TRADE AND AGRICULTURE DIRECTORATE
COMMITTEE FOR AGRICULTURE

Working Party on Agricultural Policies and Markets

MANAGING FOOD SECURITY THROUGH AGRICULTURE-RELATED POLICIES: A STOCKTAKE OF MEASURES APPLIED IN ASEAN

Contact: Jared Greenville (Email: jared.greenville@oecd.org)

JT03395781

Complete document available on OLIS in its original format
This document and any map included herein are without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries and to the name of any territory, city or area.
NOTE BY THE SECRETARIAT

This paper forms part of the work mandated under Output Area 3.2.2, Intermediate Output result 3.1 of the PWB 2015-16. The paper represents the work proposed under part 1 of theme 2 of the scoping paper on Food Security and Managing Risks: A Focus on Southeast Asia presented to the 65th session of the Working Party on Agricultural Policies and Markets [TAD/CA/APM/WP(2015)13].

This paper presents background to the agriculture sector and food security within countries that form part of the Association of South East Asian Nations (ASEAN). Following this, a review of current policy approaches used by ASEAN related to agriculture used by ASEAN to address food security is presented. The paper also explores the findings from existing research into the effectiveness and efficiency of current policies, pointing to areas of further research along with some policy alternatives. This paper represents part of a larger stream of work as set out in TAD/CA/APM/WP(2015)13. No policy recommendations are proposed in the paper. Other papers presented to the committee will set out the analytical research that will be used to develop the policy recommendations in the study. The outputs from this paper will be used within the proposed core report according to the structure presented below.


The proposed structure of entire report Food Security and Managing Risks: A Focus on Southeast Asia with elements presented in this paper highlighted is given below.

Outline

Executive Summary
Overview

Part 1: Background to the region and future outlook
1. Introduction
2. Agriculture and food security in ASEAN [Sections 1, 2 and 3 of this paper]
3. Agricultural and food security outlook for Southeast Asia

Part 2: Current policy approaches targeted at managing risks to food security
4. Stocktake of food security policies in ASEAN [Sections 4-7 of this paper]
5. Managing food insecurity risks in ASEAN: current approaches and alternatives

Part 3: Alternative policies for longer term food security
6. The enabling environment for agriculture in ASEAN
7. Opportunities for alternative policies to improve food security by enhancing agricultural productivity through the enabling environment and innovation systems
8. Improved fisheries policy as a means to improve long term food security in ASEAN: lessons from Indonesia
TABLE OF CONTENTS

EXECUTIVE SUMMARY ........................................................................................................... 5

MANAGING FOOD SECURITY THROUGH AGRICULTURE-RELATED POLICIES: A
STOCKTAKE OF MEASURES APPLIED IN ASEAN ................................................................. 7

1. Introduction .......................................................................................................................... 7

2. Agriculture and trade in the Southeast Asian region .......................................................... 8
   2.1. Agricultural production in the region ........................................................................... 9
   2.2. Trade in agricultural products .................................................................................. 13
   2.3. The rice production and trade landscape ................................................................. 15

3. Food security in ASEAN: A snapshot ................................................................................. 20

4. The policy landscape ......................................................................................................... 24
   4.1. Trade related policies ............................................................................................... 26
   4.2. Public stockholding programmes and other reserve schemes .................................. 28
   4.3. Influencing input prices ............................................................................................ 30
   4.4. Influencing output prices .......................................................................................... 31
   4.5. Transfers to vulnerable consumers .......................................................................... 32
   4.6. Regulatory constraints on land use ......................................................................... 33
   4.7. Investments in infrastructure and other aspects of the enabling environment ........... 33

5. What have been the effects of food security policy interventions? Findings from existing research 33
   5.1. On price gaps ............................................................................................................. 33
   5.2. On poverty rates ....................................................................................................... 36
   5.3. On private investment ............................................................................................... 36
   5.4. On demands for fiscal resources .............................................................................. 37
   5.5. On food distribution .................................................................................................. 37
   5.6. On price variability and volatility from export restrictions ...................................... 38
   5.7. On input use ............................................................................................................... 38

6. Regional policy responses .................................................................................................. 39
   6.1. The ASEAN Plus Three Emergency Rice Reserve .................................................... 39
   6.2. ASEAN Food Security Information System .............................................................. 40
   6.3. ASEAN integration .................................................................................................... 41

7. Concluding comments ....................................................................................................... 41

REFERENCES ........................................................................................................................... 43

Tables

Table 1. General statistics on ASEAN members, 2013 .......................................................... 8
Table 2. Self-sufficiency targets of ASEAN members .......................................................... 26
Figures

Figure 1. Agriculture share of employment and GDP .......................................................... 9
Figure 2. Production growth in Southeast Asia .................................................................... 10
Figure 3. ASEAN agricultural production shares ................................................................. 10
Figure 4. Agricultural production within ASEAN members ............................................... 11
Figure 5. Number of agricultural holdings and average size .............................................. 12
Figure 6. Distribution of farm size ..................................................................................... 13
Figure 7. Agro-food trade in ASEAN .................................................................................. 13
Figure 8. Major agro-food exports and imports .................................................................. 14
Figure 9. Net exports of rice ............................................................................................... 15
Figure 10. Rice production per capita ................................................................................ 16
Figure 11. Rice yields .......................................................................................................... 16
Figure 12. Rice consumption per capita ............................................................................ 17
Figure 13. Share of rice in total caloric intake .................................................................... 18
Figure 14. Domestic rice price volatility ............................................................................. 19
Figure 15. Domestic Rice prices across ASEAN ............................................................... 19
Figure 16. Undernourishment in Southeast Asia ................................................................. 20
Figure 17. Undernourishment across the world .................................................................. 21
Figure 18. Number of undernourished people in ASEAN ................................................ 21
Figure 19. Food inadequacy in ASEAN .......................................................................... 22
Figure 20. Rates of stunting in children under 5 years ....................................................... 23
Figure 21. Household food consumption ......................................................................... 24
Figure 22. Daily per capita energy availability ................................................................... 24
Figure 23. Import tariffs in ASEAN ................................................................................... 27
Figure 24. Price gaps in ASEAN rice markets ................................................................... 34
Figure 25. Effects of policies on food security in Indonesia ................................................ 35

Boxes

Box 1. The 2007/08 food price spike ................................................................................. 25
Box 2. Types of public food stocks .................................................................................... 28
EXECUTIVE SUMMARY

Food security policy remains high on the agenda for Association of South East Asian Nations (ASEAN) countries. Despite significant economic development and transformation, leading to higher incomes and improvements in food security, the region still contains around 60 million of the world’s undernourished (FAO, 2015). Further, poverty rates, measured as the per cent of the population living on less than USD 2 a day (in purchasing power terms) remain high, exceeding 40% in a number of member nations. As such, the continued focus on food security is understandable.

This paper is one of a series of papers related to the Building Food Security and Managing Risk: A Focus on Southeast Asia project. Each paper represents part of a larger report as set out in TAD/CA/APM/WP(2015)13. In this paper, an overview of agriculture and food security in ASEAN is presented, along with a stocktake of existing agriculture-related policy responses to issues of food security. Findings of past reviews are discussed to identify issues created by these existing policies, however, no policy recommendations are formed as these will be developed drawing on results from an array of proposed analytical studies that will be completed within the larger report.

ASEAN is comprised of countries at different levels of development, incomes and size. In terms of agriculture, some in the region have experienced significant levels of structural adjustment with employment in agricultural falling rapidly over the past 20 years. For others, much is yet to come. Rice remains the dominant crop in the region, representing the single largest production activity in value terms. The region as a whole is also a significant net exporter of this commodity. However, the primacy of rice in agriculture does not hold for all countries with palm oil, poultry and eggs also of critical importance in some countries.

Rice also remains a critical component of diets in the region. And while its importance has generally fallen over time, its status as a key production and consumption commodity has meant it has remained of significant political importance in terms of food security. Rice production is also inherently divided by geographic factors that have, over a long history, governed levels of comparative advantage and subsequent trading patterns. With self-sufficiency seen by many as the tool to improve food security, the mix of political importance and natural comparative advantages in rice production have subsequently fundamentally shaped food security policy in the region.

Overall, ASEAN food security policy can be characterised as being ‘rice-centric’. For both large and small rice producers, an emphasis is placed on rice production such that it is sufficient to meet domestic demand. The policies chosen to pursue these objectives vary. In general for importing countries they are related to attempts to spur domestic production through the use of price support, trade barriers and input subsidies. For exporting countries, governments use interventions in export markets (taxes, bans, licencing arrangements) along with attempts to ‘lock-in’ a certain quantity of rice production. This does not mean that other substantial investments to support agriculture have not been made. In particular, some countries have made substantial investments in the enabling environment, focusing on irrigation and other agricultural infrastructure. However, the relative size of this type of expenditure suggests that these are not the main focus of policy in many countries.
On the consumer side, some countries have coupled production-based policies with public stocking regimes aimed at stabilising rice prices and public distribution. These are most notable in countries such as Indonesia, Malaysia and the Philippines. While such regimes have stabilised prices compared with ASEAN peers, they have done so at much higher price levels, bringing into question the net impact on food security. For example, in 2012-14 in Indonesia, domestic prices were 70% above comparable world prices.

Past reviews of the set of agriculture-related food security policies used in the region have pointed to shortcomings with current policy approaches with some suggesting opportunities exist to pursue alternative policies that can better address food security in the longer term. Studies suggest many of the interventions have created inefficiencies in resource allocation within the economies, discouraged private investment by creating greater uncertainties and imposed significant budgetary costs on governments – for which there are significant opportunity costs in terms of other policy priorities. Further, large leakages and difficulties in effective targeting have characterised a number of the food distribution programmes used in the region.

Policies that increase domestic prices are unlikely to be effective in helping address food security for vulnerable consumer households. Moreover, the ineffective nature of the support in addressing the low farm incomes of the poorest, and in a number of cases the incidence of price support accruing to otherwise food secure households, suggests that even for poor rural producers, the long-run impacts on food security are questionable.

The relative effects of some alternative policies have also been explored. An emphasis on targeted support to vulnerable households that can be accessed both generally and more intensively during crisis has the potential to lead to significant improvements in food security. In the case of Indonesia, targeted cash transfers or food vouchers have been shown to have significant potential. For the agricultural sector, competitively operating markets, increased trade and more transparent policy making are also key inputs into more stable supply, less volatile prices and increased agricultural investment. The use of trade policy interventions in particular to maintain affordable food prices has been shown to be ineffective in both importing and exporting countries.

Despite the drawbacks of many current approaches, it is often cited that they can provide an insurance mechanism for both producers and consumers. It is argued that current policies help insure against the risks of rapid price movements on international markets along with helping combat domestic risks related to macroeconomic and environmental events. This review finds some evidence otherwise, pointing to shortcomings in how these policies perform when assessed against the risks they are intended to mitigate. Specifically, previous work by the OECD has explored some of these issues in the context of Indonesia’s policies (OECD, 2015b). However, more work in a risk-based framework is required (and envisaged as part of the larger report) to assess a wider variety of ASEAN countries and how policies play out in the context of regional risks.

Within the larger report further, work is envisaged that will shed light on the policy opportunities that are available to ASEAN governments to build a productive and sustainable agriculture sector that ultimately contributes to food security. To do this, work will be completed that explores the key elements underpinning productivity growth such as the enabling environment, innovation systems and the wide interplay of policies that influence the incentives and production decisions of agricultural producers.
1. **Introduction**

1. Food security remains high on the policy agenda of most Southeast Asian countries as it does for a number of countries across the world. And while a number of countries within the region have undergone significant economic development and transformation, leading to higher incomes, the region still contains around 60 million of the world’s undernourished (FAO, 2015). A significant focus on the food security of populations is, therefore, understandable.

2. This paper focuses on the Southeast Asian countries that form the Association of Southeast Asian Nations (ASEAN). The review provides a stocktake of agricultural, agro-food trade and other agricultural commodity-based policies used by ASEAN countries to pursue food security objectives. Policies within the scope of this paper suggest that governments in the region most often view food security from an availability perspective, and within that, in terms of the availability of domestically produced rice (Alavi et al., 2012). This perspective has spurred the use of policies that are targeted towards achieving self-sufficiency in at least rice or across a number of staple products in some countries.

3. The use of self-sufficiency policies to achieve food security has heightened since the 2007/08 food price crisis. Governments have often framed the push for self-sufficiency around a desire to reduce their vulnerability to world price movements similar to those that were seen during this period.

4. The objectives of this paper are to:
   - provide a snapshot of agriculture and trade in the ASEAN region
   - briefly explore current trends and levels of food security within ASEAN countries
   - provide a high-level overview of the array of agricultural, agro-food trade and other (agricultural) commodity based policies used by ASEAN countries in pursuit of food security objectives
   - provide a review of the effects of past findings on these policies on food security.

5. While this paper presents a review of findings from a range of analytical studies of existing policies, an assessment of alternative policy options and recommendations will be provided in additional work as set out in TAD/CA/APM/WP(2015)13. However, it should be noted that it is often the case that more efficient and effective responses to food security are to be found outside agriculture-related policies. As such, policy-makers exploring alternatives to those policies that are reviewed here and found to be ineffective or inefficient, should cast the ‘policy-net’ wider if better outcomes are to be achieved. Further work will also explore specifically policy measures related to the enabling environment and regional innovation systems that also affect food security.

---

1. ASEAN is made up of Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, the Philippines, Singapore, Thailand and Viet Nam.

2. TAD/CA/APM/WP(2015)13 is the scoping paper that sets out the structure of the overall project on Building Food Security and Managing Risks: A Focus on Southeast Asia.
6. This paper is structured as follows. Section 2 presents a brief overview of agriculture and trade in the region, with Section 3 providing a background to the level of food security as measured against a number of internationally recognised benchmarks. Section 4 provides a review of existing agricultural, agro-food trade and other agricultural commodity-based food security policies. The effects of these policies as detailed in existing research is explored in Section 5. Section 6 describes some regional responses to food security, such as the ASEAN plus Three Rice Reserve Scheme along with other policy measures of note. Finally, concluding comments are made in Section 7.

2. Agriculture and trade in the Southeast Asian region

7. Economies in the Southeast Asian region have experienced significant levels of economic growth over the past 20 years. Most Southeast Asian countries have been closing the gap with advanced economies over this period in their levels of development. However, growth has been uneven across the region, with differences largely explained by differences in labour productivity growth over the period (OECD, 2013a). Overall, trends in agricultural production and trade also point to increasing food availability within the region, which coupled with increased incomes, suggests food security has improved.

8. Countries within the region vary in their size, level of development and incomes (Table 1). Across ASEAN members, Singapore has the highest levels of GDP per capita, followed by Brunei Darussalam and Malaysia. Indonesia is the region’s most populous nation with more than double the population of the second largest country (the Philippines). Indonesia is also the largest country in terms of physical size, both in total and in terms of agricultural land. In Thailand, the Philippines, Viet Nam and Cambodia, however, the proportion of total land that is deemed agricultural is less than that of Indonesia.

Table 1. General statistics on ASEAN members, 2013

<table>
<thead>
<tr>
<th></th>
<th>General</th>
<th>Agricultural</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>GDP per capita (USD)</td>
<td>Total land (sq. km)</td>
</tr>
<tr>
<td>Brunei</td>
<td>38 963</td>
<td>5 270</td>
</tr>
<tr>
<td>Darussalam</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cambodia</td>
<td>1 006</td>
<td>176 520</td>
</tr>
<tr>
<td>Indonesia</td>
<td>3 644</td>
<td>1 811 570</td>
</tr>
<tr>
<td>Lao PDR</td>
<td>1 653</td>
<td>230 800</td>
</tr>
<tr>
<td>Malaysia</td>
<td>10 538</td>
<td>328 550</td>
</tr>
<tr>
<td>Myanmar</td>
<td>1 101</td>
<td>653 290</td>
</tr>
<tr>
<td>Philippines</td>
<td>2 765</td>
<td>298 170</td>
</tr>
<tr>
<td>Singapore</td>
<td>55 980</td>
<td>700</td>
</tr>
<tr>
<td>Thailand</td>
<td>5 779</td>
<td>510 890</td>
</tr>
<tr>
<td>Viet Nam</td>
<td>1 909</td>
<td>310 070</td>
</tr>
</tbody>
</table>

Notes: n.a.: Not available. GDP per capita measured in current 2013 USD. Poverty rate statistics represent the % of the population living on less than USD 2.00 a day at 2005 international prices (PPP). Gross value added (GVA) per worker in agriculture comprises value added from forestry, hunting, and fishing as well as cultivation of crops and livestock production measured in constant 2005 USD. Source: World Bank World Development Indicators http://databank.worldbank.org/data/.

9. Value added by agricultural workers also varies considerably. Of the major agricultural producing countries, Malaysian workers generate the highest value added in constant USD terms (2005) – more than 9 times that of the next ranked country of Thailand.
10. ASEAN member’s relative openness to other economies across the world also varies. Measured as total trade as a per cent of GDP, Singapore has the most relative engagement with Indonesia having the least.

11. Poverty, measured as the percentage of the population living on less than USD 2 a day (in purchasing power terms), continues to be a sizeable problem for a number of countries in the region. Poverty rates are the highest in Lao PDR, but are also above 40% in Cambodia, Indonesia, and the Philippines.

2.1. Agricultural production in the region

12. The relative size of the agricultural sector in ASEAN countries has changed significantly over time (Figure 1). Agriculture’s relative importance in GDP and employment declined in most countries between 1996 and 2012 (earliest and latest year’s for which data are available). Productivity improvements and opportunities outside agriculture have led to significant labour shedding in a number of countries, but most notably in Cambodia and Viet Nam. Interestingly, agriculture’s share of employment fell in Thailand even as its share of GDP rose over the period, representing a shift to higher value production along with relative changes in other sectors of the economy.

![Figure 1. Agriculture share of employment and GDP](http://databank.worldbank.org/data/)

**Note:** Data for Cambodia are for 1998 and 2012.


13. The significant structural adjustment that has occurred within the agricultural sectors of the region has contributed to strong production growth. Since the 1960s, annual compound production growth in the region has been strong (Figure 2). However, agricultural production growth has only exceeded population growth since the 1980s driven by both slowing population growth rates and increases in agricultural growth rates during the 1980s and 2000s.
14. For the region as a whole, the structure of production has remained relatively stable across broad commodity groupings. Rice is the main agricultural production activity in the region, accounting for a greater share of gross production value than any other commodity. Despite the general stability of production, some trends do appear. Most notably, the contribution of rice to total gross agricultural production value has fallen since the early 1990s – from around 40% to close to 30% in 2013 (Figure 3). Much of the change has been driven by the increasing contribution of palm oil to total agricultural production value in the region. Within categories there have also been changes, such as increasing poultry production within the meat sector.
For individual ASEAN members, the extent to which the structure of production has changed over time varies (Figure 4). In Brunei Darussalam, production has become centred on meat products (almost entirely poultry), Malaysia has shifted to palm oil production and Singapore has shifted its production away from poultry to eggs. Myanmar has also seen changes to its production mix, increasing both meat and fruit and vegetable production. The share of Myanmar’s production value coming from rice has also fallen – by around 20 percentage points between 1963 and 2013.

Figure 4. Agricultural production within ASEAN members


Of all ASEAN members, in 2013 the agricultural sectors of Brunei Darussalam, Cambodia, Malaysia and Singapore were most reliant on one production activity or sector (meat, rice, palm oil and eggs respectively). Others are more diversified, however, for most rice remains a dominant crop. Brunei Darussalam, Malaysia and Singapore have experienced the most change within their agricultural sectors. In
contrast, the Philippines has become more concentrated with share of rice in total agricultural production value increasing.

17. Little comparative information on the characteristics of agricultural producers across ASEAN countries is known. This is driven by both a lack of information at the country level and the inherent difficulties in building a consistent and coherent database. The FAO provide some information through combining various agricultural censuses and other similar data collected at the country level (Figure 5). While this data is partial and dated for ASEAN members (most recent data relates to estimates collected during the 2000s), it indicates that, in those countries were data are available, average farm size is small. Estimates range between 0.8 ha per agricultural holding in Indonesia to 3.2 ha in Thailand (Lowder et al. 2014). In terms of total holdings, Indonesia has the largest number (in line with its larger population), with close to an estimated 25 million agricultural holdings (based on 2003 data). For those countries for which time series data exists, patterns indicate a generally falling average farm size (for Indonesia, the Philippines and Thailand). In some of these countries, changes in average land holdings can be traced towards policy moves that have redistributed land, for example, such as those in the Philippines. The trend of falling farm size may have broader long-term implications for agricultural productivity growth if it is also accompanied by further fragmentation of production activities. In contrast, two countries appear to have exhibited trends of increasing farm size – Myanmar and Viet Nam (for Viet Nam, this has been in the area of livestock [OECD, 2015e]).

18. Data on the distribution of farm size is equally sparse. Again, while limited and dated, Lowder et al. (2014) report that farms of less than 1 hectare of land dominate (Figure 6). Indonesia and Viet Nam have the largest share of total producers who have less than 1 hectare of land. Thailand and Myanmar also standout as countries with different patterns of ownership with both having a relatively higher number of producers who farm between 2-5 hectares compared with other countries.
Figure 6. Distribution of farm size

% farm holdings by size, estimates during the 2000s

Source: Lowder et al. (2014).

2.2. Trade in agricultural products

19. The Southeast Asian region is playing an increasingly important role in world agro-food trade. The region has increasingly become a net agro-food exporter, with around USD 133 billion in exports in 2012 compared with 83 billion worth of agro-food imports (Figure 7).

Figure 7. Agro-food trade in ASEAN

Total trade (USD bn) and share of intra-regional trade (%) 1996 to 2012

Intra-regional agro-food trade is also an important component of food supply. The share of agro-food imports sourced from within the ASEAN group has trended up over time, and accounted for close to 30% of the region’s total imports in 2012 (depicted in red on Figure 7). Given significant agro-food export growth to non-ASEAN countries, particularly in the 2000s, regional trade markets are less important for agricultural exporters – around 20% in 2012. However, the relative importance of regional markets has trended up over time.

Of the products traded, vegetable and animal fats and oils (in this case, palm oil) are the most important agro-food export accounting for the largest share of agro-food export value from the region as a whole – a share that has grown over time (Figure 8, top panel). Fisheries and aquaculture are also important to the region, with exports of fish and seafood products (fish on Figure 8) the second largest export earner. Exports are also quite concentrated, with the top 10 products accounting for around 80% of total export value.

**Figure 8. Major agro-food exports and imports**

Share of total export and import value, selected years

![Diagram showing major agro-food exports and imports](https://wits.worldbank.org/WITS/WITS/Restricted/Login.aspx)
22. On the import side there is more diversity. The top 10 imported products account for around 60% of total imports. Flours, brans and other food industry preparations and residues, dairy products, fish and seafood and wheat are all major import products within the region (Figure 8, bottom panel).

2.3. The rice production and trade landscape

23. The ASEAN region is a mix of mainland countries and island or narrow peninsula states. With this comes a mix of geographic and climatic conditions that fundamentally influence agricultural production systems and inherent comparative advantages. With respect to food production, the geography of the region determines natural rice production capabilities.

24. Over the long run, the production and trade positions of ASEAN member countries show a consistent pattern of high production and net exports from mainland countries, and net imports by island and peninsulas states (Dawe, 2013). This pattern is primarily driven by the fact that mainland states are dominated by large river systems that provide ample water and flat land that is well suited to rice production. In general, these conditions mean that Viet Nam, Cambodia, Lao PDR, Thailand and Myanmar have historically been net exporters of rice, producing more than domestic consumption. On the other hand Indonesia, Malaysia, the Philippines, Singapore and Brunei Darussalam have traditionally been net importers.

25. Historical trends in net export/import status appear to persist today. The region as a whole is a significant net exporter of rice, however, this position is driven primarily by exports from Thailand and Viet Nam (Figure 9). Recently, Cambodia also became a net exporter, with the remaining countries for which data exists being net importers.

Figure 9. Net exports of rice

USD millions 2000 to 2012


3. Net exports of rice are calculated as total exports to all partners less total imports from all partners.
26. The geographic influence on rice production is also represented in production per capita statistics (Figure 10). All mainland producers have high production rates compared to other ASEAN members.

**Figure 10. Rice production per capita**


**Figure 11. Rice yields**

| Source | USDA PDS online http://apps.fas.usda.gov/psdonline/psdquery.aspx |
27. In terms of yield, differences across countries are less marked than differences observed in production (Figure 11). A number of net importing (or traditional net importing countries) have higher yields than mainland producers – indeed Viet Nam is the only exception due to a sustained period of strong yield growth since early 1990s. Higher yields in importing countries are likely to be partly explained by pressures for “induced innovation” (Hayami and Ruttan, 1985). With relatively limited suitable land resources, competition from mainland rice producers who have a natural comparative advantage has provided a strong incentive for producers in these countries to seek productivity improvements. Results are also likely to be influenced by government policy, including the provision of input subsidies by some (discussed in detail below).

28. Trends in per capita rice consumption of rice for food are also mixed across the region (Figure 12). Except for Indonesia, net exporting countries generally have higher consumption rates. For some countries, per capita consumption has fallen over time – particularly evident for Malaysia and Thailand. For others, the opposite is true (Indonesia and the Philippines). However, rice for food consumption is only part of the story. In some countries such as Myanmar, there is reported significant consumption of rice for animal feed in some published statistics. USDA data, for example, suggests total domestic consumption of rice is higher with the recent increases seen in Viet Nam and Myanmar also larger.

29. But while aggregate consumption of rice shows a mixed picture, the importance of rice in meeting total caloric consumption has fallen in almost all ASEAN countries since the 1960s (Figure 13). The rates of change have been most significant for both Thailand and Malaysia, indicating that diets have diversified most in these countries compared with the 1960s. In contrast, the importance of rice in the average diet has increased in the Philippines (and to a lesser extent Brunei Darussalam more recently, albeit off a much smaller base).

Figure 12. Rice consumption per capita

<table>
<thead>
<tr>
<th>Average decadal kg/person</th>
</tr>
</thead>
</table>

Notes: Consumption drawn from FAO food balance sheets and represents rice used for food expressed as kg per capita per year. Decade averages taken as the simple average over each decade with 2010s being incomplete. 
Source: FAOSTAT http://faostat.fao.org/
Irrespective of the production capacities of various countries in the region, a number have sought to become self-sufficient in rice as a means to improve food security (self-sufficiency as a policy approach is discussed in detail below). However, despite strong yields in countries such as Indonesia, some research has suggested that achieving self-sufficiency in island and peninsula states will be difficult. Making use of agricultural production information on yields and available resources (such as land and water), Clarete (2013) suggests that there is only a small probability that countries such as Indonesia and the Philippines could achieve self-sufficiency over the long run if historical shocks to yield are replicated in the future (in the presence of expected yield improvements based on a continuation of historical trends). Over the long-term, Clarete (2013) suggests that there is only a small likelihood of Indonesia becoming self-sufficient in rice production, and only a 5% likelihood for the Philippines. It was noted, however, that if sustained yield improvements were achieved, self-sufficiency over the long run may be possible, but it would come at a significant costs as high domestic prices would need to be maintained to encourage production (and discourage consumption).

Another influence on rice production relates to market prices. Many importing countries in the region have taken steps to reduce price volatility: concerned that it harms both consumers and producers. For producers, excessive volatility is suggested to make production and incomes uncertain, lessening the ability of producers to make investments that would otherwise increase their productivity. This is particularly so when there are a large number of small producers. For consumers, as many spend a large share of their budget on food, excessive price movements can push households into poverty and food insecurity. Such reasons have spurred attempts by governments to reduce rice price volatility. Price stabilisation policies have most often been implemented in historically importing countries. In importing countries where data are available, price volatility appears lower than in exporting countries as a result of government policy, but prices are significantly higher (Figures 14 and 15). In contrast, for countries like Viet Nam, where producers have faced lower and more volatile prices, significant increases in production have still been achieved. For all countries, with the exception of Viet Nam, prices pre-2007 were more volatile than prices post. This is in line with changes in price volatility observed on world markets for a number of commodities in recent years (see OECD, 2016 forthcoming for more details).
Figure 14. Domestic rice price volatility

Coefficient of variation in real prices in USD, April 2001 to March 2015

Entire period

Notes: Volatility measured as the coefficient of variation of real prices expressed in USD for the entire period. Black bars indicate net importers, blue net exporters.


Figure 15. Domestic Rice prices across ASEAN

Real prices in USD, April 2001 to March 2015

Notes: Real prices of rice in wholesale markets. Series represent different quality levels in some instances. Black lines indicate net importers, blue net exporters.

3. **Food security in ASEAN: A snapshot**

32. Food security is a multi-dimensional concept. According to the FAO definition, agreed at the 1996 World Food Summit, food security exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life.

33. The FAO’s definition gives rise to four dimensions of food security. That is, it suggests that people will only be food secure when sufficient food is available, they have access to it, and it is well utilised. The fourth requirement is that those three dimensions are stable over time.

34. The multi-dimensional nature of food security means that no one indicator captures current and past levels of food security. Despite this, most ASEAN nations have shown significant increases in food security since the early 1990s across a range of different measures related to the four dimensions.

35. One commonly used measure – the prevalence of undernourishment\(^4\) – shows a general fall in rates of undernourishment since 1992 (Figure 16). Despite this, trends across individual countries within the region are not uniform. Some countries, such as Lao PDR, Myanmar, the Philippines, Thailand and Viet Nam have experienced continued and persistent declines in the prevalence of undernourishment. For others, the declines have not been consistent, with a range of factors playing a role, including macroeconomic conditions (such as the Asian Financial Crisis for Indonesia) and domestic conflict (for Cambodia).

![Figure 16. Undernourishment in Southeast Asia](http://example.com/figure16.png)

**Figure 16. Undernourishment in Southeast Asia**

Prevalence (3-year moving average) 1990 to 2016


36. In comparison to other regions worldwide, Southeast Asia’s reduction in undernourishment has been impressive (Figure 17). In the early 1990s, the region’s undernourishment rates were the world’s highest. Most recently, the rate of undernourishment had fallen below those seen in a number of other regions.

---

4. The FAO’s prevalence of undernourishment indicator is based on a comparison of usual food consumption expressed in terms of dietary energy (kcal) with certain energy requirement norms.
37. In terms of absolute numbers, Indonesia has the largest population of undernourished people – with just under 20 million people in 2013-15 (Figure 18). Trends in absolute numbers largely follow those seen in the rates with the exception of the Philippines. In the Philippines, numbers of undernourished people have been fairly stable since the early 1990s.

38. The undernourishment indicator shows how many individuals are food insecure. However, a greater number of households may be at risk of food insecurity as their current dietary intake is inadequate (based on consumption patterns in the country and with reference to a minimum intake requirement). FAO statistics show that across ASEAN countries, there are a greater number of households either experiencing food insecurity or at risk of doing so. On average, a further 10% of the population across ASEAN countries...
are at risk of food insecurity (based on the notion of food inadequacy – Figure 19) compared with rates of undernourishment Further, for more developed members such as Malaysia and Brunei Darussalam, food inadequacy statistics suggest that risks to food security remain with around 5% of the populations in 2013-15 being food inadequate.

**Figure 19. Food inadequacy in ASEAN**


39. Other measures still point to significant challenges in achieving food security in the region. A measure used to better depict the stability of food security, that of stunting amongst children under 5 years of age, points to high rates across Southeast Asia. Stunting occurs when children do not receive enough food consistently, or do not fully utilise the food they receive, to grow to heights at levels expected given the demographic characteristics of the population they live in. As such, rates of under nourishment provide a snapshot of individuals at any given point of time, with rates of stunting partially indicating how common it is for families to experience some level of food insecurity to such an extent that it influences health outcomes. Stunting rates are highest in Cambodia and Lao PDR and lowest in Thailand and Malaysia (although the figure for Malaysia is dated) (Figure 20). The FAO suggests that rates of stunting have not changed much over the past two decades (FAO, 2015). It is argued that the data on stunting conveys the persistence of long-term food insecurity, lack of heath care and hygiene, or a combination of these in parts of the region.
Figure 20. Rates of stunting in children under 5 years

% of children under 5 years who are stunted

Note: Data is latest year available being Cambodia (2010), Indonesia (2013), Lao PDR (2011), Malaysia (2006), Myanmar (2009), Philippines (2011), Thailand (2012) and Viet Nam (2010). Given a lack of data, a consistent time series for this indicator is not available and as such it is not possible to show trends over a longer time period as depicted for rates of undernourishment.


40. Headline food security indicators mask a number of differences between and within populations that are important for policy makers to consider in designing efficient and effective responses to tackle food insecurity. The socio-economic characteristics of food insecure households are particularly important, taking into account, for example, an understanding of where they live (rural versus urban), whether they are food producers (and if so, the extent they are net sellers or buyers), and the demographic characteristics of these households. Some information is available from FAO collected household surveys for Cambodia (2009), Lao PDR (2008) and Viet Nam (2006) (Figure 21). Looking at food consumption, households in these three countries on average rely most heavily on carbohydrates for their energy needs – between 70% and 80% of total energy consumption. For many, much of the food consumed comes from own production, particularly for households in Lao PDR. Although dated, data for all ASEAN members based on availability of different forms of food confirm the importance of cereals in total caloric intake (Figure 22). When compared with other developed countries in the Asia-Pacific regions the importance of cereals is noticeably high. In 2007-09 cereals accounted for close to 59% of food availability in Southeast Asia, with animal (and fish) products making up around 11% and other crop products the remaining 30%. Cambodia and Lao PDR had the highest reliance on cereals for food availability (around 70%) while Viet Nam and Malaysia having the highest rates of food available from animal and fish products – 19% and 17% respectively.

41. Household level data of the sort used to estimate indicators shown in Figure 21 can also be used to shed light on the areas of greatest risk to food security faced by households, along with the effects of policy interventions. A more fuller depiction of the socio-economic characteristics of food insecurity will be provided in a subsequent paper within the broader project Building Food Security and Managing Risks: A Focus on Southeast Asia [TAD/CA/APM/WP(2015)13].
4. The policy landscape

Policies used in the ASEAN region to target food security focus on the availability of domestically produced rice (Alavi et al., 2012). The focus on the importance of rice has spurred the use of policies that are targeted towards achieving self-sufficiency in at least rice, or across a number of staple products. The interest in rice by governments in the region is driven by its importance to both consumers...
and producers. High rates of cereals (rice) consumption and the dominance of the sector in overall production means that rice and its price is critical to incomes (for producers) and to levels of consumption (all households).

43. Food security policies in the region often also have multiple objectives. On one hand, they attempt to spur production towards self-sufficiency through price and input incentives for producers. On the other, they are also often directed at ensuring food availability and access for vulnerable consumers. These goals can compete, creating a tension between the interests of producers in moving towards self-sufficiency with the interests of vulnerable consumers and their ability to access affordable food (Gillson and Fouad, 2015).

Self-sufficiency targets

44. The use of policies directed at achieving some level of self-sufficiency has increased since the 2007/08 food price crisis. The push towards self-sufficiency has often been framed around a desire to no longer be vulnerable to world price movements similar to those that were seen during this period – especially for rice – despite the fact that it was largely policy factors, and not global imbalances in supply and demand, that explained the food price spike (Box 1).

<table>
<thead>
<tr>
<th>Box 1. The 2007/08 food price spike</th>
</tr>
</thead>
</table>

Analysis by the OECD and others has pointed out that market imbalances were not sufficient to explain the price spikes that occurred. Instead, government policy actions contributed significantly.

Food price rises were driven by a confluence of mutually reinforcing longer term structural changes, short term market shocks, and policy responses (OECD, 2008; Piesse and Thirllte, 2008; Naylor and Falcon, 2010; Heady, 2011). On top of underlying structural changes to world agricultural markets from rising levels of food and feed demand, falling stock-to-use ratios and increasing share of production being channelled to biofuels production, world markets were hit by a number of short term shocks that placed further upwards pressure on prices. Droughts in key grain producing regions and other weather effects, exchange rate movements, along with hoarding and panic buying by private agents helped spur already rising prices. On top of this, government policy interventions through trade restrictions and import measures, coupled with panic purchases by some governments helped create the spike in prices that was observed. Government policies surrounding biofuels mandates and subsidies also contributed. Price rises were particularly witnessed for wheat, coarse grains, rice and oilseed crops – all of which experienced strong real price growth between 2005 and 2010.

In terms of rice, Alavi et al. (2012) suggest that government policy was the key driver of the rapid price increases experienced in the ASEAN region (and more generally: Anderson, Ivanic and Martin, 2014; Headey, 2011). They point to strong production growth in the lead up to 2007, which continued throughout the crisis. Indeed, production growth had continued to grow rapidly and overall faster than demand growth in the region. Preceding the crisis, stock levels were also reported to be sufficient, with stock to use ratios for rice in particular not especially low by past standards (Alavi et al. 2012; Dawe and Slayton, 2010). In fact, by the end of the crisis stock to use levels had actually increased.

Of particular importance were the effects of major producers initiating export restrictions. India was the first major producer to put in place such restrictions in October 2007. Between then and the first quarter of 2008, other exporters including Viet Nam, Brazil, Cambodia, China, Egypt and Pakistan all put in place some form of export restriction (Alavi et al., 2012). These actions, coupled with short-term buying by the Philippines were the major drivers of the price spike. Ultimately, these actions that were intended to keeping downward pressure on rice prices actually made them rise higher in domestic markets than would have likely occurred in the absence of government intervention (Anderson, Ivanic and Martin, 2014). As such, these policies actually worked against food security.

45. Policies that look to domestic solutions for food security have continued to be the major policy response by ASEAN countries since the crisis. Indonesia, for example, has continued in its push for
self-sufficiency not only in rice, but also soybeans, maize, sugar and beef (OECD, 2012a). Other countries such as Viet Nam, the Philippines and Malaysia are also committed to either maintaining a certain level of rice production (Viet Nam) or increasing it towards self-sufficiency levels. While all these countries also use less distortionary policy interventions, ranging from investments in research, development and extension to investments in infrastructure, the major policy tools employed relate to either input subsidies or market price support or a combination of both (OECD 2012a; Alavi et al., 2012).

46. Self-sufficiency policies are often supported by production targets for a particular commodity or set of commodities. Across the ASEAN group, almost all countries have some form of self-sufficiency related target (Table 2). Within this, Indonesia has the most ambitious set of targets, aiming for self-sufficiency across all main staple products. The Philippines is the only country which has coupled a drive for self-sufficiency in its two main staple crops (rice and maize) with attempts to diversify individual diets by encouraging consumption of a wider set of food products (Philippines Government, 2011).

47. These targets are further underpinned by a wide variety of output, input and trade related interventions. Beyond the supply side, some countries have also sought to intervene in markets with an expressed aim of stabilising prices for the benefit of both producers and consumers. Such policies have been operationalised by public stock holding policies, most notably in the Philippines and Indonesia. The following section briefly reviews the major policies (by broad programme classification) used in the region that are framed by governments as directly targeting food security.

Table 2. Self-sufficiency targets of ASEAN members

<table>
<thead>
<tr>
<th>Country</th>
<th>Self-sufficiency target</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brunei Darussalam</td>
<td>Rice self-sufficiency of 20% by 2015 and 60% over the longer term (2035)</td>
</tr>
<tr>
<td>Cambodia</td>
<td>No specific self-sufficiency targets</td>
</tr>
<tr>
<td>Indonesia</td>
<td>Complete self-sufficiency (100% of domestic production) targets for rice, maize, and soybeans by 2017 and beef and sugar by 2019</td>
</tr>
<tr>
<td>Lao PDR</td>
<td>Production targets for rice ~ 4.2 mil tonnes by 2015 and rate of increase targets for other products. Absolute quantity targets of food production for some commodities</td>
</tr>
<tr>
<td>Malaysia</td>
<td>Self-sufficiency targets for rice of 90% of domestic consumption plus other production targets</td>
</tr>
<tr>
<td>Myanmar</td>
<td>No specific self-sufficiency targets</td>
</tr>
<tr>
<td>Philippines</td>
<td>Self-sufficiency in rice by 2013 but later abandoned set year target. Self-sufficiency in maize production by 2013</td>
</tr>
<tr>
<td>Singapore</td>
<td>Increase self-sufficiency levels to 30% for eggs, 15% of fish and 10% of leafy vegetable</td>
</tr>
<tr>
<td>Thailand</td>
<td>No specific self-sufficiency targets</td>
</tr>
<tr>
<td>Viet Nam</td>
<td>Maintain a 2.5% rice yield increase per year until 2020 and the set aside of 3.8 m ha of land specifically for rice production</td>
</tr>
</tbody>
</table>


4.1. Trade related policies

48. Some ASEAN countries have adopted, either formally or on an ad-hoc basis, policies to manage the importation or exportation of rice, and at times other products, as a means to limit domestic price growth or volatility or in efforts to ensure adequate supplies on domestic markets.

Import barriers

49. Most ASEAN countries, with the exception of Singapore, apply a range of tariffs on agro-food imports (Figure 23). Of those with tariffs, rates are highest for Thailand and Lao PDR and lowest for Malaysia. However, for most products, the application of tariffs is not due to concerns over food security.
For some, applied rice tariffs are also high, including in a number of strongly exporting countries despite little imports (Thailand and Viet Nam).

50. Some trade barriers, however, do relate to food security. In this respect, import barriers in the form of tariffs or restrictions are often used to support self-sufficiency policies so as to create a more favourable environment for domestic producers. In Indonesia, import restrictions, in the form of tariffs, restrictions (quotas and import bans) and licensing arrangements are used to support the self-sufficiency targets related to rice, maize, soybeans, beef and sugar. For example, the beef imports are controlled via quotas and the importation of rice is controlled centrally and not based on market demand. Further, Indonesia has also been able to significantly reduce and control rice imports through its licensing schemes.

51. Policies like those of Indonesia are also in place in Malaysia and the Philippines. Rice imports are controlled by state owned enterprises (or regulated monopolies) that control the quantity of imports. Imports are managed to avoid domestic shortages and to manage domestic prices. These policies limit the supply of rice to the market and provide a means for the government to increase producer prices whilst also being able to control excessive price increases through supplementing domestic supply with imports.

52. Not all policy action around imports is directed at limiting trade flows. During the 2007/08 food crisis, a number of countries altered pre-existing tariffs in an attempt to make food cheaper for domestic consumers. For example, both Indonesia and Viet Nam reduced import tariffs on specific commodities in an attempt to make food cheaper for domestic consumers. For example, both Indonesia and Viet Nam reduced import tariffs on specific commodities in order to limit price escalation (OECD, 2010). Similar action has been repeated at other times of high prices. Indonesia, for example, suspended its 5% import duty of wheat in 2011 in the face of high domestic prices (APEC Policy Support Unit, 2012).

Figure 23. Import tariffs in ASEAN

MFN applied rates, selected ASEAN members, 2013

Agro-food

Weighted average

Simple average

Rice

Weighted average

Simple average

Note: Data for Lao PDR is from 2008 and 2012 for Cambodia. Data on rice tariffs in Indonesia are unavailable for 2013, but are also not the main tool used to manage rice imports.

Export restrictions

53. Some countries with net surpluses have used export restrictions in response to price rises on either domestic or international markets.

54. For example, Myanmar made use of export restrictions on rice despite no formal export related food security policy being in place. Export bans were applied in 2004 and 2008 (after a natural disaster), and limits to previously licensed export amounts were put in place in 2011 and 2013. In 2001, an informal agreement was reached with millers and exporters to release stocks and restrict exports (World Bank, 2014a).

55. Lao PDR has also made use of export bans in circumstances of rising prices. Within Lao PDR, export bans are possible at both a provincial and national level (Eliste and Santos, 2012). Export bans were used in 2010 in response to rapidly rising prices (Durevall and van der Weide, 2014). Cambodia, on the other hand, has not made use of export restrictions despite having experienced shortfalls in rice supply in the past (Eliste and Santos, 2012).

56. A number of exporting countries also use licensing arrangements to control the level and value of exports, in order to manage domestic prices and supplies in the long term. Again, the focus is primarily on rice. For example, in Viet Nam rice exports are centrally controlled through licensing arrangements and state owned enterprises.

4.2. Public stockholding programmes and other reserve schemes

57. Not all public stock holding programmes are the same. Broadly, public stocks can be classified into 3 categories: buffer stocks, social safety net stocks and emergency stocks (Box 2).

Box 2. Types of public food stocks

Buffer stocks are used to stabilise commodity prices. Buffer stocks aim to protect producers from price drops and/or consumers from price hikes.

Social safety net stocks function as working stocks for regular food distribution programmes. These stocks aim to provide social safety nets for the impoverished and the chronically food insecure.

Emergency stocks are kept to provide assistance during transitory food shortages and crises, which are caused by sudden supply shocks, such as natural disasters.

Source: OECD (2015a).

58. Every ASEAN country has a type of stockholding policy. These vary in purpose, scope and impacts on markets and production. The type of stockholding policy in place varies generally along importing and exporting lines. Importing countries have stockholding policies aimed at both domestic price stabilisation and insurance against emergency events. For exporting countries, stocks often are in place for emergency management, but also as insurance against rapid price spikes as opposed to price stabilisation in general. Stocks in exporting countries are generally not sufficient for stabilisation purposes.

59. However, there are exceptions to this, with Singapore on the importing side applying a policy primarily aimed at emergency management, and Thailand as an exporter, previously holding stocks in order to influence world market prices and so increase domestic prices. A brief description of the various

28
national stockholding policies is set out below. The regional initiative, the ASEAN Plus Three Emergency Rice Reserve is discussed in detail in section 6.

- **Brunei Darussalam**: Maintains a strategic national stock equivalent to 6 months of demand. Given the large share of imports in domestic consumption, this is held for emergency and strategic purposes.

- **Cambodia**: In 2012 the Cambodian Government established the Cambodian Food Reserve System which holds stocks of rice to be distributed in case of emergencies (FAO, 2014c). The reserve holds 16,000 tonnes of rice (or equivalent) along with rice and vegetable seeds. The holding of rice is split between a cash equivalent of 6,000 tonnes and a physical stock of 10,000 tonnes. The reserve is only used for to provide assistance during emergencies or crisis.

- **Indonesia**: Buffer stocks are managed by Badan Urusan Logistik (BULOG). BULOG was created in 1967 with a rice price stabilisation policy that was implemented using a price-band. Starting from 2005, the focus shifted from a price-band policy to setting a floor or procurement price while selling subsidised rice to the poor via the Raskin programme (OECD, 2015a). The Indonesian Government also controls imports to complement both its price stabilisation objectives and those of supporting producer farm gate prices. BULOG has four functions: it is the provider of subsidised rice to poor households under the RASKIN programme (see below); it intervenes in markets whenever the government deems that retail prices of rice are above tolerable levels; it manages the government’s emergency reserve; and it sets minimum purchase prices for farmers through its purchasing responsibilities. Stocks held by BULOG are in the order of 1 million tonnes to undertake its first three functions (of which around half is for emergency management) (OECD, 2012a). However, over recent years it has been reported that the Government of Indonesia has instructed BULOG to maintain a minimum secure stock of around 2 million tonnes of rice (USDA FAS, 2015).

- **Lao PDR**: In 2009 the government began a trial programme of establishing an emergency rice reserve. This was done through the provision of subsidised credit to millers via state owned banks to encourage them to maintain a minimum rice stock (Eliste and Santos, 2012). This scheme, titled the National Rice Reserve, seeks to maintain stocks of around 5,000 tonnes. The reserve also includes a component for seed reserves and rice distribution as part of poverty safety nets (Eliste and Santos, 2012).

- **Malaysia**: Public rice stocks are managed by PadiBeras National Berhad (BERNAS), a private company traded on the Kuala Lumpur Stock Exchange. BERNAS purchases paddy from farmers at a guaranteed minimum price, manages farm input subsidies, runs milling operations, maintains the nation’s rice stockpile, and acts as the sole importer of rice. Its monopoly position was extended in 2011 for another 10 years (OECD, 2015a). BERNAS is contracted by the Malaysian Government to maintain a rice stockpile for food security purposes of 292,000 tonnes – an increase from pre-2008 levels of 200,000 tonnes (Vengedasalam, Harris and MacAulay 2011).

- **Myanmar**: The Myanmar Government does not hold stocks in its own right but rather makes use of a public private partnership through an agreement with the Myanmar Rice Federation (World Bank, 2014a). The government coordinates with the federation to release stocks when prices are high. Stocks are reportedly released at market prices.

- **Philippines**: The National Food Authority (NFA) is tasked to stabilise rice prices by keeping farm gate prices high and retail prices reasonable for consumers. In addition, the NFA also has the mandate to guarantee stable rice supply during emergencies and calamities by releasing rice from
its stocks. The NFA is also responsible for the importation of rice to meet domestic production shortfalls and in distributing subsidised (mainly imported) rice to poor households. The NFA imports 35% of the import allocation of rice at duty-free rates while 65% is imported by the private sector (Tobias et al., 2012).

- **Singapore**: The Rice Stockpile scheme is operated through regulations imposed on rice traders (Singapore Government, 2015). Rice is a controlled commodity under the Price Control (Rice) Act 1990 and licences to import and trade (including re-export) in the wholesale market. The Rice Stockpile Scheme compels importers to store two months’ worth of imports in a private warehouse designated by government. The importers continue to own the stocks; however government can acquire the stocks subject to compensation. Importers are also responsible for rotating stocks; any batch of stock may be stored for a maximum of one year (Briones, 2014).

- **Thailand**: In 2011 the Thai Government pledged to pay domestic rice producers 50% more than the market price (Permani and Vanzetti 2014). The resulting supply response led to the accumulation of a large holding of stocks by the Thai Government. Unlike in some other ASEAN members, the purpose of these stocks were not to intervene to stabilise prices nor was accumulation driven by concerns over transitory food shortages or emergencies. Instead, the stocks resulted from a producer support policy and a reported belief that by withholding supply of rice to the world market, the Thai Government may have been able to influence world price (discussed further Section 4.4). The Thai Government subsequently abandoned the scheme and has looked to sell much of its stockholding.

- **Viet Nam**: A State Reserve is operated by the government which holds stocks of rice and various production inputs (OECD, 2015e). The State Reserve is designed as an emergency reserve and seeks to provide insurance against a number of risks such as natural disasters and various epidemics. The scheme is to hold around 500 000 tonnes of paddy and rice (paddy equivalent); 10 000 tonnes of rice seed; 1500 tonnes of maize seed; 130 tonnes of vegetable seeds along with fertilisers and various pesticides and animal vaccines.

### 4.3. Influencing input prices

60. Assistance to the agricultural sector via input subsidies is common the world over. Input subsidies are often provided in the belief they will lead on to increased production and food availability, and thereby increase food security. Assistance has been targeted at both physical and financial inputs. ASEAN countries vary considerably in the type and extent of their interventions.

61. The objectives of input subsidies are most often a mix of food security concerns with other policy objectives related to rural development and producer support. However, for countries such as Malaysia and Indonesia, strong links exist between such programmes and the objective of food security due to the policy link between self-sufficiency and food security. As with other policy interventions, rice is the main commodity targeted.

62. In Malaysia, rice farmers can access subsidies for fertilisers, chemicals and for harvesting costs. Fertiliser subsidies come in the form of an allocation of free fertilisers to producers, with support for other incentives paid in monetary terms on a per ha basis (Malaysian Department of Information, 2015; Harun, 2015).

63. Indonesia has in place fertiliser subsidies paid on domestically produced fertiliser. While having a long history dating back to 1979, the current arrangements have evolved from measures introduced in 2003 which were targeted towards farmers producing on less than 2 ha (OECD, 2012a). Instead of being
paid to farmers, the subsidy is paid to producers (five state-owned companies) with these companies obliged to sell fertilisers to small scale farmers at low prices. Fertiliser subsidies represent the largest government budgetary support programme for agriculture. In 2013 the value of this subsidy was around IDR 17.6 trillion (USD 1.7 billion), accounting for 41% of total budgetary expenditures provided to support agriculture (OECD, 2015c). Indonesia has also recently provided subsidies for other inputs used in rice production such as hand tractors and water pumps under its renewed focus on self-sufficiency.

64. In both Myanmar and the Philippines, fertiliser subsidies were part of government support to agriculture. However, both countries have phased out this type of support – in 2003 in Myanmar and in 2010 in the Philippines. Cambodia, Lao, Singapore, and Thailand do not use explicit input subsidy arrangements. Viet Nam does provide subsidies related to irrigation, seeds and credit amongst others (OECD, 2015e).

4.4. Influencing output prices

65. Outside of trade policy interventions that influence the price of food within domestic markets, a number of ASEAN governments have separate policies that seek to influence the prices received by domestic producers for key food security crops. The mechanisms used vary, but most commonly governments attempt to institute minimum prices through a system of public procurement of production (either direct or through an agent). Such policies are targeted at both maintaining returns for producers and often reducing uncertainty. In doing so, it is believed that production will be more stable and investment in the sector will increase, thereby increasing the availability of food.

- **Indonesia**: outside of trade policy, government intervention in rice markets to influence producer prices is limited. BULOG, which is responsible for the government’s stockpile and rice for the RASKIN programme, does purchase at set prices, however, the share of domestic production purchased is limited, and has ranged between a low of 4% in 2006 to a high of 9% in 2009 (OECD, 2012a).

- **Lao PDR**: the Lao Agricultural Law of 1998 states that the State will maintain minimum prices and intervene in the market as a purchaser when needed. This is done through purchases of rice for public sector employees and military personnel, with around 25 000 tonnes purchased each year (Eliste and Santos, 2012). However, questions have been raised in regard to the contracting arrangements used and around whether these have any influence on the prices received by farmers. Currently, contracts formed between the government and millers (Eliste and Santos, 2012). Lao PDR has also attempted to introduce minimum prices for pigmeat through setting reference prices to which traders are supposed to adhere (World Bank, 2014a). However, as with rice, questions have been raised over the ability of the scheme to influence producer prices (World Bank, 2014a).

- **Malaysia**: Malaysia’s BERNAS, the privately owned company responsible for the government’s stockholdings, is also charged with the responsibility of being a purchaser of last resort for farmers (Gillson and Fouad, 2015). In this sense, it provides for some price floor, but as in the Indonesia (and the Philippines), it is trade policy that is most influential on rice prices.

- **Myanmar**: in 2013, Myanmar adopted the Farmers’ Right Protection Act that sets out the possibility for the introduction of minimum prices for agricultural commodities such as rice. However, the World Bank reports that implementation details are not yet clear and given limited fiscal resources, a public procurement system as used in some other countries is unlikely to be feasible (World Bank, 2014a).
**Philippines:** similar to Indonesia, the NFA has minimum purchase prices for rice. However, the NFA has traditionally purchased a lower share of domestic production than BULOG, meaning much of the influence on domestic prices is driven through import controls (Gillson and Fouad, 2015).

**Thailand:** the Thai government has variously sought to establish minimum prices for rice producers. Most recently, the government (re)instituted the paddy pledging scheme in 2011 which paid domestic rice producers 50% more than the market price (Permani and Vanzetti 2014). The scheme was abandoned due to rising costs and an accumulating stockpile of rice. However, it has been argued that the scheme was not related to food security concerns, but rather an attempt to increase world prices through stockpiling rice (Mahathanaseth and Pensupar 2014). The original scheme provided credit (payment in advance) for rice production that was ‘pledged’ to the government in an attempt to provide market certainty for producers rather than influence prices (Chulaphan et al., 2012).

**Viet Nam:** Since late 2009, Viet Nam has targeted a price for rice producers so that it provides growers with a profit of more than 30% (OECD, 2015e). Prices are calculated regionally and based around average costs determined from surveyed farmers. The prices are ‘implemented’ through another scheme that provides for subsidised credit for the temporary storage of rice purchased at the target price during harvest time (all interest costs are paid by the government). However, implementation of the scheme has meant it has had little influence on producer prices, with much of the benefits captured by exporters (OECD, 2015e).

4.5. **Transfers to vulnerable consumers**

66. ASEAN members have a number of food-based safety net systems in place as a means to improve the accessibility of food to vulnerable households (or households in general). Programmes are either based around ‘supplementary’ feeding arrangements which represent targeted programmes designed to increase food consumption of particular groups, or transfer systems.

67. Supplementary feeding programmes have been used in both the Philippines and Thailand. The Philippines has made use of two programmes – a Healthy Start Feeding Program and a Food for School Program – with Thailand also providing a school based intervention through its School Lunch Programme (Hangzo, 2010).

68. The larger programmes are those which seek to provide subsidised food to consumers in general or a specific set of poorer households. Most often, the focus of these programmes is on subsidised rice provision. Significant programmes of this type exist in the Philippines, Malaysia and Indonesia.

- **Indonesia:** the Raskin programme, originally called Operasi Pasar Khusus, first provided subsidised rice in July 1998 in order to provide assistance to households suffering the effects of the Asian Financial Crisis (World Bank, 2012a). Rice is distributed by BULOG along agreed quotas of rice to over 50,000 regional distribution points where eligible households may purchase fixed quantities at below-market prices. Between 2005 and 2010 households could purchase a maximum of 15 kg of Raskin rice per month at 75% to 80% lower than the market price (World Bank, 2012a).

- **Malaysia:** In 2009 the Government began a rice subsidy programme aimed at providing subsidised rice to poor households. The programme, titled Subur or Rice Subsidy Programme for the People provides cash vouchers that can be exchanged for subsidised rice (lower quality rice). This was initially set at 30 kg a month (Malaysian Office of the Prime Minister, 2009).
• Philippines: The National Food Authority is tasked with providing subsidised rice to poor households alongside its price stabilisation responsibilities. Rice is sold to eligible households at below market prices. In 2008, for example, rice was sold at around 50% below prevailing market prices (Philippines Senate Economic Planning Office, 2010). Subsidised rice is reported to account for around 15% of total household consumption across the country.

4.6. Regulatory constraints on land use

69. Agricultural land is sometimes zoned such that it is forbidden, or it is difficult, to make use of that land for the production of other commodities (or for residential or industrial uses). In this way, governments believe that a sufficient production base will be kept domestically in order to maintain adequate supply of staple foods.

70. Land use restrictions are used both in Viet Nam and Malaysia. In Viet Nam, 3.8 million ha of land has been set aside for the production of rice only (OECD, 2015e). In Malaysia, due to pressures faced by demand for land due to urban development and from incentives to convert paddy land into palm oil production, land in granary regions has similarly been set aside exclusively for rice production.

4.7. Investments in infrastructure and other aspects of the enabling environment

71. A number of ASEAN governments have also sought to encourage production growth to reach self-sufficiency targets or food security objectives through investments that provide for longer term productivity growth stemming from an improved enabling environment. Much of the attention of governments is directed to the provision of irrigation infrastructure.

72. Indonesia, for example, has recently significantly expanded its investments in infrastructure supporting production as part of its renewed focus on self-sufficiency. With fiscal space created by the removal of the fuel subsidy, Indonesia has made a number of investments in irrigation infrastructure. Much of this is targeted towards rice production. In 2015, the Ministry of Agriculture committed IDR 4.2 trillion (USD 355 million) to rehabilitate irrigation canals covering an area of 1.5 million hectares, along with investments aimed at ‘optimising’ 500 thousand hectares of existing land for food production (OECD, 2015c). This increased investment is in addition to the current exemptions in place where farmers are not charged for the cost of delivering water from the source to the tertiary system via primary and secondary canals. Similarly, Viet Nam allocates a large proportion of its total budgetary support for agriculture to irrigation.

73. Focusing on innovation, Singapore has invested in the “Food Fund”. The Singapore Government has invested S$20 million in a fund (initiated in 2009, with funds released in stages) to incentivise farms to explore new farming technologies that would ensure Singapore’s food supply resilience through the local production of three key food items: eggs, leafy vegetables, and fish (Lim, 2013).

5. What have been the effects of food security policy interventions? Findings from existing research

74. The current set of food security policies used across ASEAN members have been examined in various levels of detail. Policy impacts differ across countries and across programme types. The broad findings from these existing studies are explored in this section.

5.1. On price gaps

75. Overall, the effects of interventions in agricultural markets, most notably for rice, have led to higher and more stable prices in importing countries such as Indonesia, Malaysia and the Philippines.
These higher prices effectively act as a tax on consumers, many of whom are food insecure, and do little to aid improvements in food security. It should be noted that the price gaps observed are unlikely to be entirely explained by policy interventions. For some ASEAN members prices are also influenced by domestic characteristics such as available infrastructure, short term seasonal conditions and other market imperfections that create rigidities in prices adjusting. These effects mean that within each country prices are likely to vary geographically. Particularly for less developed countries, these ‘development gaps’ can often result in depressed prices in rice growing areas (an effective tax on producers) and higher prices in areas with high demand (effective tax on consumers). Despite this, the size of the price gaps, the direction of change and non-uniform trends relative to international markets, and the comparison markets chosen indicate that policy is the major driver in the observed gaps depicted in Figure 24.

Figure 24. Price gaps in ASEAN rice markets

% difference to Thai wholesale price, Real prices USD, April 2001 to March 2015

Notes: Price gap expressed as the difference in percentage terms between domestic wholesale price and Thai wholesale price. Real prices from Figure 15. It should be noted that during the period of the paddy pledging scheme in 2011, the Thai wholesale price was artificially high, influencing the price gaps presented. This suggests that during the period from 2009 to 2011, price gaps relatively to the international price are likely to be understated in high price markets and overstated in low price markets. Despite this, for the entire period the Thai price represents a reasonable proxy for the world price. No adjustment for transportation cost has been included in the calculation. Gap for Indonesia is compared with Thai 15% broken price based on OECD (2012a), for Philippines with 25% broken price based on Intal, Cu and Illescas (2012) and similarly so for Cambodia based on Maltsoglou, Dawe and Tasciotti (2010). The remaining are compared with Thai 5% price. Thai prices are based on price in Bangkok market.

Recent work by the OECD exploring Indonesia’s policies demonstrates how such policies can have conflicting effects on domestic food security (OECD, 2015b). Overall, Indonesia’s domestic rice prices are close to 70% higher than international prices in 2012-14 as a consequence of policy interventions, compared to just 8% higher in 2000-02 (OECD, 2015c). The current price support measures have contributed to undernourishment within poorer households (by between 2 to 22 percentage points depending on the degree of price transmission from international markets). Fertiliser and other input subsidies were also found to have only minor effects on decreasing rates of undernourishment as they do not effectively decrease production costs and hence have limited effects on rice prices (Figure 25). In addition, as a result of current policy settings, Indonesian food security is more susceptible to more frequent domestic economic and natural disaster risks than international events. But even for international risks, current policy tools were found to be less effective than alternatives. For example, export restrictions on rice can only help avoid a surge of undernourishment in the case of a rice price spike on international markets estimated to occur only once every 30 years.

Figure 25. Effects of policies on food security in Indonesia

Probability weighted impacts based on food insecurity risks

Notes: Insecurity risks include natural disasters, crop failure, a macroeconomic crisis along with international rice and fuel price spikes. Indonesia currently has a trial crop insurance programme, an expanded version was analysed in the study.


Overall, the policies adopted by Indonesia were found to be less effective at reducing rates of undernourishment in the face of a number of risks (OECD, 2015b). This, combined with the large fiscal costs of some programmes (fertiliser subsidies) and the efficiency costs of others (trade barriers and associated price support) suggests that alternative policies are likely to be more effective and efficient responses to improving the nation’s food security. In exploring alternatives, OECD (2015b) highlighted the potential gains of moving to policies that addressed food security through either food vouchers or targeted cash transfers (Figure 25). Both these policies were found to have a greater potential effect on reducing undernourishment in Indonesia than the combined effects of the current policy mix. While these policies
will better address the issues related to food security, to overcome a number of issues facing the agricultural sector (such as yield gaps and other issues of low productivity) other complementary policies would be required. Policies, such as those that promote sustainable productivity growth, will help improve farmer incomes and also highlight the need to a multi-faceted approach when trying to address food security.

78. For the Philippines, Cororaton (2004) found that the controls placed on imports of rice into the country contributed to higher rates of poverty than would be observed in markets were opened. Given the link between poverty and food security, these results suggests that the system of supported rice prices is likely to be contributing to higher levels of food insecurity than otherwise would be the case.

79. Higher domestic prices for rice also create transfers between different groups – in particular from consumers (and disproportionally poor consumers) to producers (again, disproportionally large producers with a large share of production). In Thailand, for example, during the failed 2011 paddy pledging scheme which temporarily increased Thai domestic prices above world prices, it was estimated that USD 8.5 billion was transferred from consumers and government to producers (Permani and Vanzetti 2014).

5.2. On poverty rates

80. A large part of the motivation behind price support and related policies is that through such intervention, producers will become better off and so poverty rates will fall, resulting in food security improvements in rural areas. However, analysis conducted on the distribution of the returns and the incidence of the costs of price support policies raises significant doubts about whether such policies decrease poverty and even suggests that poverty rates (and so food insecurity) may have increased.

81. In Indonesia, an examination of the impacts of rice price support policies on households has suggested that in sum around 80% of all Indonesian households are made worse off, in terms of the impact on household income, from price support policies on rice and other staples (McCulloch, 2008). And while producers are made better off, any benefits only accrue to only around 25% of all households (for some, these benefits are not sufficient to outweigh the costs from higher prices on consumption goods). Further, the households that benefit are spread across the income distribution and so benefits flow to both poor and non-poor households.  

82. In the Philippines, similar results have been found (Dawe et al., 2006). The likely negative impact on poverty of such policies in both Indonesia and the Philippines is due to the fact there are more net buyers of rice than there are net rice sellers, especially at the bottom of the income distribution. In addition, a large proportion of the net sellers (those who benefit from higher prices) are relatively better off. For example, in the Philippines, Dawe et al. (2006) estimated that the wealthiest 40% of rice farm households account for two-thirds of the marketed surplus.

5.3. On private investment

83. For countries such as Myanmar, the uncertain application of export restrictions to avoid domestic price spikes has been argued to have discouraged private investment in the agricultural sector (World Bank, 2014a). Despite no formal export restrictions being in place, recent history of application of

5. Relating these results to statistics on undernourishment, it would be expected that without higher prices, rates of undernourishment would have fallen faster with the overall rise in incomes that has been experienced over the relevant period.
restrictions has created uncertainties. Conflicts between government objectives of export promotion and price stabilisation has been argued to have created additional uncertainty for rice millers and traders, as in the past traders have been forced to sell privately accumulated stocks at a loss to place downward pressure on domestic markets.

84. The added uncertainty reduces private investment in processing and storage facilities that would otherwise help to moderate price movements and also better link producers to markets (World Bank, 2014a). Both of such developments are critical for modernisation of agricultural production systems and for improved incomes of producers – key processes that enhance food security of rural households.

85. Similarly, government intervention in input markets can crowd out private sector involvement. Where policies are directed to subsidies on domestically produced inputs, the incentive for investment and innovation that can flow from foreign direct investment in the sector can be muted.

5.4. On demands for fiscal resources

86. Some policies create large demands on fiscal resources, such as those associated with public stockholding (OECD, 2015a). For all countries, but perhaps developing countries in particular, the drain on fiscal resources coupled with the lack of effectiveness of many of these interventions carries with it large opportunity costs. Investments in other areas which can provide direct support to vulnerable households (for example conditional cash transfers – see OECD, 2016b forthcoming); allowing for market-based solutions to reduce fiscal costs associated with stockholding (OECD, 2016b forthcoming); encouraging sustainable productivity improvements; and facilitating structural adjustment are often neglected or given less priority.

87. Input subsidies in a number of ASEAN countries place a significant drain on public resources. In Indonesia, for example, fertiliser subsidies remain by far the most important programme through which the government provides budgetary support to agriculture (OECD, 2015c). In 2013 the value of this subsidy was IDR 17.6 trillion (USD 1.7 billion), accounting for 41% of total budgetary expenditures provided to support agriculture – both on-farm and those paid to the agriculture sector as a whole (that is, general services such as infrastructure, research and development, amongst others).

88. Alongside the issues of higher domestic prices and difficulties in targeting subsidised rice distribution, stockholding and price stabilisation policies require significant resourcing. The Philippines Senate Economic Planning Office highlighted the cost of the NFA on the national budget – around PHP 27 billion in 2009 (USD 567 million). Due to its high cost and the lack of effectiveness of the NFA in improving food security, it was suggested that a continuation of the stockholding programme could not occur indefinitely. Instead, well designed safety nets and policies directed and improving productivity and sustainability of the rice sector were favourable (Philippines Senate Economic Planning Office, 2010).

5.5. On food distribution

89. Food based safety nets have the potential to provide targeted assistance to food insecure households, providing them with access to subsidised food and thereby increasing total food consumption. Systems in place in Indonesia, Malaysia and the Philippines have all delivered food to needy and vulnerable households. However, a number of the larger programmes used in ASEAN countries, which are often supported by larger public stockholding programmes, have suffered from ‘leakages’. Leakages occur when subsidised food flows to non-needy households or even into other uses. This decreases the effectiveness of the programme in improving food security.

90. In Indonesia, issues in the targeting of the RASKIN programme have meant that a significant proportion of subsidised rice does not flow to poor food insecure households. The World Bank found that
only around half of all the rice procured for the programme was delivered to households (World Bank, 2012a). The remaining did not find its way to households and was unaccounted for. And for the proportion delivered to households, a significant share flowed to non-poor households.

91. Based on analysis of household level data, the RASKIN programme has been found to only have a small impact on undernourishment overall, reducing rates by only 1.3% percentage points. This has not been enough to offset the negative impact of price support policies that have been estimated to increase undernourishment by between 2 to 22 percentage points compared with a situation of lower prices and depending on the degree of price transmission from international markets (OECD, 2015b).6

92. The Philippines has also reported similar issues associated with the efficacy of its programme to distribute of subsidised rice (Jah and Mehta, 2008). In 2008, the programme was found to suffer from significant under coverage and large leakages with only 25% of poor households benefiting from the programme (Jah and Mehta, 2008). Further, of the rice distributed, 48% went to non-poor households.

93. Malaysia has also not been immune from issues of leakage associated with its rice distribution scheme. A recent audit by the Malaysian Government’s Public Accounts Committee has questioned the efficacy of the scheme citing both large costs and high levels of leakages as issues. Further, the impact of the programme on poorer households was questioned (PEMANDU, 2015).

5.6. On price variability and volatility from export restrictions

94. At the global level, a number of analyses have shown the effects of export restrictions (and ad hoc variation in import barriers) on overall price movements. During the period of rapidly rising food prices, Anderson, Ivanic and Martin (2014) found that such policies exaggerated overall world price movements. These effects were particularly felt by net food importing countries who already had low trade restrictions. The exaggerated price movements created by the application of insulation policies in other countries created worse outcomes globally than what would have otherwise occurred. As such, from a global perspective, the various individual country interventions that were targeted at improving food security lessened it. Indeed, Anderson, Ivanic and Martin (2013) find that the trade based food price insulation policies implemented in 2008 could have actually increased the number of people living in poverty around the world.

95. Among ASEAN countries, recent research suggests that the use of export restrictions has also contributed to price spikes and to increased volatility (Durevall and van der Weide, 2014). In Lao PDR, for example, the combinations of expectations about export restrictions and other controls encourage a surge of exports during good times when restrictions are relaxed, exacerbating the potential impact of any externally induced price spike such as that which occurred in 2010. Compared to neighbouring countries, it is argued that the removal of such controls, while beneficial on a number of efficiency grounds, would also likely reduce the incidence and severity of price spikes (Durevall and van der Weide, 2014).

5.7. On input use

96. Subsidies provided on inputs, and more specifically fertilisers, are prefaced on the belief that agricultural production has been limited by the inability of many farmers to make use of inputs and

6. As was found for the effects from McColloch (2008), relating these results to statistics on undernourishment, it would be expected that without higher prices and irrespective of the effects of RASKIN, rates of undernourishment would have fallen faster with the overall rise in incomes that has been experienced over the relevant period.
technologies that are known to be effective (Wiggins and Brooks, 2010). The lack of uptake is based around knowledge gaps; lack of functioning markets; compensation for high transport costs that result from a lack of infrastructure; or credit constraints faced by producers (poorly functioning credit markets). Arguments have also been made from an environment perspective.

97. However, despite a range of market failures put forward to justify the use of fertiliser subsidies, evidence on the functioning of schemes show generally poor effectiveness in targeting such objectives over the longer term – questions of efficiency aside. Based on studies from India, Malawi and Sri Lanka, Wiggins and Brooks (2010) suggest that input subsidies, despite promoting input use over the short to medium term, had questionable lasting effects and as such were unlikely to meet their objectives over the long term. Indeed, should the subsidies be rescinded, it is likely that input use would fall (and so limited impacts on issues associated with knowledge gaps). Further, given the considerable fiscal costs of many of these programmes which are often plagued by leakage, addressing the market failures directly, such as through investments in infrastructure and training, would often produce greater benefits at lower costs.

98. In the case of Indonesia, the fertiliser subsidy arrangement has not operated without difficulty. The system has experienced shortages and delays in fertiliser delivery, suffered from significant leakage and had a limited impact on the actual price paid by farmers. Studies have found that only 10% of farmers paid the ceiling price set by the government or below for Urea in 2007 (Osorio et al., 2011). Further, the OECD (2012a) found that in reality many farmers who operate more than 2 ha also receive the subsidy by splitting land into several plots on behalf of their family members. The price disparity between subsidised and non-subsidised fertiliser on the domestic market, and between the domestic price of subsidised fertiliser and fertiliser price in the international market, creates a strong incentive to illegally sell product to farmers ineligible to purchase the subsidised product or smuggle subsidised fertiliser abroad. As there is limited monitoring, leakage from the system is high. A second issue is that the lack of competition in the distribution system removes the incentive for manufacturers to innovate and invest in producing and distributing fertiliser more efficiently. This is compounded by the fact that while Java accounts for about 60% of demand for urea fertiliser only about 20% of urea is produced there. Accordingly there is a high transportation cost associated with distributing fertilisers.

6. Regional policy responses

99. Not all responses to food security issues have been of a domestic nature. Within the ASEAN cooperation framework, members have sought to also pursue regional initiatives to help collectively address issues of food security. These are explored in this section.

6.1. The ASEAN Plus Three Emergency Rice Reserve

100. ASEAN members have long sought to build cooperation around public stockholding of rice to prepare for emergencies. In 1979, the Agreement of the ASEAN Food Security Reserve was signed (originally by Indonesia, Malaysia, the Philippines, Singapore and Thailand) which established the ASEAN Emergency Rice Reserve. This agreement sets out an amount of domestically held stocks that are earmarked to meet emergency requirements in the region. The agreement does not require the holding of physical stocks, but rather a commitment to provide a set amount of rice in emergency situations (Briones, 2014). This agreement was later expanded as ASEAN grew.

101. In 2002, a trial of a more regional scheme was conducted which expanded beyond ASEAN members to include China, Japan and Korea. The scheme was called the East Asia Emergency Rice Reserve, and consisted of rice that would be donated in the face of acute emergency within member countries. Under this scheme, 13 000 tonnes of rice were distributed in Cambodia, Indonesia, Lao PDR, Myanmar, and the Philippines (Briones, 2014).
The East Asia Emergency Rice Reserve was later converted into the currently operational ASEAN Plus Three Emergency Rice Reserve (APTERR) through an agreement that came into force in 2012. In total, 787,000 tonnes of rice are earmarked by members (based around historical allocations from the preceding schemes). The three non-ASEAN members account for the largest amounts of earmarked stocks, accounting for 700,000 tonnes of the total pledged amount.

Stocks can be released from APTERR under a ‘tiers’, or types of agreements between member countries.

- Under Tier 1, stand-by arrangements between countries are negotiated which pre-specify the quantity, quality and terms and conditions of release in an effort to avoid negotiations after an emergency has occurred. The system is formalised by 3 year renewable forward contracts between countries. Price does not need to be part of the contract, but if it is not, a formula for determining price must be agreed within the contract. Delivery is intended to be 1 month or earlier after request.
- Under Tier 2, earmarked stocks under the scheme can be released on the basis of bilateral negotiations between members that take place after an emergency has occurred.
- Under Tier 3, stock piled rice can be released to help meet the needs of acute emergency situations.

Members have made use of APTERR, although issues of timeliness were encountered. Following a recent natural disaster in the Philippines in late 2013, the Philippine Government sought emergency supplies of rice from APTERR. In total, 6730 tonnes of rice was delivered over an 18 month period, with rice received from China (800 tonnes in March 2014), Thailand (5000 tonnes in April 2014), Malaysia (350 tonnes in August 2014) and Japan (580 tonnes in March 2015).

The lack of timeliness of some of these supplies has led to further reforms of the scheme. Currently, the storage of stocks outside of the donor country is being trialled, with Japan agreeing to hold some of its emergency stocks in both Cambodia and the Philippines.

**ASEAN Food Security Information System**

At the time of the establishment of the early initiatives that later transformed into the APTERR, ASEAN members expressed concern over the information available to policy makers on factors that influence food security in the region. In response, the ASEAN Food Security Information System (AFSIS) was formed in 2002.

AFSIS targets two main goals:

1. **Capacity development**: improve capacity of member nations to develop, analyse and share information related to domestic and regional food security as it relates to their own country. More advanced member nations are requested to help improve the capacity of the others as necessary.

2. **Information network development**: this includes the development of a database of relevant information so that member nations can better plan policy and its implementation.

Under the second objective AFSIS regularly produces Early Warning Information and a Commodity Outlook detailing information that will help identify possible future food security crisis. The early warning information details forecasted production and yield (current year) for major food security
crops of rice, maize, sugar soybean and cassava. The commodity outlook then provides forecasts of these crops for the following year.

6.3. **ASEAN integration**

109. A notable regional policy development that could significantly enhance food security is the push towards closer integration of ASEAN economies. The *ASEAN Economic Community (AEC)* initiative has set a target for regional integration by 2015. By this, integration in envisaged to create:

- a single market and production base
- a highly competitive economic region
- a region of equitable economic development
- a region fully integrated with the global economy (ASEAN, 2014).

110. This initiative goes well beyond agriculture and aims to allow for the free flow of goods, services, investment and skilled labour across the region, along with the freer flow of capital. As such, it has the potential to significantly impact growth opportunities in the region and therefore food security.

111. Full economic integration will take time to occur. Nevertheless, in moving down this path and through exploiting the potential benefits from developing a single market and production base, food security could be enhanced. Bello (2005) argued that through free trade in rice and maize, enhanced through improved trade facilitation measures and harmonisation of food regulations, food security for each of the 10 ASEAN members could be improved. Such measures could exploit the natural diversity in agricultural production systems across the region to the benefit of all members. It was argued that a shift in focus of food security policy from a domestic desire for self-sufficiency to a regional perspective is required. Such a shift is possible through the pursuit of closer economic integration.

112. Others have explored further integration specifically in the area of rice. Currently, despite the large number of steps towards a single production base for many commodities, rice has remained a product where differences in policy stances have remained (as outlined above). Hoang and Meyers (2015) explored the price effects of the removal of impediments to trade (mainly created through the state-trading and licencing arrangements in place) and have suggested that significant falls in consumer prices are possible. For the importing countries of Indonesia, Malaysia and the Philippines, falls of around 30-40% were projected, whereas price rises on world markets were around 30% (far less than the price spikes observed in the late 2000s). The author’s stress, however, that these benefits are best realised through shared actions over time – that is, through ASEAN. In this way, the disruptions to world markets are minimised and the time for adjustments in both exporting and importing countries is allowed avoiding pressures on world markets that could lead to price surges.

7. **Concluding comments**

113. ASEAN food security policy can be characterised as being ‘rice-centric’. For both large and small rice producers, an emphasis is placed on rice production. As discussed, the policies chosen to pursue these objectives vary, but in general are related to attempts to spur domestic production in importing countries through the use of price support, trade barriers and input subsidies, and for exporting countries, interventions in export markets (taxes, bans, licencing arrangements) along with attempts to ‘lock-in’ a certain quantity of rice production. At the same time, some countries have also made significant investments in the enabling environment, and in particular, in irrigation infrastructure. Despite this, where
information on relative expenditures is available, such investments, while worthwhile, are often much smaller than the costs of interventions in output or input markets.

114. On the consumer side, some countries have coupled production based policies with public stockholding regimes aimed at stabilising rice prices and to provide for public distribution. These are most notable in traditionally importing countries such as Indonesia, Malaysia and the Philippines. While such regimes have stabilised prices compared to ASEAN peers, they have done so at much higher price levels, bringing into question the net impact on food security. Indeed, in 2012-14 in Indonesia, domestic prices have been estimated to be 70% above comparable world prices.

115. There have been a number of studies that have reviewed the economic impacts of these policies. These reviews suggest that such interventions create inefficiencies in resource allocation within the economies, discourage private investment by creating greater uncertainties and impose significant budgetary costs on governments – for which there are significant opportunity costs in terms of the alternatives to which those outlays could be better directed. Further, the effects on prices for some suggest that these policies are unlikely to be effective in helping address food security for vulnerable households. Moreover, the ineffective nature of the support on farm incomes of the poorest, and in a number of cases the incidence of support accruing to otherwise food secure households, suggests that even for poor rural producers, the long run impacts on food security are questionable.

116. Alternative policies have also been suggested. In terms of food security, an emphasis on targeted support to vulnerable households that can be accessed both generally and more intensively during crisis has the potential to lead to significant improvements in food security. In the case of Indonesia, targeted cash transfers or food vouchers have been shown to have significant potential. For the agricultural sector, deregulated markets, increased trade and more transparent policy marking are also key inputs into more stable supply, less volatile prices and increased agricultural investment. The use of trade policy in particular to maintain affordable food prices has been shown to be ineffective in both importing and exporting countries.

117. However, despite the significant focus of these assessments on the economic impacts of such food security policies, this review points to a gap – that of how these policies, and alternatives, perform when assessed against the risks they are intended to mitigate. It is often cited that despite the costs of such policies on the economy, they provide an effective insurance mechanism for both producers and consumers. Risks insured relate to international price movements, natural disasters and even macroeconomic events that can reduce the purchasing power of domestic consumers on international markets. Such a proposition, explored in the context of Indonesia’s policies (OECD, 2015b), is questionable. However, more work is required to assess how such policies play out in the context of regional risks. Such an assessment will be explored in a supporting study as outlined in TAD/CA/APM/WP(2015)13.
REFERENCES


Dawe D., P. Moya and C. Casiwan, eds. (2006), Why Does the Philippines Import Rice? Meeting the Challenge of Trade Liberalization, International Rice Research Institute and Science City of Muñoz (Philippines), Philippine Rice Research Institute, Manila.


FAO (2015), *Regional Overview of Food Insecurity Asia and the Pacific: Towards a Food Secure Asia and the Pacific*, FAO, Bangkok.


FAO (2012), *Selected Indicators of Food and Agricultural Development in the Asia-Pacific Region 2001-2011*, FAO Regional Office for Asia and the Pacific, Bangkok.


