Presented at the DLSU Research Congress 2014
De La Salle University, Manila, Philippines
March 6-8, 2014

Food Security versus Rice Self-Sufficiency: Policy Lessons from the Philippines

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Abstract: In the 2007-2008 rice price crisis, the price of rice in the world market suddenly rose. This became a big problem for most of the developing countries, including the Philippines, because the marginalized households in these countries eat rice as their staple food. Before the crisis happened, the market was in good condition and there were no drastic changes in the consumption and production of rice. These factors would have caused the crisis; instead, the government policies were the ones that contributed to the crisis. The policies of the government, such as banning exports for exporting countries and lifting tariffs for importing countries, greatly affected the international and domestic prices. In this scenario, the government plays an important role in creating and implementing policies. Various Philippine government programs like the FIELDS, Liberalization Program, FSSP (food staples sufficiency program), and AFMA (Agriculture and Fisheries Modernization Act), among others, were directed to achieve rice self-sufficiency and to achieve domestic food security. More so, the expansion of rice production and yield through the development, adaptation and implementation of advanced agricultural technologies, the reduction in rice consumption and other alternatives to diversify the Filipino rice diet to other staples (non-rice) also contribute to achieve the government's objective of rice self-sufficiency. Through a review of relevant literature and collection of secondary data from the FIES, UNCOMTRADE, USDA, BAS, DBM, Tariff Commission, FAOSTAT and IRRI the study concludes with a compilation and comparison of the objectives, weaknesses and strengths of relevant policies and an analysis on the policies that succeeded in contributing to the attainment of food self-sufficiency.

Key Words: food self-sufficiency; food security; input policy

1. Introduction

After reaching historic lows, the world prices for rice suddenly went up in the years 2007 and 2008. This affected mostly the marginalized households in developing countries, as these people are one of the main consumers of rice. Exporting countries banned their exports, while importing countries lifted their tariffs in order to avoid shortages in their country. Governments should be able to make concrete plans on their policies before implementing it and constantly refine the existing ones. The Philippine government is faced with the dilemma of achieving food security or rice self-sufficiency.

1.1 Overview

While GDP grew in 2011, agriculture sector exhibited a slower growth. In the early 1970s, rapid growth in agricultural production was experienced but started to decline in the 1980s due to low world commodity prices combined with high costs of inputs such as fertilizers. The country's agri-sector is relatively losing its competitive advantage. The ratio of agricultural imports to exports has significantly increased in the mid-1990s, and maintained a food trade deficit from 1990 up to present. Agricultural export earnings increased. Agricultural imports also went up. The share of the labor force engaged in agriculture has been declining since early 1980s but agriculture remains a very important sector in providing employment and livelihoods especially for people living in the rural areas.

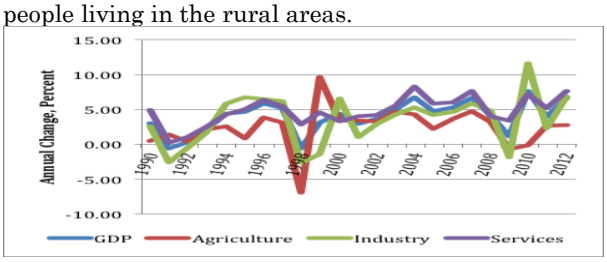

Fig. 1. Share of agriculture and other sectors to GDP growth, 1990-2012. Data from the *National Statistics Office*

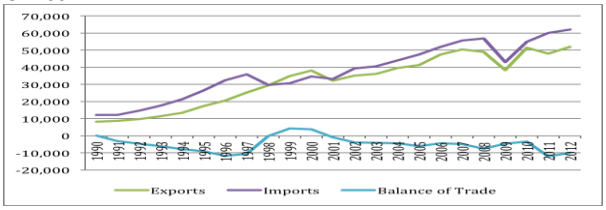

Fig. 2. Balance of Trade. Data from the *National Statistics Office*

Table 1. Share of agriculture in total employment

Average							
	1990-1995	1996-2000	2001-2005	2006-2010	1990-2010	2011	2012
Total Labor Force	100	100	100	100	100	100	100
Agriculture	41.2	35.2	33.7	35.1	36.6	33	32.2
Industry	14.3	14.9	13.9	13.6	14.2	14.9	15.3
Services	35.9	40.8	43.2	44.4	40.7	52.1	52.5

Data from *National Statistics Office*

The diminishing trend could be attributed to migration from the agriculture to non-agriculture sectors, which has been driven by wage differentials across sectors. Farmers are paid an average daily wage salary of Php 158 in 2011 relative to the non-agriculture's Php349 (LFS, Bureau of Labor and Employment Statistics, 2012). In the ASEAN, Figure 3 shows the same declining trend in the share of their agriculture in the GDP. Even though the share of agriculture to the GDP is declining in the past years, there is still a considerable amount of Gross Value Added of Agriculture (Figure 4).

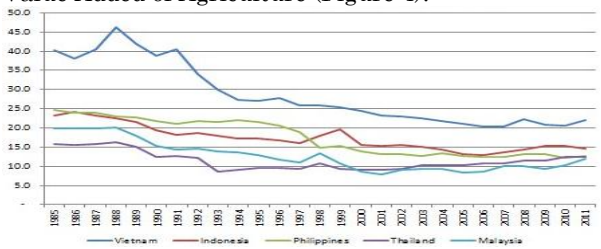

Fig. 3. Percentage Share of Agriculture to GDP. Data from the *International Rice Research Institute*

For the past two decades, total expenditure of the national government (Figure 5) has been increasing drastically while the expenditure allocated to the agriculture sector has been relatively stagnant at below one percent to total national expenditure. It is important to recognize the increase in budget allocation to the agriculture sector. The trend in the production and consumption of rice (Figure 6) is continuously increasing in accordance with the goal of self-sufficiency.

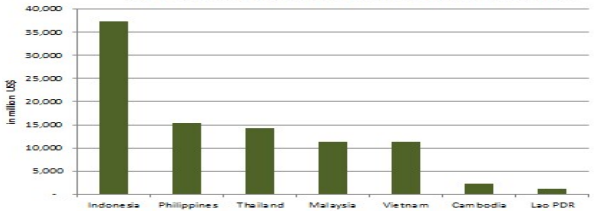

Fig. 4. Gross Value Added of Agriculture. Data from the *IRRI and BAS*

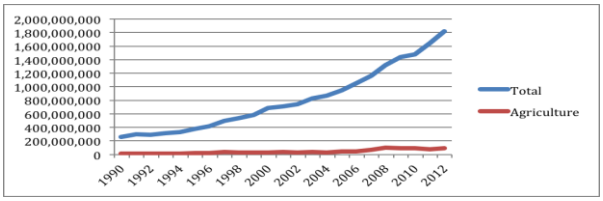

Fig. 5. Government Expenditure for Agriculture Sector. Data from DBM

Per capita consumption has been rising along with modest improvements in incomes. Rice yields are up but poverty among small producers persists at unacceptable levels. Agricultural input

policies of the Philippines are geared to achieving high agricultural productivity, food staples sufficiency and food security, and sustainability. Food self-sufficiency has been a desired goal of the government even before the rice crisis in 1995. According to a release of the Department of Agriculture (2012), national self-sufficiency in food staples will be achieved by raising productivity and competitiveness of Filipino farmers, by providing adequate economic incentives and enabling mechanisms, and by managing food demand including promoting diversification towards other traditional staples.

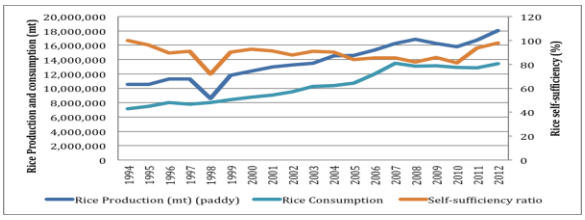

Fig. 6. Trends in Production, Imports, Consumption, and Self-sufficiency ratio of Rice. Data from the BAS and UNCOMTRADE

The Philippines rank 64 out of 107 countries in terms of global food security index with a score of 46.9 over 100 (Economics Intelligence Unit, 2013). Data from FAO shows the food inadequacy across Southeast Asian countries from 2005-2012. The figures indicate that the Philippines ranks midway compared to its Southeast Asian neighbors. A negative correlation between self-sufficiency and food security means households that are more self-sufficient in food in general, i.e., households that produce what they consume, tend to be poorer and less food secure, as measured by the share of non-staples and the share of animal products

Table 2. Average Values of Measures of Self-Sufficiency, Food Security, and Standard of Living

Indicators	Urban	Rural	Overall
Households with sufficient food for the past 6 months (as % of total)	19.73	37.69	28.74
Cereal self-sufficiency (%)	4.40	14.42	9.32
Rice self-sufficiency (%)	4.84	14.57	9.67
Per capita food expenditure (%)	28.43	27.98	28.20
Share of nonstaples in food (%)	65.34	60.12	62.72
Share of animal products in food (%)	32.73	29.53	31.13
Per capita food expenditure (Php/mo)	3,688.07	2,274.55	2,979.02

Data from FIES 2009, NSO

The implication of these findings is that some households (particularly rural households) may be forced into food self-sufficiency by lack of market access, but encouraging household food self-sufficiency is not a useful strategy for achieving food security or reducing poverty.

Table 3. Correlation of Self-Sufficiency Indicators and Food Security Indicators Among Rural Households

	Food security indicators			
	Per capita food expenditures	Share of nonstaples in food (%)	Share of animal products in food (%)	Households with sufficient food for the past 6 months (%)
Food self-sufficiency (%)	0.0037	-0.0748*	-0.0623*	0.7772*
Cereal self-sufficiency (%)	0.0954*	-0.0860*	-0.0826*	0.6126*
Rice self-sufficiency (%)	0.0868*	-0.0330*	-0.0332*	0.6290*
Per capita expenditure (Php/month)	0.4008*	0.3153*	0.2714*	-0.1718*

Data from FIES 2009, NSO

Hence, development efforts need to focus on transforming agriculture into one that is highly productive and also sustainable. This paper aims to review policies that facilitated or constrained transformation of the Philippine agricultural sector. The overall goal of this paper is to assess the evolution of agricultural input policies, with particular focus on policies relating to food security and rice self-sufficiency, and the status quo of food security and rice self-sufficiency in the Philippines

2. METHODOLOGY

This paper reviews relevant literature with particular focus on those papers regarding the Philippine rice and seed, agricultural input policies. Through the collection and analysis of secondary data from the FIES, UNCOMTRADE, USDA, BAS, DBM, Tariff Commission, FAOSTAT and IRRI, the researchers establishes the data trends and the evolution of policies.

3. RESULTS AND DISCUSSION

2.1 Role of Macroeconomic Policy on Food Security

According to FAO (1996), food security is achieved "when all people, at all times, have physical and economic access to sufficient, safe and nutritious

food to meet their dietary needs and food preferences for an active and healthy life." The opposite of food security is food insecurity. The macroeconomic policies on agriculture answers to the food and nutrition needs, and production and pricing issues of the existing economic state of the agriculture sector. However, establishing a 'perfect' macroeconomic policy is difficult to attain. Some necessary prerequisites for a 'perfect' macroeconomic policy are economic growth, full participation of the public, full and complete support from the government and special measures that will entail that the accessibility, assurance and availability of food and nutritional needs are always present (FAO, 1996).

2.2 Political Economy and Evolution of Input Policies

Green Revolution (1960s to 1980s). This period has left a mark of substantial increases in rice production and has improved the country's comparative advantage in rice production. It was during this time when the Philippines briefly achieved self-sufficiency in rice and became one of the rice exporters in Asia (Rosset, Collins & Lapp, 2000). This was a result of government efforts through the increased public expenditures for irrigation and the Masagana 99 Program (1970s) geared towards attaining self-sufficiency in major staple crops, namely, rice and corn. There was high adoption rate of MVs of rice from 1960s-1990s, which certainly improved productivity and profitability of farmers (David, Intal & Balisacan, 2007). This adoption of high yielding varieties was brought about by the introduction of the green revolution technology—a package of adoption of modern rice varieties, increase use of fertilizer and pesticides, increase use of irrigation or controlled water supply, and associated management skills.

Liberalization Policy of the Government (1990s to 2000). This regime is characterized with a growth in participation of the private sector, reduced public sector roles, market interventions, and protection of local industries from imports through tariff or non-tariff policy such as the tax exemption for fertilizer import. The government began to liberalize its trade policies in 1981 including those related to the agricultural sector. Fertilizer trade was deregulated through the following measures: a) Removal of procurement control (i.e. determination of import requirements, conduct of bidding and allocation of import volume); b) Scrapping of the price-setting function of the government; c) Discontinuance of the issuance of FPA Import Permit for fertilizer importations.

Current Policy Environment and Structure (post 2008). After the 2008 Crisis, the primary goal is "self-sufficiency through production of own food and reduction of dependency on food imports". The different strategies promoted by the said program which all ultimately correspond to the availability and affordability of food for everyone are the "Irrigation Program for 2011 to 2016, the abolishment of the direct seeds subsidy, the increase in budget for small irrigation projects, the development and promotion of upland agriculture and the improvement of organic fertilizer production". In other words, the government highly prioritized the relevance of maximizing what is currently available and affordable for the local farmers and then further develop that to benefit the farmers even more.

3.3 Effectiveness of input policies in transforming agriculture in the Philippines

A 2009 evaluation of the Department of Agriculture indicates that the vision of providing farmers the needed support in an integrated manner to increase production growth is sound and is being satisfactorily met. There are some weaknesses noted that should be amended. First, sustained implementation may be difficult due to funding problems. Second, weak coordination among agencies involved in the programme and weak enforcement of regulations. The third weakness is the inefficiency of rice marketing.

3.4. Process of Agricultural Policy Making

The process of agricultural policy making involves assistance of the government through government budgets for research and development. Researches and evaluations provide and forward the disparities that exist in the present agricultural system (Baracol, 2013). Systematic investigations and evaluations on agriculture, seeds, fertilizers and credit policies would then influence future agricultural policies. Thereby, not only national and international stimulus but also the previously implemented agricultural policies should also be considered. With that said, a brief summary of the

evolution of particular aspects of agriculture that are most relevant in this research is necessary.

Table 4. Summary Table of the Evolution of Agricultural policies

Policy/year	Green Revolution	1990-2000s	during food and financial crisis in 2007-2008	after 2008 to present
Pricing Policy	Fertiliser and seed prices (as well as quantities) were fixed by the government.	Fertiliser prices were market dependent. Seeds were subjected to guaranteed pricing and installment payment for agri-transactions.	Fertiliser prices were determined by the market. World agricultural prices spiked and domestic prices became very volatile due to crisis.	Fertiliser prices were basically determined by the market. However, fertilisers were subject to price stabilization (2012 Price Law)
Seed Policy	Direct subsidy on seeds.	Adopted hybrid seeds and granted total tax exemption to direct users.	Gradual phase out of seeds subsidy	Total removal of direct subsidy on seeds. Seed subsidy through community seed banks.
Fertilizer Policy	Fertilizer manufacturing was subsidized.	Fertilizer trade was deregulated	Starting from 2004, the direct fertilizer subsidy was fully phased-out by 2007.	Improvement of organic fertilizer production and implementation of fertilizer support and production program
Credit	Expansion of credit facilities and implementation of credit subsidies with 'low interest and no collateral'	Subsidized credit programs in agriculture were terminated.	Gradual implementation of credit assistance to farmers through low interest loans for farm inputs and farm mechanizations.	Provision and intervention of government on agricultural credit loans and crop insurance
Trade Policy	Quantitative trade restrictions on a wide range of imports (tariff and non-tariff barriers).	Local industries were protected from imports through tariff or non-tariff policy (tariff reform program).	Heavy increase of importation of rice	Further reduction of tariffs on sugar, and other agricultural inputs and further regulation on rice and fertilizer trade

3.5 Private Sector Participation

The government has developed a policy that promotes the participation of the private sector. This policy aims to allow the inflow of private resources for the developmental programs of the government. The public-private partnership (PPP) will include improvement of existing postharvest processing and trading centers, establishment of a cold chain system, and construction of a multipurpose reservoir dam. As stated in the paper of Briones (2013), the private sector has been actively participating in the efforts of the government to distribute and sell fertilizers in as many areas as they can. However, there are only five firms which produce and supply fertilizers domestically because of large economies of scale. In the paper of Sombilla and Quilloy (2013), the private sector has also been participating in the supply and distribution of seeds either through producing their own bred seeds or importing hybrid rice seeds. On the other hand, the government monitors the distribution of the privately bred hybrid rice seeds through the data on seed availability provided by the private seed companies. Thus, farmers prefer the publicly bred hybrid seeds because it is set at a lower price as compared to the privately bred hybrid seeds.

3.6 Policies on Food Security and Rice Self-Sufficiency in the Philippines

Food security and rice self-sufficiency in the Philippines are the part of the current goals of the incumbent administration. Through the years, there is a pressure on rice self-sufficiency alongside with various government efforts and policies. Since food security and rice self-sufficiency are related yet different from each other, it is but apt to analyze the strengths and weaknesses of agricultural policies in line with their objectives.

Green Revolution - Heavy public sector role (1960s to 1980s)
Irrigation Expansion
Objectives: a. improve agricultural production b. enhance farmers' profitability
Strengths: a. large farms greatly benefited from the new technologies since they have better access to irrigation water, agricultural inputs and credit b. Irrigation grew from less than 500,000 hectares to 1.5 million hectares Weaknesses: a. Lack of consistent funds to sustain the operations b. Hard to maintain these irrigation systems along with inadequate water supply and inadequate technical capacity of IA and NIA
The Masagana 99 Program
Objectives: a. agricultural development towards improved agricultural environments b. eased financial conditions c. accelerate farmers' recovery from widespread infestation and bad weather shocks d. ease the adjustment cost of the land reform program e. protect farmers from sharp increase in fertilizer price f. ensure adequate domestic rice production
Strengths: a. Provision of fertilizer subsidies and credit subsidies to farmers b. government grants full exemptions to tax and customs duties (RA 35) c. granted tax exemptions to cooperatives (RA 3050) d. lower costs (fertilizer to food), lower selling price for fertilizer, higher profits e. supervised credit of low interest and no collateral Weaknesses: a. an expensive undertaking for the government b. non-repayment of farmer-borrowers c. farmers resorted to buying agricultural inputs of poor quality at a small quantity d. forced farmers under large credit and low income e. susceptible to natural and economic disasters f. low domestic stocks resulted to increased importation
Comprehensive Agrarian Reform Program (CARP) through RA 6657
Objectives: a. distribute agricultural land to the landless farmers b. mitigate social unrest c. enhance household incomes d. promote rural development
Strengths: a. increased support for capacity building, rural infrastructures, technology promotions and agribusiness development b. credit support and other factors that uplifted the social well-being of farmers Weaknesses: a. lack of sustained political will b. landlord resistance c. selective implementation, mismanagement, graft and corruption d. inability of the Department of Agrarian Reform to spend allocated budget for land reform
Other Input Policies
Objectives: a. import substitution b. export taxes and an exchange rate overvaluation c. creation of government corporations
Strengths: a. government shifted to policies that protected agriculture b. higher tariffs, higher nominal protection rate, and relatively higher domestic support Weaknesses: a. creating a bias in favor of manufacturing and against agriculture and exports, which effectively penalized the returns to agricultural investments b. reduced earnings from agriculture c. government corporations drained gains from trade d. food prices are still high
Price Stabilization Program
Objectives: a. secure farmers' profit b. maintain retail prices as affordable for consumers

Strengths: a. palay output recovered b. stabilized retail prices Weaknesses: a. relatively maintained level of rice imports b. huge public losses c. increased domestic prices' volatility d. operational inefficiency
Liberalisation – reducing public sector roles (1990s to 2000s)
The Agricultural and Fisheries Modernisation Act (Republic Act 8435)
Objectives: a. food security b. poverty alleviation and social equity c. income enhancement and profitability, especially for farmers and fisherfolk d. global competitiveness e. sustainability
Strengths: a. amended to further strengthen the expected impact: amendment included exemptions for enterprises engaged in agriculture from paying tariffs and import duties on importations of all types of agriculture and fisheries inputs until 2015 b. fertilizer imports as well as hybrid seeds by direct users were granted total tax exemption Weaknesses: a. hybrid rice technology is 'quite new' to farmers and 'difficult' to follow b. rice is susceptible to pests and diseases, has high cost of production and is prone to seasonal variations in yield
Gintuang Masaganang Ani – High Value Commercial Crop Program (GMA- HVCC) → Hybrid Rice Commercialization Program (HRCP)
Objectives: a. promote partnership between private and public sector b. form linkage between consumers and producers c. improve rice productivity
Strengths: a. government provides additional subsidies for other farm inputs b. guaranteed crop insurance and enhanced production loans Weaknesses: a. performance of the HRCP has not been cost-effective b. for many farmers, hybrid rice was costly and inefficient c. the private seed companies are the ones who benefited much from the hybrid rice program
Post Global Food Price Crisis – Revisiting public sector roles (post 2008 to current)
Increased Importation of Rice
Objectives: a. food security b. mitigate scarcity of rice stocks
Strengths: a. satisfied domestic demand that local producers cannot supply Weaknesses: a. shift in focus in terms of production b. lack of local support to the local industry c. consumers bear the brunt of these crippling price hikes d. estimates about the accuracy of the domestic supply and demand are derived from food balance sheets that incorporate many assumptions: these assumptions are highly fluid e. the timing of rice imports
FIELDS Program
Objectives: a. beef up rice production b. attain self-sufficiency in rice by 2013
Strengths: a. provision of subsidized fertilizer b. specified budget for roads, irrigation facilities, labor and research development, agricultural credit, and post-harvest facilities c. seed subsidy and stock procurement of fresh harvest Weaknesses: a. Use of certified rice seeds and hybrid seeds over good seeds
Food security policy thru the Food Staples Sufficiency Program (FSSP)
Objectives: a. self-sufficiency b. food security c. raising rural incomes d. improve farm productivity e. enhance economic incentives f. enable mechanisms g. manage food staple consumption
Strengths: a. provision of adequate economic incentives and access to credit and crop insurance b. guaranteed reasonable returns for farmers c. less government intervention on retail prices Weaknesses: a. NFA's role will be reduced to rice distribution and importation b. focus on buffer stocking and domestic procurement
Seed Subsidy through Community Seed Banks
Objectives: a. promote seed exchange b. encourage more farmers to plant rice using traditional and where acceptable modern-bred varieties
Strengths: a. rice varieties are screened and evaluated b. ensured quality of special-purpose rice varieties c. provision of a steady supply of certified and locally-adapted seeds d. contributed in the improvement of agricultural biodiversity conservation and development e. improved human well-being Weaknesses: a. increased partiality to certified seeds b. deterioration of available natural resources
Farm Mechanization Roadmap: Rice Self-Sufficiency Plan, Agricultural Credit System, and Available program budget
Objectives: a. post-harvest loss reduction by an average of 0.5 percent per year b. encourage private sector investment in mechanization c. for small-scale farmers and cooperatives to benefit
Strengths: a. lowering labor cost in labor-intensive processes b. availability of credit loans for farmers to afford the rice-milling systems c. agricultural credit system and funding systems for rural development Weaknesses: a. if seed and fertilizer prices become volatile that result to costs that cannot offset the profit b. if systems and available support are not efficiently maximized

Fig. 7. Matrix on Agricultural Policies and their objectives, strengths and weaknesses

4. CONCLUSIONS

Various agricultural policies and programs since the green revolution up until now contributed to the success of agriculture transformation. The Philippine government plays a key role in the development of the agricultural sector through the implementation of macroeconomic policies and programs. A recommendation is to increase and sustain investments in agriculture, especially on research and development, infrastructures and smallholder productivity. Through these, there can be low cost irrigation and resource-efficient technologies, like integrated soil fertility management using the combination of both fertilizer and manure or compost, especially for the rainfed areas. There is also a need to improve and build on human resource capacity through education, training and extension. To boost investments further, the government should encourage private sector participation, especially where market failure is evident. Next, the government should improve access to the main agricultural inputs, such as fertilizers and seeds. These should be at a low price so that the farmers can afford them and for the distributors to get back their costs and still earn profits. Lastly, the government should overcome institutional contraints. The government should also safeguard the right of the farmers especially to their land. Also, the government should provide better access to credit, specifically accessing such from the private sector. The Philippine government has consistently prioritized rice self-sufficiency. It is but apt to continue towards rice self-sufficiency.

5. ACKNOWLEDGMENTS

We would like to acknowledge everyone who helped us with this research. We are very grateful to our families and friends for their unwavering support and guidance. Last but not the least, we would like to thank the Almighty God for the wonderful blessings He has and will be

bestowing upon us.

6. REFERENCES

Baracol, D. S. (2013). Philippines: Stakeholder participation in agricultural policy formation. *World trade organization*. Retrieved from http://www.wto.org/english/res_e/booksp_e/casestudies_e/case36_e.htm

Briones, R. M. (2013). *Role of mineral fertilizers in transforming philippine agriculture.* Philippine institute for development studies research paper [Draft].

David, C., Intal, P., & Balisacan, A., (2007) Distortions to agricultural incentives in the Philippines. *World bank*. Retrieved from http://siteresources.worldbank.org/INTTRADERESEARCH/Resources/544824-1146153362267/Philippines_0308rev.pdf

Department of Agriculture. (2012 June). Food staples sufficiency program 2011 to 2016. Retrieved from http://www.philrice.gov.ph/images/other_products/knowpro/Food-Staples-Sufficiency-Program.pdf

Food and agriculture organization of the United Nations. (1996). The state of food and agriculture - 1996: Part III. Retrieved from http://www.africaportal.org/dspace/articles/role-macroeconomic-policy-towards-food-security-botswana

Rosset, P., Collins, J., & Lapp, F. M. (2000). *Lessons from the green revolution: Do we need new technology to end hunger?*. Tikkun magazine, 15(2). Retrieved June 20, 2013 from http://www.twnside.org.sg/title/twr118c.htm

Sombilla, M. A., & Quilloy, K. (2013, August 26). *Role of seed in transforming the agriculture in the Philippines: A focus on rice*. Retrieved from http://www.slideshare.net/resakssasia/mercy-sombilla-seed-sector-ppt-sep12-26949252