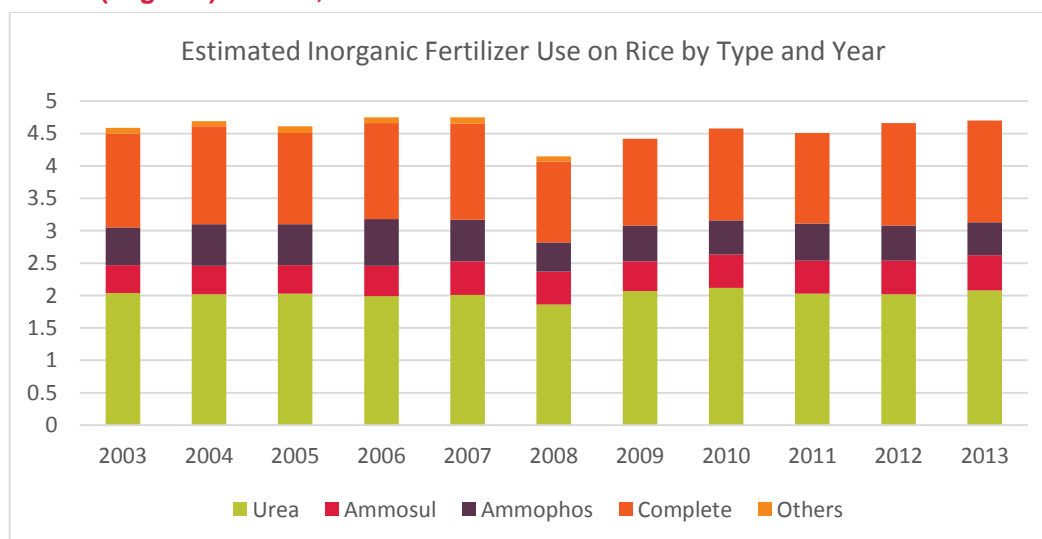
Note: 2012 is projected

Fertilizer consumption has been decreasing since the late 1990s. Moreover, recent domestic fertilizer production has been decreasing; without protection the domestic production became non-competitive and most fertilizer demand is therefore met through imports (Figure 1). From 2008 to 2010 domestically produced fertilizers only accounted for 12 percent of national fertilizer consumption though it rebounded in 2012.

Nitrogen fertilizers have been the most consumed fertilizers, followed by phosphate fertilizers. The major types of fertilizers are potassium sulfate, NPK, ammonium phosphate, DAP, ammonium sulfate and urea. Fertilizer consumption is measured through sales since there are no other viable or consistent measurement tools. According to this measure, urea and ammonium sulfate account for approximately 50 percent of fertilizer sold. NPK accounts for about 20 percent of fertilizer sales.

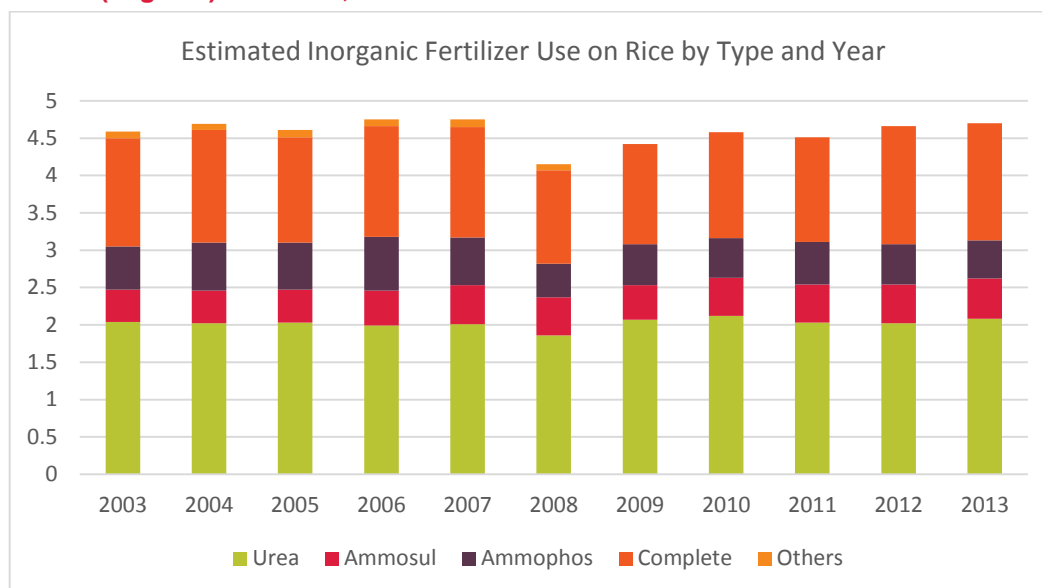
The major users of fertilizers are cereal crops. Fertilizer use rate per hectare has been fairly stable for this user group with the exception of a decrease in 2008. Both rice and maize use 200-250 kg/ha (4-5 bags) with a concentration of about 100 kg/ha of urea. Rice accounts for 33 percent and maize 21 percent of fertilizer use; fruits and vegetables are 19 percent, sugarcane is 7 percent and other crops are 15 percent. Fertilizer costs account for 10-15 percent of the production cost of crops.

Figure 2—Fertilizer use (bags/ha) for rice, 2003-2013



Source: CountryStat <http://countrystat.bas.gov.ph>.

Figure 3—Fertilizer use (bags/ha) for maize, 2003-2013



Source: CountryStat <http://countrystat.bas.gov.ph>.

Numerous studies have found that smallholder rice farmers in the Philippines are applying insufficient quantities of fertilizers. A late 1990s studies by IRRI found that farmers are applying the same amount of nitrogen as site-specific nutrient management (SSNM) farms, but that farmers were applying less phosphate (25 percent less) and potassium (57 percent less). Other studies from the same time period have found similar results, yet it remains unknown as to why farmers apply less than the recommended amount of fertilizer.

Market Structure and Performance

There are currently five domestic fertilizer producers in the Philippines. PHILPHOS, established in 1980, is the largest fertilizer producer and produces for both the export and domestic markets. Originally PHILPHOS was a government organization, but was privatized in 2000.

Table 1—Capacity and products of fertilizer manufacturers in the Philippines, 2012

Company	Capacity (tons/year)	Products
AFC	45,000 30,000 80,000 75,000	Single superphosphate Ammonium sulfate Complete NPK Ammonium phosphate
Farmfix Fertilizer	50,000	Fertilizer blends
Inchem	22,000	Potassium sulfate
PHILPHOS	1.17 million	NP fertilizers, NPK fertilizers, Ammonium sulfate
Soiltech Agricultural Products	1 million	NPK fertilizers: 14-14-14, 16-20-0, 6-9-15

Source: FPA, company websites: AFC, Farmfix fertilizer, Inchem, Philphos, and Soiltech Agricultural Products.

PHILPHOS has the largest production capacity, followed by Soiltech. Smaller fertilizer production companies produce smaller quantities of common and specialty fertilizers. Economies of scale limit the number of large domestic fertilizer producers; however, the market is not an oligopoly since there is strong competition from international fertilizer imports. There are no domestic sources of ammonium in the Philippines and natural gas deposits are prioritized for use by the power and fuel industries. Domestic production depends on imported raw materials such as rock phosphate, anhydrous ammonia, sulfuric acid, and other finished fertilizer grades which are then blended (Alcala, 2012). It is estimated that free trade partners account for 89 percent of fertilizer imports most of which are ASEAN countries. The majority of imports come from China.

Licensing and product registration requirements are relatively straightforward and simple to comply with which has helped to make the Philippines fertilizer sector is highly competitive. In 2012 there were 483 licensed handlers in the industry; 150 of which were importers and the others farmer cooperatives or associations that distribute fertilizer to their members. There is no official data on wholesaler or importer prices so official price data is based on retailer and/or dealer prices. Key informant interviews suggest that competition limits the incentives for dealers and distributors to increase mark-up rates since farmers can easily source their fertilizer from other dealers. The mark-up rate for dealers is generally fixed at around 3 percent with rates higher than 10 percent rare.

Figure 4—Fertilizer supply chain, 2013 (PHP/50kg bag)

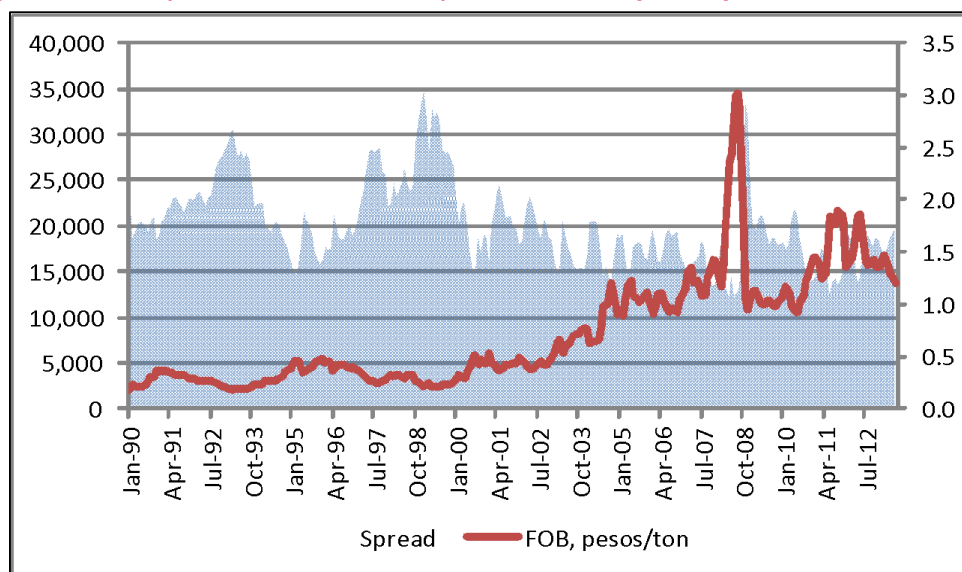


Source: Author, based on key informant interviews

Price Integration: Local and Global Prices

World and domestic prices of fertilizer are highly variable and cointegration analysis suggests that the domestic market is well integrated with the world market. It is difficult to calculate the implicit tariff rate because the only official data that exists is for retail prices, not wholesale prices which are needed to compare with CIF prices for the major fertilizer grades. Analysis also shows that the Philippines is a small and open economy that does not affect world fertilizer prices and that the fertilizer sector does not affect the market exchange rate in the Philippines.

Figure 5—Monthly price of urea (FOB Black Sea, \$/ton) and domestic price spread



There is a wide variety of retail prices across the country, meaning that domestic markets are not integrated due to infrastructure and logistics constraints. The cheapest fertilizers are found in the northern, central, and western regions, while the most expensive fertilizers are in the ARMM and Eastern Visayas which are the poorest regions of the country. Variations in price are very similar (6-7 percent) across fertilizer grades.

Key Challenges and Options for the Future

There have been many changes in the fertilizer sector since its inception in the 1950s. Originally the sector concentrated on establishing a strong domestic market to substitute imports through protectionist policies and other government interventions, but since 1986 the industry has been market oriented. However, significant challenges continue to remain in the fertilizer sector.

Inefficiencies in Fertilizer Marketing

Marketing remains an issue; there are large discrepancies in pricing across adjacent regions for the same product. Although the markets are highly competitive, price discrepancies across space continue to persist in the fertilizer supply chain perhaps due to poor transportation infrastructure, weak logistics systems, and low investments.

Inappropriate Application of Fertilizer

Farmers apply less-than-optimal amounts of fertilizer to their crops. Studies have demonstrated that farmers are not applying enough N, P, K, and micronutrients thereby getting sub-optimal yields.

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