Chapter 3

Controversy over animal feed

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Industrial feed on an intensive farm in Sơn La

Intensification of crop and livestock production

A revolution in two phases

The growth in animal production was based on the boom in crop production. In reforming collectivized agriculture, Vietnam departed from a system of shortages and became self-sufficient in rice beginning in 1995. The country even started to export cereals in 1997. High-yielding varieties were introduced for rice (1980), sweet potato (1986), maize (1994) and then cassava (2000).

Today, yields per hectare reach up to 7 tons for rice, 4.5 tons for maize, 18 tons for cassava and 10 tons for sweet potatoes. Soybeans are in last place with a yield of under 2 tons per hectare. In 2013, over 60 million tons of the key annual crops were produced. Food production is growing at a rate of around 1.6 million tons per year. The rice crop today represents 90% of the country's cereal resources.

Fertilizing a rice field

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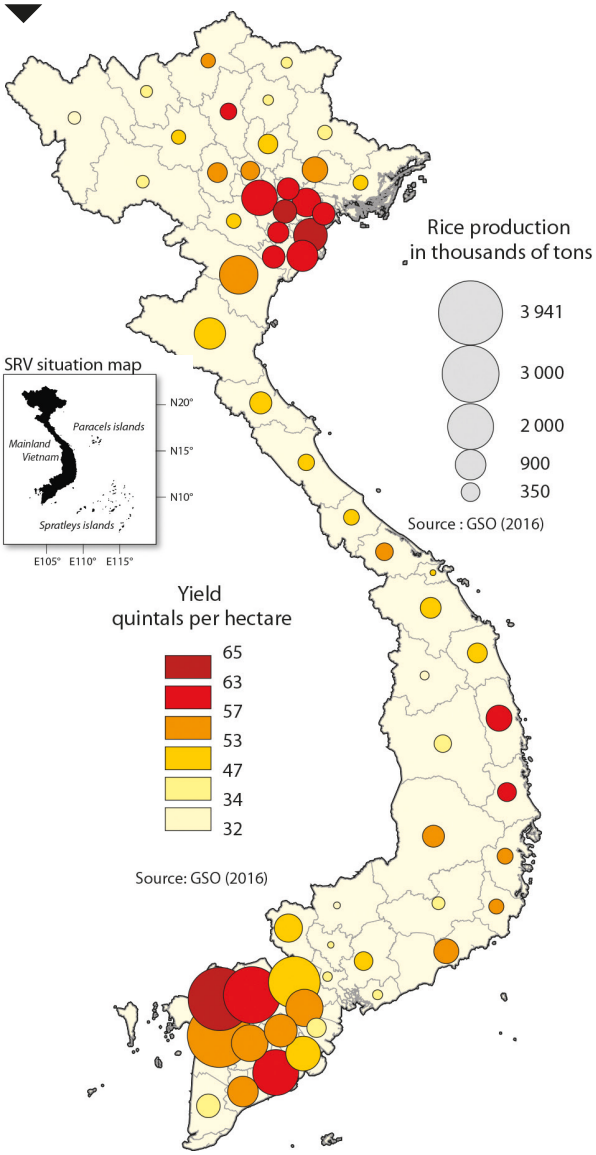
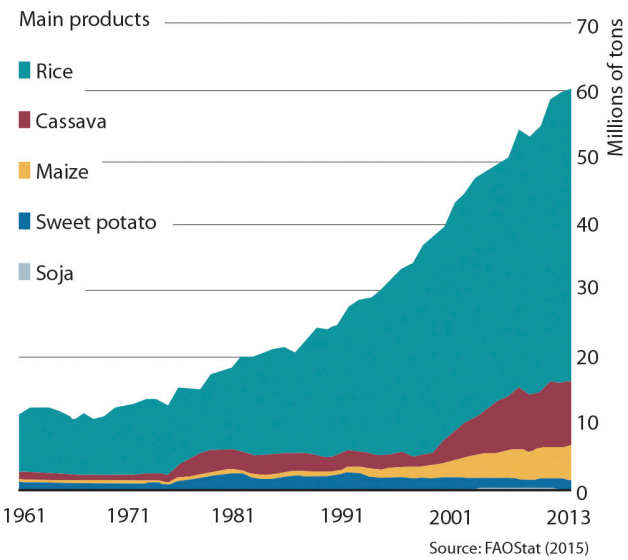
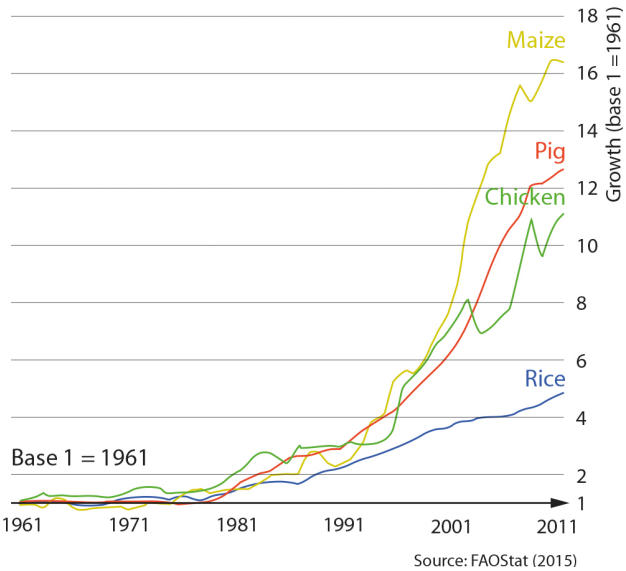
Rice: production (thousands of tons) and yield (quintals/ha/year) in 2015



Evolution of the production of the main agriculture products since 1961



Evolution of the production of rice and maize crops and pig and chicken meat since 1961



"Pre-industrial" animal feed

At the end of the 1990s, the composition of the average ration for fattening pigs in the north of Vietnam was based on rice. Rice bran accounted for 48% of the average national ration. Broken rice was 33% of the total. In sum, 81% of pig feed came from rice. Maize (7%), sweet potato (6%) and cassava (6%) made up the rest. Starting from the 2000s, the proportion of maize in rations went up to 40% in some regions, but maize was rapidly replaced by industrial feed. Today, local maize is processed by feed factories and sold to livestock producers as concentrates.

Animal and crop growth evolving together

By comparing the growth of animal and crop production, a coevolution phenomenon of the crop revolution and the livestock revolution may be observed. Rice production was five times higher in 2015 than in 1960. The production of chicken and pork was multiplied by 11 and 12.5 respectively. The increase in rice production is therefore providing a solid foundation for developing livestock production, even if it remains insufficient to feed all of the livestock. As for maize, its production is 16 times higher than in 1960.

The geographic distribution of raw materials

Rice is found in the deltas, while maize and cassava are grown in highland areas. The number of crop cycles and yields are higher in the plains than in the mountains, and generally are higher in the south of the country than the north. To make the most of the opportunity to use agricultural products in animal feed, factories are located near delta and mountain regions.

Harvest and transport of maize to Sơn La

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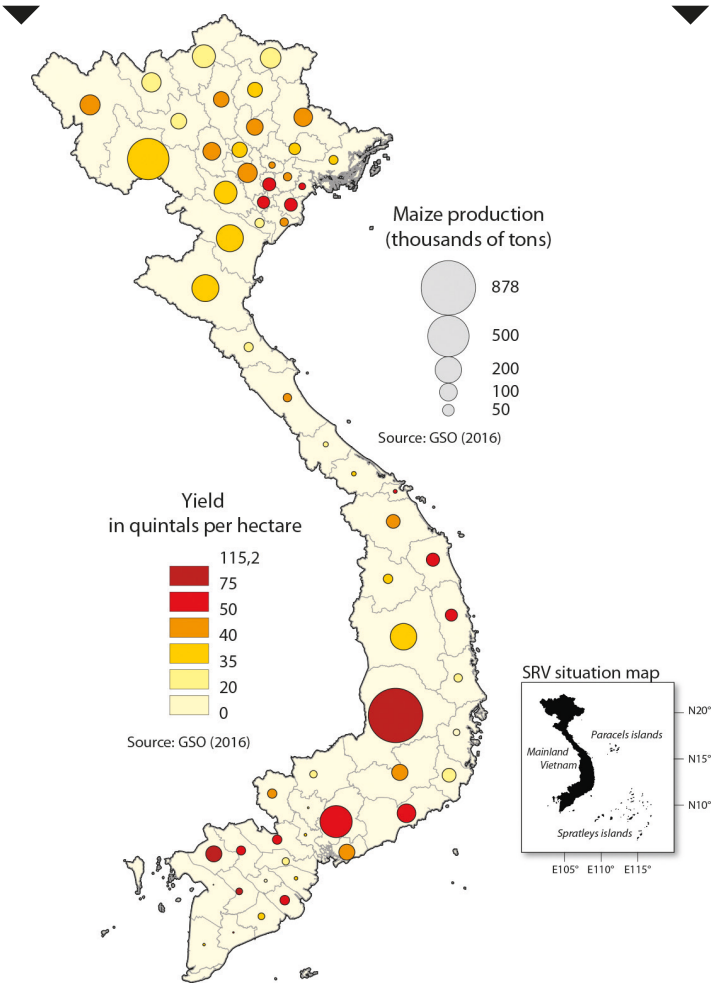
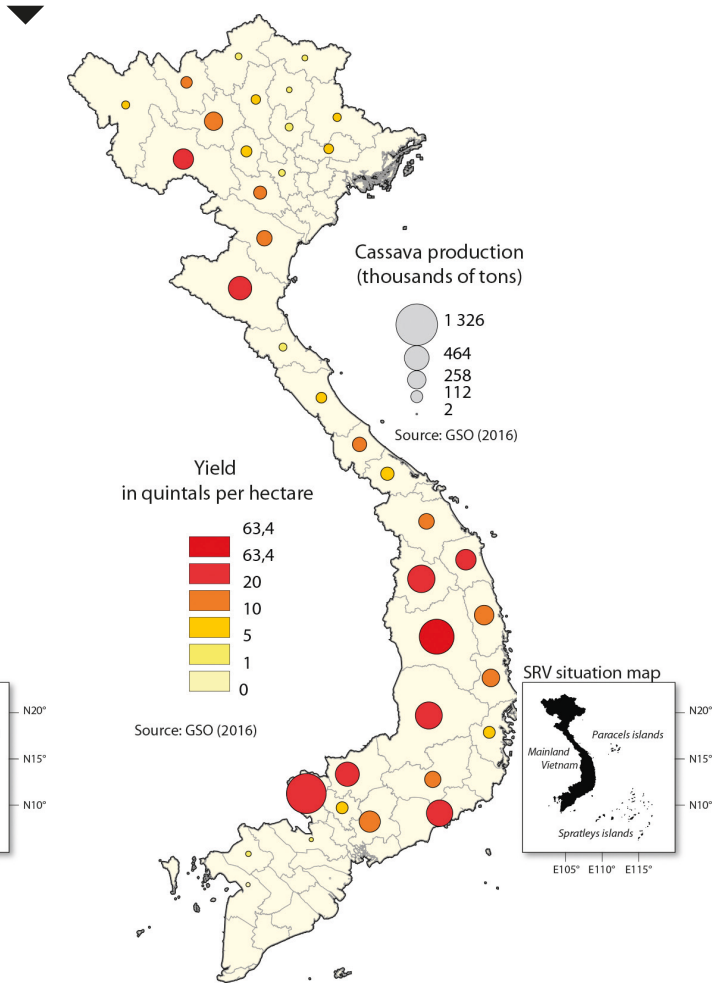
Testing GM crops before dissemination

In 2014, the Vietnamese government authorized the cultivation of four varieties of genetically modified (GM) maize resistant to insects and/or herbicides; two were produced by Monsanto, and two by Syngenta. The government expects that half of all farms will cultivate GM crops by 2020. According to official data, 45,000 hectares (4% of the total) were planted in 2015 alone. The pressure of imports against a backdrop of climate change has led the government to adopt this new crop strategy.

Maize: Production (thousands of tons) and yield (quintals/ha/year) in 2015



Cassava: Production (thousands of tons) and yield (quintals/ha/year) in 2015

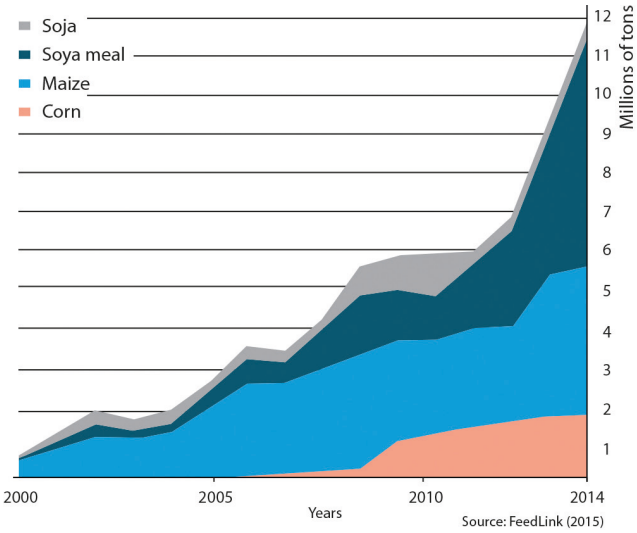


Surging livestock feed imports

Imports driven by demand

In 2000, soybean and maize imports amounted to approximately 500,000 tons. These imports reached almost 12 million tons in 2014 and 13.5 million tons in 2015. The first strong growth occurred between 2000 and 2003, then between 2004 and 2007, and then again between 2012 and 2015. This last increase was particularly impressive in terms of volume but corresponded to the same rate of growth. Indeed, in each wave of growth, imports essentially doubled in volume. However, these surges of imports did not always involve the same products. Between 2000 and 2010, maize imports accounted for the majority of imports, while after 2010, soybean imports increased sharply.

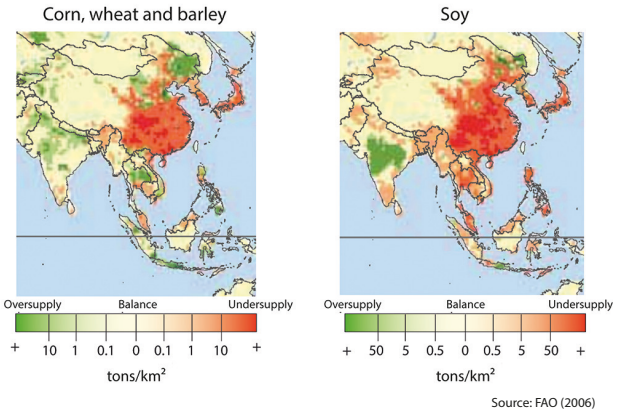
Evolution of imports of the main agricultural products used for animal feed since 2000



Asia's increased dependence on soybeans and maize

Asia is facing a very strong imbalance between the production of corn and soybean and demand from livestock farms, particularly in China and Vietnam. This region of the world cannot meet the rising demand for animal products without importing increasing amounts of agricultural raw materials for their herds. This question is crucial to the sustainability of Asian livestock systems.

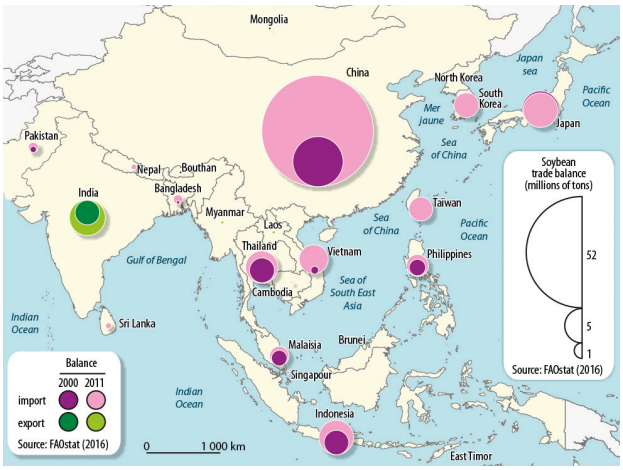
Estimation of agricultural output (maize, wheat, barley, soybean) compared to demand from livestock farms in 2000



Sharply increasing soybean imports

Since 2008, soybean imports have been growing at a rapid pace. Between 2012 and 2015, they literally tripled. This development is being driven by the increasing needs of industrial livestock farms, and particularly poultry farms. This increase in volume is in fact coupled with a very strong increase in value. According to the FAO, this development in Vietnam is greater than in any other Asian country relative to the volumes imported in the early 2000s. Vietnam's soybean imports grew four times faster than China's. This situation is causing stock ruptures on an animal feed market which is itself increasing in overall value by 10% per year.

Comparison of soybean trade balances in Asia between 2000 and 2011



Asia's overall impact on global soybean trade

Global soybean trade has increased from 8 million tons in 1990 to over 65 million tons in 2011. Three quarters of this goes to Asia, of which East Asia (China, Japan, Korea) alone accounts for 64% of the overall total. For maize, East Asia currently imports 39 million tons, compared to 29 million in 1990. Its dependence on maize is lower because the region's own output fills a large part of its needs. This region nonetheless imports about one third of world maize flows.

Sacks of animal feed arriving in Ho Chi Minh City

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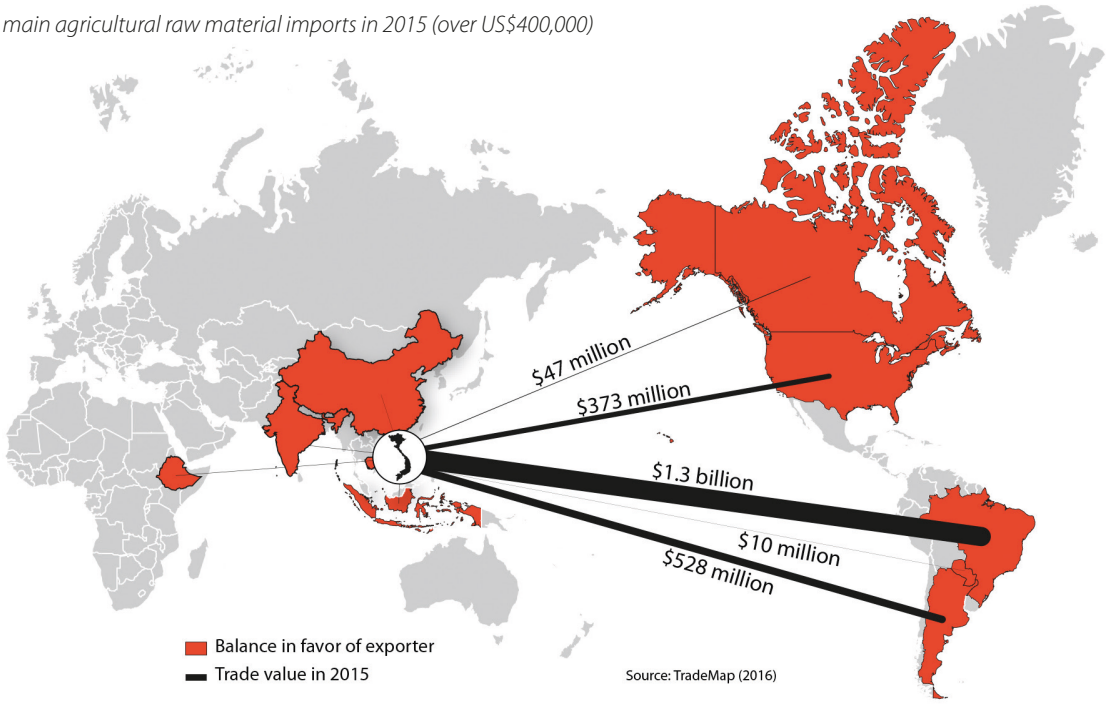
Value of the main agricultural raw material imports in 2015 (over US$400,000)



Sharply increasing values

According to international trade statistics, the value of Vietnamese imports of the main ingredients for livestock feed is at a record high. In 2014, imports of maize were valued at US$1.2 billion while soybean imports exceeded US$873 million. In 2001, these same imports were just US$3.5 million for maize and US$28 million for soybeans. Between 2008 and 2015, the increase in the price of raw materials was 10 times higher than that of volumes. Faced with this situation, the government decided to lower taxes on imports.

Evolution of taxes on imports

In November 2014, the National Assembly adopted law 71/2014/QH13 concerning taxes on soybean imports. Between 2014 and 2015, these taxes dropped from 2% to 0%. For other raw materials, they dropped from 10% to 2%. This situation has contributed to a steep increase of imports, thereby stimulating the volume of the animal feed industry. At the same time, bountiful soybean harvests in Brazil and Argentina helped to reduce soybean prices between 2013 and 2015. In contrast, the price of maize continues to increase on international markets. Even though volumes are relatively stable, the bill continues to increase.

Article from the Vietnam News on tax exemptions for animal feed

14 Việt Nam News vietnamnews.vn BUSINESS Wednesday September 3, 2014

PM backs VAT exemption for animal feed

HÀ NỘI — The Prime Minister is supporting the proposal of the Ministry of Finance to include animal feed in the list of products exempted from value added tax (VAT) payment.

The Prime Minister told the ministry to submit for review and approval the proposal at the Eighth Session of the 13th National Assembly due late this year.

A five per cent VAT rate is currently being imposed on animal feed. The proposed exemption aims to stabilise the price of feed in the domestic market and benefit the farmers, who have had to deal with diseases, declining consumption and other difficulties in breeding farm animals in recent years.

The farmers' situation further worsened following the increase in feed prices last year. The Department of Livestock Production attributed the increase to the country's dependence on imported raw materials for production and foreign producers' domination of the industry.

Animal feed is produced at Guyomarch Việt Nam. The finance ministry's proposal to include animal feed in the list of products exempted from value added tax (VAT) payment now has the Prime Minister's support. — VNA/VNS Photo Minh Đức

Figures from the Ministry of Agriculture and Rural Development showed that Việt Nam has 58 animal feed producers with more than 200 feed production plants. Foreign animal feed producers make up one-third of the total and account for around 65 to 70 per cent of the market.

According to Nguyễn Đăng Vang, President of the Việt Nam Husbandry Association, a VAT exemption for animal feeds is good news for farmers, who expect the price of animal feed to fall.

To further boost breeding and aquaculture and ensure that Government support reaches the farmers, the Ministry of Finance has been asked to help the Ministry of Agriculture and Rural Development and other concerned authorities in tightening management of the pricing of imported and locally-produced animal feed, as well as quality standards for and measures to protect local animal feed production.

Regarding tax policies on agricultural inputs such as fertilisers, pesticides and veterinary medicine, the Prime Minister ordered concerned ministries to formulate policies that conform with the Government's agricultural development and taxation system reform strategies for 2011-20. — VNS

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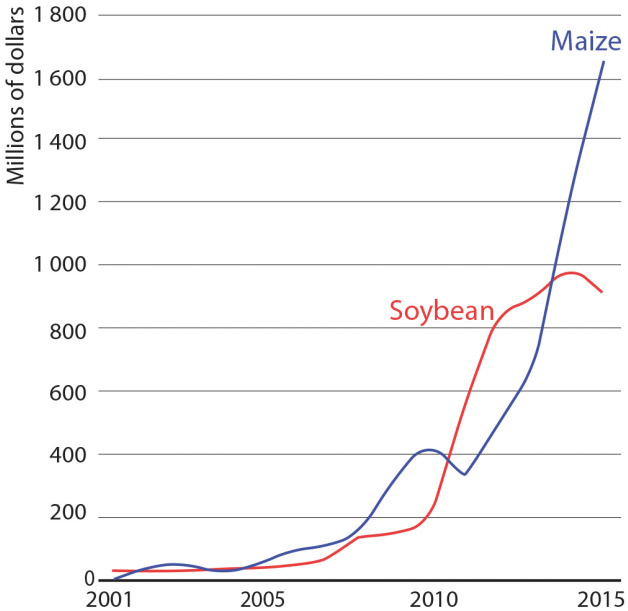
Imports from the Americas

Brazil, Argentina and the United States together account for more than 95% of the value of agricultural raw materials imported for animal feed. For purposes of comparison, in 2015, Vietnam earned US$2.2 billion from rice exports, while maize and soybean imports cost the country more than US$2.5 billion. In value terms, the trade balance for cereals and protein crops has fallen into a deficit.

The massive industrialization of animal feed

Overall, five companies manage the soybean and maize trade. By lowering its import duties, Vietnam is seeking to attract industrial investment and increase bulk volumes with the intent of becoming a regional player in industrial feed production in order to then re-export within the ASEAN market, or even to China.

Evolution of the value of agricultural raw material imports (maize/soybean) since 2000



Source: TradeMap (2017)

Emerging livestock feed industry

Emergence of animal nutrition agro-industry

Since the 1990s, Vietnam has encouraged foreign investors to build industrial feed factories. The Thai company Charoen Pokphand (CP) started operating near Ho Chi Minh City in 1988. In approximately 20 years, the company created a network of about one dozen factories. In 1991, Proconco, then a Franco-Vietnamese company, set up operations in the port of Biên Hòa, 10 km north of Ho Chi Minh City, and then in the port of Hải Phòng in the north of the country. In 1995, after economic agreements between the United States and Vietnam were signed, the American company Cargill also set up shop in Biên Hòa. It extended its distribution network into the south of the country, followed by the north and center. In 2009, the country had 260 companies specialized in animal feed. The top 17 companies accounted for 73% of production. Only one company in the "top 10" was Vietnamese.

Feed factory on the road between Hải Phòng and Hanoï

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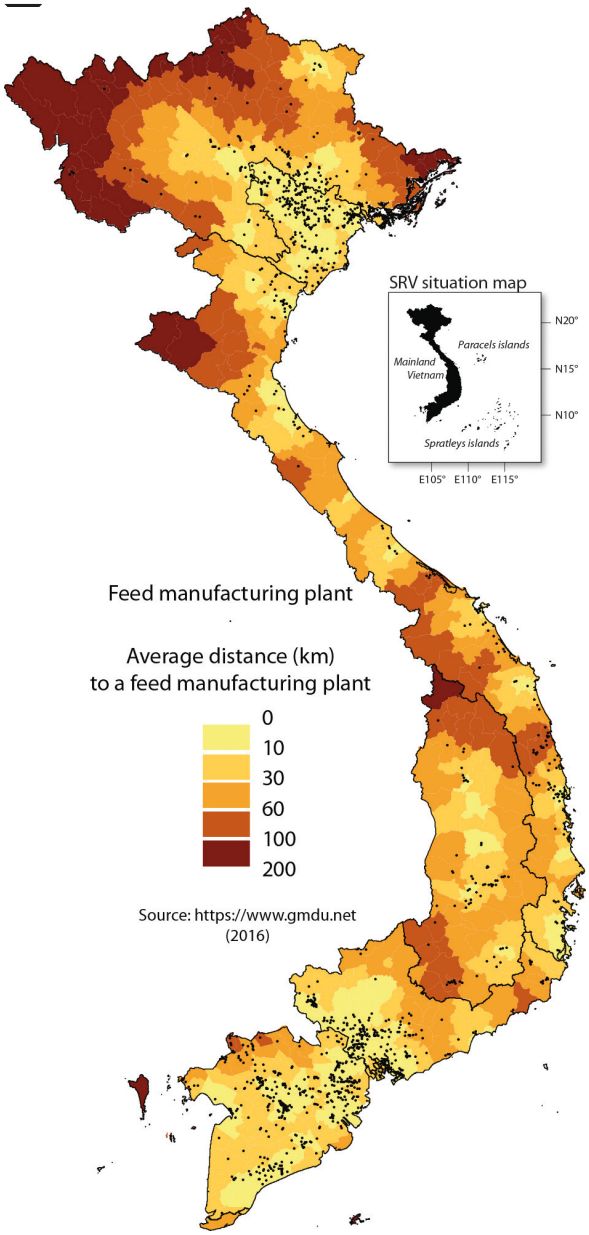
A strategic but poorly described sector

The geography of livestock feed factories is poorly described. Various lists of livestock feed companies can be found on the internet. Some are detailed but dated, while others are incomplete but more recent. Using the best lists, it was possible to georeference some of the feed factories. It was difficult to determine the volume produced on each site. A specific study would be required to provide supplementary information on these agro-industries.

The spatial spread of industrial feed

Based on the location of the country's 260 feed factories, it is possible to estimate the average distance to a feed production site for each district. The mapping of feed factories renders it possible to understand the spatial organization of the distribution of different livestock production systems. On the outskirts of Ho Chi Minh City and in the Red River Delta, there is at least one feed factory within 10 km. In the center of the country and along the borders, average distances to reach a feed factory exceed 100 km. The use of industrial feed in livestock production is lower in these areas than elsewhere in the country.

Distribution of feed factories and average distance per district in 2014



Industrial feed on a farm in Mai Sơn

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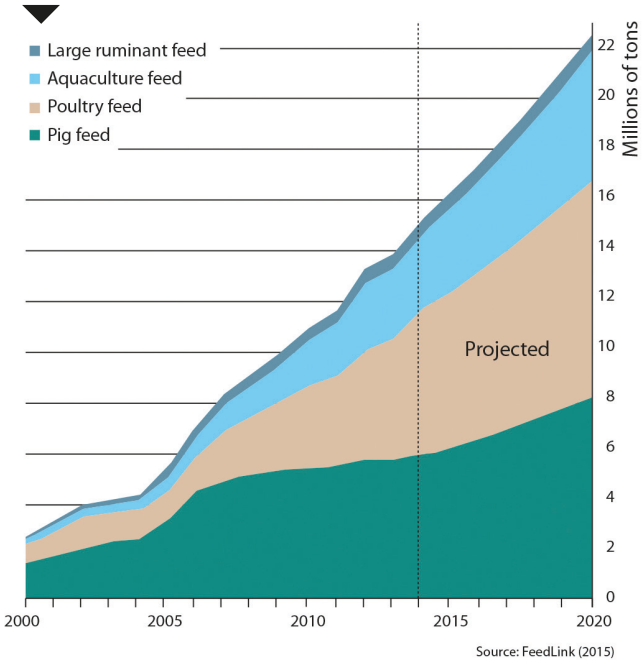
Evolution of industrial feed production by type of species since 2000



Pig feed, the starting point of industrialization

Until only recently, industrial animal feed was mainly intended for pig farming. In 2007, about 60% of the volume of feed produced by agro-industries went to pig farms. In 2015, pig feed only represented 37% of the total. The volume of pig feed in effect did not increase much between 2007 and 2015, rising from 5 to 6 million tons.

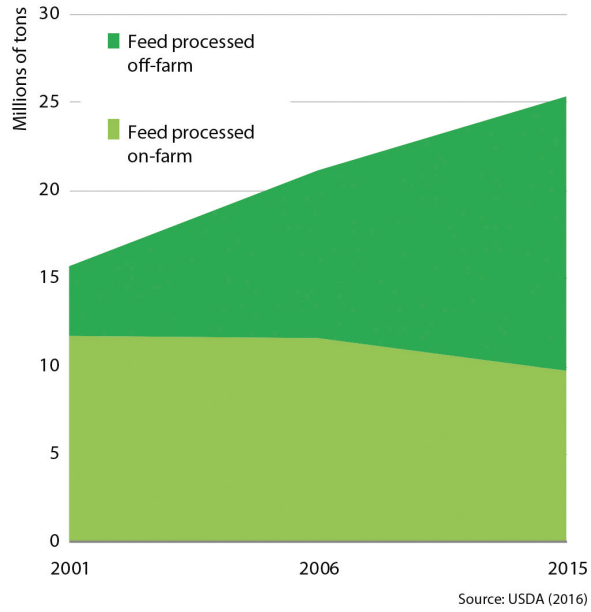
Poultry farming well positioned for the future

In contrast, the volume intended for poultry farming increased from 2 to 6 million tons between 2007 and 2015 and is now on par with the pork sector. The aquaculture sector also is growing rapidly but remains in second place in terms of volume. Estimations by species shows a resumption of growth in the pork sector after 2015. Even if this recovery takes place, in terms of volume, the pig sector will be overtaken by poultry by 2020.

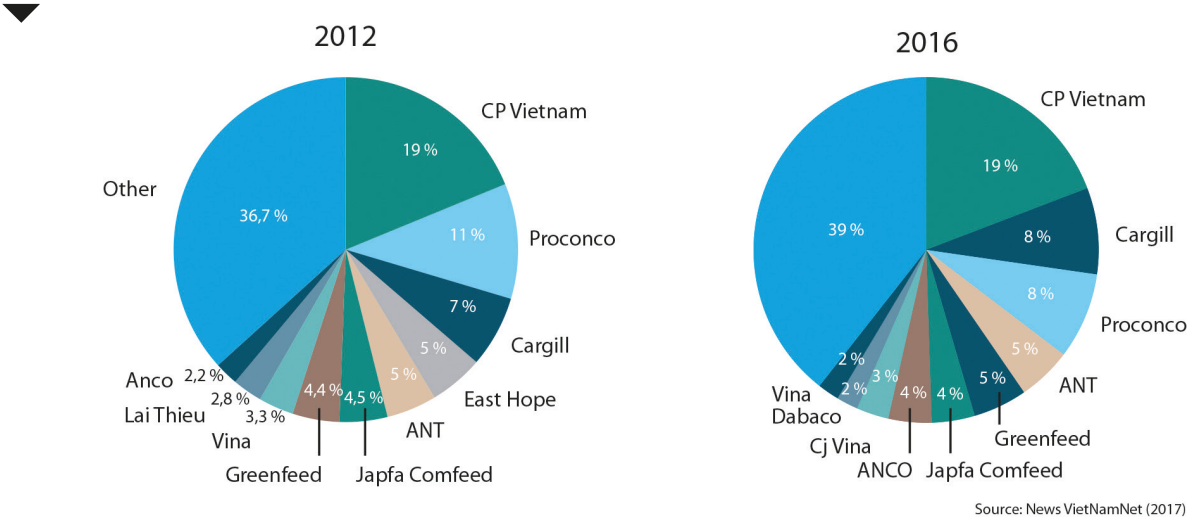
The growing dependence of livestock systems

According to the U.S. Department of Agriculture (USDA), in 2015, Vietnam produced about 13 million tons of agricultural raw materials for livestock. 5.3 million came from maize crops, 5 million from rice crops. Moreover, there were 500,000 tons of broken rice and 1 million tons of cassava. However, the demand was for over 25 million tons of raw material. The country consequently imported 12 million tons of raw material, mainly soybeans (5.2 million tons) and maize (2.9 million tons). Other commodities such as wheat, livestock by-products and additional components (animal meat and bonemeal, fishmeal) accounted for almost 1.8 million tons. This highly dynamic market has already changed considerably. Farms have become very dependent on industrial feed. Indeed, according to the USDA, the penetration rate of industrial feed in animal nutrition has increased from 21% in 2001 to 65% in 2015. This average hides a wide variety of penetration rates under various livestock farming systems.

Average change in volume of feed processed on and off livestock farms since 2001



Comparison of the market share of the main livestock feed companies in Vietnam between 2012 and 2016



Deforestation and animal feed: how are they linked?

Deforestation in Vietnam: abandoned for half a century

Vietnam has long been known for its rapid deforestation. Between 1950 and 2000, the country's forest cover rate dropped from 40% to under 10%. Logging and agriculture have been the two main drivers of this loss of forest cover. Under the Đổi mới reforms, small farmers could cultivate the land on forest slopes. In the center, coffee trees have replaced wooded areas, while in the north, smallholders are growing maize and cassava instead. The latter two crops, which are used for animal feed, are helping to reduce reliance on imports, and explain why feed factories are located near mountain areas. However, these annual crops raise several environmental questions because they lead to substantial soil erosion when land is put under cultivation.

Cattle feed and agro-forestry: is there a potential?

How can one reconcile annual crops cultivated on sloping land with the protection of resources and soils? Conservation agriculture and landscaping, such as *Sloping Agricultural Land Technology (SALT)*, seem to be potential ways to address the multiple needs of production and resource conservation. However, the government is implementing a new reforestation policy with a higher level of protection for mountain slopes. In some districts, hundreds of smallholders lost access to land when slopes were put under protection. This loss of cereal and tuber production is compensated in the plains by the introduction of high-yield GM crops and maize imports, which are less expensive than the maize produced in the highlands. Grass-fed ruminant farming is gradually developing with the return of the forest.

Advertising for hybrid maize seeds in the province of Sơn La

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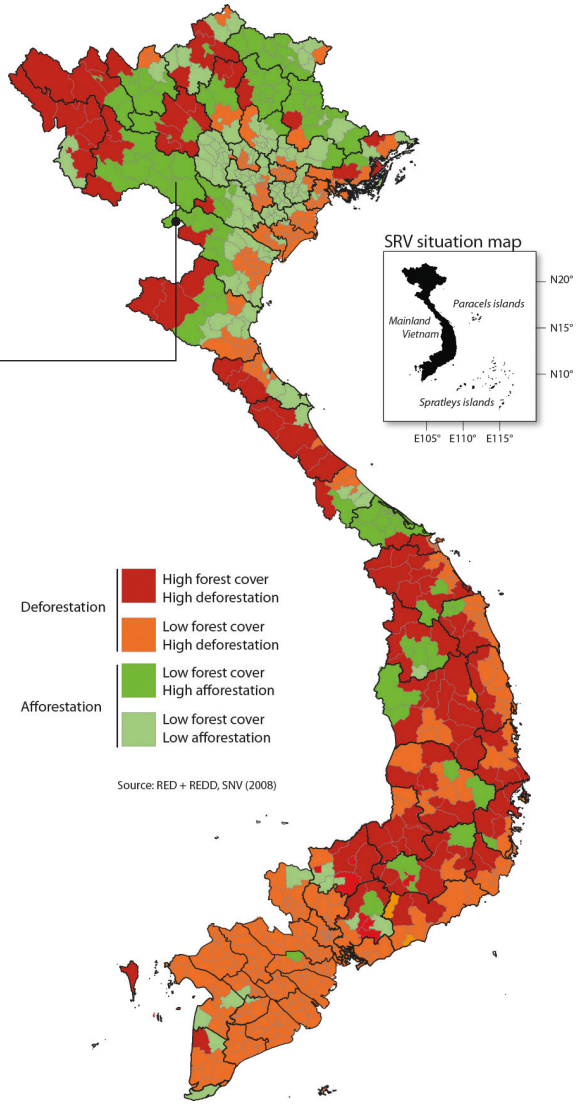
Evolution of forest cover by district between 1998 and 2008



Forest cover in Sơn La in December 1995

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Forest cover in Sơn La in December 2015

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