Cautious or misguided? Vietnam's rice policies

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Abstract

Vietnam has designated 3.8 million hectares of agricultural land for paddy rice production, reflecting historical and ongoing concerns about food security. However, Vietnam is now the world's second largest exporter of rice, and it imports vast quantities of livestock feed, some of which could be produced domestically if the land area restrictions were relaxed. Rather than improving food security, this policy may in fact increase malnourishment because some groups in the population lack a diversified diet. The Government has a plan to diversify into other crops.

The implications of the Government land use policy for domestic consumers and producers of food, feed and livestock products are assessed in this paper with the aid of VAST, a dynamic, eight region, 13 commodity non-linear programming model of Vietnam's agricultural sector. The reallocation of land currently designated for rice production would allow increased production of maize and a range of vegetable crops. However, the switch into feed products sold primarily on the domestic markets puts downward pressure on producer prices. The Government should remove restrictions on land use and let producers judge for themselves what products to grow.

Introduction

Vietnam has a policy that requires that the area of land devoted to rice production to remain at 3.8 million ha until at least 2020.[2] The purpose is said to try to ensure national food security. In the past, rice production has played an important role in providing enough food for the whole population, but Vietnam is now the second largest rice exporter, with exports of 7 million tonne, a quarter of annual production. The question arises as to whether the land may be allocated to more productive uses.

The policy has several objectives. While maintaining food security, another, possibly conflicting, objective is to raise incomes of farmers. The policy has not been obviously successful in meeting this objective. Rice producers remain among the poorest sectors of society. They may be better off producing more valuable crops.

Food security is an issue for Vietnam, but the problem is not one of shortages in rice production. As incomes continue to grow, there will be an increased demand for high protein products, including pork, poultry, beef and dairy products. The additional demand could be met by imports or domestic production. To produce more livestock locally, the choices are to import the feed or to produce it domestically. The major feeds currently are maize, rice, cassava and soy. There are large imports of maize and soy, while cassava is the only significant feed export. If more maize is to be produced, this may require a switch out of other crops to provide the necessary land. An alternative is to move to more marginal areas, as yet not producing crops. This may have detrimental environmental aspects.

Much agricultural production occurs around the Mekong River Delta and the Red River Delta. However, many poor farmers are livestock producers outside of the deltas, producing pigs and poultry. As a result, there could be net benefits from producing these products domestically.

The purpose of this paper is to examine the potential impact of removing the designated rice area policy on the grains-oilseed-livestock sector and the implications for producers in eight regional areas of Vietnam. To quantify the likely impacts, a dynamic, eight region, 13 commodity non-linear programming model of Vietnam's agricultural sector, called VAST (**V**ietnam **A**gricultural **SecT**or model) is used. The effects on output and trade by commodity

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[2] Resolution No. 17/2011/QH13 November 22, 2011.

and region after a ten year period are assessed. Rice consumers are largely unaffected because rice prices are internationally determined.[3] Livestock producers benefit from lower feed costs. Food security will improve because of a more diversified diet. These effects will differ across the eight regions. The Government will also lose some tariff revenue on import of livestock feed.

In the next section we examine regional production and trade then describe the policies and its implementation. The methodology section describes the model. The penultimate section presents the results, and we finish with implications, limitation and refinements.

The pattern of production and trade

Regional production is shown in table 1[4]. Rice is the major crop, and most of this is produced in the one region, Mekong River Delta, but some rice is produced in all regions. Rice is a major stock feed, providing about 40 per cent total domestic feed supplies. Maize and sweet potato are also used as on-farm feeds. Maize accounts for 35 per cent of domestic feed supplies. It is widely grown across the country. Sweet potato, cassava and soy provide 6-10 per cent of domestic feed. Soy is a protein supplement and is not substitutable with the other feeds, which are energy intensive.

The major livestock product is pigs. Seafood is also a major source of protein. Poultry makes a significant contribution while production of beef is relatively minor at present. While seafood is produced mainly in the delta regions, production of the other livestock products is dispersed across the eight regions.

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[3] There are sizeable tariffs on rice imports, but these are aromatic varieties that are not very substitutable with Vietnam's domestically produced rice.
[4] Excluded from the model are some important non-feed crops such as sugar, coffee, vegetables and flowers.

Table 1 Regional production of agricultural commodities, 2010

	Red River Delta	North East	Northwest Mountains	Northern and Central Coast	Southern and Central Coast	Central Highlands	South East	Mekong River Delta	Total
	kt	kt	kt	kt	kt	kt	kt	kt	kt
Rice, paddy	6,805	2,476	612	3,373	2,780	1,042	1,323	21,596	40,006
Maize	441	855	681	512	338	1,184	415	200	4,626
Sweet potato	247	221	36	282	59	152	16	307	1,319
Cassava	39	781	532	1,000	1,625	2,206	2,360	52	8,596
Soy	146	53	28	10	-	47	2	12	299
Pigs	832	451	69	278	213	160	335	553	2,892
Chicken	122	67	16	42	16	15	59	70	406
Other poultry	54	38	7	24	14	12	29	41	219
Beef	40	30	12	52	58	37	17	30	278
Milk	19	5	3	6	4	8	223	40	307
Seafood	260	30	5	68	15	21	151	755	1,305

Source: Derived from GSO. On-farm production before conversion and post-harvest losses.

Production is insufficient to meet demand for livestock feed. Self-sufficiency ratios are shown in table 2. Maize and soy are heavily dependent on imports while cassava is exported, mainly to China. Among the livestock products, pigs are exported, mainly to Hong Kong, but hams and processed pork are imported. Beef and dairy products are also imported in significant proportions.

Table 2 National self-sufficiency ratio, 2010

Rice	1.30
Maize	0.82
Sweet potato	1.00
Cassava	1.72
Soy	0.54
Pigs	0.99
Chicken	0.87
Other poultry	0.97
Beef	0.70
Milk	0.51

Source: Derived from GSO.

Given the agronomic conditions, it is not surprising that soy and cattle products are imported. Nonetheless, if there is an increasing demand for beef and dairy products, as expected, the choices are to import these products directly or to produce them locally. The Government seems inclined towards the second option, as evidenced by the significant tariffs it maintains on imported beef and dairy products. Regardless, increasing pig and poultry production will require an increased demand for feed, much of which will need to be imported. Converting some rice area to feed production will displace some imports. This is not necessarily optimal. It depends on the best uses of the agricultural land. Vietnam also exports half its production of seafood.

A mix of instruments

In recent times, the Government has paid much effort to ensure food security and to develop the agricultural and rural sector. In 2009, the Government approved Resolution No. 63/NQ-CP on December 23 on National Food Security. According to this 2009 directive, Vietnam needed to maintain at least 3.8 million arable hectares for rice production until 2030. A more recent 2011 Resolution revised the end date back to 2020 (see footnote 2). With two or three crops a year, this area would produce 41-42 million tonne annually of paddy rice for domestic consumption and export at current yields. When converted to milled rice, this is about 27 million tonne. With domestic consumption of around 20 million tonne, some seven million tonne are available for export.

The Government has several measures to encourage farmers to stay in the rice sector. This includes a floor price, domestic support, a payment in kind scheme and the designated land area policy. The land area policy is considered by some to be the most distorting (World Bank 2012).

The floor price is aimed to ensure that farmers could earn at least a 30 per cent profit margin over the cost of production. The Ministry of Finance (MoF), in collaboration with Ministry of Agricultural and Rural Development (MARD) is responsible for implementation of this policy. At the beginning of the harvesting season, the People's Committee at provincial level is responsible for calculating the average cost of rice production for each crop within the local area. This is undertaken under the guidance of MoF and MARD. After that, MoF and MARD will examine, review and calculate the average production cost for each crop in the whole county. Based on that, MoF will determine and announce the directed paddy price at

the beginning of a crop year as the basis for policy intervention to guarantee the profit for the average rice farmers. The Government intervenes only when the market price for rice is lower than the directed price. This has occurred every year since 2008. The drawback of this policy is obvious. Because costs of production differ across farms, some farms get more assistance than they need while others get not enough. The policy is poorly targeted.

The Government has other policies affecting rice production.[5] In addition to the floor price, the Government also provides domestic support of 500,000 VND/ha/year for producers of land for wet rice, and 100,000 VND/ha/year for producers of dry land rice.[6] Some rice consumers in remote areas are subsidised through a payment-in-kind scheme. There is also a tariff of 25 per cent on rice imports, although the benefit of this is limited because imports don't compete closely with domestic production.

Although there is a Resolution to maintain 3.8 million hectares of land for rice production until 2020, the Government also has a plan to reallocate ten per cent of the area sown to rice to other crops by 2020. This is shown for the whole country in table 3. The most notable change is a switch to maize (230,000 hectares) and vegetables and flowers (163,000 hectares). There are some large percentage changes for small crops, such as soybean, but the main economic impact is the switch from rice to maize.

Table 3 Government plan for land re-allocation

	2013	**2020**	**Change**
	('000 ha)	('000 ha)	%
Paddy	7,899	7,144	-10
Maize	1,173	1,403	20
Soybean	118	166	41
Sesame, peanut	259	353	36
Vegetables, flowers	878	1,041	19
Feed crops	91	141	55
Aquaculture	207	299	44
Other crops	687	765	11

Source: Decision 3367/QĐ-BNN-TT: Approval to the plan of crop structure transformation on paddy land in the 2014-2020 period.

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[5] Decree No 42/2012/NĐ-CP of Prime Minister and Circular No 47/2013/TT-BNNPTNT of Minister of MARD.
[6] US$=21,000 VND.

The plan details changes by region. For example, paddy production is to be reduced by seven per cent in the Mekong River Delta and 11 per cent in the Red River Delta.

Some of this transformation has already occurred. In 2013 the Government converted some 80,000 hectares of paddy rice land into production of other crops (table 4) in the Mekong River Delta. The provinces where maize replaced rice were those where maize yields were high, most notably Đồng Tháp (7.1 t/ha). This is also by far the largest area, some 31,000 hectares, although it is not clear how much was allocated to maize as opposed to other crops.

Table 4 Transformed paddy area in Mekong River Delta in 2013

Province	Transformed area (ha)	Crops
Long An	1,140	Maize, dragon fruit, lime
Đồng Tháp	30,725	Maize, soybean, sesame, lotus flower, vegetables
An Giang	3,500	Maize, soybean, sesame, vegetables
Tiền Giang	1,483	Maize, watermelon, chilli, vegetables
Vĩnh Long	0	
Bến Tre	0	
Kiên Giang	5,951	Sweet potato, cassava, maize, water melon, sesame, soybean
Cần Thơ	6,177	Sesame, watermelon
Hậu Giang	1.5	Piloting hybrid maize
Trà Vinh	12,080	Maize, vegetables, peanut, other crops and aquaculture
Sóc Trăng	19,800	Vegetables, shrimp, aquaculture, feed crops
Bạc Liêu	567	Vegetables, watermelon, marrow
Cà Mau	0	

Source: Reports from different DARDs in Mekong River Delta, 2014.

Ignoring for the moment the costs of production and prices for output, it makes sense to take out of production a crop where the yield is relatively low and replace it with one with relatively high yields. In fact, evidence for the Mekong River Delta suggests the Government has attempted to follow this approach. GSO data suggest that the average yield for paddy rice in Vietnam is 5.6 tonnes per hectare. This is consistent with planted area of 7.9 million hectares producing 44 million tonne. The average yield for maize is 4.4 tonnes per hectare, but the area planted is only 1.2 million hectares. Paddy rice prices in 2012 were 6.2 million VND per tonne, US$299, whereas maize prices were 6.7 million VND per tonne, US$312. In terms of gross revenue per hectare, ignoring costs of production, rice would seem to be more profitable, at least using national yield data.

However, national yields are misleading because yields vary across the country, within regions and provinces, and perhaps, even within fields. GSO provides estimates of yields by

province for the major crops. In the Mekong River Delta, the average yield for rice is 5.75t/ha, but the range is from 4.21 t/ha in Ca Mau to 6.3 t/ha in An Giang.

The average yield for maize in the Mekong River Delta is 5.45t/ha, some 0.3t/ha less than rice in the three years to 2013. The most high yielding provinces for maize in the Mekong River Delta are Đồng Tháp (7.5 t/ha) and An Giang (7.0 t/ha), but most of the maize is grown in the Central Highlands where average yields are somewhat lower (5.2 t/ha).

Comparing three year average yields to 2013 for rice and maize, there are 17 provinces where maize yields exceed rice yields. The most notable of these are Dong Nai in the South East region (1.4t/ha), Lang Son in the Northern Midlands and Mountains region (0.9t/ha), and Bac Lieu (1.1t/ha), Dong Thap (0.9t/ha) and An Giang (0.9t/ha) in the Mekong River Delta. All these provinces grow significant quantities of both rice and maize, suggesting these crops are substitutes in production.

It is common to produce three paddy rice crops in the south of the country — winter, autumn and spring. The Red River Delta, Northern Midlands and Mountain Areas and most of Central Highlands do not produce an autumn crop. The highest yields are obtained for the spring crop (6.2 t/ha), well above autumn (4.9 t/ha) and winter (4.6 t/ha). The spring is also the best time for growing maize. The Government plans to reduce planting mostly (44 per cent) from the winter-spring crop and somewhat less (28 per cent) from the other two seasons.[7]

In a simulation, we use provincial averages of yields to assess the loss in production when land is switched from rice to an alternative crop. For the Mekong River Delta, the average yield for maize on land transformed from rice production is assumed to yield 6.4 t/ha instead of the average for the region of 5.75 t/ha.[8] A weighted average of the yields in the five provinces where rice land was transformed into maize production (i.e. Long An, Đồng Tháp, An Giang, Tiền Giang, Trà Vinh) is 6.4 t/ha, although the weights take no account of the amount of land transformed into crops other than maize. This approach takes account of the Government's attempt to have maize planted in the highest yielding areas. We remove the constraint on rice production and assess the impact on the feed livestock sector over ten years. Next, we describe the model used to do this.

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[7] Decision 3367/QĐ-BNN-TT: "Approval to the plan of crop structure transformation on paddy land in the 2014-2020 period."

[8] These are averages of the years 2011 to 2013.

Methodology

Vietnam **A**gricultural **SecT**or model (VAST) has been developed within the General Algebraic Modeling System (GAMS) framework. It solves for the national consumer and producer prices by maximising producer and consumer surplus. Supply and demand are functions of price, all markets must clear (production plus imports equals consumption plus exports) and price relationships must hold. Price relationships are held through the following assumptions:

a) producer and consumer prices relate through margins;

b) imports are determined through Armington equations describing substitution between imports and domestic products; and

c) regional prices are linked to national prices. Transport and other costs are modelled as constant so that the relationship between regional and national prices is maintained.

The demand side of the model is represented by a log-log model where price elasticities are calculated from an underlying regional AIDS model for food expenditure calculated for budget shares in the base year. (Estimation of the demand elasticities is described in Brennan et al. 2010). Over a ten year time horizon income and, to a lesser extent, population growth, determine demand for a product.

The model is dynamic in that it projects changes over time in response to demand growth driven by income and population growth. Productivity growth in terms of crop productivity, yield per animal and food conversion ratios drive growth in output over time. Aside from food demand, treatment of the interaction between the Vietnamese agriculture sector and the rest of the economy is dealt with by using exogenous, user determined, parameter assumptions that reflect economic growth paths, such as changes in urban and rural income, and world prices. The model is described in Brennan et al. (2012).

For this application, the key equation is a Cobb Douglas supply curve, defining the quantity supplied, *S*, in year, *t*, (Q_{Scrt}) as follows:

$$Q_{Scrt} = k_{crt} . \frac{Q_{Scr0}}{P_{Scr0}^{\varepsilon_{cr}}} . P_{Scrt}^{\varepsilon_{cr}} \qquad (1)$$

where k_{crt} = the crop productivity scaling factor, defined as:

$$k_{crt} = (1 + \psi_{cr})^t \qquad (2)$$

and ψ_{cr} = the annual productivity growth. This variable is shocked to reflect changes in land available for rice. The scaling factor measures net productivity, and can be negative if yield growth doesn't compensate for the change in land area.

Q_{Scr0} = quantity supplied in the baseline year, *0*,

P_{Scr0} = the supply price in the baseline year, *0*,

P_{Scrt} = the supply price at time, *t*, and

ε_{cr} = the own-price elasticity of supply.

Initially, k_{crt} is set to 1 (and is updated on iterations of the model as a function of Q_{Scr0}, P_{Scr0} and ε_{cr}) and ε_{cr} is assumed to be 0.2.

Regional supply prices for all products, *p*, (of which crops, *c*, is a sub-set) all regions, *r*, in year *t,* are determined by national supply prices multiplied by a supply factor:

$$P_{Sprt} = P_{Spnt} * \Phi_{pr} \qquad (3)$$

where: P_{Spnt} = national supply price, and

Φ = the supply price factor, defined as the producer prices by region divided by national domestic supply price.

The Armington approach assumes domestically produced and imported goods are imperfect substitutes. This means domestic prices are not linked directly to border prices.

This relationship also determines consumer prices. These are a weighted average of domestic and imported prices.

The model solves recursively for national supply prices in subsequent years.

Scenarios

We undertake two scenarios. The first is a ten year baseline which includes exogenous growth in crop and livestock yields, population and income. In the absence of any policy

change, rice production is projected to grow at 3.2 per cent per year, based on annual average growth since 1995.[9]

The second scenario is a reduction in productivity growth equivalent to reducing land area allocated to rice from 7.81 to 7.48 million hectares, a reduction of 4.25 per cent. This is as outlined in the Government plan but excludes allocation to crops that are not in the model, such as vegetables and flowers. However, the exogenous growth in yield continues as indicated in Appendix table A1, which shows the rate of growth taking into account the reduction in land area plus the exogenous productivity growth at similar rates to those observed in previous years. These two factors mean that rice production increases in all areas in spite of the reduction in area sown to rice.

The land taken out of rice production is not evenly spread across all regions. The Government has prescribed where the reductions will occur and what should be grown in its place.

Table 6 Change in land allocation

	Change ('000 ha)	%
Paddy	-332	-4.25
Maize	230	20
Soybean	49	42
Feed crops (soy, cassava)	51	56

Source: Derived from GSO data and assumed policy changes.

Where land is reallocated, yields are assumed to change according to the regional average for the new crops. The exception is maize in the Mekong River Delta where we know the Government has allocated land to the most productive maize growing areas. For this region, as noted earlier, the average yield is 6.4t/ha rather than 5.75/ha which is the regional average.

Real income growth per capita is assumed to be four per cent per year in both rural and urban regions. Given population and income growth, national income is expected to increase about 60 per cent over ten years.

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[9] Average annual growth in yields for feed crops is shown in Appendix table A1.

Results

The baseline

Baseline changes in production over ten years (table 7) reflect the projected changes in population, income and productivity growth. Pigmeat is the major source of protein, but production over the projection period, 20 per cent, is well below the increase in consumption 37 per cent (not shown). The increase in poultry production, 43 per cent, almost keeps up with demand. The increase in consumption reflects the increase in demand for protein as incomes increase. To provide feed for the home grown livestock, there are large increases in production of maize, sweet potato and cassava. These feeds provide energy for livestock, and complement soy and other protein supplements. Sweet potato is not traded.

To meet the increased demand for meats, there is some switching into imports, particularly pigmeat, poultry and beef. However, imports of maize are projected to fall because productivity growth as quite high, around 5 per cent annually in some central regions.

Table 7 Changes in production over ten years

	Base year 1	Base year 10	Change
	kt	kt	%
Rice	24556	35608	45
Maize	4341	6298	45
Sweet potato	1003	1255	25
Cassava	3969	6451	63
Soy	318	420	32
Pig	1792	2149	20
Chicken	362	517	43
Other Poultry	191	223	16
Beef	116	139	20
Milk	302	389	29
Seafood	1313	1610	23

Source: VAST simulation. Cassava is used only for feed.

Policy reform

Producers respond to prices so the change in production is not the sum of the productivity changes. In reality, production may also vary depending on whether the best or most marginal

land is converted to other uses. The first feature is captured in the modelling but the second is not.

The change in rice land area leads to a reduction in rice production compared with the ten year baseline but an increase nonetheless because of ongoing productivity gains. Rice production increases from 25 mmt to 34 mmt after ten years instead of 36 mmt under the baseline scenario. This is shown in the first row of table 8. There are big increases in maize and cassava. These are energy sources for livestock. As a result, there is also an increase in pigs and beef, although not chicken or milk products.

Table 8 Production following 4.25 per cent reduction in area sown to rice

	Base year 10	Scenario year 10	Change
	kt	kt	%
Rice	35,608	34,174	-4.0
Maize	6,298	6,751	7.2
Sweet potato	1,255	1,771	41.1
Cassava	6,451	8,333	29.2
Soy	420	525	24.9
Pig	2,149	2,181	1.5
Chicken	517	520	0.6
Other poultry	223	225	0.9
Beef	139	145	3.9
Milk	389	392	0.6
Seafood	1,610	1,611	0

Source: VAST simulation.

Rice is a major export crop for Vietnam. Our projections have rice exports falling from 16.6 mmt to 15.2 mmt after ten years, a drop of 8 per cent (table 9). There is a big increase in cassava exports and a small increase in pigmeat exports. However, imports of other products are also reduced because more feed and livestock can be produced domestically. Changes in imports are also shown in table 9.

Table 9 Trade flows following reduction in area sown to rice

	Base year 1	Base year 10	Scenario year 10
	kt	kt	kt
Exports			
Rice	9217	16559	15217
Cassava	2887	5112	6977
Pig	722	681	709
Imports			
Maize	1059	408	158
Soy	225	259	172
Pig	27	38	38
Chicken	54	68	68
Other poultry	7	11	11
Beef	58	87	85

Source: VAST simulation.

Because the largest feed crop is maize, this is where the changes in imports are greatest, reduced by 60 per cent. There is also a 34 per cent reduction in soy imports. This reflects partly the lower self-sufficiency ratio for soy compared with maize. In spite of the lower cost of feed, the impact on imports of livestock products is minimal. There is a modest increase in livestock production as a result of the changes, but consumption has increased as well, leaving little impact on imports.

The problem for Vietnam farmers is that the prices of rice and cassava are relatively inelastic whereas crops sold onto the domestic market drive down producer prices. The four per cent reduction in rice output has almost no impact on prices, so the value of production falls proportionately (table 10). However, there are significant falls in producer prices of maize (30 per cent) and sweet potato (70 per cent) as a result of increased output, so although the quantity of production rises (table 10), the value of production falls.[10] In total, the value of production for the products modelled here falls 2.1 per cent. In the absence of any price changes, the aggregate value of production would increase marginally.

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[10] There is a large loss in the value of production of sweet potato, because prices fall significantly in the absence of an export market. It is not clear that policy makers would persevere with this policy if prices fell as modelled here.

Table 10 Value of production following 10 per cent reduction in area sown to rice

	Base year 10	Scenario year 10	Change
	VND m	VND m	VND m
Rice	181,655	175,354	-6,300
Maize	19,346	14,686	-4,660
Sweet potato	2,835	1,091	-1,744
Cassava	9,965	12,872	2,907
Soy	3,554	3,906	352
Pig	57,823	58,688	865
Chicken	25,052	25,165	113
Other poultry	8,675	8,657	-18
Beef	7,175	7,275	101
Milk	4,251	4,262	11
Seafood	69,944	69,896	-48
Total	392,048	383,628	-8,420

Source: VAST simulation.

Policy implications

Given these results, is rice land area reform a good idea? The demand curve on the domestic market is more elastic and the additional supply drives down prices, reducing farmer incomes. By contrast, reducing the supply of rice has little impact on producer prices as these are largely determined internationally.[11]

On the face of it, producers are worse off because the additional crops that they may be prescribed to produce from land previously used for growing rice do not appear to be particularly productive. The best yield for maize in the Mekong River Delta is 7.5t/ha in Đồng Tháp, not greatly better than the best yield for rice 6.3 t/ha in An Giang. Prices are similar, but maize prices are more responsive to an increase in supply, reducing returns.

One difficulty with this analysis is that with the exception of maize in the Mekong River Delta, we use regional yields. This may seem reasonable if land is allocated to alternative crops without any knowledge of specific circumstances. It is clear that yields vary considerably across and within provinces. The allocation of land to the best performing crops is obviously important.

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[11] Maize in imported but the domestic price of maize received by farmers depends in the model on the share of domestic production in consumption and the Armington elasticity. Here, the elasticity is quite high, 5, reflecting the high substitutability between domestic and imported maize.

These results also suggest that the land area requirement of 3.8 million hectares may not be binding. Farmers may choose to plant that amount anyway in the absence of a directive. In any case, it is good policy to remove the constraint and see how the market adjusts. If the current policy is binding, it implies that farmers would prefer to grow alternative crops, and they are forgoing revenue by not being able to do so. In the absence of more detailed yield data, it is difficult to assess what these losses might be.

Farmers themselves are in the best position to know whether their land is suitable for growing particular crops, and they can decide whether switching from one crop to another would be profitable. Rather than the Government specifying which crops should be grown where, farmers should be able to determine which crops they plant.

From the Government's perspective, one problem with removing constraints on production is that farmers may rush into growing a particular product, such as peanuts, which may then lead to a collapse in the price. By controlling production, the Government may hope to avoid this problem. A better solution is to let producers grow what they judge best, but to provide a credible forecasting service to inform producers of likely prices a year or so ahead.

The current policy is supposedly put in place to try to ensure food security. While this may have been important at one time, it is no longer relevant. Vietnam is the second or third largest exporter of rice. Food security has dimensions other than national supplies, such as accessibility at the household level, nutrition and diversity of diet. These aspects are likely to be more easily met by growing a greater range of crops.

In addition to removing the designated land area constraint, the Government should also revise other policies impinging on the rice sector. One such measure is a floor price that is supposed to ensure that farmers receive a 30 per cent profit margin. This margin is based on costs of production estimated by the Ministry of Agriculture and Rural Development. Such estimates are notoriously difficult because cost of production vary considerably. Supporting some farmers adequately implies providing too much support to others. The scheme is poorly targeted, with much of the benefits going to non-targeted agents up and down the supply chain. In addition, it is regressive in supporting larger farmers more than small ones. Doing away with a floor price will make the sector more efficient. Furthermore, there will be less need for such support if producers can grow what they wish.

Limitations and refinements

When drawing policy implications the limitations of the model should be noted. One limitation is reliance on average yield to determine changes in production when land area is reduced or increased. In reality, producers may pull their most marginal land out of rice so the reduction in output would not be as great as suggested here. Then there is the question of the increase in output for maize, cassava, soy and other crops. Here we also assume average yields, but if the land is less productive then average, this will be an overestimate. The reality depends on the manner in which land is reallocated. If driven by the market, we would expect farmers to choose the most productive use.

A further limitation is the coverage of agricultural products in the model. Farmers might chose to grow sesame, peanuts, flowers, watermelons and various other fruits and vegetables. There is limited data on yield and prices of these crops.

The model is partial equilibrium, and restricted to the agricultural sector, indeed only a part of the sector. There is no capital in the model, nor is there any substitution between labour and land. A general equilibrium model would be required for that. This limits what can be said about national welfare, because resource pulled into the agricultural sector appear to come from nowhere, without cost. Likewise, workers forced to leave the sector are assumed to remain unemployed.

The regional data does not include trade between the regions. At present, the regions are linked to a national pool, so regional prices tend to move with national prices. This limits what can be said about regional impacts.

In addition to expanding the coverage of products, useful refinements to the model might include improved specification of the supply side, particularly the substitution between land and other inputs. Better linkages between regions would show how shocks in one region affect output and prices in other regions. At present there is only limited data on trade between regions. The model could be liked to a microsimulation module to assess the impact at the household level. The impact on poverty could then be determined.

References

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Appendix

Appendix table A1 Average annual growth in yield of feed crops by region

	RRD	NEM	NWM	NCC	SCC	CH	NES	MRD
	%	%	%	%	%	%	%	%
Base								
Rice	1.4	3.8	3.8	3.0	5.7	5.7	2.0	3.8
Maize	3.2	4.9	4.9	5.1	5.1	4.6	4.3	1.7
Sweet potato	1.6	2.0	2.0	1.9	1.9	3.3	5.8	4.4
Cassava	6.5	2.7	2.7	5.9	4.6	3.5	4.6	5.6
Scenario								
Rice	0.9	3.3	3.3	2.4	4.7	5.2	1.2	3.5
Maize	6.7	5.4	5.4	6.5	8.9	5.0	6.6	14.2
Sweet potato	5.1	2.0	2.0	7.6	8.6	3.3	6.6	20.5
Cassava	9.9	2.7	2.7	11.7	11.3	3.5	5.4	21.6
Soy	3.1	1.1	1.1	1.8	11.6	0.9	0.0	27.6

Source: GSO and authors' estimates.