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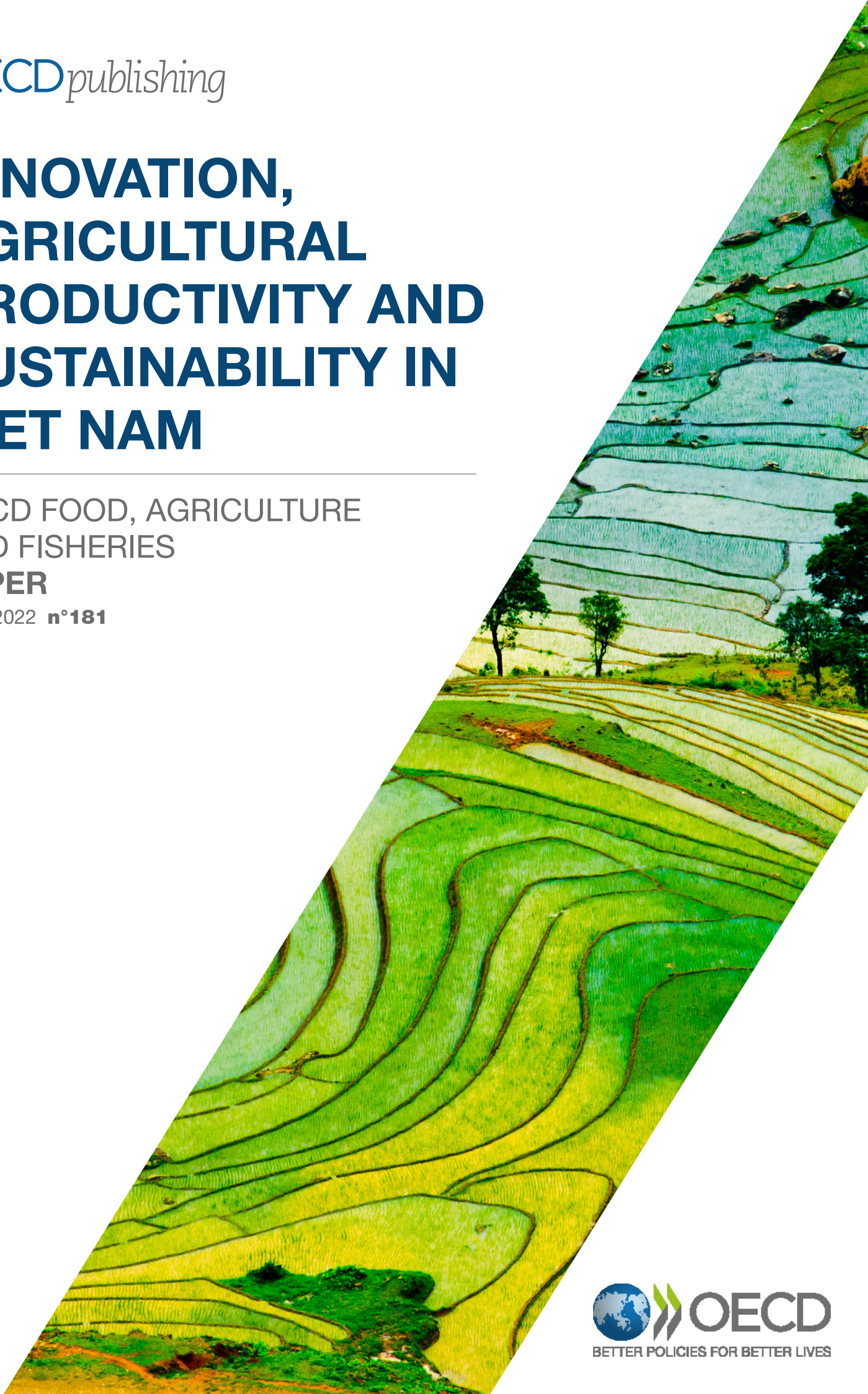

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Innovation, Agricultural Productivity and Sustainability in Viet Nam

Emily Gray and Darryl Jones

This report assesses Viet Nam's agricultural sector through the lens of the OECD Agro-food Productivity-Sustainability-Resilience (PSR) Policy Framework. Agriculture has played an important role in Viet Nam's remarkable economic growth over the past thirty years. In the 1990s, government policies contributed to strong agricultural productivity growth, but this has since fallen. OECD Agri-Environmental indicators also reveal weaknesses in the environmental footprint of growth, notably with respect to nutrient balances, as a result of the excessive use of agro-chemicals and poor animal waste management practices. The agricultural sector faces significant resilience challenges from climate change impacts, including sea level rises and more frequent and severe storm events. Although the level of agricultural support provided to farmers is relatively low, policies such as land use regulations are skewed in favour of rice production, thereby maintaining a production structure dominated by small part-time household farms that limit innovation. Viet Nam's support for general services for agriculture (GSSE) was equivalent to 2.5% of agricultural value added in 2018-20, well below the OECD average. Shifting the focus of support towards research, development, and innovation partnerships with the private sector will contribute to improving the agri-environmental performance of agriculture in Viet Nam. This should ideally be accompanied by a reform of land use regulations.

Key words: Agricultural productivity, agricultural policies, environmental sustainability

JEL codes: O13, O3, Q1, Q18, Q24

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Key messages

- The agricultural sector has played an important role in the strong and stable growth experienced by Viet Nam over the past thirty years, providing export returns, food for the growing domestic population, and labour for the expanding manufacturing and service industries.
- Support provided to Viet Nam's agricultural sector fluctuates at low and negative levels. In 2018-20, Viet Nam's producer support estimate (PSE) was -9.2%, implying an implicit overall taxation compared to the positive level of support in 2000-02. Budgetary transfers to producers are relatively small.
- Government policy measures, including a significant opening of the economy and irrigation infrastructure, contributed to strong productivity increases during the 1990s and 2000s. However, productivity growth has fallen in the 2010s.
- At the same time, the negative environmental impacts of high agro-chemical use and poor animal waste management have increased as showed in the OECD Agri-Environmental indicators such as high values of nutrient balances. The agricultural sector also faces significant resilience challenges from climate change impacts including sea level rises and more frequent and severe storm events.
- The sector is dominated by small, part-time household farms. Farmers show a strong willingness to adopt innovation in response to market opportunities, but creative innovation is weak. While the level of support provided to farmers is low, policies such as land use regulations are skewed in favour of rice production. There are also policy implementation challenges such as enforcing environmental regulations, maintaining infrastructure and co-ordinating across agencies.
- Greater effort is needed to strengthen the implementation of existing policy initiatives or frameworks. These include the reintroduction of the irrigation service fee, the development of appropriate risk management schemes and enforcement of environmental regulations.
- Restrictions on land use need to be reformed to provide greater opportunities for more efficient farmers to expand, innovate and produce what the market demands.
- Support for general services for agriculture (GSSE) was equivalent to 2.5% of agricultural value added in 2018-20, below the OECD average of 5.6%. Expenditure to develop and maintain infrastructure, in particular irrigation, dominates support for general services. Research, development, and innovation partnerships with the private sector need to be developed to provide increased funding, appropriate technology, and stronger market linkages.

Executive Summary

The agricultural sector in Viet Nam has undergone a massive transformation over the past thirty years. Many factors, including government policy actions, have contributed to this. Important measures include land reform, increased market competition and market based incentives, the provision of irrigation and flood protection infrastructure, and the making available of modern technologies and practices. Viet Nam is one of the most open economies in the world. Overall, the level of support provided to farmers is low, even slightly negative implying an implicit overall taxation compared to the positive level of producer support estimate (PSE) in 2000-02. The agro-food sector has shown a strong willingness to adapt to these market developments, with a shift in land use to higher value export commodities, and livestock production to feed growing domestic demand.

However, productivity growth, whether measured by total factor productivity or commodity yields, has fallen over the past decade. Despite reforms, Viet Nam's agricultural sector remains dominated by small, part-time household farms, and skewed in favour of rice production. Moreover, the productivity increases have come at the expense of environmental degradation. There is an excessive use of fertilisers and pesticides by crop farmers and poor waste management practices by livestock producers. The resilience of the agricultural system is under threat from climate change. Viet Nam is already considered one of the countries most affected by natural disasters, and these are expected to increase because of anticipated sea level rises and higher rainfall events. Finally, while the sector is willing to adopt innovation, it is relatively weak in terms of creative innovation and the skills of extension workers need to be expanded. Support for general services for agriculture (GSSE) is below the OECD average and focused on developing and maintaining infrastructure, in particular irrigation, rather than on Knowledge and Innovation.

To overcome these challenges, policies need to focus on five key areas: consolidating economic stability and trust in institutions; ensuring market incentives for private investment and innovation; building capacity through the provision of essential public services; incentivising the productivity and sustainability of the agro-food sector-specific incentives; and strengthening the agricultural innovation system. Specific actions in each of the five area include:

- Strengthen the environmental regulatory framework that is already in place through improved monitoring, compliance and enforcement, and co-ordination between central government ministries and with local authorities.
- Freeing up the allocation of scarce land resources so that farmers have more control over the area of land that they can use and the output they can produce.
- Continue to support infrastructure development and the ability of farmers to access to finance. While investment is needed to maintain irrigation and flood protection infrastructure, it is also required to improve logistic and digital connections.
- Support the development of appropriate risk management schemes and reintroduce the water user fee for farmers, in line with the OECD Council Recommendation on water. The former will provide farmers with instruments to cope with shocks, while the later will encourage the more efficient use of a growing scarce resource, and both will contribute to resilience.
- Increase spending on research, development and innovation by both the public and private sector. The development of partnerships with the private sector will not only provide a source of funding, but will help ensure the transfer of appropriate technology and improve the linkages between farmers and the market.

1. Overall assessment and recommendations

The OECD Agro-food Productivity-Sustainability-Resilience (PSR) Policy Framework responds to the Declaration of the 2016 OECD Agricultural Ministerial and is the benchmark used for this review (OECD, 2020[1]). This report refers to Viet Nam's agro-food sector, which excludes the fishery (including aquaculture) and forestry sectors unless otherwise stated. Following the framework, Section 2 provides two important building blocks of information; setting out the context of the agro-food sector in the economy, its general structure and its role in trade; and the broad macroeconomic environment and quality of governance.

Section 3 discusses the economy-wide policies that impact on the performance of the Vietnamese agro-food sector. Nine general policy areas have been identified as particularly relevant in the case of Viet Nam. Six areas related to markets, finance and investment: trade and foreign investment, competition, finance, taxation, infrastructure and rural development. And three areas linked to natural resource management and environmental sustainability: land use planning, environmental protection and climate change and product and process regulations. Section 4 examines agricultural policy, covering support provided directly to agricultural producers through prices and direct payments, and indirectly in the form of general services. One category of general services is discussed in detail because of its historical and on-going dominance in Viet Nam: the provision of irrigation infrastructure. Section 5 focuses on the agricultural knowledge and innovation system, a key focus of this report. The final chapter assesses some aspects of the three drivers of agricultural performance identified in the PSR framework: natural resources, structural adjustment and innovation; and then finally the performance in relation to productivity and the environment outcomes.

The framework identifies four channels through which policies affect the drivers and hence performance of the agricultural sector. This chapter uses these four channels to provide the overall assessment and recommendations.

- Economic stability and trust in institutions (justice, security, property rights), which are essential to attract long-term investment in the economy.
- Market incentives and private investment, through a regulatory environment that does not hinder innovation and enables competition, ensures sustainable use of resources, and facilitates the adoption of new technologies; trade that facilitates flows of goods, capital and knowledge; access to finance and tax provisions.
- Capacity building, including provision of essential public services, which facilitates access to markets and knowledge, and improves skills needed to innovate and improve resource use efficiency.
- Agro-food sector-specific incentives for innovation, structural change and sustainable resource use, derived from agricultural policy and agricultural innovation policy.

1.1. Overall assessment

The remarkable transformation of Viet Nam's agricultural sector over the past three decades owes much to the response of mainly small, independent household farms to the introduction of market-based incentives in the early years of *Doi Moi* (second half of the 1980s). Farmers responded to land reforms and the partial lifting of restrictions on markets by adopting modern technologies and practices, including Green Revolution technologies, and shifted towards higher value crops and livestock. This helped drive sustained and rapid growth in agricultural output, transforming Viet Nam from a net food importer into a leading exporter of a diverse range of commodities, and contributing to significant reductions in poverty rates and food insecurity.

However, the agricultural reforms initiated by the *Doi Moi* have largely run their course. Growth in agricultural output and productivity is slowing, and most of the easy sources of lifting production – expanding the agricultural land area and increasing fertiliser and pesticide use – have been fully exploited. Viet Nam's agro-food exports are frequently sold at a discount due to their low (or inconsistent) quality, and the sector faces increased competition from imports as the country deepens its integration into the regional and global economy.

Unsustainable practices are widespread, including excessive use of agro-chemical inputs, intensive cultivation and poor livestock waste management practices. This has contributed to significant natural resource degradation, including of land and water. Increasingly, agricultural pollution and natural resource degradation are constraining output growth and affecting quality – and lowering Viet Nam's competitiveness and reputation in export markets as a result. Climate change and natural disasters also pose a significant threat to the resilience of Vietnamese farmers and the agricultural sector more broadly, with the country likely to experience temperature increases, greater climate variability, and more frequent and intense extreme weather events.

Economic stability and trust in institutions

Viet Nam has experienced strong, stable and inclusive economic growth since the early 1990s, weathering various external crises with relative ease in comparison to some of its Asian counterparts. It has managed to achieve this while transitioning to an open market economy. Foreign investment and export-led growth have been central to Viet Nam's development strategy over the past three decades. Efforts have been made to strengthen governance systems by increasing transparency, accountability and citizen participation, reducing corruption, and improving the assessment and review aspects of the policy development process.

Despite these efforts, challenges remain. Corruption continues to be highly problematic for doing business. Land administration, particularly access to land-related information and the process of certifying land use rights, is considered one of the more corrupt aspects of public administration. There remain many overlapping and inconsistent policy documents due to the large number of agencies that are responsible for different aspects of policy development. Often policies are announced without adequate attention being paid to how they will be implemented. Execution is also hampered by limited resources, particularly at the local government level.

Viet Nam is increasingly mainstreaming environmental protection into national and sectoral development plans. Comprehensive environmental and agri-environmental legislation, regulations and policies exist. However, the effectiveness of these on environmental protection is limited by implementation challenges related to weak monitoring, compliance and enforcement. Unclear responsibilities and a lack of co-ordination between ministries, departments within ministries, and with local authorities, contributes to weak enforcement of laws and regulations.

Market incentives and private investment

Viet Nam is one of the most open economies in the world, and actively pursues trade liberalisation through regional and bilateral trade agreements. This deeper integration into the global economy, including through trade agreements such as the Comprehensive and Progressive Agreement for Trans-Pacific Partnership, brings the agricultural sector opportunities to expand and diversify exports and markets. But these agreements also pose challenges to domestic producers, such as increased competition from imports as agro-food tariffs are reduced and the requirement to meet stringent food hygiene, safety and technical standards in export markets. Further, the historical approach in Viet Nam emphasises the development of a few prioritised competitive commodities in the international market, such as rice, coffee, natural rubber. This bias has exposed Vietnamese agriculture to providing products into highly competitive world markets. As an essential change in the approach, Viet Nam's agricultural production should give priority to quality instead of quantity development.

An inefficient production structure constrains the further development and modernisation of the agricultural sector. Viet Nam's agricultural sector is dominated by small household farms, and structural transformation is occurring only slowly. Land scarcity and the small and fragmented scale of production acts as a constraint to innovation on-farm and greater participation in markets (for example, in dealing with upstream and downstream enterprises in agricultural value chains). Smallholders also face difficulties in meeting food safety and quality standards, as well as other certification requirements needed to access export markets.

Private investment in agriculture and rural areas is low, and linkages between enterprises, agricultural co-operatives and farmers in agricultural value chains are weak. Agro-food enterprises and agricultural co-operatives have a role in connecting small household farms to markets and facilitating access to technology

and knowledge. However, there exists a range of constraints to private investment in agriculture, and few enterprises have established durable linkages with farmers due, in part, to their small scale and weak financial capacity. Most Vietnamese enterprises are small and micro enterprises. Few can afford the investment required and most struggle to meet the conditions for support being offered by the government, particularly support targeting the application of high technology in agriculture.

One of the specific characteristics of the Vietnamese economy has been the role played by state-owned enterprises (SOEs). Reforming SOEs is a government priority but progress has not occurred as fast as planned. While SOEs (and ex-SOEs) no longer play a major role in agricultural production, they still have a considerable degree of influence over some agricultural sectors through their involvement in processing and trade, as well as in supplying inputs to farmers. There remain SOEs in the agriculture sector in relation to the production and trade of tea, sugar, coffee, natural rubber and rice. Private enterprises face unfair competition from SOEs, which benefit from close connections to government regulators and policymakers, and preferential access to credit, land and other resources, distorting resource allocation in the economy.

Capacity building including provision of essential public services

The Vietnamese Government has identified infrastructure development as one of the priority areas to achieve the country's development objectives. Considerable progress has been made in improving some aspects of infrastructure, particularly transport networks. This contributed to welfare improvements in rural areas by increasing agricultural productivity and connecting farmers and rural communities to larger markets. However, serious infrastructure bottlenecks remain and are likely to increase as Viet Nam's economy continues to grow. Government spending has generally focused on expanding existing networks rather than maintaining them, and quality has not kept pace with demand. Furthermore, strengthening broadband and mobile phone coverage is essential to improve the efficiency of agriculture through the integration of digital solutions.

Limited access to credit constrains private investment in agriculture, by farmers (including smallholders) as well as agricultural co-operatives and enterprises. Co-operative banks and other private financial institutions have not achieved significant coverage in rural areas – in part because the Vietnam Bank for Social Policies (VBSP)'s subsidised interest rate creates an uneven playing field, making it difficult for MFIs and co-operative banks to compete. Conditions to access loans also constrain borrowing by small-scale farmers and agricultural co-operatives. Formal financial institutions only accept legally registered assets as collateral – the primary asset being the Land Use Right Certificate (LURC). Banks can be reluctant to offer loans because of the perceived riskiness of agricultural investments and farmers' inability to repay loans.

Broader rural development programmes have had an impact on agricultural development and structural adjustment in Viet Nam. Increased off-farm income and employment opportunities resulting from these have allowed the transition of employment away from agriculture to other rural occupations thereby mitigating farm household income risk. While there has been a significant improvement in access to services, gaps in remote areas remain, especially in human capital investment.

Agro-food sector-specific incentives

Agriculture remains a strategic priority for the government of Viet Nam. Agricultural policy objectives are set out in a number of documents and plans which often set specific targets and various actions for their achievement. In general, these objectives align with the outcomes that are being assessed through the PSR framework. Objectives are pursued using output and input subsidies, and the provision of services to agriculture generally. An irrigation service fee (ISF) exemption has been provided since 2009, and between 2012 and 2019 a per hectare payment was made to rice growers. Subsidised plant genetic and animal breeding material is provided to farmers, but usually in response to natural disasters or disease outbreaks. Policies to support the uptake of insurance by agricultural producers have continued to be adopted.

Overall, the level of support is low, and is often negative. This is because producers of export-competing commodities such as rice, natural rubber, coffee, cashew nuts and tea are implicitly taxed in that producers are paid prices for their outputs that are lower than international prices. However, it would be incorrect to interpret implicit taxation as solely the result of a desired policy outcome as poor infrastructure and other factors can impede the transmission of prices. Furthermore, in the case of rice, both a strategic staple and

an important export commodity, the government wants to keep prices paid by final consumers at an affordable level. Producers of import-competing commodities are supported by tariff protection. But this is reducing overtime because of trade liberalisation.

Since the 1970s the Vietnamese government has invested a significant amount of capital into improving and expanding irrigation and protecting flood prone areas from damage. Expenditures on irrigation and flood protection systems dominate general services for the agricultural sector, accounting for more than 50% of the USD 870 million average annual total expenditure on general services in 2018-20. Information and statistics on irrigation are uncertain because of confusion and weakness in data collection but evidence suggests that the condition of many dams has deteriorated due to neglect or lack of maintenance.

Viet Nam is also underinvesting in agricultural research. Expenditure on research represents just 0.2% of agricultural GDP. Furthermore, public research community has a relatively poor understanding of value chains and export markets. This has resulted in a disconnect between market requirements and the public research that is being delivered. Vietnam's private sector has traditionally played a relatively limited role in defining the country's research agenda, conducting in-house research, or funding government or university-led research. Private sector research needs to be actively encouraged.

There has been also limited government investment in the extension service which is crucial for increasing agricultural growth in a developing country. Agricultural extension projects have traditional had a strong production focus, which can be described as top-down, supply-driven model. Other constraints include low skill level, high staff turnover rates, limited evaluation and lack of co-ordination with researchers.

1.2. Recommendations

The recommendations suggested below are derived from analysis undertaken in this report. However, many of these recommendations were contained in the 2015 review of agricultural policies in Viet Nam (OECD, 2015[2]). It is essential that concrete actions be taken sooner rather than later to ensure that Vietnamese agriculture can improve its productive and environmental performance and that the cost of adjustment does not grow too large.

Consolidating economic stability and trust in institutions

Strengthen institutional co-ordination – between the Ministry of Agriculture and Rural Development (MARD) and other relevant ministries implementing programmes supporting agriculture, in particular, the Ministry of Science and Technology (MOST).

Enforce the environmental regulatory framework – to counter agricultural pollution and demonstrate the government's commitment to reduce the sector's environmental impacts. A recent World Bank report on agricultural pollution recommended that farmers be offered better technical options and that the incentive structure—positive and negative—be revised to encourage non-polluting behaviours. Good agricultural practices that have already been developed need to be scaled up. With the right packages and their dissemination, correction in fertiliser and pesticide use could produce win–win results—greater efficiency, reduced pollution, and higher incomes (improved resilience).

Ensuring market incentives for private investment and innovation

Improve the allocation of scarce land resources – by removing various forms of restrictions on land use (particularly in relation to paddy rice production), improving the land governance process, and establishing an effective market for land. Land-Use Rights Certificates (LURCs) need to provide more rights.

Encourage farm consolidation – including various forms of co-operation between farmers. This can help small-scale farming households connect to market opportunities, participate in value chains, and facilitate the development of large-scale, high-yielding agriculture. Experiment with market-based and collective solutions to land fragmentation. Market based solutions include clusters that organise smallholders into supply chains.

Continue to support private sector investment in the agro-food sector – as this will play an essential role in innovation and diversification of processed commodities. At present, the insignificant growth rate of agricultural supporting industries and services puts barrier to the increase of the added value and quality of crops, gives rise to imports of production inputs, such as agricultural machinery, seeds, breeds, and fertilisers, and drives agricultural products with export advantage (fish sauce, cashew nuts, tea, etc.) to use foreign brand names. SMEs play an essential part in helping farmers deal effectively with market inputs and outputs for agricultural production. It is essential to promote agricultural and rural start-up. Setting ecosystems of start-up in agriculture and rural areas should concentrate on the role of community groups, associations, credit institutions, and local governments, supporting innovative organisational and technical solutions.

Implement the announced state-owned enterprises reforms – to assist in the transition of agriculture to a market economy. It is also important that the results of the reforms are reviewed to ensure that the distortions that were intended to be removed through the process of equitisation have occurred and are not maintained through other mechanisms.

Building capacity through the provision of essential services

Continue to support infrastructure development – through additional government spending and by encouraging private sector investment, including PPPs, where applicable. Focus on both physical and digital infrastructure in rural areas to create an environment supportive of innovation and strengthened value chains. The effectiveness of available infrastructure funding would be improved by enhancing co-ordination between national and sub-national governments, avoiding duplication between provincial governments and promoting an integrated approach to infrastructure projects.

Improve access to finance – through the development of a much stronger and more competitive financial market, for instance by supporting the development of Co-operative Banks. Efforts to establish credit reporting systems, credit and assets registry systems (both for movable and fixed assets) and to develop financial services such as equipment leasing and warehouse receipts, should be sustained, while public subsidies should be reduced.

Ensure rural development projects are delivered – in line with the targets being set. There is a need to ensure that the focus is not just on the "easy" built infrastructure but also in terms of human resource development and climate resilience. This funding is vital as local governments are given more responsibilities to deliver.

Incentivising the productivity and sustainability of the Agro-food sector

Improve the competitiveness and quality of Viet Nam's rice exports – by continuing to reduce, and potentially remove altogether, the regulatory requirements associated with exporting rice. Viet Nam has made progress over the past twenty years in gradually opening the export rice trade to the private sector without any noticeable food security concerns. The current review of the export regulations should result in the removal of all unnecessary barriers to trade.

Continue to support the development of insurance schemes – so they become a sound and commonly understood part of the services available to agricultural producers. A subsidy on the insurance premium, in the short term, can help demonstrate to farmers the value of insurance and create a relevant database for developing viable insurance schemes. In the long term, subsidies should be limited to delivery costs and the use of new technologies to deliver indemnity or index insurance should be explored.

Reintroduce the water user fee for farmers –, in line with the OECD Council Recommendation on water. This would reduce the cost burden on the state budget and sharpen incentives to increase water productivity. Higher cost recovery would also gradually increase the budgets of irrigation management companies, which would lead to better service. A fee based on unit of water used rather than on area or crop type, as previously applied, would encourage greater water use efficiency.

Rebalancing the composition of public spending on irrigation – by reducing investment in new irrigation and shift resources to measures that: increase the efficiency and water savings of service on

existing schemes; improve on-farm water management to increase water productivity; and strengthen other functions, such as agricultural services, to promote higher productivity.

Strengthening the agricultural innovation system **Increase spending on agriculture research and development and innovation**– in line with the commitments made in recent decisions. This should be linked to a stronger research focus on the practical needs of farmers and on areas going beyond primary production, such as post-harvest, processing, product hygiene and safety, and environmental pressures. Partnerships with the private sector should be strengthened to facilitate that research responds also to needs up and downstream and innovations are adopted in practice. Improved research management is needed to ensure its effectiveness in producing high-value outputs in response to end users' needs. This process can be shortened by adopting the best research and development practices from around the world.

Re-orientate the focus of agricultural education and extension services – moving from a top-down approach where the government determines what advice is given to one where the farmer has a greater role in determining the advice being provided. This will require a significant lift in the skill level of extension service providers as a first step to improve the skills and human capital of the sector.

2. The agricultural context and macroeconomic environment in Viet Nam

This chapter covers two aspects of the framework related to the agricultural and macroeconomic context in Viet Nam, that provide important background material for the overall assessment of policy performance. Section 2.1 sets out the context of the agro-food sector, focussing on the importance of agriculture in the economy, its general structure and its role in trade. Section 2.2 describes the broad macroeconomic environment in which the agro-food sector operates. It discusses the performance of the overall economy and the general quality of governance institutions.

2.1. Agriculture in the context of the Vietnamese economy

General natural and economic context

Viet Nam is a mid-size country in terms of area, but its population of over 96 million makes it the 15th most populous country in the world (Table 2.1). Almost two-thirds of the population live in rural areas. Viet Nam has abundant water resources at the national level but is among the most land scarce countries in the world. Arable land is particularly scarce at 0.07 hectares per capita, which reflects Viet Nam's diverse topography – around 72% of the total land area is mountains or hills. The topography of the country varies greatly between the different regions, with the north characterised by mountainous and hilly areas, and the south primarily by low-lying deltas. The Red River Delta in the north and the Mekong Delta in the south of Viet Nam are the most productive agricultural areas of the country. Based on the diverse topography and climate, the country has been categorised into eight different agro-ecological zones.

Since the mid-1980s, a long series of reforms, known widely as *Doi Moi* or "Renovation", have moved the economy – including the agricultural sector – in the direction of open markets for trade and investment, private decision-making, private land use rights, and a greater role for private firms. These reforms resulted in rapid, stable and inclusive economic growth, transforming Viet Nam from one of the world's poorest nations to a lower middle-income country, and contributing to significant reductions in poverty rates and substantial improvements in other social outcomes (OECD, 2015[2]; World Bank, 2016[5]). The Vietnamese population is better educated, has a longer life expectancy and has higher income than in many countries at a similar per capita income level (World Bank, 2016[5]).

Viet Nam's economic growth since the beginning of *Doi Moi* has been both strong and steady (Table 2.2). Real GDP growth averaged 7.4% a year in the 1990s, driven by improvements in productivity induced by Viet Nam's transformation from a centrally planned economy into an open, state-regulated market economy. This included gains from easing restrictions such as production quotas, multiple price controls, collectivised agriculture, trade and investment restrictions, and removing a ban on formal private enterprise (OECD, 2015[2]; World Bank, 2016[5]). Since 2000, economic growth has averaged 6.3% a year, largely driven by factor accumulation (capital investment and a growing labour force) and structural change,

including the reallocation of labour away from agriculture towards the services and industry sectors (Eckardt, Demombynes and Chandrasekharan Behr, 2016[6]; McCaig and Pavcnik, 2016[7]; World Bank, 2016[5]).

Table 2.1. Contextual indicators in selected Asian countries, 2019*

	GDP	GDP per capita	Population	Rural population	Total land area	Agricultural land area	Arable land area per capita	Freshwater resources	Freshwater resources per capita
	Billion USD in PPP**	USD in PPP**	Million	% of total population	Thousand km^2	Thousand ha	Ha	Billion m^3	M^3
	(2019)	(2019)	(2019)	(2019)	(2019)	(2019)	(2019)	(2017)	(2017)
Viet Nam	**808**	**8 381**	**96**	**63**	**313**	**124**	**0.07**	**359**	**3 799**
(World ranking)	(29)	(123)	(15)	(43)	(68)	(67)	(139)	(22)	(69)
Cambodia	75	4 574	16	76	177	56	0.24	121	7 533
China	23 547	16 847	1 398	40	9 425	5 285	0.09	2 813	2 029
India	9 557	6 994	1 366	66	2 973	1 796	0.11	1 446	1 080
Indonesia	3 332	12 313	271	44	1 878	623	0.10	2 019	7 629
Korea	2 209	42 728	52	19	98	16	0.03	65	1 263
Lao PDR	59	8 188	7	64	231	24	0.22	190	27 384
Malaysia	945	29 564	32	23	329	86	0.03	580	18 647
Myanmar	293	5 413	54	69	653	128	0.20	1 003	18 789
Philippines	1 005	9 291	108	53	298	124	0.05	479	4 554
Thailand	1 337	19 209	70	49	511	221	0.24	225	3 244

Note: * or latest available year; ** PPP: Purchasing Power Parity.
Source: FAO (2021[3]), FAOSTAT (database), http://www.fao.org/faostat/; World Bank (2021[4]), World Development Indicators (database), http://data.worldbank.org/indicator.

Table 2.2. Real GDP growth rate in selected Asian countries, 1986-2020

Average annual percentage growth rate over the specified period

	1986-90	1991-95	1996-2000	2001-05	2006-10	2011-15	2016-20
Viet Nam	**4.8**	**8.2**	**7.0**	**6.9**	**6.3**	**5.9**	**6.0**
Cambodia	..	..	7.4	9.3	6.7	7.2	4.9
China	7.9	12.3	8.6	9.8	11.3	7.9	5.7
India	6.0	5.1	6.1	6.5	7.0	6.5	3.4
Indonesia	6.3	7.1	0.7	4.7	5.7	5.5	3.6
Korea	10.6	8.5	5.7	5.0	4.3	3.1	2.0
Lao PDR	4.3	6.2	6.2	6.2	8.0	7.8	5.2
Malaysia	6.8	9.5	4.8	4.7	4.5	5.3	2.7
Myanmar	-2.1	5.8	8.5	12.9	11.1	7.3	1.9
Philippines	4.7	2.2	3.6	4.7	5.0	6.0	3.2
Thailand	10.3	8.2	0.7	5.4	3.7	3.0	1.5

Source: World Bank (2021[4]), World Development Indicators (database), http://data.worldbank.org/indicator.

Viet Nam has been successful in achieving this rapid economic growth without significantly increasing inequality. Poverty declined significantly in both rural and urban areas, and rural–urban incomes are converging. Nevertheless, poverty remains concentrated in rural areas and among ethnic minorities (World Bank, 2016[5]). An early commitment to providing basic health, education, and other public services played an important role in raising living standards and reducing poverty. However, access to infrastructure and

essential services is generally weaker in the rural areas of Viet Nam, especially in mountainous areas, and industrialisation and modernisation are progressing slowly (Luu Ngoc Luong, 2017[8]).

Importance of agriculture in the economy

The relative importance of agriculture in Viet Nam's economy has declined over time as the non-agricultural sector has increased its share in GDP and employment. The agriculture, forestry and fishery sector accounted for over 40% of GDP in 1991, compared with 14% of GDP in 2017 (Table 2.3). Productivity improvements and opportunities outside agriculture have also led to significant movement of labour out of agriculture and into the industry and services sectors, particularly since 2000. Agriculture now accounts for 37% of employment compared with over 75% of employment in 1991 (World Bank, 2021[4]).

Nevertheless, agriculture remains a strategic sector for economic growth and development, and a major source of employment and income in rural areas. Over 51% of the rural workforce is employed in the sector, and it is the largest source of income for a significant (but declining) share of rural households – almost 48% in 2016 compared with 68% in 2006 (GSO, 2018[9]). Agriculture and the rural economy have also traditionally acted as a 'buffer' during times of economic recession by absorbing redundant labour from other sectors (World Bank, 2013[10]; Luu Ngoc Luong, 2017[8]), although there are signs that this is becoming less important (VELP, 2013[11]). Nevertheless, for many rural households, agricultural land ownership is considered a form of security, in that it ensures at least a minimal amount of food and income (Ayala-Cantu et al., 2017[12]).

Table 2.3. Share of agriculture in the economy and in natural resources in selected Asian countries, 2019*

In percentage

	Gross Value Added[1]	Employment[2]	Exports[3]	Imports[3]	Total land area	Total water withdrawals
	(2019)	(2019)	(2016)	(2016)	(2019)	(2017)
Viet Nam	**14.0**	**37.2**	**9.5**	**9.5**	**39.5**	**94.8**
Cambodia	20.7	34.5	5.8	8.6	31.5	94.0
China	7.1	25.3	2.5	6.6	56.1	64.4
India	16.7	42.6	10.5	6.8	60.4	90.4
Indonesia	12.7	28.5	20.6	12.9	33.2	85.2
Korea	1.6	5.1	1.2	5.9	16.8	58.9
Lao PDR	15.2	61.4	29.9	13.5	10.4	95.9
Malaysia	7.3	10.3	11.8	8.6	26.1	45.6
Myanmar	22.2	48.8	32.5	19.0	19.6	88.6
Philippines	8.8	22.9	7.5	11.8	41.7	73.3
Thailand	8.1	31.4	11.8	6.0	43.3	90.4

Note: * or alternative year.
1. Value added in agriculture, hunting, forestry and fishing as a percentage of total value added.
2. Share of employed persons aged 15 years and over, in agriculture, hunting and forestry in total NACE activities.
3. Agro-food definition does not include fish and fish products. Agro-food codes in H0: 01, 02, 04 to 24 (excluding 1504, 1603, 1604 and 1605), 3301, 3501 to 3505, 4101 to 4103, 4301, 5001 to 5003, 5101 to 5103, 5201 to 5203, 5301, 5302, 290543/44, 380910, 382360.
Source: FAO (2021[3]), FAOSTAT (database), http://www.fao.org/faostat/; UN (2017), COMTRADE, https://comtrade.un.org/; World Bank (2021[4]), World Development Indicators (database), http://data.worldbank.org/indicator.

Viet Nam's government considers agriculture to be a key driver of sustainable development and macroeconomic stability. Viet Nam's agricultural exports account for around 9% of exports, although this share is decreasing in line with the shift in export structure of Viet Nam (WTO, 2021[13]). Agricultural exports serve the dual purposes of generating income for rural households and earning foreign exchange that can be used to purchase imports for industrialisation. As such the performance of the agricultural export subsector is important for macroeconomic stability as well as incomes and food security in rural areas (Coxhead et al., 2010[14]; Luu Ngoc Luong, 2017[8]). Agriculture is also the only economic sector to have

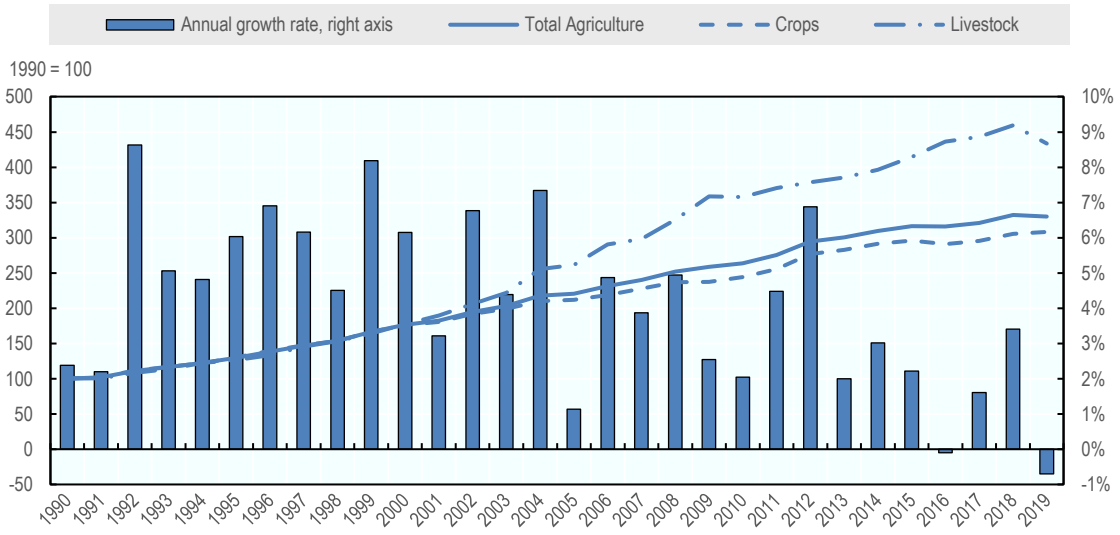
maintained an export surplus in recent decades, the size of which increases significantly if fishery products are included as well.

Agricultural production and composition

Viet Nam's agricultural sector has undergone a remarkable transformation since the beginning of the *Doi Moi*, facilitated by agricultural and economy-wide reforms that removed restrictions on private economic activity and connected farms to markets and competition by eliminating price controls and the state procurement system (Coxhead et al., 2010[14]; McCaig and Pavcnik, 2016[7]). Beginning in the late 1980s, Viet Nam abolished collective farming, opened markets for farm products and inputs to greater domestic and international competition, and issued land rights (see OECD (2015[2]) and Chapter 5). Viet Nam's agricultural and economy-wide reforms created the conditions that allowed the sector to take advantage of growing domestic demand and the commodity price boom in international markets in the 2000s (OECD, 2015[2]).

Between 1990 and 2019, agricultural output increased more than threefold (230%), transforming Viet Nam from a food insecure country to a leading exporter of a diverse range of commodities (Figure 2.1). Agricultural output growth averaged almost 6% per year during the 1990s and just over 4% per year during 2000s. The surge in production was due to many factors including an expansion of the area under agricultural production, intensive use of intermediate inputs such as fertiliser and pesticides, the rapid adoption of modern, high-yielding improved crop varieties, particularly for rice, and improvements in infrastructure, including irrigation systems (Coxhead et al., 2010[14]; Rillo and Sombilla, 2015[15]).

Figure 2.1. Growth in agricultural output in Viet Nam, 1990-2019



Note: FAO indices based on the 2014-16 period have been recalculated taking indices for 1990 as 100.
Source: FAO (2021[3]), FAOSTAT (database) http://www.fao.org/faostat/en/#home.

Many of these actions were taken by farmers in response to the introduction of market-based incentives in the early years of *Doi Moi* (Coxhead et al., 2010[14]; Thapa and Gaiha, 2011[16]). The elimination of price controls increased producer prices, which converged with border prices and made it possible for farmers to export profitably. Moreover, Viet Nam's fixed-exchange-rate regime had over-valued the national currency, the dong, effectively taxing agricultural exports. The switch to an exchange-rate regime that allowed the dong to fluctuate within a range resulted in a sharp devaluation of the currency, making Vietnamese exports more competitive on international markets. The government also lifted some restrictions on imports of fertilisers, which reduced their price and increased their use (McCaig and Pavcnik, 2016[7]). Farmers also benefited from land reforms that extended land use rights, making it easier to grow perennial commercial crops such as coffee, rubber, cashew nuts and pepper.

More recently, the rate of agricultural output growth has slowed. During the 2010s, total agricultural growth averaged just 2.5% per annum, including two years (2016 and 2019) when output fell. Over the most recent decade growth in crop production has been stronger than livestock production (2.6% per annum compared to 2.2% respectively), reversing the relative position in the 2000s when livestock production grew more than twice as fast as crops (7.3% per annum compared to 3.3% respectively).

Consequently, the composition of agricultural output has changed, reflecting a movement away from staple foods to other crop commodities (primarily perennial crops such as coffee, pepper and rubber), and towards livestock production (Table 2.4). This shift has mainly been driven by an increasing emphasis on export crops. Changing domestic consumption patterns are also playing a role, with consumers spending more on livestock products including meat (especially pork and poultry) and dairy products. However, agricultural production is still dominated by rice, which accounted for 28% of the value of agricultural production in 2019, compared with 43% in 1990.

Table 2.4. Structure of agricultural production value in Viet Nam, various years

Share of gross production value (%)

	1990	2000	2010	2019
Total crops	**76.9**	**74.9**	**68.2**	**65.5**
Rice, paddy	42.7	41.8	32.3	27.5
Coffee, green	1.1	5.6	4.9	5.8
Pepper	0.7	1.8	2.3	4.5
Cassava	2.7	1.3	3.6	3.4
Rubber, natural	0.6	1.7	2.7	3.3
Maize	1.6	2.8	4.0	3.3
Sugar cane	1.8	2.9	2.0	1.5
Cashew nuts, with shell	1.2	0.3	1.0	0.7
Tea	0.1	0.1	0.2	0.2
Other	23.7	16.6	15.3	15.3
Total livestock	**23.9**	**25.1**	**31.8**	**34.5**
Pig meat	11.7	13.2	17.8	15.3
Poultry meat	4.3	5.6	5.4	9.2
Milk	0.6	0.5	1.7	4.4
Cattle meat	2.4	1.8	3.3	2.3
Eggs	1.7	1.9	2.0	2.0
Other	3.2	2.3	1.6	1.3

Note: Gross production value (constant 2014-2016 USD million).
Source: FAO (2021[3]), FAOSTAT (database), http://www.fao.org/faostat/.

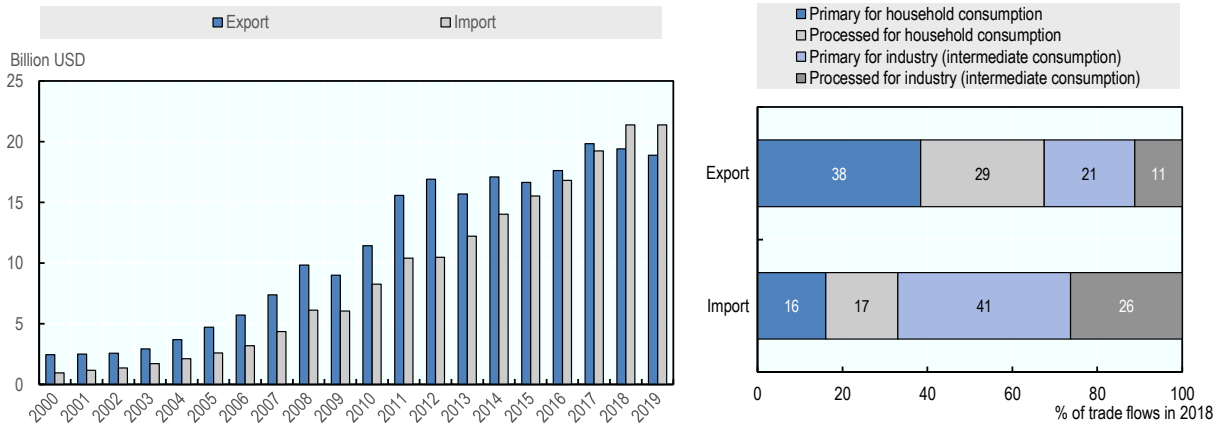
Agro-food trade

Viet Nam's agro-food sector is well integrated with international markets. Agro-food exports have increased eight-fold since the early 2000s but have plateaued in recent years (Figure 2.2). Two-thirds of Viet Nam's agro-food exports are delivered for household consumption with the remaining one-third being used as inputs into production. Viet Nam is one of the world's largest exporters of a wide range of agricultural commodities. It ranks among the top five global suppliers of rice, coffee, tea, cashew nuts, coffee, black pepper, natural rubber, and cassava (World Bank, 2020[17]). The People's Republic of China (hereafter "China") is Viet Nam's main export destination, accounting for around one-quarter of Viet Nam's agricultural exports. Other major markets are the European Union, the United States and Association of Southeast Asian Nations (ASEAN) member states.

While Viet Nam is among the world's top exporters for a range of commodities (in both volume and value terms), most of its exports sell at a discount compared with other leading exporters of the same commodities (World Bank, 2016[18]; Dao The Anh, 2018[19]). For some commodities, Viet Nam's agro-food

exports consist of lower quality varieties (e.g. Robusta coffee) and grades (e.g. 25% broken white rice), which generally have a lower unit value than alternatives (i.e. Arabica coffee or jasmine rice). However, other factors, including issues related to food safety, and the risk of contract non-fulfilment by Vietnamese suppliers, also play a role. In addition, in recent years a relatively high number of Viet Nam's agro-food export consignments have been intercepted or rejected as a result of problems such as improper labelling and pesticide residues (World Bank, 2016[18]; Tran Cong Thang, 2017[20]; Nguyen, 2017[21]).

Figure 2.2. Value and composition of Viet Nam's agro-food trade



Notes: Numbers may not add up to 100 due to rounding. Includes natural rubber but excludes fishery products.
Source: UN Comtrade Database (accessed January 2021).

Viet Nam's agro-food imports have also grown significantly since the early 2000s and now exceed agro-food exports in value terms. In contrast to exports, two-thirds of agro-food imports are used as inputs into production. Key imports include livestock feedstuffs such as oil cake and maize, and raw commodities for further processing and export like cotton and cashew nuts. The remaining one-third are products to meet food demand from domestic consumers, including for higher value foods and beverages (wheat, palm oil, dairy products, sugar and beef) (OECD, 2015[2]). In general, Viet Nam imports what it is unable to produce (or for which Viet Nam is not a competitive producer), and commodities for which domestic supply has fallen short of processing capacity or surging domestic demand (World Bank, 2016[18]). Around 20% of Viet Nam's imports is sourced from other ASEAN member states. Other major sources are the United States, Argentina and Brazil.

2.2. Macroeconomic policy environment and governance

The macroeconomic policy environment and public institutions play an important role in ensuring a favourable environment for investment on farm and by other businesses in agricultural value chains. Stable and sound macroeconomic policies and high-quality institutions enhance the effectiveness of government policies and investments aimed at supporting agricultural development. They also influence the overall performance of the economy and the opportunities for trade, which are important for sustained growth in domestic and export demand – key enablers of growth in the agricultural sector (Diaz-Bonilla, Orden and Kwieciński, 2014[22]). In addition, macroeconomic settings that create implicit – and possibly unintended – biases for or against certain sectors in the economy can distort resource allocation and constrain growth, including in the agro-food sector (OECD, 2017[23]; OECD, 2020[1]).

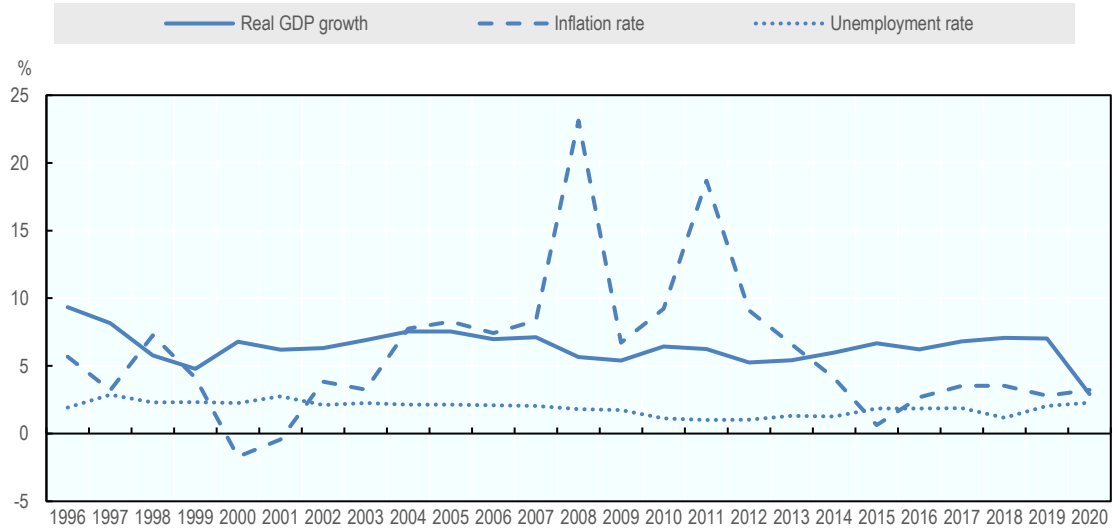
Macro-economic policies

Viet Nam has experienced strong, stable and inclusive economic growth since the early 1990s. The *Doi Moi* began a series of reforms that promoted macroeconomic stability and reduced state controls within the economy, as well as the country's gradual but steady integration into the global economy. Economic growth was driven by structural transformations that liberalised the economy and took advantage of its

comparative advantages (including in labour-intensive production and agriculture), as well as the strong external orientation of the economy (ADB, 2016[24]; World Bank, 2016[5]). Foreign investment and export-led growth have been central to Viet Nam's development strategy over the past three decades (OECD, 2018[25]).

Viet Nam experienced a period of macroeconomic instability associated with the Global Financial Crisis (GFC) in 2008-09 – economic growth slowed, foreign reserves declined, inflation peaked at 23% in 2008 and then rose to 19% in 2011, and the trade deficit expanded (Figure 2.3) (ADB, 2016[24]). However, Viet Nam's economy was largely resilient to the GFC. Macroeconomic policies implemented since 2012 have restored macroeconomic stability, and economic growth averaged 6.3% a year in 2012-19, with inflation at levels below 4% since 2015.

Figure 2.3. GDP growth, inflation and unemployment rates in Viet Nam, 1999-2020



Source: World Bank (2021[4]), World Development Indicators (database), http://data.worldbank.org/indicator.

The COVID-19 pandemic slowed economic growth in Viet Nam to 2.6% in 2020. While this is a significant slowdown relative to past performance, the impact was not as large as in other emerging Asian economies, with most experiencing a contraction in activity. The resilience of the industrial sector contributed decisively to this growth. Viet Nam's economy is forecast to rebound in 2021 and grow by 7% (OECD, 2021[26]). A key ongoing challenge will be improving macroeconomic management to maintain stability and weather external shocks, particularly as Viet Nam increases its global integration (ADB, 2016[24]).

Viet Nam's long-term economic development priorities are laid out in ten-year Socio-Economic Development Strategies (SEDS) and accompanying five-year Socio-Economic Development Plans (SEDP). SEDS 2011-20 had the overall objective of making Viet Nam a modern industrialised country by 2020 through environmentally sustainable and socially equitable economic development. It focused on three issues: 1) completing the transition to a socialist-oriented market economy by improving market institutions to create an equal and competitive environment; 2) developing human resources and skills, and in particular skills to support jobs in modern industry and for technological innovation; and 3) developing infrastructure (Government of Vietnam, 2011[27]).

Specific measures to achieve high quality and sustainable economic growth in the period 2016-20 are identified in SEDP 2016-20[1] (Government of Vietnam, 2016[28]). These include specific targets and reforms to achieve macroeconomic stability and restructure the economy, and measures to develop human capital

[1] Resolution No: 142/2016/QH13 of the National Assembly on the 5-year Socio-Economic Development Plan of 2016-20; Resolution 63/2016/NQ-CP promulgating the government's action programme to implement the national assembly resolution on the socio-economic development plan for 2016-20.

and scientific and technological capacities. It also emphasises the need for stronger resilience to climate change impacts, better climate change adaptation, improved disaster risk management, tougher environmental protection measures, and enhanced management of natural assets (especially water resources in the Mekong River Delta). The SEDP also renews the government's commitment to fighting against corruption and advancing the effectiveness of the public sector (World Bank, 2017[29]).

Governance and public institutions

Good governance systems and high-quality institutions provide economic actors with the assurance that the government is accountable, transparent and predictable. They are a fundamental pre-condition both to encourage public and private investment in the economy and to enable those investments to achieve the intended benefits, both for investors and the host country. Governance systems also play an important role in addressing market failures, influencing the behaviour of firms, and ensuring the efficient functioning of input and output markets (OECD, 2020[1]).

Government efforts to strengthen governance systems have increased transparency, accountability and citizen participation in public decision-making and development planning (Petersen, Yen and Vanzetti, 2017[30]). In recent years, the government has implemented a range of institutional changes to reduce corruption, including enhancing transparency and civil service reforms to encourage accountability (Malesky, Ngoc and Thach, 2018[31]). Reflecting these efforts, annual surveys of both private enterprises and Vietnamese citizens report improvements across a range of governance areas, including perceptions and experiences of corruption, the quality and efficiency of administrative procedures, and the provision of basic public and business services (Malesky, Ngoc and Thach, 2018[31]; Malesky, 2017[32]; CECODES et al., 2019[33]).

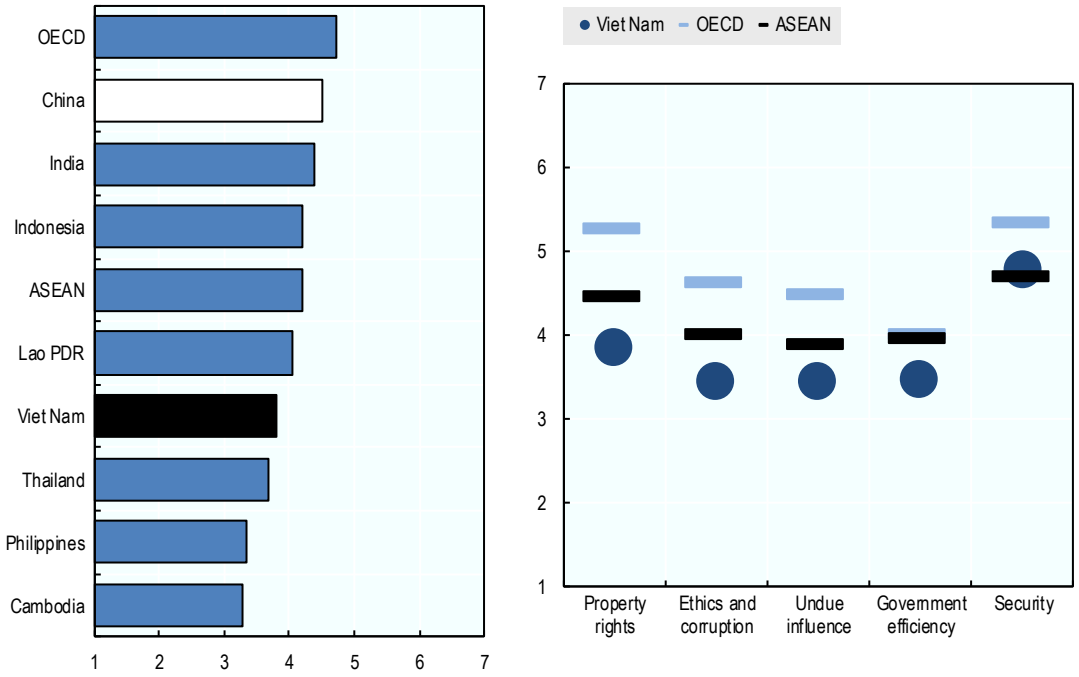
Viet Nam has also made efforts to improve the policy development processes. Policy proposals must go through a scientific review, consultation, analysis, financial review and legal review (Petersen, 2017[34]), and the process provides opportunities for consultation with relevant stakeholders (Hoang, 2017[35]). The government has also introduced mandatory regulatory impact assessments in the development of legal documents, and lawmakers are required to identify the likely distributional effects of new regulations, especially through the consultation process. In recent years, the government has directed Ministries to review regulations and investment support policies – including in agriculture – to reduce the burden of administrative procedures on businesses, including by reducing business and investment conditions in various ministries by 50%[2] (OECD, 2018[36]).

Nevertheless, significant governance challenges remain. Viet Nam is ranked 79th for the quality of its institutions, below the average for Association of Southeast Asian Nations (ASEAN) member states and significantly lower than its overall competitiveness ranking (55th) on the World Economic Forum's (WEF) Global Competitiveness Index (Figure 2.4). Despite the aforementioned improvements, corruption continues to be highly problematic for doing business in Viet Nam (WEF, 2017[37]; Maruichi and Abe, 2019[38]). Land administration, particularly access to land-related information and the process of certifying land use rights, is considered one of the more corrupt aspects of public administration (CECODES et al., 2019[33]; OECD, 2015[2]). Viet Nam has taken steps to strengthen property rights, but major issues remain, particularly related to how land-use rights are allocated and enforced, and businesses also report concerns over the security of land tenure (World Bank, 2016[5]).

[2] Resolution No. 35/2016/NQ-CP on supporting and developing enterprises by 2020; Resolution No. 19/2017/NQ-CP on the further implementation of key tasks and measures to improve the business environment and enhance the national competitiveness in 2017, with a vision to 2020; and Resolution No. 01/2018/NQ-CP on major tasks and solutions directing the implementation of the socio-economic development plan and state budget estimate in 2018.

Figure 2.4. Global Competitiveness Index: Quality of public institutions, 2017-18

Scale 1 to 7 (best)



Note: Indices for ASEAN and OECD are the simple average of member-country indices.
Source: World Economic Forum (2017[37]), The Global Competitiveness Report 2017-2018: Full data Edition, http://reports.weforum.org/global-competitiveness-index-2017-2018/.

Government effectiveness is also hampered by weaknesses in the policy development and implementation process, in addition to inefficient policy implementation. Many parties are involved in the policy process, and policies are developed and promulgated by multiple agencies with limited co-ordination. This results in a large number of overlapping and inconsistent policy documents (World Bank, 2017[29]; Petersen, 2017[34]). The policy development process pays insufficient attention to how policies will be implemented, and some policies require detailed guidance documents, which delays implementation. State resources to support policy development are limited, with some policies requiring funding from foreign donors (Acuña-Alfaro and Anh Tran, 2016[39]; Hoang, 2017[35]). Local governments often lack funding to implement policies.

3. Economy wide policies with impact on the food and agricultural system in Viet Nam

This chapter describes the important economy wide policies and regulations that impact on the agro-food sector. The overall policy environment establishes the basic conditions within which all firms, including farms, input suppliers and agro-food enterprises, operate and make investment decisions. This chapter analyses a large set of policy areas that have a direct impact on the performance of the agricultural sector and its capacity to develop innovative responses to the productivity and sustainability challenges. These are grouped into two broad categories. First, are policies on markets, finance and investment, covering: Trade and foreign investment; Competition; Finance; Taxes; Infrastructure; and Rural development. Second, are policies relating to the management of natural resources, including: Land use planning and regulations; Environmental protection and climate change; and Regulations on products and processes.

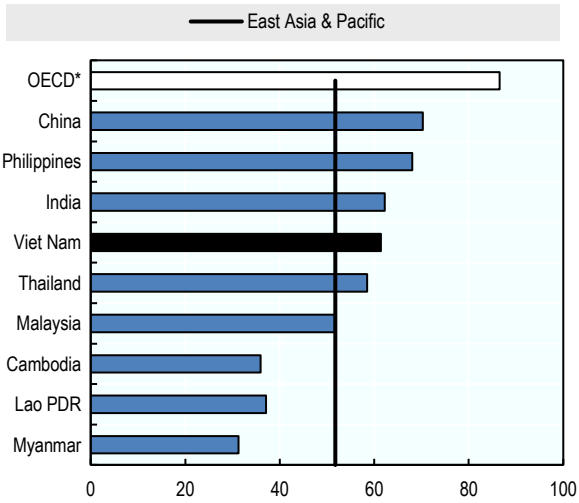
Efficient markets facilitate the flow of factors of production – such as capital – to their highest valued uses, including to uses within the agricultural sector, and provide undistorted incentives for investment. They also allow farms and other enterprises in agricultural value chains to be flexible and responsive to changes in market conditions. Effective environmental governance and regulations on natural resources are central to ensuring the sustainable use of natural resources in the long term (OECD, 2020[1]).

Viet Nam's economy wide policy environment has improved over time, as evidenced by the country's successive rankings in global surveys of the wider business environment, including the World Bank's *Doing Business* survey (from 99th in 2014 to 70th in 2020) and the World Economic Forum's *Global Competitiveness Index* (from 70th in 2013-14 to 55th in 2017-18) (WEF, 2017[37]; World Bank, 2019[40]). This improvement extends to the policy environment affecting the agro-food sector. The World Bank's *Enabling the Business of Agriculture* indicators measure how a country's regulations and processes either facilitate or hinder agricultural activities of farmers (Figure 3.1). The indicators cover eight areas where it is considered regulatory constraints to productivity are most significant: supplying seed, registering fertiliser, securing water, registering machinery, sustaining livestock, protecting plant health, trading food, and accessing finance (World Bank, 2019[41]).

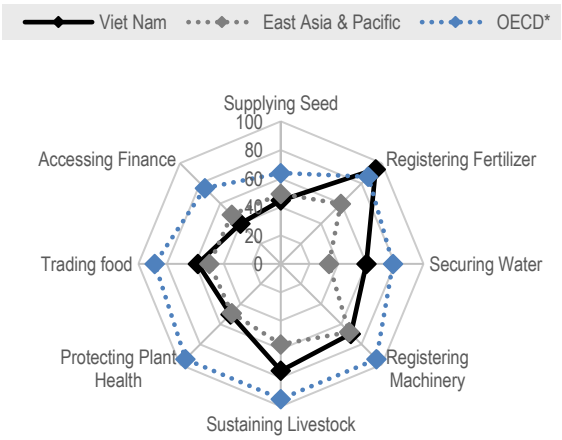
Figure 3.1. Enabling the Business of Agriculture (EBA): Global average score, 2019

Scale from 0 to 100 (best)

A. EBA global average, international comparison



B. EBA score, by topic



Note: Indices for the OECD and the East Asia & Pacific are the simple average of indices for countries from the geographical region that were covered in the database. OECD* are the 28 OECD member countries that are classified in the EBA database as High income: OECD.
Source: World Bank (2019[41]), *Enabling the Business of Agriculture 2019*, http://eba.worldbank.org/.

Within developing East Asia, Viet Nam provides a relatively supportive agribusiness environment. Scoring above the average for East Asia and the Pacific on six of the eight indicators; scoring below for supply seed and accessing finance. However, only in relation to registering fertiliser does it score above the average for high-income OECD countries.

3.1. Markets, finance and investment

Trade and foreign investment

Trade facilitates the flow of goods, capital, technology, knowledge and people needed to innovate. Openness to trade and capital flows creates conditions that are conducive to innovation by increasing the potential market for innovators and reinforcing competition. Trade also increases access to new technologies, ideas and processes, including from foreign direct investment (FDI) and related technological

spill-overs, and facilitates cross-country collaboration. Trade and investment openness can also facilitate the development of market mechanisms to foster more environmentally sustainable production (OECD, 2020[1]).

Viet Nam is one of the most open economies in the world, and actively pursues trade liberalisation through regional and bilateral trade agreements. Foreign investment and export-led growth have been central to Viet Nam's development strategy for the past three decades. The government has identified international economic integration as a major impetus for socio-economic development, the reform of the country's socialist-oriented market economy institutions, market expansion and a source of capital, knowledge, technology and management expertise.[3] Within agriculture also, the government aims to promote the role of international economic integration in creating an enabling environment, increasing access to resources and expanding markets.[4]

Viet Nam became the seventh member of the Association of Southeast Asian Nations (ASEAN) and its associated ASEAN Free Trade Area (AFTA) in 1995; was formally admitted as a member of the Asia Pacific Economic Community (APEC) in November 1998; and obtained WTO membership in 2007. As at June 2020, Viet Nam was a party to 15 regional or bilateral trade agreements (WTO, 2021[13]). Through its membership of ASEAN, Viet Nam is part of ASEAN country-specific agreements with its major trading partners in the region, including 'China, Japan, Korea, India, Australia and New Zealand. Outside of ASEAN, Viet Nam has negotiated bilateral free trade agreements with Chile, Cuba, the Eurasian Economic Union, the European Union, Japan, Korea, and the United Kingdom, with the agreements with the European Union and the United Kingdom coming into effect in 2020.

Viet Nam, along with ten other countries, signed the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP) on 8 March 2018.[5] The agreement was ratified by the Vietnamese National Assembly on 12 November 2018, and entered into force on 14 January 2019. On 15 November 2020, Viet Nam along with its nine ASEAN partners and five other regional states with which ASEAN has existing free trade agreements signed the Regional Comprehensive Economic Partnership (RCEP or ASEAN+5).[6] By early December 2021, six of the ten ASEAN signatories, including Viet Nam, and all five non-ASEAN signatories had ratified the agreement meaning that the trade pact took effect on 1 January 2022 for most members.

As its name suggests, the CPTPP involves deeper issues than most FTAs, covering other aspects of free trade including labour standards, environmental standards, free flow of information, and government procurement. It incorporates many of the provisions of the defunct Trans-Pacific Partnership (TPP) Agreement. In contrast, the RCEP primarily focuses on the regulations for market entry and investment, combining and deepening the existing ASEAN agreements. Once in force, RCEP will be the largest free trade agreement in the world, covering around 30% of both global population and GDP. Originally conceived as two distinct trading blocs, the formerly US-led TPP (now CPTPP) and the China-backed and nominally ASEAN-led RCEP have evolved into two overlapping bodies. Seven of the 11 CPTPP members, including Viet Nam, are intersection economies also belonging to the 15-member RCEP.

Viet Nam has also taken steps to improve border procedures and reduce trade costs. Reducing trade costs via improvements in trade facilitation can increase export competitiveness and facilitates the flow of goods and capital across borders (Moïsé, Orliac and Minor, 2011[42]). This can also lead to lower prices for inputs, including farm inputs, and enhance the transfer of knowledge and technology between countries. Viet Nam matches or exceeds the average performance of ASEAN countries on most trade facilitation indicators except for both internal and external border agency co-operation (Figure 3.2).

[3] Resolution No. 06-NQ/TW dated 5 November 2016 on effectively integrating into the international economy.

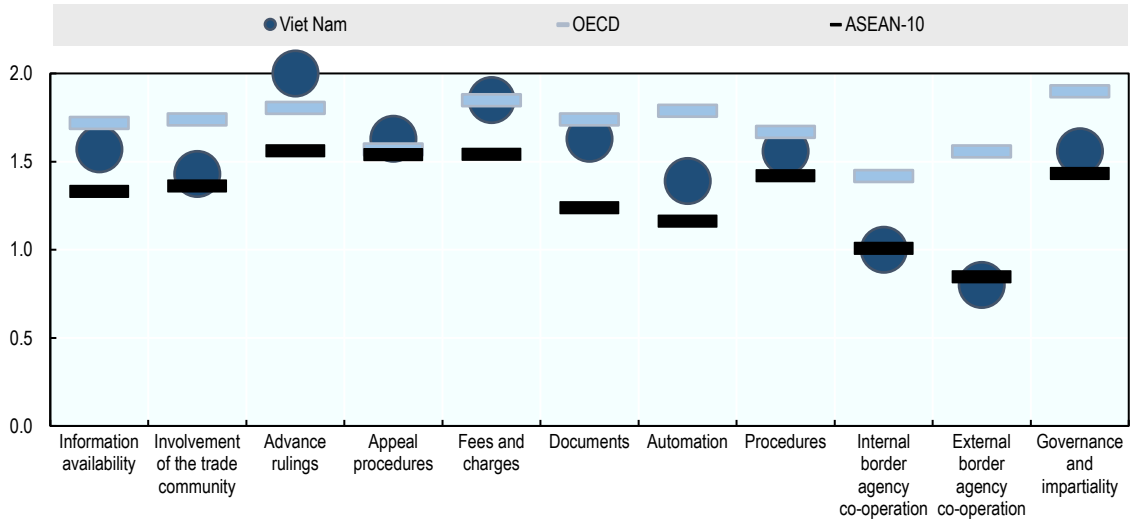
[4] Decision No. 1684/2015/QD-TTg approving the scheme on international economic integration in the agriculture and rural development sector through 2030.

[5] The 11 countries that signed the CPTPP are Australia, Brunei, Canada, Chile, Japan, Malaysia, Mexico, New Zealand, Peru, Singapore, and Viet Nam.

[6] The nine other ASEAN countries are Brunei Darussalam, Cambodia, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Singapore and Thailand, with the other five being China, Japan, Korea, Australia and New Zealand.

Figure 3.2. Trade facilitation performance, 2019

Scale from lowest (0) to highest (2) performance



Note: Indices for ASEAN-10 and OECD are the simple average of member-country indices. The 2019 update of the database is the latest available.
Source: OECD (2021[43]), Trade Facilitation Indicators, www.oecd.org/tad/facilitation/indicators.htm.

Agro-food products are also required to satisfy various regulatory provisions – such as registrations, licenses, and sanitary and phytosanitary standards – in order to access markets. Trade is facilitated when licensing requirements and export procedures are less burdensome, time-consuming and costly. Furthermore, commercially oriented agricultural production requires strong plant protection regulations that ensure reliable pest management in the field and robust inspection and verification practices at the border.

Within its overall regulatory assessment, the World Bank's *Enabling the Business of Agriculture* indicator includes a Trading food score which measures the barriers to trade preventing farmers and agro-food enterprises from accessing export markets (Figure 3.3) (World Bank, 2019[41]). While the overall Trading food score is above the East Asia and Pacific average, Viet Nam scores poorly in relation to the Trading food index component. Viet Nam imposes several additional licensing requirements and export procedures on agricultural traders that increase their trade costs. For example, exporters need to obtain individual export licenses that are valid for as little as one year. Additional costs and time are required to obtain these licenses (Divanbeigi and Kayumova, 2017[44]).

Investment in Viet Nam is governed by two laws: the Law on Investment 2014 and the Law on Enterprises 2014.[7] They were both enacted in November 2014 and entered into force on 1 July 2015, replacing earlier laws from 2005. These laws aim to enhance the transparency of the investment regime, streamline the procedures for investment registration and approval, and improve corporate governance rules for private enterprises and SOEs. The Law on Investment 2014 addresses many of the challenges associated with the previous law by clarifying the definition of foreign investment, simplifying investment registration and approval procedures, and reducing the number of sectors where investment is prohibited or conditional. It also provides equal treatment to all investors (domestic and foreign, public and private) (OECD, 2018[25]). On 17 June 2020, a revised Law on Investment and Law on Enterprises were issued; both entered into force on 1 January 2021.[8]

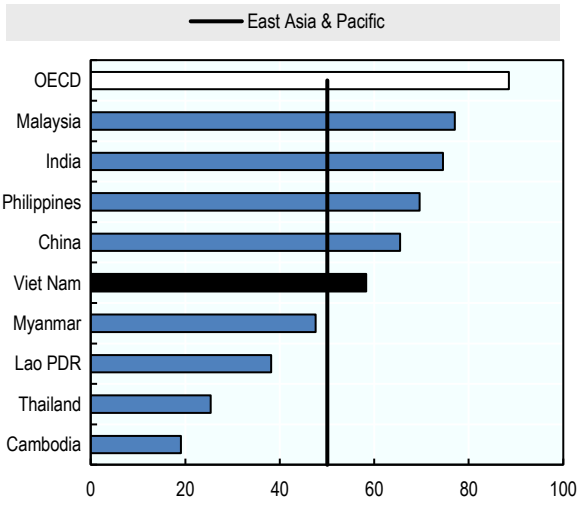
[7] Law on Investment No. 67/2014/QH13 as amended by Law No. 03/2016/QH14; and the Law on Enterprises No. 68/2014/QH13.

[8] Law on Investment No. 61/2020/QH14 and Law on Enterprises No. 59/2020/QH14).

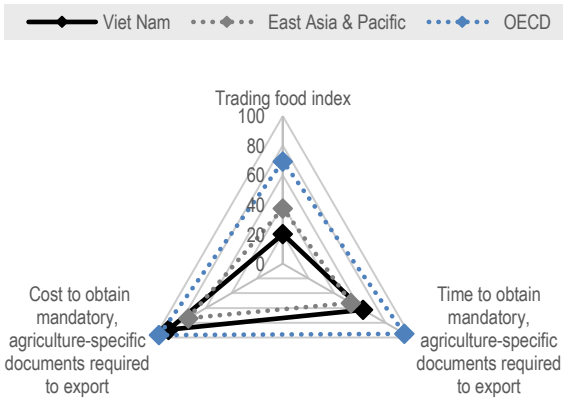
Figure 3.3. Enabling the Business of Agriculture (EBA): Trading food score, 2019

Scale from 0 to 100 (best)

A. Trade food score, international comparison



B. Trading food score, by component



Note: All components were converted to 0-to-100 scale using a min-max transformation applying the ranges indicated in the Enabling the Business of Agriculture 2019 report. Indices for the OECD and the East Asia & Pacific are the simple average of indices for countries from the geographical region that were covered in the database.
Source: World Bank (2019[41]), Enabling the Business of Ag*riculture 2019*, http://eba.worldbank.org/.

FDI has played a significant role in Viet Nam's rapid and sustained economic growth over recent decades (OECD, 2018[25]). Viet Nam's continuous reforms of its investment policies have been instrumental in the country's ability to attract FDI. However, it has had a smaller role in the agricultural sector, as investors have tended to consider the sector highly risky due, in large part, to the small and fragmented structure of production (Vietnam Investment Review, 2015[45]). While inflows have increased in recent years, they remain relatively small given the role of the agricultural sector in the economy. As of 20 December 2018, there were 491 accumulated FDI projects in agriculture, forestry and fisheries (1.8% of the total number of FDI projects) with a total registered capital of USD 3.46 billion, accounting for just over 1% of the total registered capital of FDI projects (MPI, 2018[46]). FDI projects in agriculture are mainly small-scale and largely focused on agro-processing projects and producing livestock feed.

Competitive environment

State-owned enterprises

Viet Nam's reforms have moved the economy in the direction of open markets for trade and investment. However, being a former centrally planned economy, the state is still strongly engaged in economic activities. State-owned enterprises (SOEs) have a particularly large role in the economy – including in the agricultural sector (Box 3.1). Although the number of SOEs only accounts for 0.4% of the total number of enterprises, they employ 8% of the workforce, make up almost 30% of capital, account for 20% of GDP and contribute 30% of fiscal revenues (Dang, 2020[47]). Private enterprises face unfair competition from SOEs, which benefit from close connections to government regulators and policymakers, and preferential access to credit, land and other resources, distorting resource allocation in the economy (OECD, 2016[48]). In a recent survey, 41% of private enterprises reported that bias toward centrally-managed SOEs had caused difficulties for their business; around 30% reported that SOEs had privileged access to land and credit; and 25% reported that SOEs benefited from faster and simpler administrative procedures (Malesky, Ngoc and Thach, 2018[31]).

Box 3.1. State-owned enterprises involved in the agro-food sector

SOEs in the agro-food sector generally operate in a more competitive market environment and have been opened to private ownership through the equitisation process. Since the 2015 OECD review (OECD, 2015[2]), several large SOEs have been fully or partly equitised, including:

- The Vietnam National Tea Corporation (Vinatea) in 2015. The state holds 0% of charter capital.
- The Vietnam Sugarcane and Sugar Corporation II in 2018. The state holds 7% of charter capital.
- The Vietnam Southern Food Corporation (Vinafood II) in 2018. The state holds 51% of charter capital.
- The Vietnam Rubber Group (VRG) in 2018 (along with its 40 subsidiary companies). The state holds 96% of charter capital.

There were plans to equitise additional SOEs in the agro-food sector by the end of 2020, including the Vietnam Northern Food Corporation (Vinafood I) and the Vietnam National Coffee Corporation (Vinacafe).[1] The state will initially hold at least 65% of charter capital in Vinafood I before divesting to 0%. Following equitisation of Vinacafe, the state will hold between 50% and 65% of charter capital.

While SOEs (and ex-SOEs) no longer play a major role in agricultural production (except for coffee, rubber and sugar), they still have a considerable degree of influence over some agricultural sectors through their involvement in processing and trade, as well as in supplying inputs to farmers. SOEs also continue to benefit from several privileges, including easier access to resources such as raw materials, land and credit, and close connections to government regulators and policymakers. Equitised SOEs also often continue to hold advantages from their ex-SOE status, such as continued market power and easier access to land and credit (OECD, 2015[2]). This continues to constrain greater private sector investment in the agro-food sector, by both international and domestic enterprises, and ties up government resources in relatively unproductive farms and enterprises (World Bank, 2016[18]; VELP, 2013[11]).

For example, SOEs have a major role in the export of some key commodities. SOEs account for almost 80% of rice exports, with the two largest – Vinafood I and Vinafood II – accounting for around half of total rice exports. Rice exporting SOEs benefit from access to subsidised loans for paddy procurement, tax advantages and, through the Vietnam Food Association (VFA),[2] a major voice in how export quantities, quotas, and export contracts (including government to government contracts) are allocated to specific enterprises, which results in unfair trading privileges. VRG is the largest natural rubber company in Viet Nam with 40 subsidiaries, 39 farms, and 30 processing plants. Through its subsidiaries, VRG controls about 270 000 hectares of rubber plantations, corresponding to 40% of the national total, and 85% of total production for export. It also controls most of the large rubber companies, with more than a 60% stake in equitised rubber companies. Private firms play a somewhat greater role in coffee exports, but SOEs remain important. Vinacafe has interests in all stages of the coffee chain through its subsidiaries, member companies, and associated companies, and accounts for 20-25% of Vietnamese coffee bean exports.

SOEs are also heavily involved in supplying inputs to farmers and have near-monopoly status in the supply of several agricultural inputs – specifically fertiliser (99% of total output), electricity and gas (94%) and water supply (90%). Government policy has been to encourage domestic fertiliser production through subsidised prices for natural gas, electricity and coal, all fixed by the government and made available to the large state-owned chemical companies, including the PetroVietnam Group (PVN) and the Vietnam National Chemical Group[3] (Vinachem) and their subsidiaries. Larger irrigation schemes are managed by state-owned Irrigation and Drainage Management Companies. All major farm equipment makers appear to be equitised SOEs and continue to benefit from many of the privileges of SOEs.

1. Decision No. 26/2019/QD-TTg approving the list of State-owned enterprises (SOEs) to be equitised by the end of 2020.
2. The Viet Nam Food Association (VFA) is a social organisation of enterprises involved in producing, processing and trading of agricultural produce, food and other processed food products. VFA exerts a large degree of control over the rice export market and largely favours SOEs, in particular Vinafood I and Vinafood II and their subsidiaries.
3. Vinachem is to be equitised by the end of 2020 under Decision No. 26/2019/QD-TTg approving the list of State-owned enterprises (SOEs) to be equitised by the end of 2020. Following equitisation, the state will hold between 50% and 65% of charter capital.
Source: OECD (2015[2]); IPSARD (2018[51]); and Vietnam Business Law (2018[52]).

Reforming SOEs is a government priority to restructure the economy to raise productivity and competitiveness. Viet Nam's main mechanism to reform SOEs is equitisation, whereby SOEs are transformed into joint stock companies through either the partial or full sale of state capital. Viet Nam has also improved governance of SOEs in accordance with market principles.[9] Currently, there is no *de jure* distinction between SOEs and private enterprises in the business legal system (OECD, 2016[48]).

While roadmaps have been developed to equitise SOEs, progress towards privatisation and divestment has been slow (Government of Vietnam, 2016[28]; Dinh et al., 2017[49]). The number of 100% owned SOEs fell from 1 309 in 2011 to 487 in 2019 (WTO, 2021[13]). Moreover, many SOEs have been only partly privatised through the equitisation process, as newly created equity shares may be held by the state. The government continues to hold a controlling stake, i.e. more than 51% of the charter capital, in a further 185 enterprises. As a result, enterprises may continue to hold advantages from ex-SOE status, such as continued market power and easier access to credit (OECD, 2015[2]).

More recently, Viet Nam has launched a ministry-level government agency aimed at strengthening the performance of some of the largest SOEs by separating state ownership functions from state management functions and the market-regulation functions of state administrative agencies10 – a key recommendation in OECD (2016[48]). The Committee for Management of State Capital at Enterprises (CMSC) will represent the state as owner of SOEs and state capital in SOEs, while state agencies will exercise state management functions across all types of enterprises, including SOEs, and domestic and foreign private enterprises (VCI Legal, 2018[50]). The CMSC will also work with ministries (including MARD) and relevant agencies to continue improving SOE's operational efficiency and accelerate their restructuring process. The CMSC will manage 19 SOEs and corporations, including the Vietnam Rubber Group (VRG), the Vietnam Northern Food Corporation (Vinafood I), the Vietnam Southern Food Corporation (Vinafood II), the Vietnam National Coffee Corporation (Vinacafe) and the Vietnam Forestry Corporation.

Co-operatives

Along with SOEs, another key feature of the Vietnamese business environment for agriculture is the role played by co-operatives. As part of agricultural restructuring plans, the government aims to reorganise production in a manner that gives a key role to agricultural co-operatives and enterprises, including through co-operation in production and strengthening linkages along the value chain.

The government is encouraging the development of agricultural co-operatives to address scale constraints in agricultural production, aggregate farm output to allow large-scale purchases by enterprises, and impose higher quality and food safety standards upon member farmers. New agricultural co-operatives[11] mainly provide production services for their members, although some operate agricultural land, including at a larger scale. The main services provided include irrigation services, inputs such as seeds and agro-chemicals, plant protection and land preparation. In contrast, only a small share of agricultural co-operatives provide marketing and processing services for their members due, in part, to a lack of capital, management experience, and difficulties in finding trading partners (GIZ, 2017[53]; Dao The Anh, 2017[54]).

[9] Decision No. 929/2012/QD-TTg of the Prime Minister on approval of the scheme "Restructuring of State-owned enterprises, focusing on economic groups and State-owned corporations during 2011-15".

[10] Decree No. 131/2018/ND-CP on the functions, tasks, powers, and organisational structure of the Commission for the Management of State Capital in Enterprises; Resolution No. 12/2017NQ-TW on continuing reforming, renewing, and increasing the efficiency of SOEs. Resolution No. 12 directed the government to separate the state's regulatory function over all types of companies (state-owned or private sector) and its function as the owner of the state capital held in SOEs. Also according to this Resolution, by 2030 most SOEs will be owned by shareholders other than the state, and they will primarily operate as joint stock companies.

[11] As described in OECD (2015[2]), the 1996 Law on Co-operatives and the revisions introduced in 2003 and 2012 required existing co-operatives to be transformed into membership-oriented service co-operatives promoting the income of their members rather than as a delivery mechanism for government; otherwise they had to be dissolved. The Law also allowed farmers to establish new agricultural service co-operatives from scratch and broadened the scope of activities that they could undertake.

Until recently, the number of agricultural co-operatives was in decline, despite a range of support measures being available to develop new agricultural co-operatives.[12] However, the recent census reports an increase in the number of agricultural co-operatives to 6 646 in 2016 (GSO, 2018[9]), and almost 12 600 in 2018 (VietnamPlus, 2018[55]). A key factor underlying this trend reversal is the National Target Programme on New Rural Development (NTP-NRD), which requires communes to have co-operatives operating in accordance with the provisions of the 2012 Cooperative Law to be recognised as having attained "National Rural Development (NRD) status", among other criteria.[13]

One consequence of this programme is that many agricultural co-operatives do not operate effectively, as some communes have established co-operatives only to meet the NTP-NRD criteria and access public support. A recent survey of over 9 000 co-operatives found that only 12% operated effectively in terms of the services provided to members and their linkages with other actors in value chains (VietnamPlus, 2018[55]). Recognising this, the government aims to develop 15 000 effective co-operatives and unions of co-operatives by 2020 that will connect smallholder farmers with enterprises.[14] The scheme aims to maintain, strengthen and improve the operating efficiency of existing agricultural co-operatives, dissolve weak co-operatives that have ceased operation, and establish an additional 5 200 effective agricultural co-operatives.

Private investment

Viet Nam's government has also identified domestic private investment in agriculture as an important part of the solution to restructure the agricultural sector, promote sustainable development, and advance agricultural value chains, both in terms of job creation and enhancing the value added of the sector.[15] However, private investment in the sector remains low – in 2016, around 1% of the 3 846 domestic agro-food enterprises had invested in the sector (ISG, 2016[56]).

Most Vietnamese enterprises (96%) are small and micro enterprises[16] (GSO, 2018[9]; 2018[57]), and few can afford the investment required. Furthermore, stakeholders identifying many constraints and barriers to investment in agriculture. These include the large number of administrative procedures and business conditions on production and trade; difficulties in accessing resources such as land, capital and skilled labour; high transaction costs to co-ordinate with agricultural co-operatives and large numbers of small household farms; underdeveloped infrastructure for agricultural production; and difficulties in accessing plant varieties and livestock breeds including the time and cost required to have new varieties included on lists of plant varieties and livestock breeds permitted for production and trade (IPSARD, 2016[58]; McKenna, 2017[59]; IPSARD, 2018[60]).

The government has issued various policies over the most recent decade to encourage enterprises to invest in agriculture and rural areas.[17] These have offered numerous investment incentives to small and

[12] Decree No. 193/2013/ND-CP includes support to train human resources; market development and trade promotion activities; technology transfer; preferential credit and loan guarantees; priority to participate in target programmes and socio-economic development programmes such as the National Target Programme for New Rural Development (NTP-NRD); and advice and training on provisions of the Co-operative Law. Decree No. 193/2013/ND-CP also includes preferential support for agricultural co-operatives and unions of co-operatives, namely support for investments in infrastructure, preferential credit, support to restore production in areas affected by natural disasters and epidemics (e.g. capital and seeds), and support to develop plans to process agricultural products.

[13] Decision No. 491/2009/QD-TTg promulgating the national set of criteria for rural areas (for the period 2011-2015); and Decision No. 1980/2016/QD-TTg on the issuance of the national criteria on new rural communities in the period of 2016-2020.

[14] Resolution No. 32/2016/QH14 of the National Assembly on further raising the effectiveness of implementation of the National Target Programme on New Rural Development associated with agricultural restructuring; Decision No. 461/2018/QD-TTg approving the project to develop 15 000 effective co-operatives and unions of co-operatives by 2020.

[15] Decision No. 899/2013/QD-TTg approving the plan of restructuring the agricultural sector.

[16] Small enterprises have 11 to 100 employees; micro enterprises have 10 or fewer employees (OECD/ERIA, 2018[132]).

[17] For example: Decree No. 61/2010/ND-CP on incentive policies for enterprises investing in agriculture and rural development; replaced by Decree No. 210/2013/ND-CP on policies to encourage enterprises to invest in agriculture

large investors, including subsidised credit; reductions or exemptions from land and surface water rents, land use tax and corporate income tax; subsidies and grants for agricultural R&D, extension, technology transfer, and training; and investment support for infrastructure, facilities and equipment. Investment support is prioritised for certain types of products and projects (as identified in the Agricultural Restructuring Plan), including high-tech agriculture and clean agricultural production; organic agriculture; large-scale production and value chain linkages; and the 13 key national products.[18] The most recent policy to encourage enterprises to invest in agriculture and rural areas prioritises the following types of investments:[19]

- Agro processing projects using local materials or employing at least 100 people.
- Manufacturing projects for machinery, equipment, accessories and auxiliary products for agriculture.
- Projects using an environmentally friendly production process that consumes less energy and generates less waste.
- Projects to establish value chain linkages in the production and sale of agricultural products.
- Projects to encourage co-operation and linkages between the production and the consumption of agricultural products in the fields of agriculture, organic agriculture and high technology agriculture.

Overall, uptake of these incentives – and the incentives offered under previous policies – has been low. In addition to the broader constraints outlined above, small and micro enterprises often struggle to meet the conditions for support (particularly support targeting the application of high technology in agriculture) (GIZ, 2017[53]). Local authorities also frequently lack the budget to implement the policies (ISG, 2016[56]).

Administrative simplification is a priority for the Vietnamese government (OECD, 2018[36]). In 2017, the government issued Resolution No. 19/2017/NQ-CP directing ministries to review regulations to reduce the burden of administrative procedures and business conditions on enterprises.[20] MARD has taken steps to reduce the number of overlapping and unnecessary regulations. To implement Resolution No. 19, MARD reviewed a range of business conditions for investment, and subsequently abolished 173 out of the 345 business conditions related to: animal health; animal feed; manufacture, trials and trade of plant protection products; quarantine procedures; quality control, and genetically modified products.[21] MARD also significantly reduced the number of products and groups of products subject to specialised inspections and simplified procedures related to quarantine, quality and food safety, including by reducing unnecessary duplication of product inspections (PSAV, 2018[61]).

Finance policy

An efficient financial system facilitates the flow of capital to its highest value uses, including to farms and agro-food enterprises looking to fund innovation and growth. Access to a range of finance options enables farmers to finance production and marketing activities, and invest in innovations that improve their

and rural areas; in turn replaced by Decree No.57/2018/ND-CP on incentive policies to encourage enterprises to invest in agriculture and rural areas.

[18] The 13 national products as set out in Circular No. 37/2018/TT-BNNPTNT are: rice, coffee, rubber, cashews, pepper, tea, vegetables and fruits, cassava and products thereof, pig meat, poultry meat and eggs, pangasius (a type of freshwater fish), shrimp, and wood and products thereof.

[19] Circular No. 04/2018/TT-BKHDT of 6 December 2018, guiding the implementation of the Government's Decree No. 57/2018/ND-CP of 17 April 2018, on mechanisms and policies to encourage enterprises to invest in agriculture and rural areas.

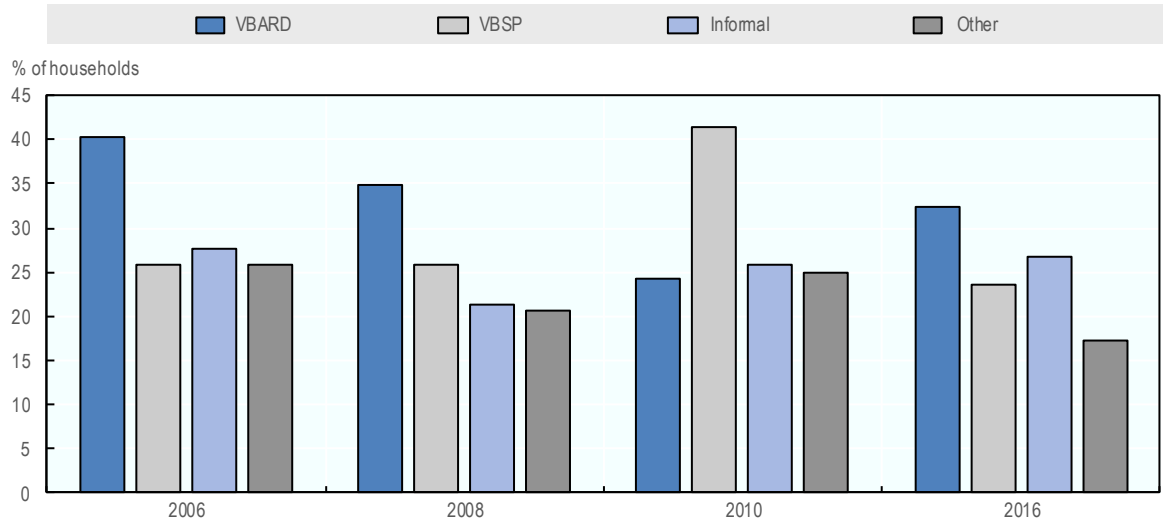
[20] Resolution No. 19/2017/NQ-CP on the further implementation of key tasks and measures to improve the business environment and enhance the national competitiveness in 2017, with a vision to 2020; and Resolution No. 01/2018/NQ-CP on major tasks and solutions directing the implementation of the socio-economic development plan and state budget estimate in 2018.

[21] Decree No. 123/2018/ND-CP amending and supplementing several decrees prescribing investment and business conditions in the agriculture sector.

productivity and environmental sustainability (OECD, 2020[1]). Access to finance also helps farmers – and smallholders in particular – to manage income and consumption shocks. A strong and competitive financial system is also important for innovating small- and medium-sized enterprises (SMEs), as these are likely to depend more on self-financing.

The formal financial sector in Viet Nam's rural areas is composed of a mix of state-owned and private banks, co-operative banks, and licensed micro-finance institutions (MFIs). Of these, the two state-owned banks – the Vietnam Bank for Agriculture and Rural Development (VBARD) and the Vietnam Bank for Social Policies (VBSP) – are the most important source of credit (Figure 3.4). VBARD is the largest state-owned commercial bank providing financial services to the rural and agricultural areas of Viet Nam,[22] mostly on a commercial basis for productive investments. In contrast, the non-profit VBSP acts as a "social policy lender" by providing highly subsidised credit without collateral, and is the largest source of microfinance (IFC, 2014[62]; OECD, 2015[2]).

Figure 3.4. Sources of credit in rural areas, various years



Note: Since households may hold loans from more than one source, the proportion of loans by source adds up to more than 100%. Other sources include credit funds, unions, private banks and everything else not included in the three main categories above. Data is taken from the Vietnam Access to Resources Household Survey implemented in 2006, 2008, 2010 and 2016 in 12 provinces.
Source: Ayala-Cantu et al. (2017[12]).

Limited access to credit constrains private investment in agriculture, by farmers (including smallholders) as well as agricultural co-operatives and enterprises. One of the primary drivers is the high degree of concentration in rural financial markets. Co-operative banks and other private financial institutions have not achieved significant coverage in rural areas – in part because VBSP's subsidised interest rate creates an uneven playing field, making it difficult for MFIs and co-operative banks to compete (IFC, 2014[62]). In 2016, VBARD accounted for 32% of loans to rural households and VBSP a further 24% (Ayala-Cantu et al., 2017[12]). Moreover, physical access to financial services remains low, particularly when compared to other countries in the region (Table 3.1). Around 20% of communes have banks, bank branches or co-operative banks (GSO, 2018[9]), with less than 25% of the rural population having an account with a financial institution (Demirgüç-Kunt et al., 2018[63]).

[22] The Vietnam Bank for Agriculture and Rural Development (VBARD) is to be equitized by the end of 2020 under Decision No. 26/2019/QD-TTg approving the list of State-owned enterprises (SOEs) to be equitised by the end of 2020. Following equitisation, the state will hold between 50% and 65% of charter capital.

Table 3.1. Access to financial services, various countries, 2012 and 2017

Number of bank branches

	Commercial bank branches per 1 000 km²		Commercial bank branches per 100 000 adults	
	2012	2017	2012	2017
Viet Nam	**7.0**	**8.1**	**3.2**	**3.4**
Cambodia	2.5	4.7	4.5	7.5
China	9.1	10.7	7.7	8.8
Indonesia	16.6	17.9	16.9	16.9
Lao PDR	0.5	0.6	2.7	3.1
Malaysia	7.2	7.3	11.1	10.1
Myanmar	1.0	2.8	1.9	4.7
Philippines	17.3	21.7	7.9	9.0
Thailand	12.6	13.3	11.7	11.9

Source: IMF (2019[64]), *Financial Access Survey*, http://data.imf.org/FAS. Updated from OECD (2015[2]).

Conditions to access loans also constrain borrowing by small-scale farmers and agricultural co-operatives. Formal financial institutions only accept legally registered assets as collateral – the primary asset being the Land Use Right Certificate (LURC). Moveable assets such as agricultural products and equipment are rarely accepted as collateral (OECD, 2015[2]). Moreover, because households can hold only one LURC, this means that they are eligible for just one loan at a time. Rural households have also identified banks' complicated loan procedures and the repayment requirements of MFIs as constraints (IFC, 2014[62]; Thang, Phuc and Petersen, 2017[65]).

Other factors also limit access to loans. Banks can be reluctant to offer loans because of the perceived riskiness of agricultural investments and farmers' inability to repay loans (Thang, Phuc and Petersen, 2017[65]). In addition, many borrowers do not use loans for their intended purpose, leading to bad debts and forcing banks to tighten regulations on lending (Ayala-Cantu et al., 2017[12]; News VietNamNet, 2018[66]). In the case of agricultural co-operatives, financial and accounting mismanagement, lack of tax records, and unprofitable business plans reduce banks' willingness to provide loans (GIZ, 2017[53]).

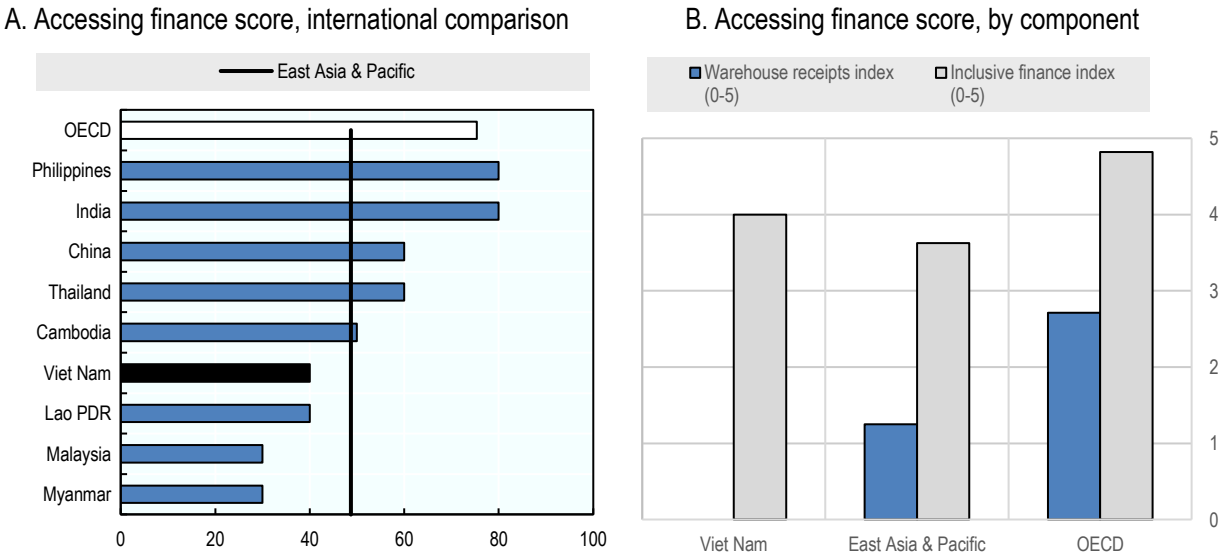
As a result, informal sources such as relatives and friends, private traders, moneylenders and group schemes remain an important source of financial services, particularly for lower-income households (IFC, 2014[62]; OECD, 2015[2]). Informal sources accounted for almost 27% of loans in 2016, and the majority of non-primary loans – over half of second loans and almost 75% of third loans (Figure 3.4) (Ayala-Cantu et al., 2017[12]). Small-scale farmers also receive value chain financing from agricultural co-operatives, enterprises and exporters, who often pre-finance inputs, provide small cash advances to meet immediate needs and sometimes pre-purchase entire crops upfront (OECD, 2015[2]; GIZ, 2017[53]).

Difficulty in accessing credit from banks and high interest rates also constrain the development of agro-food enterprises (which are mostly SMEs with limited assets and equity), such that the informal sector remains a major source of credit (OECD, 2015[2]). According to a 2014 IPSARD survey, less than 15% of agro-food enterprises could easily access bank credit. While lack of sufficient collateral was a factor, some surveyed enterprises were unable to prepare and submit the documents and project plans required by banks. For other enterprises, the loan amounts and terms offered did not align with their business models and needs (Shaikh and Dinh Thi Boa Linh, 2017[67]). Agro-food SMEs also compete for credit with SOEs and large domestic enterprises with easier access to credit.

The World Bank's *Enabling the Business of Agriculture* index an Accessing finance indicator which covers laws and regulations on the use of warehouse receipts and inclusive finance (World Bank, 2019[41]). Overall Viet Nam is below the average for East Asia & Pacific region (Figure 3.5). While it scores relatively high in terms of the Inclusive finance index component, Viet Nam lacks a warehouse receipts system. For farmers

who may not have traditional immovable collateral, warehouse receipt financing can be an effective tool to access credit.[23]

Figure 3.5. Enabling the Business of Agriculture: Accessing finance score, 2019



Note: Indices for the OECD and the East Asia & Pacific are the simple average of indices for countries from the geographical region that were covered in the database.
Source: World Bank (2019[41]), *Enabling the Business of Agriculture 2019*, http://eba.worldbank.org/.

Viet Nam is still overwhelmingly a cash economy – 94% of adults who received payments for agricultural products in 2017 received them in cash (Demirgüç-Kunt et al., 2018[63]). According to IFC (2014[62]), mobile banking has reached only a small segment of the population holding accounts with financial institutions, despite the widespread penetration of mobile phones.

Agriculture and rural areas is considered a priority sector for access to credit,[24] and the government has issued a number of policies to reduce identified constraints, including collateral requirements. The government has progressively increased the loan amounts that individuals, households, agricultural co-operatives and farm owners can borrow without collateral (Table 3.2). These loans can be used by agriculture, forestry, fishery and salt farms to cover production costs; to develop rural production and business lines; construct rural infrastructure; finance processing and consumption of agriculture, forestry, fishery and salt products; and finance trading in products and services for agriculture, forestry, fishery and salt production.

[23] A warehouse receipts system creates the possibility for using agricultural products (such as crops) as collateral—farmers deposit products in a licensed warehouse in exchange for a warehouse receipt, which they can use to obtain a bank loan (World Bank, 2019[41]).

[24] Resolution No. 14/NQ-CP of the Government dated 5 March 2014.

Table 3.2. Maximum loan amounts available without collateral

	2010	2015	2018
Individuals and households engaged in agriculture, forestry, fishery or salt production	VND 50 million (USD 2 600)	VND 100 million (USD 4 560)	VND 200 million (USD 8 690)
Individuals and households residing outside rural areas engaged in agricultural production and business activities		VND 50 million (USD 2 280)	VND 100 million (USD 4 340)
Households carrying out business or production activities or providing services for agriculture and rural areas	VND 200 million (USD 10 450)	VND 300 million (USD 13 680)	
Individuals and households investing in perennial crops		VND 200 million (USD 9 130)	
Agricultural co-operatives and farm owners	VND 500 million (USD 26 130)	VND 1 billion (USD 45 643)	
Hi-tech agricultural enterprises[1]			Up to 70% of the project value

Note: 1. Hi-tech agricultural enterprises includes enterprises without a hi-tech agribusiness certificate but having hi-tech agribusiness plans or projects.
Source: Decree No. 41/2010/ND-CP on credit policies for agricultural and rural development; Decree No. 55/2015/ND-CP on credit policies for agricultural and rural development; and Decree No. 116/2018/ND-CP amending and supplementing a number of articles of Decree No. 55/2015/ND-CP.

Subsidised credit is available to purchase assets for agricultural production, including fertilisers, pesticides, machinery or equipment (OECD, 2015[2]). For example, enterprises, co-operatives, households and individuals investing in or manufacturing machines, equipment and facilities in order to reduce postharvest agricultural losses can benefit from subsidised interest rates for long and medium-term loans covering up to 70% of the investment value. These loans can cover the full value of the cost of such goods and interest rates can be fully subsidised in the first two years.[25]

Subsidised credit is also one of several support mechanisms included in policies that encourage co-operation to develop large-scale production areas, value chain linkages, and the development of high-tech and clean agriculture.[26] In 2014, the government launched a two-year pilot lending programme for agricultural development that capped interest rates for short-term loans at 7% per year, medium-term loans at 10% per year, and long-term loans at 10.5% per year. The pilot lending programme prioritised large-scale production areas; enterprises, co-operatives and farmers with contracts; and enterprises applying high-technology in agriculture.[27]

More recently, in 2017 the government directed state-owned commercial banks to allocate at least VND 100 trillion (USD 4.4 billion) in a lending programme for high-tech, clean agriculture that offers interest rates 0.5% to 1.5% lower than market interest rates.[28] According to the State Bank of Viet Nam, 14 700 enterprises have borrowed VND 40 trillion (USD 1.74 billion) from the programme. However, there are reports that enterprises are struggling to access the preferential loans, because of difficulties in meeting the criteria to be certified as a high-tech agricultural enterprise and low commercial potential (News VietNamNet, 2018[68]).

[25] Decision No. 68/2013/QD-TTg on policies to reduce losses in agriculture.

[26] Decree No. 57/2018/ND-CP on incentive policies to encourage enterprises to invest in agriculture and rural areas; Decision No. 62/2013/QD-TTg on the policy to encourage the development of co-operation, co-operative production associated with product consumption, and the building of large fields.

[27] Decision No. 1050/2014/QD-NHNN on the pilot lending programme for agricultural development under Resolution No. 14/NQ-CP of the Government dated 5 March 2014.

[28] Resolution No. 30/2017/NQ-CP.

Tax policy

Tax policy can affect innovation, productivity and sustainability in many ways. Taxation affects the returns to innovation, and thus the decisions of enterprises and individuals to invest. It also affects the relative price of production factors and therefore priority areas for innovation. Taxes on income, property, land and capital transfer may affect structural change, while differential tax rates on specific activities (polluting or environmentally beneficial), resources, or inputs may affect sustainability. Tax policy can also be used to provide direct incentives, for example preferential tax treatment to encourage private investment in R&D; to support new, innovative enterprises; or to steer innovation towards specific areas – for example, to address particular societal concerns, towards greener technologies and practices, or environmental R&D (OECD, 2015[2]).

Various tax incentives are available for farmers and agro-food enterprises in Viet Nam, including reductions in or exemptions from land use tax, corporate income tax incentives, and exemptions from value added tax for agro-food inputs, products and machinery that is exclusively intended for agricultural production or processing.

The main mechanism of the central government to tax farm incomes is through an agricultural land use tax. However, most farm households and organisations (e.g. agricultural co-operatives) are either exempt or have had the amount they pay reduced, as a result of a number of exemptions and reductions that were introduced in 2003 – and subsequently extended to 2020 – to encourage agricultural production and support to farmers.[29] Exemptions are provided for: agricultural land under the land limits assigned by the government to both farm households and individuals;[30] agro-forestry land under the land limits allocated to households from SOEs; and agricultural land – both under and above the land limits – for poor households and households located in communes classified as having extreme socio-economic difficulties. Households and individuals with agricultural and agro-forestry land holdings in excess of land limits, including land allocated by SOEs, are required to pay the agricultural land use tax (but at a reduced rate of 50% of the agricultural land use tax for their class of land) (OECD, 2015[2]).

Agro-food enterprises also benefit from reductions in or exemptions from the agricultural land use tax. Agricultural land used for research and in trials is exempt from paying the agricultural land use tax, while organisation which manage and use agricultural land benefit from a 50% reduction. Reductions in land use taxes have also been used to encourage private investment in agriculture and infrastructure development.[31]

The corporate income tax (CIT) rate is 20%, but agro-food enterprises benefit from a range of exemptions and reductions that have been expanded over time.[32] Farming and breeding enterprises located in areas facing extreme socio-economic difficulties have been CIT exempt since 2013; in 2014, this exemption was extended to cultivation and agro-food processing enterprises in areas facing socio-economic difficulties. Farm households, individuals and agricultural co-operatives are not liable for corporate income tax (CIT), except those with high incomes and producing on a large scale as defined by the government.

[29] Resolution No. 15/2003/QH11 on agricultural land use tax exemption and reduction, implemented by Decree No. 129/2003/ND-CP; Resolution No. 55/2010/QH12 on exemption and tax reduction on agricultural land use in the period 2011-20, implemented by Decree 20/2011/ND-CP.

[30] Land area per household or individual is limited when land is allocated by the state. Land area for annual crops per household or individual directly involved in agricultural production should not exceed 3 ha for land in centrally-managed provinces and cities in the Southeast region and Mekong Delta region, and 2 ha for land in other centrally-managed provinces and cities. The land area for perennial crops should not exceed 10 ha in the delta area and 30 ha in the midland and mountainous areas. Agricultural land obtained through the transfer, lease, sublease, inheritance or donation of land use rights or through capital contribution in the form of land use rights, is not covered by allocation limits (OECD, 2015[2]).

[31] Decree No. 210/2013/ND-CP, replaced by Decree No. 57/2018/ND-CP on mechanisms and policies to encourage enterprises to invest into agricultural and rural development.

[32] Law No. 14/2008/QH12 on corporate income tax; Law No. 32/2013/QH13 on the amendments to the Law on corporate income tax; Law No. 71/2014/QH13 on amendments to tax laws.

Agro-food enterprises can also benefit from various CIT rate incentives and exemption holidays (Table 3.3). The incentives target enterprises investing in areas with socio-economic difficulties; investing in scientific research and technology development (including high-tech agriculture and high-risk investments); developing technologies for environmental protection; producing machinery and equipment serving agricultural production; and enterprises engaged in producing or processing agricultural products, among other projects.

Farmers, agricultural co-operatives and enterprises also benefit from value added tax (VAT) exemptions and rate reductions on agricultural products, inputs and services (the standard rate is 10%). A number of agricultural products and inputs are VAT exempt, including: unprocessed crop, livestock and aquaculture products; products that have undergone preliminary processing by organisations or individuals self-producing and selling such products; and products at the stage of importation.[33] Most exported agricultural products are VAT exempt. Since 2014, fertilisers, certain types of specialised machinery and equipment serving agricultural production, and certain types of feed for cattle, poultry, and other animals have also been exempt; previously, a 5% VAT rate applied to these goods.[34] The reduced 5% VAT rate applies to pesticides and a number of agricultural services, including: digging, embanking and dredging canals, ditches, ponds and lakes for agricultural production; and some crop protection services (OECD, 2015[2]).

Table 3.3. Corporate Income Tax Incentives, 2016

Project type	CIT rate[1] %	Incentive period[2]	CIT exemption holiday[3]	50% CIT reduction[4]
Incomes from breeding, rearing, growing and processing agricultural, forestry and aquaculture products, salt production, creation of new plant and animal varieties	17	10 years	2 years	3 years
Areas with difficult socioeconomic conditions; high technology zones and economic zones; manufacture of machinery and equipment serving agriculture, forestry and fish farming; manufacture of irrigation equipment; production and refining of feed for cattle, poultry and aquatic resources.	17	10 years	2 years	4 years
Agricultural service co-operatives and people's credit fund	17	No limit		
Encouraged investments and areas	15	12 years	3 years	7 years
Incomes of enterprises executing new investment projects in localities facing extreme socio-economic difficulties, economic zones and hi-tech zones; Incomes of hi-tech enterprises and agricultural enterprises that apply high technologies according to the Law on High Technologies	10	15 years	4 years	9 years
Incomes of enterprises from farming, breeding and processing of agriculture and aquaculture products in areas other than disadvantaged areas or particularly disadvantaged areas.	15	No limit		
Incomes of enterprises from planting, cultivating, and protecting forests; from agriculture, forestry and aquaculture in localities facing socio-economic difficulties; from the production, multiplication, and cross-breeding of plants and animals; from investments in post-harvest preservation of agricultural and aquaculture products, and food.	10	No limit		

1. The standard CIT rate is 20%, effective as of 1 January 2016.
2. The incentive period runs generally from the first year of revenue generation, but the tax exemption and reduction period may not begin until taxable income is generated or from the fourth year of revenue generation in the event of no taxable income within the first three years. Thus, the tax exemption and tax reduction periods cover fewer years than the incentive period.
3. CIT exemption begins once a company starts generating taxable revenue. For hi-tech enterprises and agricultural enterprises applying high technologies, this duration shall be counted from the year when they are recognised as hi-tech enterprises or agricultural enterprises applying high technologies.
4. 50% CIT reduction period begins when the CIT exemption period has expired.

Source: OECD (2015[2]); Law No. 71/2014/QH13 on amendments to tax laws; Vision & Associates (2018[69]).

[33] Law No. 13/2008/QH12 on Value-added Tax.

[34] Law No. 71/2014/QH13 on amendments to tax laws. The types of livestock feeds and specialised machinery and equipment that are VAT exempt are defined in Decree No. 12/2015/ND-CP and Official letter No. 3233/BTC-TCT dated 13 March 2017 of the Ministry of Finance regarding value added tax (VAT) on special use machinery and equipment serving agricultural production.

There is also an environmental protection tax, which is imposed on products and goods that, when used, are detrimental to the environment. Taxable products include herbicides and insecticides, which are taxed at VND 1 000-3 000/kg (USD 0.04-0.13/kg) (Vision & Associates, 2018[69]).

According to the WEF (2017[37]) businesses consider tax regulations a highly problematic factor for doing business in Viet Nam. Commentators have identified a number of issues with tax regulations (and their recent amendments). The agricultural land tax is widely seen as discouraging land consolidation by farmers, since households and individuals with land in excess of land limits must pay the tax (IPSARD, 2018[51]; OECD, 2015[2]). CIT legislation is vague and procedures for accessing corporate incentives are complex and inconsistent across various documents (OECD, 2015[2]). While Law No. 71/2014/QH13 introduces additional VAT exemptions, enterprises are no longer eligible for a VAT rebate on other inputs, including water, agricultural services and facility rental costs, resulting in many enterprises being made worse off (USDA FAS, 2015[70]; IPSARD, 2018[51]).

Infrastructure

Physical and knowledge infrastructure, including irrigation and transport networks, as well as a reliable access to energy and information and communication technologies (ICT), are important for overall growth and development. Efficient and well-developed infrastructure is vital to connect farms – and smallholders in particular – to market opportunities, knowledge and economic services. In contrast, inefficient and underdeveloped infrastructure can significantly increase farmers' and enterprises' costs (OECD, 2020[1]). Well-developed rural infrastructure is also important to attract private investment into the agricultural sector and increase competitiveness (OECD, 2015[2]). The provision of irrigation system services is specially discussed in Section 4.5.

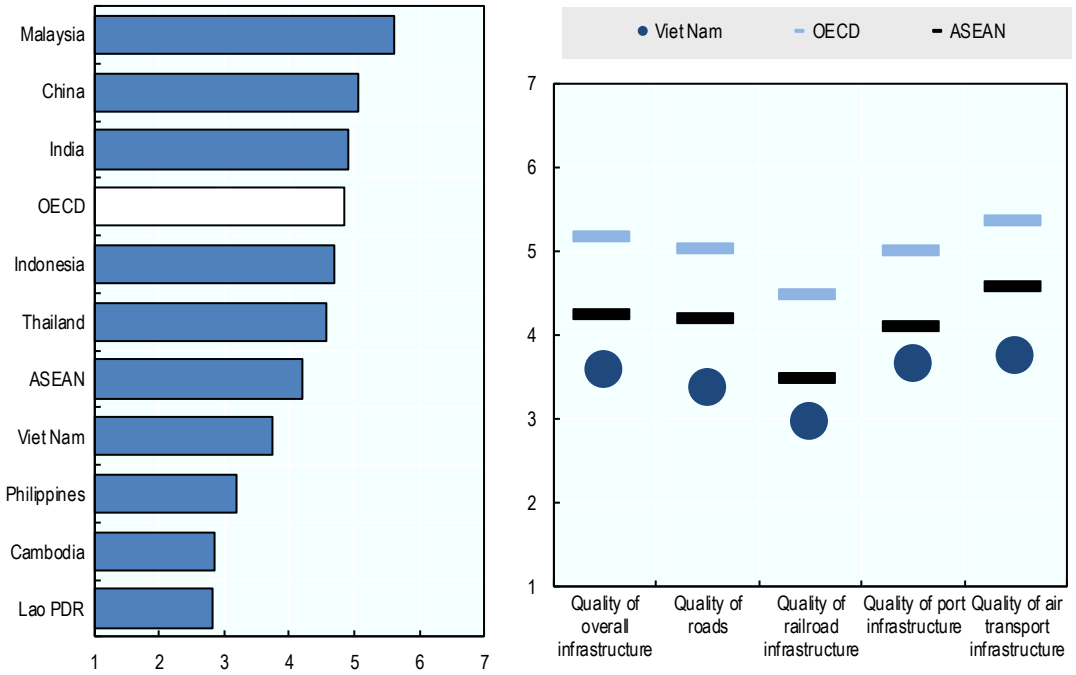
The Vietnamese government has identified infrastructure development as one of three priority areas to achieve the country's development objectives (Government of Vietnam, 2011[27]). The country's recent rapid economic growth has resulted in serious infrastructure bottlenecks, and existing infrastructure gaps – particularly in transport and electricity networks – are likely to increase as Viet Nam's economy continues to grow and industrialise. Public investments in infrastructure, while considerable, have generally focused on expanding existing networks rather than maintaining them, and quality has not kept pace with demand (OECD, 2018[25]; OECD, 2016[48]). Reflecting this, Viet Nam ranks below the averages for OECD countries and the Association of Southeast Asian Nations (ASEAN) on indicators of the quality of transport infrastructure (Figure 3.6).

According to government and independent estimates, investments in essential infrastructure over the 2011-20 period amount to 10-11% of GDP (OECD, 2018[25]). This contributed to welfare improvements in rural areas by increasing agricultural productivity and connecting farmers and rural communities to larger markets (Eckardt, Demombynes and Chandrasekharan Behr, 2016[6]; OECD, 2015[2]; GSO, 2018[9]). However, further, significant investment is needed both to maintain existing rural infrastructure and to build new infrastructure for irrigation, transport, postharvest handling, and storage.

Strengthening broadband and mobile phone coverage is essential. Integrating digital solutions into agriculture can improve efficiency by decreasing financial and labour costs, providing information to support management decisions, increasing product quantity and/or quality, reducing losses, and/or ensuring effective and sustainable use of resources. In 2019, one out of three Vietnamese still lacked internet access, with fixed broadband only available to about 12% of the population (World Bank, 2021[71]). The 2016 agriculture census found only 4% of households had fixed telephone lines, while 10% had computers with broadband internet access and 90% owned a mobile phone (FAO, 2021[72]). While mobile coverage is good overall and relatively affordable, the northern and mountainous regions have lower connectivity. A 2018 survey of 26 relatively poor communes found that only 48% of surveyed households reported a strong mobile signal (World Bank, 2021[73]).

Figure 3.6. Global Competitiveness Index: Quality of transport infrastructure, 2017-18

Scale from 1 to 7 (best)



Note: Indices for ASEAN and OECD are the simple average of member-country indices.
Source: WEF (2017[37]), The Global Competitiveness Report 2017-2018: Full data Edition, http://reports.weforum.org/global-competitiveness-index-2017-2018.

Spending on rural infrastructure has also generally prioritised new infrastructure and expanding existing networks, rather than recurrent costs such as operations and maintenance (O&M). Moreover, planning processes have paid insufficient attention to ensuring that infrastructure is climate-resilient and meets appropriate technical standards (Crockford, Kaiser and Figueroa-Geron, 2016[74]; Dinh et al., 2017[49]), although risk assessments linked to natural disasters and climate change are now compulsory for new infrastructure investments (OECD, 2018[75]). As a result, much of the stock of rural infrastructure is in a poor condition and not properly maintained.

Policies supporting private investment in infrastructure

Historically, infrastructure investment in Viet Nam has been predominantly state-led, with relatively little private investment in infrastructure despite government efforts to mobilise private sector resources (OECD, 2018[25]). However, given the significant level of investment required, the government estimated that about 50% of the financing for infrastructure investments between 2010 and 2020 will have to come from the private sector (OECD, 2018[25]).

Public-private partnerships (PPPs) can enhance co-operation between public and private actors, thereby increasing returns from public funds through cost and risk sharing, and through securing contributions that are more adapted to both public and private demand. The main conditions for forming a successful PPP include a common objective, mutual benefits, complementarity of human and financial resources, clear institutional arrangements, good governance, transparency and public leadership (OECD, 2015[2]).

The government recently issued Decree No. 63/2018/ND-CP establishing a new PPP regulatory framework.[35] Decree No. 63 encourages private investment in a wide range of sectors, including transport,

[35] Decree No. 63/2018/ND-CP replaces Decree No. 15/2015/ND-CP on investments in the form of public-private partnerships (PPPs). Decree No. 15/2015/ND-CP created a unified legal framework to attract private investment in

trade and electricity infrastructure; health and education; and agriculture and rural development (including services to develop agricultural value chains). Compared with previous PPP frameworks, the new Decree clarifies and streamlines investment procedures. Of particular relevance for agriculture, smaller-sized projects with capital less than VND 120 billion (USD 5.2 million) are subject to simplified procedures (Vietnam Law, 2018[76]; OECD, 2018[25]). Projects in this category are mostly agriculture-related projects executed by local investors. The new Decree also increases the equity capital requirement of investors and clarifies the state's participation in PPP projects.

The government is actively promoting PPPs in agriculture and rural areas.[36] Areas for investment include projects to construct, renovate, operate and manage agricultural and rural infrastructure;[37] and investment in services to develop agricultural value chains, such as agricultural production support, services for processing and preserving farm products, and services related to the consumption of farm products.[38] To strengthen PPP co-ordination, MARD has also established various PPP task forces for the coffee, fisheries, fruits and vegetables, pepper, rice and tea sectors, and to address issues related to misuse of agro-chemicals, in co-operation with the World Economic Forum. The taskforces bring together actors from the private sector, government agencies, research institutes and non-government organisations (NGOs) (PSAV, 2019[77]).

Beyond PPPs, various incentives are offered to attract private investment in agricultural and rural infrastructure such as water works, sanitation systems and transport infrastructure. For example, enterprises investing in ports for transporting agricultural, forestry and fishery products, anchorage areas, and water-saving irrigation systems for agricultural production may receive support for 50% of the cost of the investment, capped at VND 20 billion (USD 869 000). Enterprises investing in rural areas with inadequate infrastructure (for their business needs) may receive support for 70% of the cost of the investing in roads and electricity and water infrastructure, capped at VND 5 million (USD 217 000).[39] Enterprises and agricultural co-operatives developing value chain linkages with farmers may receive support of the 30% of the cost to build infrastructure servicing the linkage, including workshops, yards and warehouses for production, preliminary processing, preservation, processing and consumption of agricultural products.[40] In addition to infrastructure, financial support is also provided for investment in machinery, equipment, extension and training and consultants.

Rural development policies

Broader rural development measures affect sustainable agricultural development and structural adjustment. Increased off-farm income and employment opportunities mitigate farm household income risks, facilitate farm investment, and enable a wider range of farm production choices. Improved rural services, from banking to information and communication technologies (ICT) are important to connect households, farms and enterprises to market opportunities and economic services. Rural policy can also

infrastructure (in line with international practices) and made important improvements to the regulatory framework for investment in infrastructure. However, very few PPP projects were implemented under the Decree.

[36] Circular No. 14/2017/TT-BNNPTNT guiding the implementation of several articles of the Government's Decree No. 15/2015/ND-CP on investment in the form of PPPs in agriculture and rural areas.

[37] Includes irrigation systems; infrastructure for farming and breeding; warehouses for storing and preserving agricultural products; infrastructure for hi-tech agricultural zones or areas; quarantine facilities and facilities for testing and certifying agricultural product quality; and infrastructure for water drainage, collecting and treating wastewater, and preventing rural environmental pollution.

[38] Includes (i) services which support agricultural production: supply of inputs, finance, credits, training, human resources, technical infrastructure, science and technology and policy consultancy, agricultural extension, transfer of technical advances, mechanisation, veterinary, and plant protection; (ii) services to support the preservation and processing of farm produce: preservation services, pre-processing, and processing of farm produce; and (iii) services to support the consumption of farm products: contracts, testing services, experiment services, quality control, conformity assessments, agricultural product branding and logistics.

[39] Decree No. 57/2018/ND-CP on incentive policies to encourage enterprises to invest in agriculture and rural areas

[40] Decree No. 98/2018/ND-CP on the policy to promote the development of co-operation and links in production and consumption of agricultural products.

attract innovative upstream and downstream industries, with possible spill-over effects locally. By reducing inequalities in economic development and access to services across regions, rural development policies improve the diffusion of innovation (OECD, 2020[1]).

The government's main mechanism to address rural development challenges in the period 2011-20 were the National Target Programmes on new rural development (NTP-NRD) and sustainable poverty reduction (NTP-SPR).[41] These had the primary objective of reducing poverty in the poorest areas and are central to the government's strategy for raising rural incomes and agricultural productivity, while reducing socio-economic disparities between rural and urban areas (World Bank, 2017[78]). Both programmes provide support for investments in key capacities for the agricultural sector – infrastructure in particular – and support to develop market-oriented agricultural production.

The NTP-SPR supported infrastructure, livelihoods, basic services and capacity building in Viet Nam's poorest districts and communes through five sub-programmes.[42] The largest and most important of these programmes is the Socio-economic Development Programme for Ethnic Minorities and Mountainous Areas (known as Programme 135). While earlier phases of Programme 135 have focused on improving infrastructure and providing support for production development and livelihood diversification (including in agriculture), the current phase (2016-20) also emphasises capacity building and training for community and grassroots-level officers in Viet Nam's poorest mountainous ethnic minorities (World Bank, 2017[78]; OECD, 2015[2]).

The NTP-NRD aims to improve services and socio-economic infrastructure in rural communities in Viet Nam's 63 provinces. It establishes 11 activities that communes should undertake to qualify for recognition as having attained "National Rural Development (NRD) status", which are associated with 19 criteria that indicate improvements in economic, social and environmental wellbeing.[43]

Several NTP-NRD criteria target improvements in capacities that can directly support agricultural productivity growth and improvements in sustainability.[44] Communes are required to improve roads to a standard that allows for year-round transportation (including of goods for market) and to expand irrigation coverage with the goal of enhancing adaptation to climate change and establishing sustainable agricultural commodity production areas. They are required to improve the operational efficiency of co-operatives and promote linkages between enterprises, co-operatives and farmers in value chains for key agricultural products (Box 3.2). Communes are also required to build, operate and maintain environmental protection facilities, including for livestock waste and the disposal of agro-chemical containers.

[41] There were 16 National Target Programmes (NTPs) in the period 2011-15 that focused on specific sectors and were implemented through different ministries such as health, education, water, transport, agriculture and rural development. These were consolidated into two overarching programmes for the period 2016-20. The NTP-NRD is implemented through MARD with the budget being assigned directly to the provinces.

[42] The five sub-programmes of the NTP-SPR are (i) Programme 30A (P30a), which focuses on 64 poor and 23 near-poor districts and coastal areas with specific sub-components in district infrastructure, coastal infrastructure, production development and labour export; (ii) Programme 135 (P135), which focuses on the 2 240 poorest ethnic minority communes and 33 273 villages; (iii) Project 3 on Production support, livelihood diversification and scaling up of poverty reduction models in non-P30A and non-P135 communes; (iv) Project 4 on Communications and information poverty reduction; and (v) Project 5 on Capacity building and monitoring and evaluation .

[43] Decision No. 1600/2016/QD-TTg approving the National Target Programme on New Rural Development for the 2016-20 period. The 11 activities are: (i) new rural development master planning; (ii) social-economic infrastructure development; (iii) production development and rural economic structural transformation; (iv) social security; (v) development of education in rural areas; (vi) development of grassroots health facilities; (vii) improving cultural life; (viii) improving rural hygiene and the environment; (ix) improving quality and roles of political organizations; (x) robust national defense and security, social order and safety in rural areas; and (xi) enhancing capacity for NRD implementation and monitoring and evaluation.

[44] Decision No. 491/2009/QD-TTg on the national set of criteria on New Rural Development; Decision No. 1980/2016/QD-TTg on the national criteria on New Rural Development in the period of 2016-20.

Box 3.2. One Commune, One Product Programme

The One Commune, One Product (OCOP) programme aims to develop typical agricultural and non-agricultural products and services in each commune. The overall objectives of the OCOP programme are to develop economic sectors that produce and manufacture high-value traditional products and services that are competitive both in the domestic and international market. The programme prioritises co-operatives, small and medium enterprises and household farms, and aims to develop around 500 small and medium enterprises and co-operatives under the programme.

The OCOP programme is a key solution to implement the NTP-NRD in the 2018-20 period. The programme aims to develop the rural economy through supporting agricultural modernisation and the development of non-farm rural industries, and accelerating the restructuring of the rural workforce towards non-farm activities (and reducing urban migration), while protecting the environment and preserving Viet Nam's rural values. In doing so, it also addresses a weakness of the first phase of the NTP-NRD, namely that it had given insufficient attention to value chain development, enterprise creation and the diversification of the rural economy (Crockford, Kaiser and Figueroa-Geron, 2016[74]).

The total cost of implementing the programme is estimated at VND 45 000 billion (USD 1.95 million), mainly sourced from capital mobilised by the private sector (including enterprises, co-operatives and households), loans from credit institutions and international organisations. Production areas will be planned by the government, and the government will manage and supervise product quality standards. The government will also provide support for education, training, technical advice, the application of science and technology, branding, trade and product promotion, and credit.

Source: ISG (2018[79]), and Decision No. 490/2018/QD-TTg approving the "One Commune, One Product" programme for the 2018-20 period.

Since 2010, nearly VND 560 trillion (USD 25 billion) has been invested in commune level programmes under NTPs. A recent assessment identified that most of this funding has been used to construct infrastructure, primarily roads, followed by schools and irrigation (World Bank, 2021[73]). Consequently, there has been a significant improvement in access to services, however gaps in remote areas remain, especially in human development investment. Just 10% of the funding received was used for non-infrastructure related activities to improve livelihoods, production, education, health and environmental quality, reflecting an emphasis on quantity over quality. Poorer communes were often badly served. Pressure associated with achieving NTP criteria led some provinces to prioritise districts and communes with the best chance of achieving 'NRD status', often at the expense of poorer communes (Crockford, Kaiser and Figueroa-Geron, 2016[74]).

3.2. Natural resources management

Land use planning and regulations

Secure land rights are a necessary condition of any investment in agriculture. They support sustainable agricultural productivity growth by enhancing landholders' incentives to make long-term investments. Secure land rights also provide users of land (and water) resources with a long-term interest in maintaining the integrity of the resource base to ensure future production (FAO, 2011[80]). Secure land rights are also critical to ease the process of land acquisition and facilitate the use of land as collateral for loans, which can be important for funding productivity and sustainability-enhancing innovations (OECD, 2015[2]).

The Vietnamese Government's land policy is governed by Land Law 2013. Land in Viet Nam is owned by the "entire people" with the state as the administrator of all land. The state allocates or leases land to enterprises, households and individuals. Private ownership of land is not permitted; instead, enterprises, households and individuals own "land use rights", including the right to rent, buy, sell, and bequeath land and to use land as collateral with financial institutions for mortgages. Holders of these rights are entitled to Land Use Rights Certificates (LURCs) (commonly referred to as Red Books), which are necessary for state

recognition of a user's rights, formal land transactions and access to formal credit (OECD, 2015[2]).[45] An important change brought in by Land Law 2013 was to extend the duration of land use rights to 50 years for all agricultural land. Under Land Law 1993 the duration of rights was 50 years for perennial crops but only 20 years for annual crops. Another significant change was to allow, for the first time, foreign entities to be allocated land to build housing for sale and lease (Petersen, Yen and Vanzetti, 2017[30]; OECD, 2015[2]).

In recent years, the government has also taken steps to reduce restrictions on land use. Households no longer require permission for land use changes that convert land for planting annual crops into other types of agricultural land; convert land for planting annual crops and land for aquaculture into land for planting perennial crops; or convert land for planting perennial crops into land for aquaculture or land for planting annual crops.[46] The government is also currently reviewing land policies in order to create favourable conditions for land consolidation and accumulation for large-scale agricultural production (OECD, 2018[81]). There are also policies in place that aim to facilitate land consolidation and encourage enterprises to farm specialised, large-scale production areas (Box 3.3).[47]

Box 3.3. The Large-Scale Field production system

The Large-Scale Field (LSF) system is a way of organising production based on co-operation between farmers, agricultural co-operatives and enterprises on a large scale. The LSF system was launched by the Ministry of Agriculture and Rural Development (MARD) in 2011 to address several weaknesses in Viet Nam's rice sector, including low quality and competitiveness, and to increase the incomes of rice farmers. Stakeholders recognised that traditional cultivation techniques (including intensive use of agricultural chemicals) were reducing rice quality, increasing production costs and causing environmental degradation. Stakeholders also recognised that the small scale of production was constraining mechanisation and the adoption of new technologies, and making it difficult for enterprises to source larger quantities of high-quality rice. With the LSF system, MARD aimed to develop zones of high-quality rice production for export by establishing large areas that followed Good Agricultural Practices (GAP), reduce transaction costs, and strengthen the position of farmers in the rice export value chain (Khoi, Dat and Dung, 2014[82]).[1]

LSFs aggregate the plots of individual farmers into large, commonly managed production areas. Enterprises or co-operatives establish a co-operative relationship with households at a large scale to: 1) apply standardised production practices and varieties; 2) provide inputs and services (such as seeds, fertiliser and production services, as well as technical support); and 3) buy outputs from farmers. Within this broad model, the co-operative relationship can take several forms, which differ according to the strength of the linkage between farmers, co-operatives and enterprises[2] (Tran Cong Thang et al., 2017[83]).

While LSFs were originally implemented in the rice sector, LSFs have also been established for vegetables, sugar cane, tea and maize production. However, rice production accounts for the majority of LSFs, participating households and area (GSO, 2018[9]). LSFs are mainly located in the Red River Delta, North Central and Central Coastal Areas and the Mekong River Delta. On average, 274 households participate in each LSF, which range in size from 82 hectares for large-scale maize fields to 312 hectares for large-scale rice fields (on average).

[45] The land registration process and developments in successive Land Laws are outlined in OECD (2015[2])

[46] Circular No. 33/2017/TT-BTNMT.

[47] Decree No. 57/2018/ND-CP on incentive policies to encourage enterprises to invest in agriculture and rural areas.

Table 3.4. Large-scale fields, by crop, 2016

	Number of fields	Number of participating households	Area planted in last 12 months (Ha)	Area contracted before production (Ha)	Share of area contracted before production (%)
Whole country	2 262	619 343	579 284	169 246	29
Paddy	1 661	453 627	516 882	136 907	26
Maize	50	17 072	3 468	2 648	76
Sugar cane	95	6 607	13 981	13 494	97
Vegetable	162	74 601	17 006	1 842	11
Tea	38	20 030	7 588	4 045	53
Other crops	256	47 406	20 359	10 311	51

Source: GSO (2018[9]).

Evaluations of LSF systems have reported that participating farmers have lower production costs, as a result of less intensive input use and lower land preparation and harvesting costs, and receive higher and more stable prices (GIZ, 2017[53]; Tran Cong Thang et al., 2017[83]). The LSFs also facilitate more environmentally sustainable production and contribute to reducing greenhouse gas (GHG) emissions by providing a foundation to apply Good Agricultural Practices (GAP) and climate smart agriculture (CSA) techniques[3] (Nguyen, 2017[21]; Tran Cong Thang et al., 2017[83]).

1. Decision No. 62/2013/QD-TTg.
2. Linkage forms are specified in Decree No. 98/2018/ND-CP and include different combinations of supplying inputs and services for production, harvesting and processing, associated with contracts to buy farm outputs.
3. CSA techniques include One Must Five Reductions (1M5Rs); Three Reductions and Three Gains (3R3G); Alternate Wetting and Drying (AWD); the System of Rice Intensification (SRI); and Deep Fertiliser Placement (DPF).

However, limits on property rights to land and significant land use planning continue to prevent households and individuals from using agricultural land in its most productive and profitable uses. Land use rights are not fully private, tradeable and secure. Households and individuals face several restrictions on land use in terms of their choice of crops, capacity to build fixed structures or to convert agricultural land to non-agricultural uses. Changes in land use are only allowed that conform to central and local planning frameworks, which mostly confine farmers to growing rice on paddy land at the expense of other crops or aquaculture that would be a more profitable use of the same land (Box 3.4). Land use transfers are also strictly regulated and there are upper limits on the allowable land area for transferring land use rights (OECD, 2015[2]).

The Land Law also limits the land area held by households and individuals when land is allocated by the state. Paddy land and annual cropping land is limited to only 3 hectares for land in centrally-managed provinces and cities located in the Southeast and Mekong River Delta regions, and 2 hectares for land in other centrally-managed provinces and cities. Perennial crop land is limited to 10 hectares. Holdings in excess of these limits are discouraged by restricting the agricultural land tax exemption to households and individuals with holdings within the land limits (IPSARD, 2018[51]; OECD, 2015[2]).

There are also significant issues related to how land use rights are allocated and the security of tenure. State agencies have a significant role in determining how land use rights are allocated and the price at which land use rights are issued does not reflect the market value of land. As a result, land is most likely to be allocated to those with connections to the state and state officials rather than to productive and innovative enterprises (World Bank, 2016[5]).

Farmers and enterprises also lack secure land tenure. Under the 2013 Land Law, the state can recover land for the purposes of national defence or security, and socio-economic development for national and public benefits. While the law requires the state to pay compensation based on the market price, farmers are rarely compensated according to the open market land prices but the agricultural use value (OECD,

2015[2]). Similarly, annual surveys of private enterprises report that enterprises hold significant concerns about land expropriation and that compensation will be too low after land seizures, which acts as a disincentive to invest on the land (Malesky, Ngoc and Thach, 2018[31]).

The increased tenurial security provided in Land Law 2013 by extending the land use right period from 20 years to 50 years lead to greater farmer investment. A recent study estimated that farmers were 17% more likely to make an investment in irrigation technology or soil and water conservation because of this change (Bellemare, 2020[84]). However, restrictions on land use rights constrain further investment and agricultural productivity growth, and prevent farmers from earning higher profits from other activities (Petersen, 2017[85]), a fact that is recognised by farmers (Thang, Phuc and Petersen, 2017[65]). Moreover, by preventing farmers from diversifying their crop mix, land use restrictions also reduce the ability of farmers to smooth their income sources and manage risk.

Box 3.4. Rice land preservation policies

Agricultural land use plans and support policies favour rice production. Viet Nam's master plan for agricultural production development stipulates that at least 3.8 million hectares of land should be allocated to rice, of which 3.2 million hectares should be irrigated and cropped at least twice per year.[1] Households require permission of the People's Committee of the commune to convert land use from rice to a perennial crop, and land that is converted to a perennial crop must stay in a condition that allows rice to be grown in the future – for example, irrigation systems for rice production cannot be damaged and soil cannot be degraded.[2] The Land Law also limits land use change from rice land to non-agricultural land. To support farmers growing rice, rice growers receive area payments to protect and develop land for rice cultivation nationwide and face penalties if they convert paddy fields to non-agricultural uses, levied at a rate not lower than 50% of the value of wet paddy land.[3]

Protection of rice land is motivated by food security concerns – through protecting 3.8 million hectares, Viet Nam aims to produce 41-43 million tonnes of rice per year, to meet total demand for domestic consumption and provide exports of around 4 million tonnes per year. In practice, rice land protection has let Viet Nam exceed its food security objectives and generate a massive exportable surplus that produces only modest net returns to the country. Moreover, it prevents rice farmers from maximising their profits due to the lack of freedom in crop choice (Chu et al., 2017[86]; Petersen, 2017[85]; OECD, 2015[2]). Studies analysing the removal of policies protecting rice land have shown that resulting shifts in land use would benefit the economy, including notable increases in real GDP and consumption, accelerate growth in agriculture and reduce poverty (Chu et al., 2017[86]; Giesecke et al., 2013[87]; IPSARD, 2017[88]).

Recognising this, the government has set goals for converting some paddy land to other crops. The government has also encouraged the expansion of cultivated land for maize to increase Viet Nam's self-sufficiency in maize production for livestock feed.[4] For example, in 2016, the government offered a one-time payment to support farmers in converting their land use from rice to maize cultivation in Northern Midland and Mountainous provinces, North Central region, Mekong Delta, South Central Coast and Central Highlands (OECD, 2017[89]).

1. Decision No. 124/2012/QD-TTg approving the master plan for agricultural production development through to 2020 with a vision toward 2030. Decision No. 124/2012/QD-TTg gives effect to Resolution No. 63/2009/NQ-CP to ensure national food security, which set the target of protecting 3.8 million ha of rice land.
2. Decree No. 01/2017/ND-CP on amendments to the decrees implementing the Land Law.
3. Decree No. 35/2015/ND-CP on management and use of land for rice cultivation.
4. Decision No. 899/2013/QD-TTg and Decree No. 915/2016/QD-TTg.

Environmental protection and climate change

Viet Nam is increasingly mainstreaming environmental protection into national and sectoral development plans. The Socio-Economic Development Strategies (SEDS) 2011-20 recognised that socio-economic development should be accompanied by environmental protection and improvement, while the five-year plan SEDP (2016-20) emphasised the need to actively respond to climate change, effectively manage

natural resources and protect the environment. Similarly, strategies for developing the agricultural sector have the goal of strengthening natural resource management and reducing greenhouse gas emissions and other negative impacts of agriculture on the environment.

Viet Nam has comprehensive environmental and agri-environmental legislation. The Law on Environmental Protection[48] sets environmental standards, including on surface and groundwater pollutants and on effluents flowing into water resources; defines environmental protection requirements; and prohibits the discharge of untreated wastes and toxic chemicals into soils, water bodies, and air. All projects that may have a significant environmental impact are required to undertake Environmental Impact Assessments (EIAs). On agriculture, the law provides guidance on the treatment of farming tools, packaging materials, and expired fertilisers and pesticides, and requires concentrated livestock zones to have a plan for environmental protection and meet certain requirements on waste management and hygiene (Cassou et al., 2017[90]; Tran, 2017[91]). Moreover, in recent years, a number of laws (and their implementing measures) have come into effect or were adopted that specifically address the prevention and control of agricultural pollution at the farm-level.[49] This includes laws that provide for plant protection, phytosanitary and veterinary matters;[50] and regulations, policies and programmes on environmental protection, pesticides and fertiliser management, and Good Agricultural Practices (GAPs) (Cassou et al., 2017[90]).

However, the effectiveness of laws, regulations and policies on environmental protection is limited by implementation challenges related to weak monitoring, compliance and enforcement. Unclear responsibilities and a lack of co-ordination between ministries, departments within ministries, and with local authorities, contributes to weak enforcement of laws and regulations. Government agencies struggle to monitor and control nonpoint sources of agricultural pollution – including 8.6 million household farmers – due to staff and resource constraints. Authorities are also often unable or reluctant to enforce environmental laws and regulations, particularly in the case of violations by small household farms. When imposed, penalties for noncompliance with laws and regulations are minimal and generally provide an inadequate disincentive (Cassou et al., 2017[90]).

Viet Nam has issued a wide range of strategies and plans that respond to climate change. While each document has its own priorities, they share the common aim of adapting to and mitigating the impacts of climate change, enhancing sustainable development and socio-economic development associated with environmental protection (IPSARD, 2019[92]). Four key national level documents among the range and their specific goals or tasks for the agricultural sector are set out in Table 3.5.

Viet Nam launched the National Adaption Plan in Agriculture (NAP-Ag) in 2016 with the primary objective of identifying entry points for mainstreaming climate change adaption priorities for the agricultural sector.[51] As part of NAP-Ag, a climate change vulnerability assessment was carried out in the agricultural sector (crop, livestock and aquaculture) together with a stocktake of climate change adaption measures and CSA practices in use in the sector. A salinity monitoring and early warning system was also piloted in some provinces of the Mekong River Delta to keep farmers informed about salinity levels. Moreover, a pilot mapping of landslide disaster risk was carried out in 13 mountainous provinces, to be scaled-out to the whole country in 2018. Further, to successfully integrate adaptation priorities in the NAP, the capacities of MARD officials and other stakeholders in the agricultural sector were built through rapid capacity assessments, the formation of a Technical Working Group within MARD, the development of guidelines on prioritising climate-responsive investments (especially in the Mekong Delta) and trainings for national and provincial officials on valuation of climate change impacts (FAO and UNDP, 2020[93]).

[48] Law on Environmental Protection No. 55/2014/QH13, effective 1 January 2015.

[49] See Tran (2017[91]) for a detailed summary of major legal measures relating to the prevention and control of farm-level agricultural pollution.

[50] Plant Protection and Phytosanitation Law No. 41/2013/QH13 dated 25 November 2013; Veterinary Law No. 79/2015/QH13 dated 19 June 2015.

[51] National Adaptation Plans were established in 2010 as part of the Cancún Adaptation Framework to enhance urgent action on adaptation and were adopted by Parties to the United Nations Framework Convention on Climate Change (UNFCCC) (Decision 1/CP.16.). NAPs enable countries to identify, prioritise and implement the most needed medium– and long–term adaptation actions.

Table 3.5. Key national multi-sector level documents on climate change in Viet Nam

Document	Agricultural specific goals, tasks or actions
Decision No. 2139/QD-TTg dated 5 December 2011 approving the *National Strategy for Climate Change*	Tasks the agricultural sector with reducing greenhouse gas (GHG) emissions by 20% every ten years, while increasing gross production by 20% and reducing the poverty rate by 20%.
Decision No. 2053/QD-TTg dated 28 October 2016 on the *Action Plan to Implement the Paris Agreement on Climate Change*	Set 41 tasks for the Ministry of Agriculture and Rural Development (MARD), including the following three compulsory tasks: • Implement GHG emission reduction in the agriculture and rural development sector in order to implement the NDC in accordance with national conditions on the basis of a periodic review of global efforts. • Establish a Measurement, Reporting and Verification System (MRV) for sector-level GHG emission reduction activities in the land use, land use change and forestry (LULUCF) sectors. • Establish a MRV System for sector-level GHG emission reduction activities in the agricultural sector.
Decision No. 1055/QD-TTg dated 20 July 2020 on *National Climate Change Adaptation Plan for the period 2021-2030, with a vision to 2050*	The plan identifies the following adaptation needs in the agricultural sector: • improving the resilience of the agricultural sector through revising and completing laws and policies, and providing training and improving capacity; • adjusting farming plans, arranging crop structures and scaling-up appropriate models for improving the effectiveness of agricultural land use and climate change adaptation; and • improving the resistance of plants and livestock to disease and pests under climate change impacts. Funding to implement the plan will be sourced from the state budget, and from funding for implementing adaptation actions in the national target programmes and other programmes and projects.
Decision No. 1658/QD-TTg dated 1 October 2021 on *National Strategy on Green Growth for the period 2021-2030, with a vision to 2050*	Its overall objective is to contribute to Viet Nam's economic restructuring to achieve economic prosperity, environmental sustainability, and social justice, with the goal of a green and carbon-neutral economy that positively contributes to limiting global warming. To assist with reducing the country's intensity of GHG emissions per GDP (target reductions of at least 15% by 2030 and 30% by 2050 compared to 2014 levels), the agricultural sectors contribution targets are to maintain forest cover at 42% (to 2030) and 42-43% (2050); and apply advanced and water-saving irrigation methods to 30% (by 2030) and 60% (by 2050) of the total irrigated dry crop area.

In response to various national level decisions, and drawing on the findings of NAP-Ag, MARD has issued several agricultural specific strategies and plans to adapt to or mitigate climate change in the agricultural sector.[52] For example, in March 2020, MARD approved its Plan to Implement the Paris Agreement on Climate Change for the period 2021-2030.[53] It sets out tasks for the sector to implement the government's 2016 action plan for the agreement. Key tasks for MARD include reducing greenhouse gas (GHG) emissions in the agriculture and rural development sector; and establishing measurement, reporting and verification systems (MRV) for the agricultural sector and the land use, land use change and forestry (LULUCF) sectors. To reduce GHG emissions in agriculture and rural areas by 20%, these plans and programmes prioritise research on, selection and production of plant varieties and animal breeds able to minimise GHG emissions and adapt to climate change, and the adoption of more sustainable practices and climate smart agriculture techniques.

Viet Nam signed and ratified the Paris Agreement on Climate Change in 2016. In its initial Nationally Determined Contribution (NDC) submitted in 2015, Viet Nam committed to reducing its estimated 2030 Business-as-Usual (BAU) GHG emissions of 787.4 $MtCO_2eq$ by 8% using domestic resources, and up to 25% conditional on receiving international support. In July 2020 Viet Nam submitted its updated NDC (Government of Vietnam, 2020[94]). In this update the 2030 BAU GHG emission level was revised up to 927.9 $MtCO_2eq$, with the commitment made to reduce this level by 9% using domestic resources and up to 27% with international support.[54]

[52] Most recently in Decision No. 819/2016/QD-BNN-KHCN approving the agriculture and rural development sector's action plan for responding to climate change 2016-20; Decision No. 923/2017/QD-BNN-KH approving the Green Growth Action Plan of the agriculture and rural development sector for the period 2016-20.

[53] Decision No. 891/QD-BNN-KHCN of 17 March 2020.

[54] The original NDC 8% reduction commitment used 2010 as the base year for estimating the 2030 BAU; the revised commitment used 2014 as the base year.

At the 26th United Nations Climate Chance Conference (COP26), held in November 2021, Viet Nam announced its commitment to achieving net zero carbon emissions by 2050. Viet Nam also signed onto the Global Methane Pledge, which aims to reduce global methane emissions by at least 30% from the 2020 levels by 2030. As rice cultivation is identified as a major source of GHG emissions, particularly methane emissions, Viet Nam is looking into solutions for emission reduction in this sector. On 9 December, MARD's National Agriculture Extension Centre (NAEC) and the International Rice Research Institute (IRRI) organised a consultation workshop on the Modernization and Low Carbon Rice Production Transformation project (ModeLRice). The project will be piloted in three major rice growing provinces of An Giang, Dong Thap and Can Tho in the Mekong Delta to increase low carbon rice production models using climate smart technology.

In 2020 the government also approved VND 530 billion (USD 22.8 million) in financial support to prevent and combat drought, water shortages and salinisation in eight provinces in the MRD, including the impacts on agriculture (Ben Tre, Long An, Tien Giang, Ca Mau, Kien Giang, Soc Trang, Tra Vinh and Bac Lieu) (Decision No. 504/2020/QD-TTg). The funding will be used to implement urgent measures such as pumping water; dredging canals and ditches, and building temporary dams to prevent salinity to maintain fresh water; and digging ponds and wells for storing fresh water.

Regulations on products and processes

Regulations on products and processes aim to protect human, animal and plant health and can also impact on natural resource use. Regulations can support innovation by building consumer and societal trust in the safety and sustainability of new products or processes (OECD, 2020[1]). However, regulations that are unnecessarily burdensome, complex or redundant can constrain innovation and impose heavy costs on farms and enterprises (ADB, 2017[95]).

Viet Nam has a modern food safety regulatory framework that aligns with international standards and approaches to food safety management. The 2010 Food Safety Law addresses food safety across the food chain.[55] It assigns food safety responsibilities to three ministries: MOH, which has over-arching responsibility for food safety in Viet Nam and is responsible for a number of commodities, food ingredients and packaging material; MARD, which has responsibility for food safety in agriculture, agroforestry and aquatic products in the food supply; and MOIT, which is responsible for some commodities and for retail marketing of food, namely, markets and supermarkets (World Bank, 2017[96]). However, food safety remains a major concern for Vietnamese consumers and policymakers, despite the government's efforts to improve institutional arrangements for food safety. Food safety is also a significant issue in agro-food exports. Responsible agencies lack the capacities to implement food safety controls effectively, particularly at the regional and local levels. Co-ordination between agencies, risk analysis and identification systems are poor, both at the central government level and between central and local government.

The legal framework for genetically modified organisms (GMO) regulation is established by the 2010 Decree on Biosafety for Genetically Modified Organisms. The decree was revised in 2011 to make it compliant with provisions of Viet Nam's Food Safety Law on the management of food derived from agricultural biotechnology, and to designate MARD as the governing authority on regulating GM crop field trials and approving GM products used as animal feed and human food.[56] Together these two decrees provide the legal framework for both food and bio-safety management of GMOs, genetic specimens, and products derived from GMOs. All of the necessary regulations required for commercialising agricultural biotechnology were completed in early 2014 (USDA FAS, 2018[97]; OECD, 2015[2]).

The development of organic agriculture has been constrained by the lack of regulations and criteria on production requirements and certification. In 2018, the government issued a decree on organic agriculture that establishes the principles of organic agriculture and sets out the requirements to produce and certify organic products, as well as labelling and traceability requirements.[57] The decree defines organic agriculture as a production system that sustains the health of soils, ecosystems and people, relying on

[55] Law on Food Safety No. 55/2010/QH12, which is implemented by Decree No. 15/2018/ND-CP.

[56] Decree 69/2010/ND-CP on the Biosafety for Genetically Modified Organisms and Decree 108/2011/ND-CP in November 2011 revising Decree 69/2010/ND-CP.

[57] Decree No. 109/2018/ND-CP on organic agriculture.

ecological processes, biodiversity and cycles adapted to natural conditions, rather than the use of inputs with adverse effects. The decree prohibits the use of synthetic inputs, genetic modification, and some processes and technologies (including irradiation).

The government is encouraging farmers to produce high-quality and safe products through the application of Good Agricultural Practices, including GlobalGAP and the national version, VietGAP.[58] These programmes encourage farmers to produce clean and safe agricultural products by helping farmers control and use pesticides and fertilisers more effectively, which would add more value to the products and consequently improve farmers' income (Nguyen, 2017[21]). Various types of support are available to facilitate the adoption of VietGAPs.[59] This includes support to cover 100% of the cost of baseline surveys, topographical surveys, soil analysis, and analysis of water and air samples to determine ideal production areas; up to 50% of the cost of investing in infrastructure to meet the technical requirements of VietGAP (e.g. roads, irrigation and waste treatment system); training provided for managers, technicians and agricultural extension officers; and the cost of certification. Support is also available for farms applying other GAPs including GlobalGAP.[60]

In August 2018, the government issued Decree No. 109/2018/ND-CP on organic agriculture. The decree establishes the principles of organic agriculture and provides support to enterprises producing organic agricultural products. This includes priority in assessing support provided through investment promotion policies for agriculture and rural areas, as well as funding for science and agricultural extension.

Following this decree, the Prime Minister has approved a decision on the *Scheme for Developing Organic Agriculture in the Period 2020-2030* (Decision No. 885/2020/QD-TTg). The scheme sets out specific goals for increasing the share of **organic production** in agricultural production, including for key crops, in livestock and aquaculture production, and for improving the value per hectare of organic production by 2025 and 2030. By 2025, organic agriculture is to account for 1.5-2% of the total agricultural area (and 2.5-3% by 2030); over 1% of the cultivated area for major crops including rice, fruit and vegetables, tea, pepper, coffee, cashew nuts and coconut (2% by 2030); and 1-2% of domestically produced livestock products (2-3% by 2030). In addition, by 2025 the value per hectare of organic production is to be 1.3 to 1.5 times higher than non-organic production (1.5 to 1.8 times higher by 2030). Other goals include: diversifying how organic production is organised, including linkages between agricultural co-operatives and enterprises in the production and processing of organic products to create large-scale production areas; the application of technology in organic agriculture; promoting processing, consumption and exports of organic products; developing certification bodies and a system of standards for organic production; research and development on organic agriculture; and human resources training.

4. Agricultural policies in Viet Nam

This chapter analyses agricultural policies in Viet Nam. The context section provides an overview of the national policy framework and the trends in support policies as estimated by the OECD's Producer Support Estimate (PSE). The main agricultural trade policies and producer support policies that contribute to the PSE are then discussed in detail. Irrigation and flood protection is considered separately as it is a key policy area in Viet Nam, contributing to the productivity, sustainability and resilience of the agricultural sector.

[58] Although VietGAPs are not recognised on international markets, they are based on GlobalGAP practices. Viet Nam has also participated in the development of ASEAN GAP standards, which help producers upgrade to GlobalGAPs (McKenna, 2017[59]).

[59] Decision No. 01/2012/QD-TTg on policies supporting the application of VietGAPs in agriculture, forestry and fisheries.

[60] Circular No. 54/2014/TT-BNNPTNT on the recognition of other good agricultural practices eligible for incentives for agriculture, forestry and aquaculture.

4.1. The context of agricultural policy support

Agricultural policy framework and objectives

Prior to 1986, agriculture's primary role was to support Viet Nam's industrialisation by providing food at low prices (Table 4.1). Agricultural production was organised around co-operatives and state farms, with state-owned enterprises providing inputs and controlling output markets. Since the late-1980s a series of reforms have progressively liberalised Viet Nam's agricultural sector.[61]

Table 4.1. Viet Nam: Agricultural policy trends

Period	Framework	Changes in agricultural policies
1976-1986	Reunification: Socialist centrally planned system	Centrally planned economy, including the agricultural sector Agricultural production organised into co-operatives that also administered land Upstream and downstream sectors reorganised as state-owned enterprises
1986-1993	Renovation (*Doi Moi*): Launch of reforms to transition Viet Nam to a socialist-oriented market economy	Farm households replace co-operatives as focus of agricultural and rural development Role of co-operatives reduced: farmers allowed to make production decisions; co-operatives limited to trading and providing services (e.g. irrigation) Economy opened to trade Reduced government control over prices, although prices regulated for some products (including fertiliser, sugar and rice)
1993-2000	Expansion: Further reforms to expand food production and exports	Land Law 1993; land use rights extended to 20 years (annual crops) and 50 years (perennial crops) Land use tax replaces production quota and agricultural output tax Rural households allowed to borrow loans from commercial institutions Price Stabilisation Fund for essential commodities Restrictions on rice exports relaxed Increased budgetary expenditure for agriculture
2000-2008	Consolidation: Policies to promote agricultural and rural modernisation and industrialisation	Policies to encourage production of primary and processed commodities, quality improvement, domestic and international trade, and increase investments from various sources in physical and social infrastructure Regional and bilateral trade agreements WTO accession
2008-present	Reorientation: Shift in emphasis from extensive development of agriculture based on quantity to one focused on quality and efficiency improvements	Agricultural policy guided by two major resolutions: - Resolution No. 26/2008/NQ-TW on agriculture, farmers and rural areas (Tam Nong) - Resolution No. 63/2009/NQ-CP to ensure national food security Implemented through the master plan for agricultural development (2012) and the agricultural restructuring project (2013)

Source: OECD (2015[2]).

Agricultural reforms were embedded into the economy-wide programme of reforms (*Doi Moi*) initiated in 1986, which transformed Viet Nam from a centrally planned to a socialist-oriented market economy. Under *Doi Moi*, agriculture was elevated to primary importance. The focus of agricultural management moved from co-operatives to farm households, with farmland redistributed in the form of land use rights and farm households given the ability to make their own production decisions provided they met certain quotas. Broader reforms opened the market to both greater domestic and international competition. However, reforms were limited for strategic commodities and inputs, including sugar, rice, and fertiliser. Import tariffs were cut in 1988 and trade with 'China resumed in 1989. Private firms and state-owned enterprises (SOEs) were licensed to trade with foreign firms, and the fixed-rate exchange rate regime was switched to one that was allowed to fluctuate within a range.

From the early 1990s, reforms introduced more market-oriented policies with the aim of expanding food production for export to generate foreign exchange earnings. A number of these reforms aimed to improve investment and technological innovation. These included the Land Law 1993, the establishment of a

[61] A detailed review of Viet Nam's agricultural policies since Reunification in 1976 can be found in OECD (2015[2]).

national extension service and credit facilities for farmers via increased government funding to the Vietnam Bank for Agriculture and Rural Development (VBARD). The compulsory production quota system and the agricultural output tax were replaced with a land use tax, giving farmers a greater say in marketing their production. Viet Nam also entered into a several bilateral and regional trade agreements and partnerships to expand market opportunities.[62] The improved policy environment was supported by a rapid increase in budgetary expenditure, which quadrupled in real terms during the 1990s, including on irrigation infrastructure. At the same time, a Price Stabilisation Fund was created to stabilise the prices of essential commodities including urea, paddy and rice, coffee, and sugarcane.

From 2000, the policy framework aimed to stimulate agricultural and rural modernisation and industrialisation by improving yields, quality and the value of production. Further international integration at the bilateral, regional and multilateral level locked in previous reforms and motivated further actions. The remaining few quantitative restrictions on agricultural imports and exports were progressively withdrawn. For example, it was not until the late 2000s that private sector involvement in the rice export trade was encouraged. Prior to this, even though the rice export quota had been expanding, from less than 1 million tonnes in 1992 to 4.5 million tonnes by 1998, the right to export was limited to national and provincial SOEs.

The Communist Party of Viet Nam's current orienting document for agriculture, rural development and farmer livelihoods is Resolution No. 26/NQ-TW dated 5 August 2008 (commonly referred to as the Tam Nong resolution).[63] It emphasises agricultural and rural development based on the market economy with socialist orientation. It sets broad goals of building a modern and stable agricultural sector, developing rural areas, and improving the life of rural residents. Alongside this sat government Resolution No. 63/NQ-CP of 23 December 2009 which seeks to ensure national food security by guaranteeing adequate food supplies, particularly for rice. It included specific targets of maintaining 3.8 million hectares of rice land and a farm-gate price for rice that provides growers with a profit of 30% above production costs. Resolution No. 63 was replaced by Resolution No. 34/NQ-CP dated 25 March 2021 on ensuring national food security until 2030. Like its predecessor, the overall goals of Resolution No. 34 include ensuring enough food supply for domestic consumption in all circumstances while allowing for exports, and increasing incomes of people so they can purchase good quality and safe food. The list of specific goals includes stabilising 3.5 million hectares of land in rice production and a target that rice farmers in large-scale production areas have an average profit of 35% above production costs.

These high-level resolutions, which given direction to SEDS and SEPS, are implemented through numerous policy documents. Two of the most important are the master plan for agricultural production development (Prime Minister's Decision No. 124/QD-TTg of 2 February 2012) and the agricultural restructuring scheme towards value-added and sustainable production (Prime Minister's Decision No. 899/QD-TTg of 10 June 2013).[64] Both of these decisions contain general objectives which align to varying degrees with the outcomes that are being assessed through the PSR framework (Table 4.2).

[62] In 1995 Viet Nam became a member of the Association of Southeast Asian Nations (ASEAN) and its associated ASEAN Free Trade Area (AFTA). Viet Nam was formally admitted as a member of the Asia Pacific Economic Community (APEC) in November 1998. In December 2001, the US-Viet Nam Bilateral Trade Agreement came into effect. In 2007, Viet Nam obtained WTO membership.

[63] Resolution No. 26 is currently being reviewed with the intention of issuing a revision.

[64] Decision No. 899 was replaced in 2021 with a new agriculture industry structural plan for 2021-2025 (Prime Minister's Decision No. 255/QD-TTg dated 25 February 2021).

Table 4.2. Alignment of Vietnamese agricultural policy objectives with the PSR framework

Outcomes of the PSR framework	Master plan for agricultural production development (No. 124/QD-TTg of 2 February 2012)	Agricultural restructuring schelme towards value-added and sustainable production (No. 899/QD-TTg of 10 June 2013
Productivity	To develop the agricultural sector towards modern, sustainable, large-scale commodity production on the basis of comparative advantage To apply science and technology to increase productivity, quality, effectiveness and competitiveness to ensure national food security in both the short and long term while adapting to the diverse needs of domestic and exports	Maintain robust agricultural growth and improve sectorial competitiveness, primarily via advances in productivity, efficiency, and value addition, and better meet the needs and preferences of consumers
Sustainability	To improve the effectiveness of land use, water, labour and capital	Improve natural resources management, reduce impacts, contribute to get environmental benefits and improve capacities to manage weather-related and other natural hazards in the context of Viet Nam.
Resilience	To raise incomes and living conditions of farmers, fishermen, salt producers and foresters.	Continue to raise farmer incomes and rural living standards, reduce the incidence and severity of rural poverty, and ensure household and national food and nutrition security

The Ministry of Agriculture and Rural Development (MARD) has primary responsibility for policy development and implementation (Box 4.1). However, many other central government ministries and agencies are also involved, and since fiscal decentralisation in 2002, local government has had a greater role in planning and implementing agricultural policy. As an example, MARD has the task of overseeing implementation of Resolution No. 63/2009/NQ-CP on ensuring national food security. However, the annex to the Resolution lists almost 20 distinct government agencies with roles to play, and there are over 60 associated policy documents implemented across ministries, branches and provincial-level People's Committees, leading to conflicting and inefficient outcomes (Petersen, 2017[34]).

Box 4.1. Institutional arrangements for administering agricultural policy

MARD has the main responsibility for formulating, implementing and administering agricultural policy. It is also responsible for performing the state management functions in relation to forestry, salt production, fisheries, irrigation, natural disaster prevention and control, and rural development.

The main tasks of MARD[1] are to:

- Submit to the government draft laws and resolutions of the National Assembly; draft ordinances and resolutions of the Standing Committee of the National Assembly; and draft decrees of the government under the Ministry's approved annual law-making programmes and plans. Develop resolutions, mechanisms, policies, projects, schemes and other legal documents under the Ministry's state management as assigned by the government or Prime Minister.
- Submit to the government and Prime Minister development strategies, master plans, long-term, medium-term and annual plans, and important national projects and works in the sectors and fields under its management.
- Issue decisions, directives, and circulars within MARD's mandated areas; guide how to implement these documents and monitor the implementation process.
- Guide, supervise and organise the implementation of legal documents, strategies, master plans, programmes, projects, standards, techno-economic norms relating to agriculture, forestry, salt industry, fishery, irrigation/water services and rural development. Disseminate information and raise public awareness about regulations within areas covered by MARD's mandate.

The organisational structure of MARD is arranged to carry out these responsibilities. MARD is comprised of 27 units, consisting of 21 professional departments/state management offices, and 6 public non-business units serving the Ministry's state management function. MARD also has responsibility for various institutional agencies including research institutions, universities, colleges, secondary schools, and media organisations.

There are 63 Departments of Agriculture and Rural Development (DARD), one for each of the 58 provinces and 5 municipalities. These operate as local branches of MARD, in conjunction with the respective Provincial People's Committee (PPC). DARDs are responsible for applying laws and policies around the country, and provide advice, administration and instruction at the provincial and district levels to plan and implement central government policies, including agricultural land registration, land allocation, extension, irrigation and rural development planning. At the same time, DARDs also implement the socio-economic development plans of the PPCs.

Many other central government line ministries or public institutions have responsibilities for policies that directly impact the agricultural sector, including:

- Ministry of Natural Resources and Environment (MONRE) is responsible for land- and water-use, and has agri-environmental responsibilities and roles, including in monitoring and enforcement.
- Ministry of Planning and Investment (MPI) is responsible for the state management of planning, development, investment and statistics, including allocating state investment in agriculture.
- Ministry of Industry and Trade (MOIT) is responsible for the state management of industry and trade in both the domestic market and internationally, including food distribution and trade.
- Ministry of Finance (MOF) is responsible for fiscal policy, including support to agriculture.
- Ministry of Science and Technology (MOST) is responsible for the state management of science and technology, including research, intellectual property, standards and meteorology.
- Ministry of Health (MOH) is responsible for social policies, food safety and food security.

At a local level, the PPCs are responsible for some aspects of agricultural policy, and some provinces issue additional policies to encourage agricultural production depending on their natural conditions or their own objectives for development.

The private sector is represented by the Vietnam Food Association (VFA), the Vietnam Farmers' Union, with some sector-specific associations also representing producers. The VFA is an industry association for enterprises involved in the production, processing and trading of agricultural produce, food and other processed food products. However, in practice, the VFA is highly influenced by two large State-Owned Enterprises (SOEs): the Vietnam Northern Food Corporation (Vinafood I) and the Vietnam Southern Food Corporation (Vinafood II). In addition, the Partnership for Sustainable Agriculture in Vietnam (PSAV) provides an opportunity for the private sector to participate in policy dialogues related to the coffee, fisheries, fruits and vegetables, pepper, rice and tea sectors, in addition to agro-chemical regulation.[2]

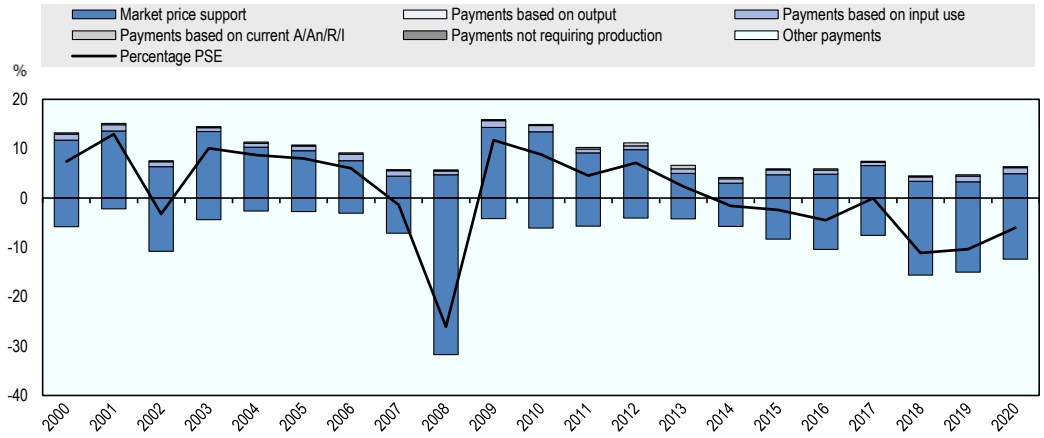
1. Decree No. 15/2017/ND-CP defining the functions, tasks, powers and organisational structure of the Ministry of Agriculture and Rural Development.
2. PSAV brings together actors from the private sector, government agencies, research institutes and non-government organisations (NGOs) to develop value chains in the coffee, fisheries, fruits and vegetables, pepper, rice and tea sectors, and to address issues related to misuse of agro-chemicals.
Sources: OECD (2015[2]); PSAV (2019[77]); and WTO (2021[13]).

Overview of agricultural support policies

Support provided to Viet Nam's agricultural sector fluctuates at low and negative levels, largely driven by changes in market price support (MPS). In 2018-20, Viet Nam's producer support estimate (PSE) was -9.2%, implying an implicit overall taxation compared to the positive level of support in 2000-02. Budgetary transfers to producers are relatively small and include payments based on variable input use – primarily expenditure to subsidise an irrigation fee exemption and direct payments to rice producers tied to maintaining land in rice production.

Figure 4.1. Level and composition of Producer Support Estimate (PSE) in Viet Nam, 2000-2020

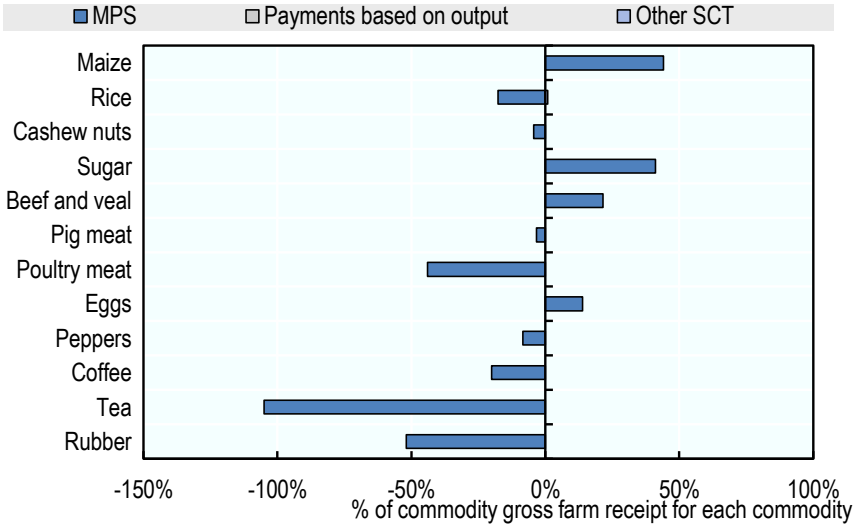
As a percentage of gross farm receipts



Note: A/An/R/I:Area planted/Animal numbers/Receipts/Income.
Payments not requiring production include Payments based on non-current A/An/R/I (production not required) and Payment based on non-commodity criteria. Other payments include Payments based on non-current A/An/R/I (production required) and Miscellaneous payments.
Source: OECD (2021[98]).

MPS varies across commodities (Figure 4.2). Producers of import-competing commodities, such as maize, sugar cane and beef, benefit from tariff protection, while producers of cashew nuts, pig and poultry meats, pepper, coffee, tea, and rubber are implicitly taxed. Rice producers also benefit from price support based on target prices designed to provide farmers with a profit of 30% above average production cost.[65] In some years, this system results in implicit taxation of rice producers when domestic prices are below international levels. On average during 2018-20, effective prices received by farmers were 9% lower than world prices, though this hides large differences between commodities.

Figure 4.2. Transfers to specific commodities (SCT) in Viet Nam, 2018-20

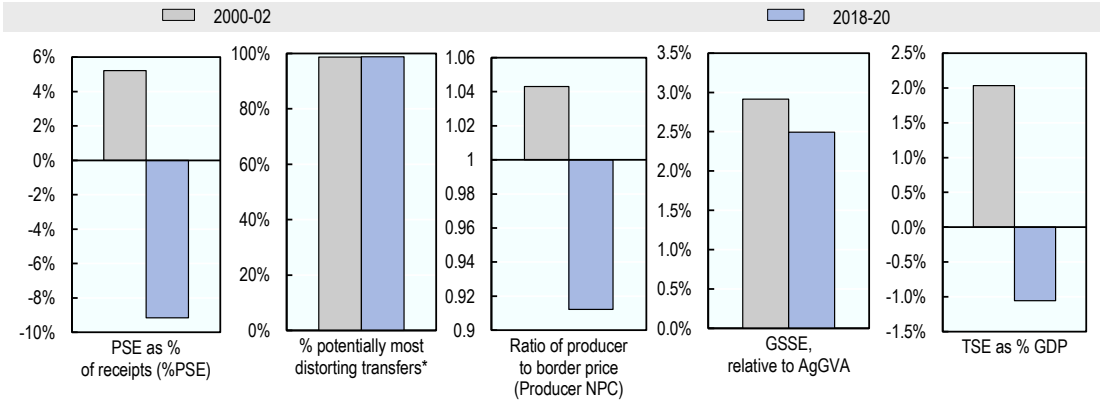


Source: OECD (2021[98]).

[65] Separate target paddy prices (production cost plus 30% profit) are established for each region and for each season based on production survey data (OECD, 2015[2]).

Support for general services for agriculture (GSSE) was equivalent to 2.5% of agricultural value-added in 2018-20, down from 2.9% in 2000-02 (Figure 4.3), and below the OECD average of 5.6%. Expenditure to develop and maintain infrastructure, in particular irrigation, dominates support for general services. Total support to agriculture (TSE) varies between positive and negative values, as in some years budgetary transfers to producers and expenditure on general services do not compensate for overall negative MPS.

Figure 4.3. Development of support to agriculture in Viet Nam, 2000-02 and 2018-20



Note: * Share of potentially most distorting transfers in cumulated gross producer transfers.
Source: OECD (2021[98]).

4.2. Agricultural trade policy

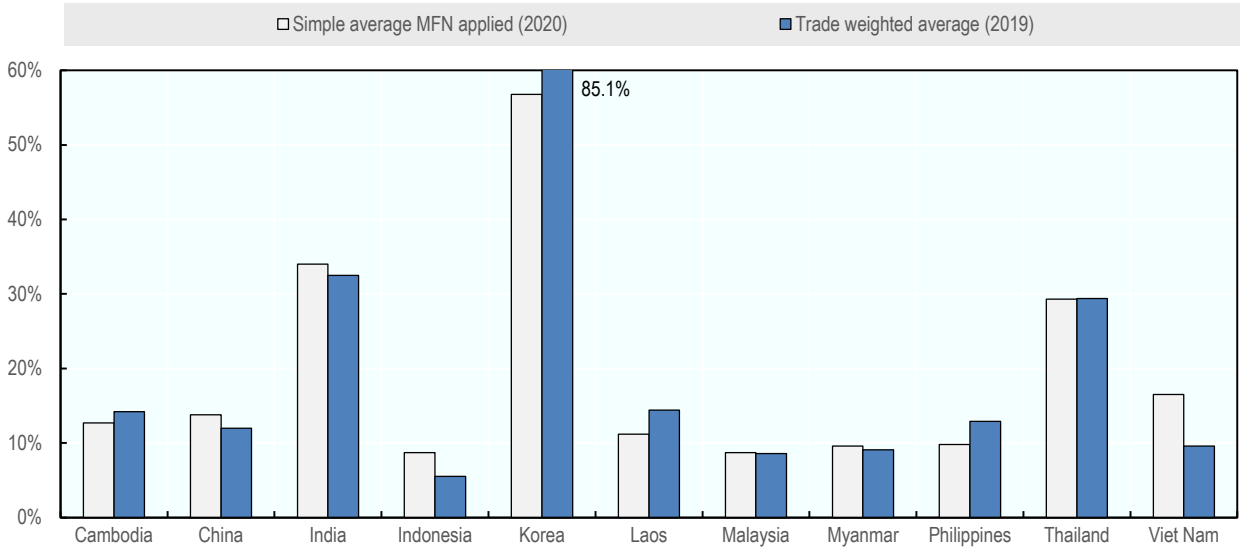
Import measures

Following Viet Nam's accession to the World Trade Organization (WTO) in 2007, the simple average Most-Favoured-Nation (MFN) applied tariff on agricultural imports decreased from around 25% in the mid-2000s to 16.5% in 2020. This is slightly lower than the simple average bound tariff on agricultural products of 18.8%. But it is almost double the simple average MFN applied tariff on non-agricultural goods of 8.4% (WTO, 2021[99]). All agricultural tariffs are ad valorem making the regime very transparent.

Further, applied tariffs are much lower on agricultural imports originating from countries or regions with which Viet Nam has signed free trade agreements. For example, the simple average tariff is just 2.3% on agricultural imports from ASEAN members and China, and 4.5% on products from Australia and New Zealand (WTO, 2021[13]). Consequently, the trade weighted average tariff on agricultural imports was 9.6% in 2019 (WTO, 2021[99]). Again, this is still almost double the trade weighted average tariff for non-agricultural imports (5.2%). The trade weighted average agricultural tariff in Viet Nam is at a similar level to many other Asian countries, although considerably lower than some such as India and Korea (Figure 4.4).

Among the agricultural products attracting the highest MFN applied rates are cigarettes and cigars (100-135%), and wine and spirits (45-55%). Considerably higher tariffs are applied to processed agricultural products than to most live animals and cereals used in production (Figure 4.5). An MFN applied rate of 40% applies to a range of commodities including meat of poultry, turkey and duck, tea (green and black), grapefruit, milled rice, refined sugar and many types of prepared or preserved fruits and vegetables. Import tariffs of 0% also apply to most material and inputs associated with agricultural production, such as fertilisers and seeds.

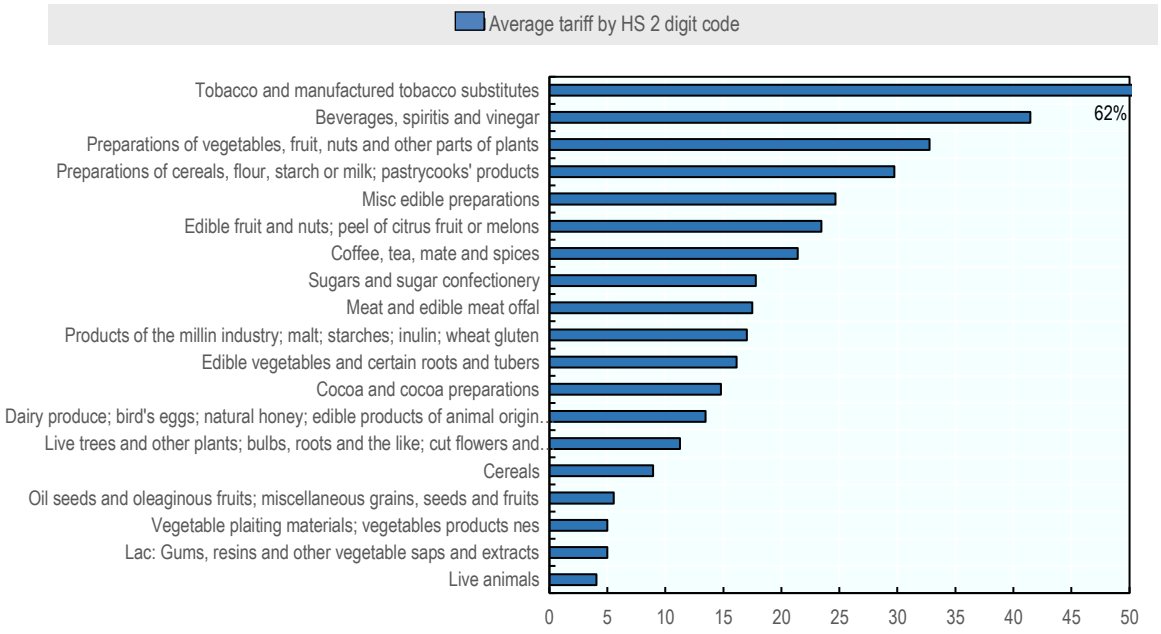
Figure 4.4. Average applied MFN and trade weighted agricultural tariffs in selected countries



1. Simple average of the ad valorem tariff or ad valorem equivalent (AVE) HS six-digit duty averages.
2. HS six-digit MFN tariff averages weighted with HS six-digit import flows for traded national tariff line.
Source: WTO, World Tariff Profiles, (2021[99])

Figure 4.5. Average MFN applied tariff at HS two-digit tariff code level in Viet Nam, 2020

Percentage



Source: WTO, World Tariff Profiles (2021[99]).

Viet Nam has tariff rate quotas (TRQs) on eggs, sugar cane, and tobacco. The most recent WTO notification on imports under tariff quotas for 2019 shows no imports of eggs under the tariff quota; about one-quarter of the sugar quota was used, and about two-thirds of the tobacco quota (WTO, 2021[13]). In addition, Viet Nam has quotas for preferential imports of rice, paddy, and unmanufactured tobacco from

Cambodia and the Lao People's Democratic Republic. Under the CPTPP, Viet Nam committed to remove in-quota duties for sugar and eggs five or ten years (depending on the good) after the implementation of the Agreement.

Ad hoc tariff reductions are sometimes made outside WTO and trade agreement commitments to relieve domestic price pressures. For example, in May 2020, the government of Viet Nam issued a decree revising Most Favoured Nation (MFN) tariff rates on several agricultural products (Decree 57/2020/ND-CP). The Decree entered into force on 10 July 2020. MFN tariff rates were reduced for dairy products, ethanol, almonds, apples, grapes, wheat, walnuts, frozen potatoes, raisins, and chilled pork. A temporary reduction for frozen pork until 31 December 2020 was also issued.

Since joining the WTO, Viet Nam progressed towards implementing the requirements of the Sanitary and Phytosanitary Agreement. However, the regulatory regime still suffers from limited enforcement capacity, poor co-ordination and many overlapping regulations.

Export measures

Until 2016, the government maintained a large degree of control over rice exports. Exporters had to meet specific milling and storage requirements, the minimum export price had to be respected (to limit price declines), and certain administrative functions were given to the Viet Nam Food Association (VFA).[66] However, in January 2017, in line with the Investment Law of 2014, Viet Nam's Ministry of Industry and Trade (MOIT) abolished Decision No. 6139/2013/QD-BCT, which capped the number of rice exporters at 150 and stipulated strict conditions for becoming a rice exporter. In June 2017, the Prime Minster approved a rice export development strategy for 2017-2020, with a vision to 2030. The strategy aims to increase the value of exports while reducing volumes by focusing on improving quality and export competitiveness, and reduce the share of Asian shipments in overall exports.

In 2018, the government further relaxed export conditions on rice.[67] Since 2011, to obtain a certificate to export rice from MOIT, traders were required to own warehouses that can hold at least 5 000 tonnes of rice and mills that can process at least 10 tonnes per hour. They were also required to maintain rice reserves equivalent to 10% of the volume exported in the preceding six months. The government may request traders to sell product from these reserves into the domestic market to stabilise any sudden price increases. Finally, they were required to register their export contracts with the VFA who set minimum export prices. Under the new decree, the capacity and ownership restrictions were loosened. To obtain an export certificate, companies must have at least one storage and one milling facility that meet national standards and regulations, which can be owned or leased, and maintain rice reserves equivalent to 5% of the volume shipped in the preceding six months. Furthermore, the decree also removed the requirement to register export contracts and the regulations on setting minimum export prices (WTO, 2021[13]). Traders exporting organic, parboiled and multi-micronutrient fortified rice are not bound by these conditions nor are they required to acquire an export certificate. MOIT is currently consulting on changing the current decree which may amend requirements on business to own or lease minimum sized rice storage and processing facilities.

In response to rising prices as consumers stockpiled rice in response to the COVID-19 outbreak and impending lockdown, and in the context of a severe drought in the Mekong River Delta, the government announced in late March 2020 that it would not permit any new rice export contracts to be signed (FAO, 2021[100]). At the same time, rice traders were ordered to release their reserves onto the domestic market. However, the decision to suspend new rice export contracts was revised on 3 April 2020 in favour of a monthly 400 000 tonne (revised up to 500 000 tonnes) export quota, allocated on a first-come, first-served basis. Furthermore, in late April it was declared that rice exports would resume unrestricted as of 1 May 2020.

[66] The VFA, although a social organisation of enterprises involved in producing, processing and trading food agricultural produce, has been historically influenced by SOEs, particularly VINAFOOD I and II.

[67] Decree No. 107/2018/ND-CP replaced and repealed Decree No. 109/2010/ND-CP on rice export businesses.

Trade agreements

As discussed in Section 3.1, Viet Nam has entered into numerous regional and bilateral trade agreements over the last 30 years. While these have reduced border protection for agricultural products entering Viet Nam (as discussed above in this section), they have also expanded export opportunities. For example, under the European Union-Viet Nam Free Trade Agreement (EVFTA**)** which entered into force on 1 August 2020, the European Union will progressively phase out duties for most Vietnamese products over a period of seven years. The European Union established duty-free tariff rate quotas (TRQs) for a variety of Vietnamese agricultural imports under the agreement: 30 000 tonnes of milled rice; 20 000 tonnes of husked rice and 30 000 tonnes of fragrant rice, as well as quotas for sweet corn, garlic, mushrooms, sugar and manioc starch. The tariff on broken rice will be phased out over five years, starting with a 50% cut. At the end of the implementation period, an average tariff of 1.1% will apply to agricultural goods originating in Viet Nam and 2.1% to processed agricultural products. The European Union will recognise and protect 39 Vietnamese geographical indications (GIs).

4.3. Support to producers

Price support

Domestic price support is the main form of support for Vietnamese agricultural producers, with border protection being the main tool used. Domestic price support varies across commodities. Tariffs protect producers of import-competing commodities, such as beef and veal, and sugar cane. Producers of export commodities, such as natural rubber, coffee, cashew nuts and tea are implicitly taxed in that they receive prices lower than world prices for their outputs. As a result, total MPS is the sum of positive and negative support.

There are two main policy instruments used in response to the target of providing rice farmers a 30% profit about production costs. When prices are too low, the government provides concessional loans to rice purchasing enterprises for the temporary storage of rice during harvest. The government also considers this objective when it determines the annual volume and price of rice that it purchases each year to maintain its national reserve stockpile, managed by the General Department of State Reserves (GDRS) under the Ministry of Finance.[68] The annual quantity of rice to be brought into the reserve is set by Prime Ministerial decision. For example, in 2020 Viet Nam announced it would purchase 190 000 tonnes of milled rice and 80 000 tonnes of paddy rice for the national reserve, about the same level as the previous year. This represents less than 1% of the 43 million tonnes of paddy rice produced each year. National reserve stocks are primarily used to provide direct food support to poor households through various food distribution programmes and to overcome natural disasters and epidemics rather than as a mechanism to prevent variations in market prices (OECD, 2015[2]).

Direct payments

Direct payments to Vietnamese agricultural producers are relatively small. In total they averaged USD 511 million per annum during the three-year period 2018-20, equivalent to 1.3% of the value of agricultural production (OECD, 2021[98]). Expenditure associated with subsidising the irrigation service fee (ISF) exemption is the dominant form of budgetary support, accounting for 70% of payments in 2018-20. Rice producers had been supported by a per hectare payment, although its implementation has been recently revised. Input subsidies are also provided but these are not very large and often made in response to emergency events. The exception being a subsidy for insurance premiums which has transitioned from a pilot to an on-going programme. Most farming households and organisations are exempt from paying agricultural land use tax or benefit from a land tax reduction.

In 1963 farmers and other water users began paying an ISF to contribute to the costs of managing, maintaining and protecting irrigation works above the “canal gate”, i.e. the upper-level systems comprising diversions or pump stations, and primary and secondary canals that lead into tertiary canals. It was

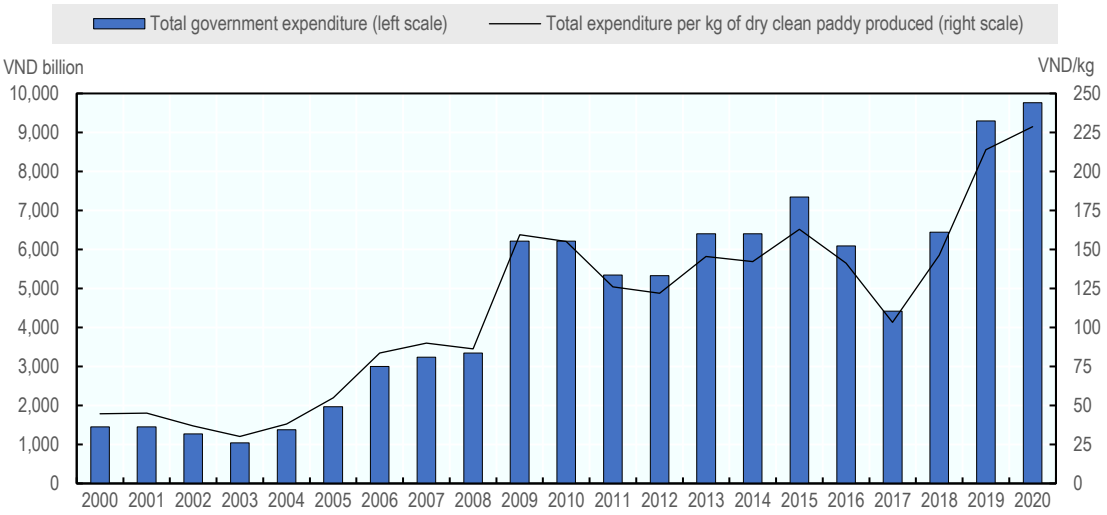
[68] Other agricultural related products held in the national reserve include rice, maize and vegetable seeds, pesticides, and animal vaccines and antiseptics.

originally collected from farmers in the form of paddy production. But in 1995 it changed to monetary units. For food crops, the fee was based on a fixed charge per hectare that differed by region and irrigation equipment used. For non-food crops the fee was volumetric based, varying by the output produced.[69]

However, since 2009 individuals and households in agricultural, forestry, salt and aquaculture production have been exempted from payment of the ISF (OECD, 2015[2]).[70] The rationale behind the exemption for farmers is that irrigation canals, bunds and dykes perform a range of public good functions and are widely used for transport. Farmers are still responsible for supporting the management of the tertiary and field canals through the provision of labour, in-kind contributions and finance. Nevertheless, removing the ISF weakens the link between farmers and those responsible for managing the resource. It also reduces the efficiency of water use as farmers have no incentive to conserve water or to maximise water productivity.

Funding from central and local government to irrigation management companies increased to offset the fall in ISF revenue, which previously covered about half their costs. Total combined government funding rose from VND 3.3 trillion (USD 200 million) in 2008 to over VND 6.2 trillion (USD 340 million) in 2009, rising to almost VND 10 trillion (USD 420 million) in 2020 (Figure 4.6). When measured in terms of rice paddy production, this expenditure is equivalent to around VND 220 per kg (USD 10/tonne), or about 5% of production costs.

Figure 4.6. Total government expenditure on supporting irrigation operations and maintenance, 2000-2020



Source: Own calculations based on OECD (2021[98]).

In June 2017, a new Law on Irrigation (Law No. 08/2017/QH14) was issued, providing for the reintroduction of ISF for all users. According to this Law, ISF should cover management costs, operations and maintenance expenses, depreciation charges, and other reasonable expenses, allowing for profits deemed suitable to the marketplace. Affordability will be considered when setting the price level. Decree No. 96/2018/ND-CP provides the guidelines for setting prices of irrigation products and services, and financial support for use of public irrigation products and services. However, while the framework for reintroducing the ISF has been established, it has yet to be implemented.

As part of the measures introduced to achieve the policy target of keeping 3.8 million hectares in paddy rice production, the government introduced for the first time a direct per hectare payment to rice farmers

[69] See, for example, Decree No. 143/2003/ND-CP which includes the provisions for setting ISFs.

[70] Decree No. 115/2008/ND-CP dated 14 November 2008 and effective 1 January 2009, and replaced by Decree No. 67/2012/ND-CP.

in 2012.[71] The initial payment rates were VND 500 000 (USD 22)/ha/year for land under wet paddy cultivation, and VND 100 000 (USD 4)/ha/year for other rice land, except upland fields not under paddy land-use plans.[72] These payments were increased in 2016 to VND 1 million (USD 43)/ha/year for land under wet paddy cultivation, and VND 500 000 (USD 22)/ha/year for other rice land.[73] While support payments were increased significantly, at the same time penalties were introduced for paddy growers if they convert paddy fields to non-agricultural uses at the rate of not lower than 50% of the value of wet paddy land. Under the new decree rice growers also received support when land is reclaimed for rice cultivation, amounting to VND 10 million (USD 430)/ha/year, except for upland fields, and VND 5 million (USD 215)/ha/year for wet-paddy land reclaimed from one-crop paddy land or other crop land.

In 2019, while maintaining the objective of protecting land for rice cultivation, the government replaced the direct area-based payments to rice growers with increased funding for local support programmes.[74] At least 50% of funds available to support rice growers are to be used to support the adoption of new rice varieties, new technologies in rice production, and to promote value chain linkages for the production and sale of rice. Remaining funds are to be used for activities such as periodic soil analyses to guide restoration measures, making improvements to land quality, and investments in agricultural and rural infrastructure. Local authorities can determine the form of support provided based on local needs. Detailed information on how funding is being spent is presently unavailable, but it is being used to maintain irrigation systems.

There are many support programmes through which plant genetic and animal breeding materials are provided to farmers at subsidised rates. Many of these are conducted at the provincial level and thus are difficult to quantify. However, the limited information available suggests that the amount of money spent on doing so is not that large (OECD, 2015[2]). At the national level, these are often provided to assist farmers recovering from natural disasters or disease outbreaks. Payments to farmers following natural disasters and epidemics are set by the government under Decree No. 02/2017/ND-CP dated 9 January 2017.

For example, in response to African swine fever in 2019-2020, which reduced the national pig herd by more than 20%, the government provided financial support to compensate producers for animals that had to be destroyed.[75] For pig producers, the support level was VND 25 000 (USD 1.07)/kg to VND 30 000 (USD 1.29)/kg for live pigs in 2019, and VND 30 000 (USD 1.29)/kg to VND 35 000 (USD 1.51)/kg for live pigs in 2020. For small and medium-sized livestock enterprises, the level of support was VND 8 000 (USD 0.34)/kg to VND 10 000 (USD 0.43)/kg in 2019, and VND 10 000 (USD 0.43)/kg to VND 12 000 (USD 0.52)/kg in 2020. As a further example, the government provided paddy, maize and vegetable seeds from national reserves to four provinces – Quang Tri, Quang Binh, Ha Tinh and Thanh Hoa – that were affected by landslides and flooding following tropical storms and cyclones in October 2020.[76]

In 2011, a three-year National Agricultural Insurance Pilot Programme (NAIPP) was introduced. It was created because, despite being subject to relatively high production risks, less than 1% of agricultural production was covered by insurance (Khoi, 2017[101]). Under NAIPP the government subsidised between 20% to 100% of the insurance premium depending on the degree of poverty (OECD, 2015[2]). While more than 0.3 million farmers participated in the scheme, uptake was considerably less than hoped for

[71] Decree No. 42/2012/ND-CP on the management and use of land for rice cultivation dated 11 May 2012 and in effect from 1 July 2012.

[72] Wet-paddy farming land is defined as land currently under wet-paddy cultivation or having the conditions for growing two or more wet-paddy crops a year; other paddy farming land is defined as land for growing only one wet-paddy crop a year and land for growing upland rice. Approximately 95% of current paddy land meets the wet-paddy land definition (OECD, 2015[2]).

[73] Decree No. 35/2015/ND-CP on the management and use of land for rice cultivation.

[74] Decree No. 62/2019/ND-CP which also revised the registration procedure that applies when paddy land is converted from rice to another crop.

[75] Decision No. 793/QD-TTg dated 27 June 2019 of the Prime Minister on Mechanisms, policies, beneficiaries, level of funding in the prevention and control of African swine fever; Decision No. 2254/QD-TTg dated 30 December 2020 of the Prime Minister on Mechanisms, policies, beneficiaries, level of funding in the prevention and control of African swine fever.

[76] Decision No. 2144/2020/QD-TTg.

particularly given the level of subsidy being provided. It was concluded that lack of farmer awareness and trust were two key reasons behind the low take-up, along with the limited range of insurance products on offer to farmers (Khoi, 2017[101]) It is also suggested that private transfers substitute for agricultural insurance demand in Viet Nam (King, 2020[102]).

Policies to support the uptake of insurance by agricultural producers have continued to be adopted. In 2018, the government issued Decree No 58/20154/ND-CP to regulate the types of events supported and the level of support provided. Decree No. 22/2019/QD-TTg was issued by the Prime Minister to implement Decree 58. Individuals engaged in rice, cattle and aquaculture production in specified provinces and centrally run cities receive subsidies for insurance premiums of up to 90% for those classified as being in or near poverty and up to 20% for all others. While initially available from 26 June 2019 to 31 December 2020, it was later extended to the end of 2021 by Decision No. 03/2021/QD-TTg dated 25 January 2021. In addition to subsidies, other work is being carried within the framework of Decree 58 to boost farmer demand and uptake through education and awareness raising. For example, the International Fund for Agricultural Development (IFAD) is working in partnership with the government to provide training for trainers and farm-friendly teaching materials covering the basics of how insurance works.[77]

In July 1993 an agricultural land use tax was introduced as the main mechanism of central government to tax farm income, replacing the previous agricultural output tax that dated from 1983.[78] Since 2003, most farming households and organisations are exempt from paying agricultural land use tax or benefit from a land tax reduction. The exemptions and reductions were initially provided for a seven-year period but were extended in 2010 for a further ten-year period to the end of 2020.[79] In June 2020, the government extended the exemption for a further five-years out to 31 December 2025 (Resolution No. 107/2020/QH14).

In response to the COVID-19 pandemic, Viet Nam allowed enterprises, individuals and household businesses to defer payment of value-added tax, corporate income tax, personal income tax, and land rental fees. Enterprises, organisations, households and individuals engaged in agricultural, forestry and fishery production, and food production and processing, are among those eligible to defer payments of tax and land rent.

4.4. Irrigation and flood protection services

Expenditures on irrigation and flood protection systems dominate general services for the agricultural sector, accounting for more than 50% of the USD 870 million average annual total expenditure on general services in 2018-20 (OECD, 2021[98]). Expenditures on other forms of general services, such as infrastructure provided through rural development Programme 135, agricultural knowledge and innovation systems, inspection and control, marketing and promotion, and public stockholding make up the remaining. This section discusses the provision of irrigation and flood protection services. Given the subject matter focus of this report. Chapter 5 deals specifically with agricultural knowledge and innovation systems.

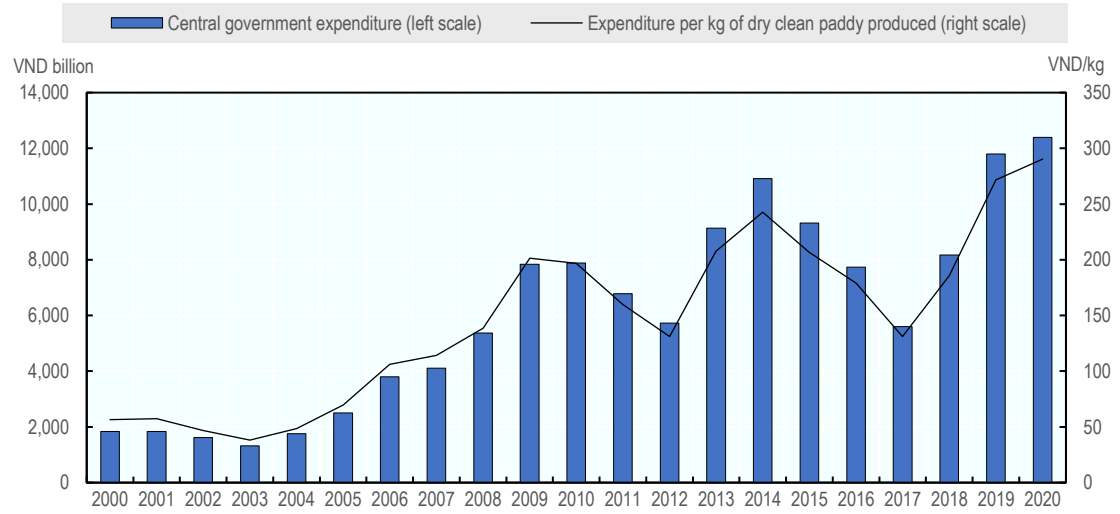
Since the 1970s, the Vietnamese government has invested a significant amount of capital into improving and expanding irrigation and protecting flood prone areas from damage. The rapid expansion of agricultural production in response to the *Doi Moi* reforms in the mid-1980s were enabled by earlier investments in irrigation systems. Central government expenditure on capital development increased from around VND 2 trillion (USD 130 million) in the early 2000s to around VND 8 trillion (USD 420 million) in 2009-2010 (Figure 4.7). After fluctuating through the 2010s, it averaged around VND 12 trillion (USD 520 million) per annum in 2019-2020.

[77] See https://www.ifad.org/en/web/latest/-/bringing-the-benefits-of-agricultural-insurance-to-smallholders-in-viet-nam.

[78] The land use tax is set in terms of a fixed quantity of rice per ha and is collected in cash by using a rice price determined by the provincial government based on local market prices (OECD, 2015[2]).

[79] Resolution No. 55/2010/QH12 of the National Assembly on agricultural land use tax exemption and reduction, amended and supplemented by Resolution No. 28/2016/QH14 of the National Assembly.

Figure 4.7. Central government expenditure on irrigation and flood protection capital development, 2000-2020



Source: calculations based on OECD (2021[98]).

The actual area currently equipped for irrigation, the state of repair of the irrigation systems and other statistics on irrigation are uncertain because of confusion and weakness in data collection (World Bank, 2019[103]). There are over 1 000 separate irrigation schemes, of which 110 can serve more than 2 000 hectares. Supporting these irrigation networks are 6 336 reservoirs (in operation) with a volume of more than 50 000 m^3, 13 400 large electrical pumping stations and 235 000 kilometres of canals. Available data suggests the land area equipped for irrigation increased from around 2.9 million hectares in the early 1990s to 4.6 million hectares in the mid-to-late 2000s (FAO, 2021[3]). With an expanding total area of land in agriculture over this time, the share of land equipped for irrigation remained relatively constant at around 45%. About 58% of the area under irrigation is used for rice production, and 96% of the rice area is irrigated.

Over the years many dams have deteriorated due to neglect or lack of maintenance, with the result that storage has decreased (World Bank, 2019[103]). About 1 500 small and medium-sized dams and reservoirs need to be rehabilitated and modernised, including restored and increased storage and outflow capacity. Siltation of reservoirs is a further problem. The problems of poorly maintained infrastructure are compounded by multiple threats to degrading river ecosystems. Increased precipitation and inflows because of changes in climate require better storage and management to reduce the risks of flooding. Irrigators are also affected by increasingly polluted water that compromises yields, particularly downstream of major settlements.

In January 2020 the government approved Viet Nam's irrigation strategy to 2030, with a vision to 2045 (Decision No. 33/2020/QD-TTg). Specific objectives include water supply targets, such as ensuring the supply of water to 85% of double-cropped paddy rice fields, of which 30% should be cultivated with advanced methods by 2030, and 60% by 2050 to reduce water demand. Other objectives in the irrigation strategy are improving drainage and environmental protection, and preventing and combating natural disasters, and responding to climate change, including by responding to drought, saltwater intrusion, floods, and riverbank and coastal erosion. Targets in the strategy will be achieved through a combination of investments in irrigation infrastructure, improved planning and management of irrigation laws, development of human resources and technical solutions.

5. Agricultural knowledge and innovation system

Agricultural innovation is a key driver of the transformation process of Vietnamese agriculture to respond to its challenges in terms of productivity and sustainability performance. This chapters analyses the different elements of the agricultural innovation system in Viet Nam: the main organisations involved in research, the sources of funding, and the knowledge flows, including the extension services.

5.1. Agricultural research institutions

Forty-four agencies conduct agricultural research in Viet Nam (excluding the private for-profit sector) (Stads, 2020[104]). More than 75% of researchers are employed within 33 government agencies, with the remaining spread across 11 universities. The Vietnamese Academy of Agricultural Sciences (VAAS), comprising a headquarters and 19 member institutes/centres, is the main body overseeing crop research. Some VAAS members are commodity specific (for example, the maize, fruit, sugarcane, or cotton research institutes), while others have a geographic focus (for example, institutes focusing on the northern mountainous region, the western highlands, or the southern coastal areas). The largest members in terms of expenditure are the Maize Research Institute, the Western Highlands Agro-Forestry Science Institute, the Cuu Long Rice Research Institute, the Soil and Fertilizer Research Institute, and the Field Crops Research Institute. These five accounted for half the spending by the 19 VASS agencies (excluding VASS headquarters spending).

There are 13 non-crop institutes, the largest of which is the National Institute of Animal Science, which focuses on poultry, cattle, swine, sheep, and goats. Four government institutes conduct fisheries and aquaculture research, while the Vietnam Academy of Forest Science is the main performer of forestry research. Other government institutes focus, for example on rubber, oil plants, water resources and agricultural engineering.

The Vietnam National University of Agriculture in Hanoi is Viet Nam's main agricultural university. In 2017, it employed 205 FTEs concentrating on research related to crops, livestock, and agricultural engineering. In 2015, the university was moved from the Ministry of Education to MARD, which had a positive impact on its focus on research (as opposed to teaching). Other important universities include the Vietnam National University of Forestry, Nong Lam University of Agriculture and Forestry, Thai Nguyen University of Agriculture and Forestry, and Hue University of Agriculture and Forestry.

While it is difficult to quantify the level of non-public sector involvement, private enterprises are increasingly investing in agricultural research. Companies like Binh Dien Fertilizer, Hoang Anh Gia Lai Group, Loc Troi Group, Nafoods Group, Que Lam, Thai Binh Seed, TH True Milk, Vinamilk, Vinaseed, and Vingroup, are believed to be the main performers of private agricultural research in Viet Nam (Stads, 2020[104]). Thai Binh Seed has state-of-the-art research facilities and seed-processing infrastructure. The company mostly focuses on rice, but it also conducts research on maize, tubers, and legumes, which has resulted in a considerable number of new varieties in recent years. Nafoods Group is one of the most innovative fruit and vegetable growers, processors, and exporters in Viet Nam; it operates its own R&D institute, which has released a steady stream of new fruit varieties.

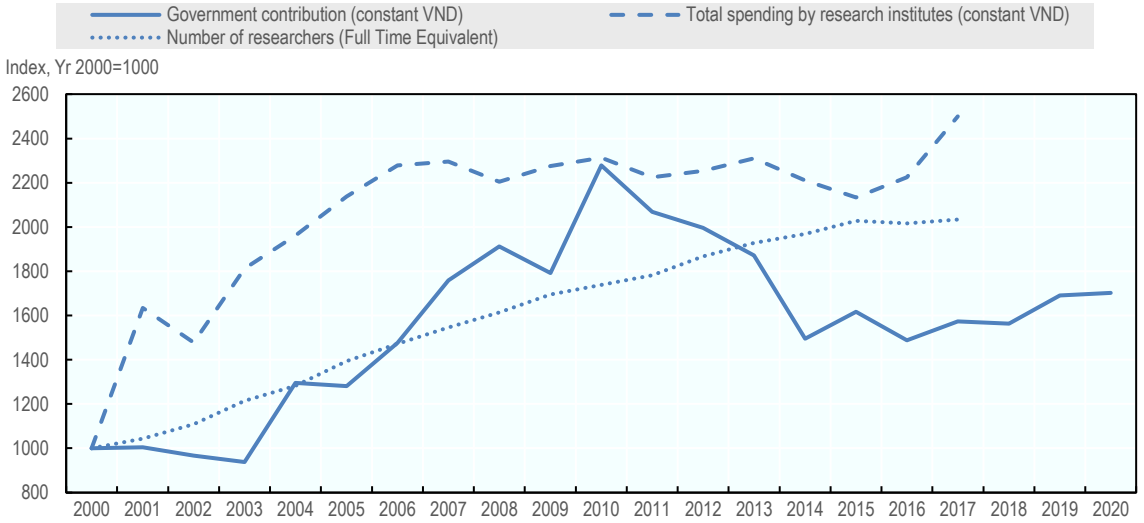
During 2013–18, a total of 351 new crop varieties were formally registered in Viet Nam, the bulk of which were rice (46%) and maize (14%) (Stads, 2020[104]). More than three-quarters of these new varieties were released by local and foreign private companies. The innovative capacity of the government agencies is more limited compared with private entities. VAAS member institutions released a combined total of just 30 new crop varieties during 2013–18 (24 rice, 3 maize, 2 horticultural, and 1 groundnut variety).

5.2. Funding for research

Government funding for agricultural research is channelled to the agencies through MARD, MOST, or the provincial governments. Between 2000 and 2012 the government's expenditure contribution on agricultural research (including aquaculture, fisheries and forestry) increased from VND 153 billion (USD 10 million) to VND 822 billion (USD 40 million), an average annual increase of 11% in USD terms. In constant local currency, spending peaked in 2010 (Figure 5.1). Government funding then fell during the first half of the

2010s before slightly increasing again. But it remains well below the peak in real terms, equivalent to USD 40 million in 2020, the same as in the early 2010s.

Figure 5.1. Government agricultural research spending and researchers in Viet Nam, 2000-2020



Note: Values include research spending and researchers in aquaculture, fisheries, and forestry.
Source: OECD PSE database, OECD (2021[98]) and Agricultural Science and Technology Indicators (ASTI) database, IFPRI (2021[105]).

While government funding fell, spending by research institutes remained relatively constant in real terms during the period 2005-15 before rising to VND 1.5 trillion (USD 64 million) in 2017. Since 2005, Viet Nam has embarked on a gradual process of giving more financial and managerial autonomy to research institutions, which has demanded that an increasing share of budgets be self-funded through the sale of goods and services (Stads, 2020[104]). This has led to a proliferation of non-research services, such as the production and sale of seed and planting material, as well as consultancies and extension services. During 2013–17, 47% of the funding for VAAS member institutions was derived from government sources, 36% was generated internally, and 8% was contributed by donors and development bank loans. Similar shifts in the composition of funding are also occurring at non-VAAS government agencies and universities.

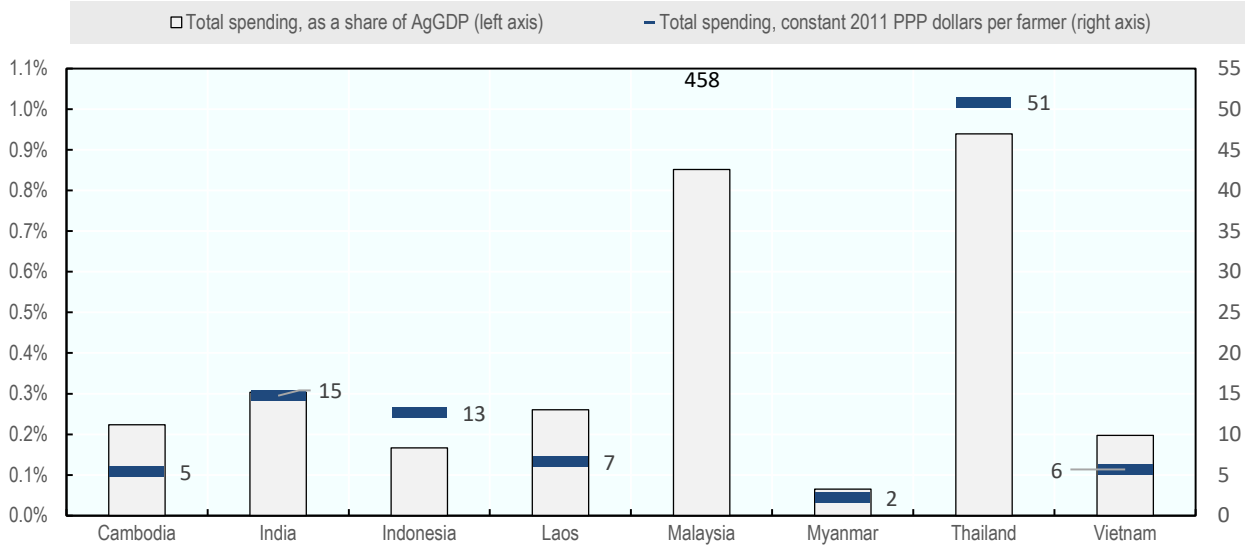
The principal donors to Vietnamese agricultural research are ACIAR, the Japan International Cooperation Agency, Korea's Rural Development Administration, and several CGIAR centres (Stads, 2020[104]). The Asian Development Bank has provided considerable support for agriculture research since 2000 with loans for the Agriculture Sector Development Programme and the Agriculture Science and Technology Project providing USD 90 million. Viet Nam's agricultural universities are receiving substantial support via a World Bank loan through the Support for Autonomous Higher Education Project (2017–22), which focuses on strengthening research, teaching, and institutional capacity.

Increased R&D efforts by universities and a rapid growth in contract staff at government agencies have prompted an upsurge in Viet Nam's agricultural researcher numbers since 2000. The number of researchers doubled during 2000–17, and average qualification levels also improved markedly.

As of 2017, total spending on agricultural research by government institutes and universities in Viet Nam amounted to just 0.2% of its agricultural GDP or around USD 6 (PPP[80]) per farmer (Figure 5.2). While this is similar to the relative levels of spending in some other Asian countries it is insufficient to address the multitude of challenges the agricultural sector is facing. Furthermore, the growth in researchers has led to severe staffing imbalances, with too many young, inexperienced researchers entering the system and a severe lack of senior researchers to train and mentor them.

[80] In Purchasing Power Parity PPP terms.

Figure 5.2. Government research spending intensity in selected Asian countries, 2017



Source: Agricultural Science and Technology Indicators (ASTI) database, IFPRI (2021[105]).

The government has introduced several measures to rationalise the country's imbalanced R&D system, while also improving its responsiveness to the country's agricultural priorities. This has included cutting the number of researchers employed at VAAS's member institutes by at least 10% between 2015 and 2021 (primarily by not replacing departing and retiring staff), as well as reducing university admissions into agriculture-related disciplines.

The government approved the research and development programme for plant and livestock varieties serving agricultural restructuring for the period 2021-30 (Decision No. 703/2020/QD-TTg). The programme aims to improve research capacity and the production of agricultural plant and livestock varieties to support the modernisation of the agricultural sector, adaptation to climate change, and the restructuring of agricultural production to improve competitiveness, increase value-added and promote sustainable development. Specific tasks include enhancing the science and technology for developing seeds, developing capacity to produce seed, and improving research infrastructure for seed variety research and production. Total investment in the programme is VND 103 050 billion (USD 4.4 billion) over the period 2021-30, including private funding. This would represent a significant increase in investment over recent levels.

5.3. Knowledge flows – the extension system

The public extension system in Viet Nam is organised into five levels: a central-level National Agriculture Extension Centre (NAEC) within MARD; provincial agricultural extension centres within their respective DARDs; district agricultural extension stations under the control of the provincial extension centre or the district peoples committee; commune agricultural extension cadres; and village-level agricultural extension collaborators and clubs (OECD, 2015[2]). The NAEC has overall responsibility for establishing extension policies and management mechanisms, developing norms for extension works, and disseminating information relating to extension services. All 63 provincial governments have their own extension centres, almost all non-urban districts have a station, and 87% of communes have extension workers. In total there are about 30 000 people working below the national level, making an average of about one public extension worker per 300 farming households. In addition to the government extension service, there are about 50 other agricultural extension providers in Viet Nam, including research institutions, universities, enterprises and NGOs (Ngan, 2018[106]).

Both central and provincial governments provide funding for extension services. In the three-year period 2018-20, an average annual total of VND 324 billion (USD 14 million) was provided, split 50/50 between

central and provincial government (OECD, 2021[98]). With 8.8 million farm households, this equates to VND 37 000 (USD 1.50) per household. Since 2001 central government funding for agricultural extension has been allocated through an open bidding process, open to both public and non-public providers. The Science, Technology and Environment Department of MARD is responsible for administering the bidding process for national level projects, and provincial People's Committees for local level projects.

Agricultural extension projects have a strong production focus, which can be described as top-down, supply-driven model. They are usually associated with the introduction of new varieties (e.g. hybrids of rice, corn, cotton, sugarcane) or special production techniques (e.g. changing cropping pattern, integrated pest and nutrient management). The extension system also provides farmers information related to new policies and market prices. Projects are delivered using demonstration sites and field days, training farmers, and organising science-technology forums in the fields of crops, livestock, veterinary care, forestry, water resource management, agro-forestry processing and engineering. When participating in extension events, farmers engaged in small-scale production or from poor households are given free access to materials, travel, accommodation and meals. Other farmers receive free materials and are funded for half the cost of travel, accommodation and meals. Several communities have taken steps to develop market-driven extension models. (Ngan, 2018[106]).

In addition to the limited resourcing and the supply driven focus, several other constraints that reduce the performance of the extension service have been identified (Ngan, 2018[106]). These include the low skill level of some commune and village extension workers, the high rate of resignation (20%) among extension workers, the limited evaluation of extension quality (e.g. performance based on output indicators such as the number of training courses provided or number of participants rather than outcomes/results), and the lack of co-ordination between researchers and extension workers.

6. The drivers and performance of agriculture in Viet Nam

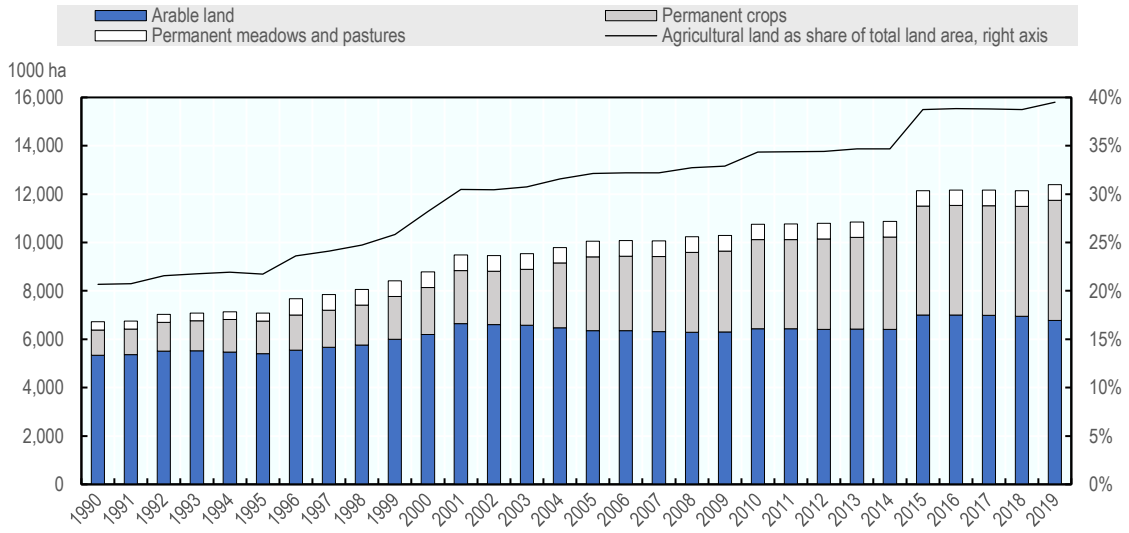
This chapter assesses the drivers and performance of the agricultural sector in Viet Nam. The performance of the agricultural sector is driven by the dynamic interaction between three sets of constraints and dynamic forces. Following the OECD Productivity-Sustainability-Resilience Policy Framework (OECD, 2020[1]), the first section discusses three drivers: natural resources and climate change; structural adjustment; and innovation. The performance of the sector then analysed with respect to two main outcomes. First, the capacity of Viet Nam to produce more with less inputs, that is, its total factor productivity growth. Second, the impact of the sector on the preservation of the stock of natural resources and its contribution to climate change mitigation.

6.1. Drivers of agricultural performance

Natural resources and climate change

The land area used for agricultural production has grown considerably over the past thirty years (Figure 6.1). Since 1990, the total agricultural land area has increased by more than 80% and now covers 40% of Viet Nam's land area (FAO, 2021[3]). Much of the expansion has occurred in the area under permanent crops, mainly for export, particularly in upland areas, including coffee and, more recently, rubber and cassava (World Bank, 2016[18]). Permanent crops account for 40% of the area used by agriculture in 2019 compared to 19% in 1990. While the share of arable land has decreased from around 80% in early 1990s, it is still the largest agricultural land use (almost 7 million hectares, 55% of total).

Figure 6.1. Land used for agricultural production in Viet Nam, 1990-2019



Source: FAO (2021[3]), FAOSTAT (database), http://www.fao.org/faostat/.

The agricultural policy framework favours rice production. Viet Nam's master plan for agricultural production development stipulates that at least 3.8 million hectares of land should be allocated to rice (of which 3.2 million hectares should be irrigated and cropped at least twice per year).[81] In support of this, rice growers also receive area payments to protect and develop land for rice cultivation nationwide, which were doubled in 2016. Agricultural land holders also require permission from competent state agencies to convert land use from rice to perennial crops, and land that is converted to a perennial crop must stay in a condition that allows rice to be grown in the future.

However, agriculture faces increasing competition from non-agricultural uses for land, including urban and industrial uses, but also aquaculture. By some reports, up to 70 000 hectares a year of agricultural land is being converted to non-agricultural uses (Luu Ngoc Luong, 2017[8]). Rising sea levels are also encroaching on the overall land area, including in key agricultural regions such as the Mekong River Delta.

Agriculture is the major user of Viet Nam's abundant freshwater resources, accounting for almost 95% of total freshwater withdrawals. Due to the S-shaped territory stretching over 15 degrees of latitude, Viet Nam consists of several ecological and climate zones from north to south. Surface water resources are unevenly distributed across the country, partly due to uneven rainfall distribution. As a result, Viet Nam can find itself in a situation where it must cope with floods and droughts at the same time, or in short sequence, in different parts of the country (OECD, 2018[75]). Moreover, around 60% of total water resources are generated in neighbouring countries. This means that Viet Nam is affected by decisions made about water resources in upstream countries (FAO, 2016[107]; WEPA, 2018[108]). In addition to surface water, groundwater is also an important water supply source for domestic, industrial and agricultural activities, particularly in rural areas.

Monitoring data in recent years show that water flows at hydrological stations in major main river basins are below the average for several years. In many places, water levels have reached historic lows, causing water shortages for agricultural production and for people's daily use. It is also causing deeper saline intrusion into estuaries (Government of Vietnam, 2020[94]).

Viet Nam is considered one of the countries most affected by natural disasters. The country is highly exposed to natural hazards such as floods and typhoons, which can result in significant economic damage. For instance, Viet Nam was exposed to an average of 3 disastrous floods and 2.95 disastrous storms per

[81] Decision No. 124/2012/QD-TTg approving the master plan for agricultural production development through to 2020 with a vision toward 2030. Decision No. 124/2012/QD-TTg gives effect to Resolution No. 63/2009/NQ-CP to ensure national food security, which set the target of protecting 3.8 million hectares of rice land.

year from 1997 to 2016 (OECD, 2018[75]). Natural disasters have caused average annual economic losses estimated at 1-1.5% of GDP in the last two decades (World Bank, 2017[29]). For example, in 2016, the damage caused by natural disasters, including drought and saltwater intrusion in the Central Highlands, South Central and Mekong River Delta, amounted to VND 39.73 trillion (USD 1.75 billion) (GSO, 2017[109]).

The impacts of climate change are already visible in Viet Nam. Average annual temperatures increased by approximately 0.62°C between 1958 and 2014, while annual rainfall decreased in the north and increased in the south, leading to different patterns of drought across the country, while the sea level along the coasts of Viet Nam has risen by more than 20 cm over the past 50 years (MONRE, 2016[110]). According to the initial biennial updated report of Viet Nam to the UNFCCC issued in 2014, climate change-induced natural disasters – especially typhoons, floods and droughts – have also increased in intensity and frequency (MONRE, 2014[111]).

According to the climate change and sea level rise scenarios developed by the Vietnamese government, under a medium emission scenario, annual mean temperature is projected to increase by 1.9°C to 2.4°C in the north and 1.7°C to 1.9°C in the south by 2100, while average rainfall is projected to increase by 5% to 15% nationally (Government of Vietnam, 2020[94]). However, rainfall would decrease in the dry season and increase in the rainy season. The number of strong to very strong typhoons is projected to increase, with the summer monsoon starting earlier and ending later. The average sea level for Viet Nam's coastline is projected to rise by 32 cm to 76 cm by 2100 (MONRE, 2016[110]). By 2050, a 1% to 3% loss in real GDP is predicted from climate change impacts (World Bank, 2017[29]).

Viet Nam's agricultural sector is highly vulnerable to the impacts of climate change, including rising sea levels, longer and more severe droughts and floods, and typhoons. In particular, rice and livestock production are concentrated in the Mekong and Red River deltas, areas that are likely to be affected by saltwater intrusion from rising sea levels, as well more frequent floods and droughts (ISPONRE, 2009[112]). These risks are expected to be even greater in coastal areas due to intensive groundwater pumping, which is accelerating salinisation and creating local land subsidence (Akam and Gruere, 2018[113]). In 2016, natural disasters damaged more than 527 000 hectares of rice paddy land (GSO, 2017[109]). Higher temperatures, increased pest incidence and droughts are expected to lower rice yields by 4.3% between 2016 and 2045, and to significantly affect livestock production. High value plantation crops, including tea, coffee, pepper, and rubber, are mainly located in the Central Highlands, an area that is likely to be affected by more frequent and intense droughts and reduced availability of irrigation water (UNDP, 2016[114]; World Bank, 2016[18]; Nguyen et al., 2017[115]).

Structural change

Viet Nam's agricultural sector is dominated by agricultural households, which account for more than 99.9% of the 8.5 million production units in the sector. These farmers cultivate their own land using family labour. Among the population employed in agriculture, only 8% were hired workers in 2016 (Liu, 2020[116]). This has changed very little since 1992 when it was 5.1%. Viet Nam has not seen the emergence of a farmworker class.

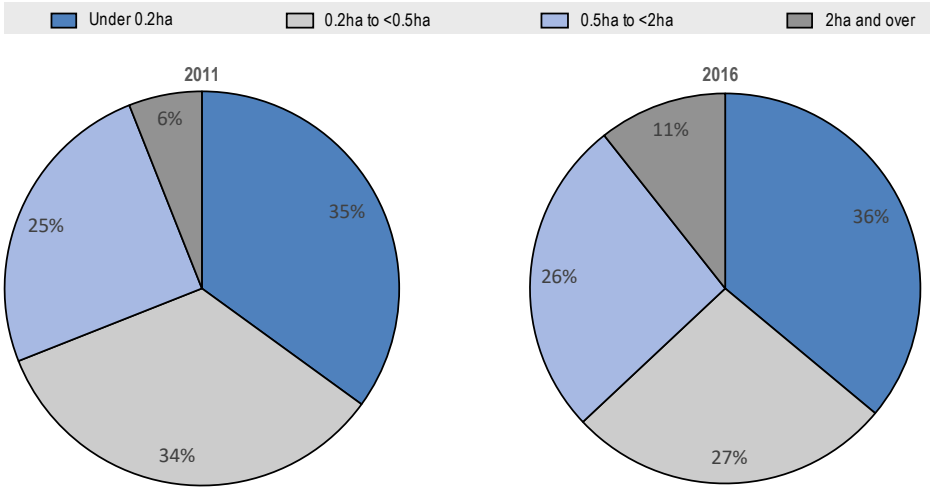
Most farms operate at a very small scale. The results of the 2016 agricultural census show that around 36% of agricultural households – and almost 54% of households growing rice – operate less than 0.2 hectares (GSO, 2018[9]). Households raising livestock also operate at a very small-scale. Moreover, scale constraints are compounded by the fragmented nature of holdings. Farmland was allocated to households in an egalitarian way based on both the quantity and quality of land. As a result, households in many areas received several, non-contiguous plots of land. On average, agricultural households operate 2.5 land plots, sometimes separated by considerable distances (World Bank, 2016[18]).

Structural transformation is occurring slowly, with the share of households operating larger areas increasing marginally since 2011 (Figure 6.2). Only a very small share of agricultural households are large enough to meet the government's definition of a farm.[82] In 2016, there were nearly 33 500 agricultural,

[82] Households engaged in crop or aquaculture production must operate an area of at least 3.1 hectares in the South East and Mekong River Delta regions, and 2.1 hectares in the other regions, and have minimum sales of VND 700 million (USD 30 000) a year. Households engaged in livestock production must have minimum sales of VND 1 billion (USD 43 000) a year (GSO, 2018[9]).

forestry and fishery farms – an increase of 67% since 2011 – including 9 276 crop farms and 21 060 livestock farms, most of which are pig (71%) and poultry (15%) operations (GSO, 2018[9]).

Figure 6.2. Distribution of agricultural, fishery and forestry households, by size of holding, 2011 and 2016



Source: GSO (2012[117]; 2018[9]).

The small scale and fragmented structure of production is widely acknowledged to constrain the further development and modernisation of the agricultural sector. Viet Nam's strategies for developing the agricultural sector[83] aim to restructure production to improve competitiveness, increase value-added and promote sustainable development. Agricultural plans encourage the restructuring of the sector through increasing the scale of production, including by expanding farm size and developing large-scale production areas; fostering closer linkages between farmers, rural enterprises, agricultural co-operatives and farmers' groups; and increasing mechanisation and the application of 'high technology' in agriculture and modern farming methods.[84]

A range of policies aims to facilitate farm restructuring and land accumulation, and promote the development of specialised, large-scale and mechanised cultivation areas. Several provinces – mainly located in the Red River Delta, North Central and Central Coastal regions – have implemented programmes to reduce the fragmentation of holdings by facilitating the merger or exchange of plots between households. In the Red River Delta, for example, the area of exchanged or merged farming plots accounted for 52.5% of the total agricultural area. Across the whole country, exchanged or merged plots account for around 6% of agricultural land (GSO, 2018[9]).

The government is also encouraging the development of specialised, large-scale fields (LSF) to establish areas of high-quality production for export, closely linked with enterprises in the agricultural value chain. Enterprises, agricultural co-operatives and farmers can access a range of preferential support measures tied to participation in large-scale fields and contracts.[85] However, it appears that eligible actors have been reluctant or unable to participate in LSF projects, despite the potential benefits to all parties and the

[83] Decision No. 124/2012/QD-TTg approving the master plan for agricultural production development through to 2020 with a vision toward 2030, and Decision No. 899/2013/QD-TTg approving the plan of restructuring the agricultural sector.

[84] Decision No. 738/2017/QD-BNN-KHCN. High-tech agriculture includes modern farming methods that increase the productivity, sustainability and value of agricultural products, such as: biotechnology; cultivation and preservation technologies; automation; and technology for producing agricultural materials.

[85] Decision No. 62/2013/QD-TTg on the policy to encourage the development of co-operation, co-operative production associated with product consumption, and the building of large fields. In 2018, Decision No. 62 was cancelled by Decree No. 98/2018/ND-CP on the incentive policy for the development of linkages in production and consumption of agricultural products.

availability of preferential support. Reasons include: the lack of effective dispute resolution mechanisms to deal with breach of contract; difficulties in meeting the conditions for preferential support; and difficulties in implementing the LSF system, such as when members' plots are interspersed with those of non-members, and ensuring standardised production practices and technologies are applied by all members (Khoi, Dat and Dung, 2014[82]; GIZ, 2017[53]). The agricultural area covered by large-scale fields accounts for less than 10% of Viet Nam's arable land area, and of that, around 29% was under forward selling contracts to enterprises (GSO, 2018[9]).

Agricultural innovation at farm level

A third main driver of the achievements in terms of productivity-sustainability-resilience outcomes is the performance of the agricultural innovation system. Unfortunately, information on the agricultural innovation system in Viet Nam is scant. At the broad country level, innovation remains a weak area, and it is unlikely to be different in relation to agriculture. The number and value of Intellectual Property (IP) assets are low, few Vietnamese products based on IP are competitive, and counterfeiting and piracy in both physical and online markets remain major concerns of Viet Nam's trade partners. (WTO, 2021[13]). Larger and joint-venture firms in Viet Nam are more likely to undertake product innovation than are smaller and domestic firms. Managerial competence and capabilities hinder the accumulation of knowledge and engagement in innovative processes in Viet Nam (World Bank, 2021[71]).

There is a reliance on foreign innovation, and the support of international companies and NGOs to help implement. For example, the remote sensing-based Information and Insurance for Crops in Emerging Economies (RIICE) is a collaborative project between the International Rice Research Institute, SwissRe, Sarmap, the German Society for International Cooperation, and the Swiss Agency for Development and Cooperation, to deliver advanced technologies to low-income farmers who would otherwise be unable to access them. Using remote-sensing technologies, RIICE provides producers and government officials with advanced information to make better decisions and manage risks.

While creative innovation may be lacking due to factors such as the small-scale and fragmented land structure, and part-time nature of involvement in agriculture, evidence shows a degree of willingness by Vietnamese farmers to adopt innovation. Trends in agricultural mechanisation provide a good example of this.

The government has identified increasing agricultural mechanisation as a solution to modernise and develop the agricultural sector with respect to improved productivity, quality, competitiveness, effectiveness and sustainability.[86] The masterplan for agricultural production development sets the target that by 2020, mechanisation rates will reach: 95% for soil preparation; 70% for sowing, cultivation and fertiliser application; 70% for harvesting; and 80% for processing. Over the most recent decade, agricultural mechanisation has been supported by a range of policies, including subsidised credit to buy machinery and equipment and investment support.[87] More recently, the Ministry of Industry and Trade (MOIT) has issued a list outlining the 12 groups of agricultural machinery that are eligible for investment subsidies, including: tractors, automatic irrigation machinery, harvesting machinery, and other cropping machines.[88] Investment in or hiring of machinery is also supported in policies to encourage land consolidation and the development of large-scale fields.[89]

[86] Decision No. 124/2012/QD-TTg approving the master plan for agricultural production development through to 2020 with a vision toward 2030.

[87] For example, Decision No. 497/2009/QD-TTg on giving interest rate support to loans for procurement of machine, equipment and materials to serve agricultural production and materials for building dwelling houses in rural areas; and Decision No. 68/2013/QD-TTg on support policies to reduce losses in agriculture.

[88] Decree No. 57/2018/ND-CP on mechanisms and policies to encourage enterprises to invest in agriculture and rural areas; Decision No. 176/2019/QĐ-BCT on the list of agricultural machinery eligible for investment subsidies in accordance with Article 11 of Decree No. 57/2018/ND-CP.

[89] Decision No. 62/2013/QD-TTg on policies to encourage co-operation and linkages between the production and the consumption of agricultural products. Decision No. 62 provided support to agricultural co-operatives of up to 30% in the first year and 20% in the second year of the actual cost of machine hire to perform general services for members. Decree No. 62 was replaced by Decree No. 98/2018/ND-CP on the incentive policy for development of linkages in

Recent census results point to rapid growth in machinery for crop production, albeit from a low base and at a low level of mechanical power (Table 6.1 and Annex Table A.1). While mechanisation is being driven by rising labour costs and the emergence of larger farms cultivating more than three hectares, increasing machine use has also been enabled by rentals rather than ownership, particularly for smaller farms (Takeshima, Liu and Cuong, 2018[118]). Some agricultural co-operatives offer their members a machine hiring service, either of their own tractors or by acting as an intermediary between farmers and individual tractor owners. However, surveys of agricultural co-operatives suggest that this is not common because most agricultural co-operatives lack finance to buy machinery and equipment (GIZ, 2017[53]). Instead, Takeshima, Liu and Cuong (2018[118]) suggest that private-sector led machinery hiring services are taking over from co-operative-based service providers, including enterprises and larger (mostly rice) farms.

The role played by policy support for mechanisation is less clear. In its 2015 review, the OECD suggested that credit subsidies and investment support may have created additional demand for modern harvesting and post-harvesting processing machines like combine-harvesters (OECD, 2015[2]). However, support measures were less effective than expected due to local content rules (between 40% and 60%), as domestic machines were more expensive than imported machinery and offered less choice, and enterprises and agricultural co-operatives have found it difficult to access support measures. Instead, rental markets have emerged to address the scale-based, indivisibility problems in machinery and permit mechanisation in the face of labour out-migration and rising real wages, enabling small farmers to benefit from machinery adoption (Liu, 2020[116]).

Despite this progress, agricultural mechanisation is generally low in Viet Nam, and there is still a high reliance on manual and animal labour in some sectors and for some production operations. Mechanisation rates are highest for annual crops and in the rice sector, where land preparation is around 70% mechanised, and around 35% of rice production is harvested by combine harvesters. In contrast, mechanisation is increasing more slowly in other sectors. For example, except for land preparation, most operations for upland crops are undertaken manually, e.g. seeding, cultivation and harvesting (Takeshima, Liu and Cuong, 2018[118]). Use of facilities and equipment for protected cropping, such as net-houses, greenhouses or polyethylene houses for vegetables, flowers and seedlings is also low, and concentrated in areas of urban agriculture such as Lam Dong province, HaNoi and Ho Chi Minh City (GSO, 2018[9]).

Table 6.1. Mechanisation in the agriculture, fishery and forestry sector, 2011 and 2016

	Number (Thousand items)		Change 2011-2016 (%)
	2011	2016	
Tractor	497.7	719.3	44.5
Seed sowing machine	25.7	27.7	7.8
Combine harvester	13.1	22.2	69.5
Other harvester	62.0	171.8	177.1
Motorised threshing machine	231.1	249.8	8.1
Stoves and dryers for AFF products	58.9	72.3	22.8
Food processing equipment	204.7	189.5	-7.4
Animal food processing machine	62.4	116.2	86.2
Food processing machine for aquaculture	5.8	12.2	110.3
Aerators, water stirrers for aquaculture	151.1	413.9	173.9
Water pumps	1 932.3	2 782.8	44.0
Motorised pesticide sprayers	551.5	1 537.6	178.8

Source: GSO (2018[9]).

production and consumption of agricultural products, which offers a subsidy of up to 30% of the total cost of investing in machinery, equipment and construction of infrastructural facilities serving the linkage.

6.2. Agricultural productivity

Total factor productivity

Increasing total factor productivity (TFP) of agricultural production—that is, getting more output from the same amount of resources—is critical to sustaining agricultural growth in Viet Nam. TFP is an indicator of how efficiently agricultural land, labour, capital, and other inputs (seed, fertiliser, and so on) are used to produce a country's agricultural outputs (crops and livestock).[90] TFP is calculated as the ratio of total agricultural outputs to total production inputs, so when more output is produced from a constant amount of resources, TFP increases. R&D activities producing new technologies and innovations are a crucial factor in driving TFP, but technological spillovers from abroad, higher numbers of skilled workers, investments that favour the development of input and output markets (such as roads and communications), and government policies and institutions that promote market development and competition are major factors as well.

Growth in Viet Nam's agricultural output peaked at 6% per year on average between 1991 and 2000 (Table 6.2). The increased use of inputs was responsible for almost two-thirds of this growth, growing 3.8% per annum over the period. TFP contributed the remaining 2.3 percentage points. This fast growth in the use of inputs (largely in the form of capital, irrigated land area and intermediate inputs) set the stage for higher productivity in the following decade. Growth in input use slowed to 1.7% per year on average during 2001–2010, but TFP growth accelerated to 3.7% per year on average.

Table 6.2. Agricultural output, total factor productivity and input growth in Viet Nam, 1971-2019

Average annual growth rate over the specified period

	1971-80	1981-90	1991-2000	2001-10	2011-19
Output	2.7	4.0	6.0	5.4	2.9
Total Factor Productivity	1.2	1.4	2.3	3.7	1.1
Input	1.5	2.6	3.8	1.7	1.9
Contributions to input change					
Primary factors	1.2	2.1	2.3	1.0	0.9
Labour	0.9	1.2	0.5	-0.6	-0.9
Land – non-irrigated	0.0	-0.3	0.2	0.2	0.6
Land – irrigated	0.2	0.5	0.6	0.3	0.0
Capital	0.0	0.7	1.1	1.1	1.3
Intermediate inputs	0.3	0.5	1.5	0.7	0.9
Animal materials	0.2	0.1	0.9	0.7	0.9
Crop materials	0.0	0.4	0.5	0.0	0.1

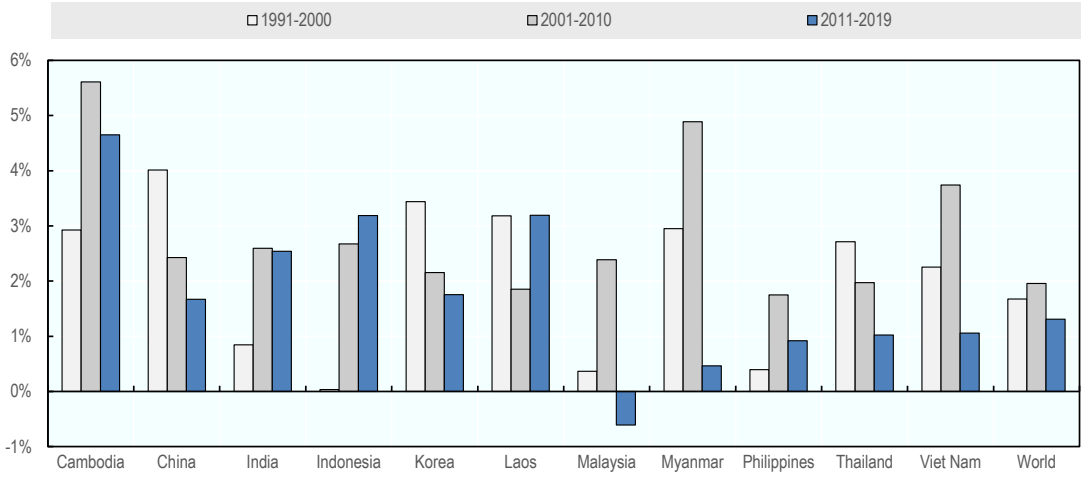
Source: United States Department of Agriculture (2021[119]), USDA Economic Research Service, International Agricultural Productivity (database), https://www.ers.usda.gov/data-products/international-agricultural-productivity (accessed November 2021).

However, agricultural growth in Viet Nam has slowed in the last decade to under 3% per annum, half the 1991-2000 rate, and like the 1970s. While growth in total input use has remained relatively constant (except for labour that fell to negative in the last two decades) there has been a significant fall in TFP growth. This fall in TFP in 2011-19 is common across most Asian countries, with only a couple of exceptions (Indonesia and Lao People's Democratic Republic), and the world (Figure 6.3).

[90] TFP is an indicator for measuring agricultural productivity that takes into account all of the market inputs used in agricultural production (labour, land, livestock, machinery and intermediate inputs) and compares them with the total market outputs produced (crop and livestock commodities). The USDA Economic Research Service's methodology for measuring international agricultural TFP growth is available at https://www.ers.usda.gov/data-products/international-agricultural-productivity/documentation-and-methods/.

Figure 6.3. Agricultural total factor productivity in selected Asian countries, 1991-2019

Average annual growth rate over the specified period



Source: United States Department of Agriculture (2021[119]), USDA Economic Research Service, International Agricultural Productivity (database), https://www.ers.usda.gov/data-products/international-agricultural-productivity (accessed November 2021).

Studies of Viet Nam's agricultural productivity performance highlight the significant effect of the reforms undertaken in the late 1980s and early 1990s, especially the role played by land reforms and the partial lifting of restrictions on markets (IFPRI, 2016[120]; Rillo and Sombilla, 2015[15]; Kompas et al., 2012[121]). Reforms also facilitated the rapid adoption and diffusion of Green Revolution technologies – particularly modern and high-yielding rice varieties (Coxhead et al., 2010[14]; Rillo and Sombilla, 2015[15]). Other drivers included investments in infrastructure (mostly irrigation) and a shift towards higher-value crops and livestock.

More recently, there are concerns that agricultural productivity growth is slowing relative to the high growth rates achieved in the 1990s and 2000s, and relative to the rates achieved by other countries in the region at a similar stage of development, including China and Korea (World Bank, 2016[18]; International Support Group, 2017[122]). Commentators have suggested that Viet Nam's past productivity growth reflected gains from one-off adjustments associated with reform, including a one-off catch-up as Vietnamese farmers adopted more efficient production practices (ADB, 2017[95]; Coxhead et al., 2010[14]). Following the initial gains from the adoption of modern technologies and practices, science, technology and innovation have played a more limited role in driving agricultural productivity growth (Tran Ngoc Ca, 2016[123]). For example, farmers have limited access to improved seeds – in the rice subsector, for example, nearly 70% of farmers use noncertified seeds, using instead a mix of varieties saved from previous harvests (McKenna, 2017[59]; IPSARD, 2016[58]). Similarly, there is limited application of science and technology in animal husbandry, and low productivity livestock breeds are common (IPSARD, 2016[58]; Yen, Nhung and Dung, 2017[124]).

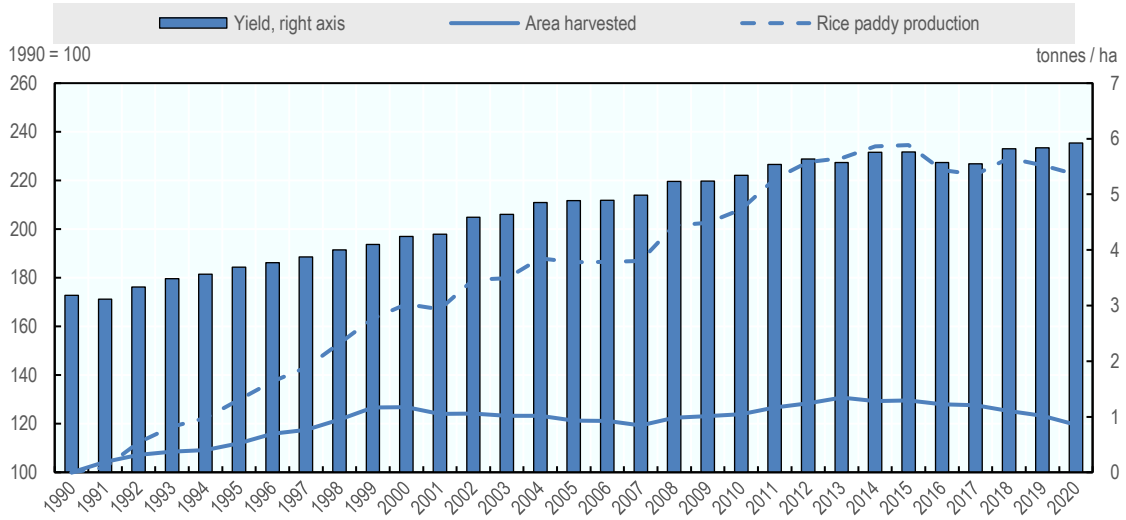
Shifts in land use patterns (towards higher value crops) have also slowed, reflecting land use plans that favour rice production (Eckardt, Demombynes and Chandrasekharan Behr, 2016[6]). Another study has found that a substantial misallocation of factor inputs persists across farms and that a variety of constraints facing households are preventing more rapid productivity growth (Ayerst, 2020[125]). This misallocation arises primarily from an inefficient allocation of land and constraints on changing landholding and restrictions on crop choice. Overuse of inputs, particularly agro-chemicals, is also decreasing productivity section.

Commodity yields

A falling rate of agricultural productivity growth is observed in paddy rice production (Figure 6.4). During the ten-year periods 1990-2000 and 2000-2010 paddy rice yields (tonnes per hectare) increased by 2.9% and 2.3% per annum. However, rice yields have only grown by 1% per annum on average over the last

decade (2010-20). Overall, there has been an impressive increase in rice yields over the past thirty years in Viet Nam, rising from just over three to almost six tonnes per hectare between 1990 and 2020. While the area of land used for rice production has increased by 20% since 1990 (with most of this increase occurring before 2000), paddy rice production has more than doubled in Viet Nam, rising 120%.

Figure 6.4. Growth in paddy rice area, production and yield, 1990-2020

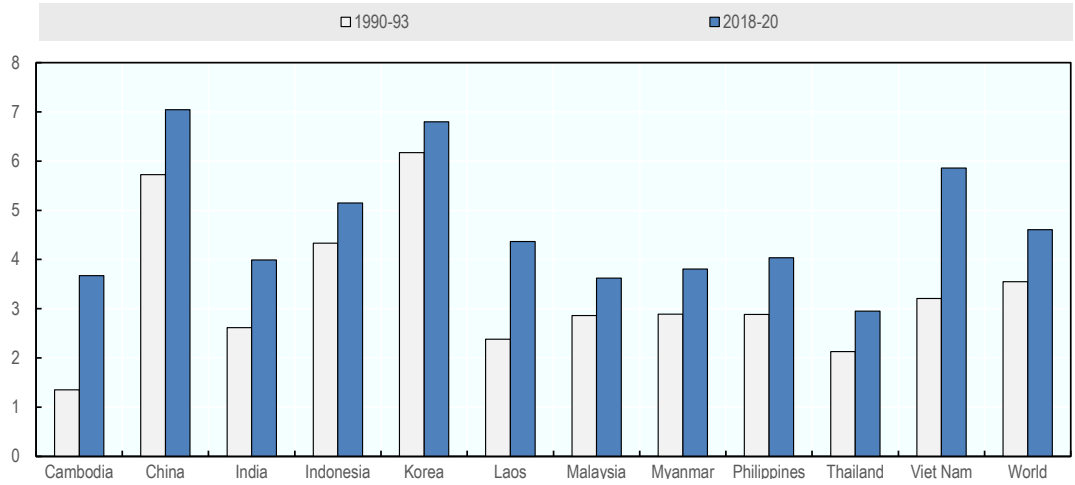


Source: FAO (2021[3]), FAOSTAT (database) http://www.fao.org/faostat/en/#home accessed 10 January 2022.

The increase in Viet Nam's paddy rice yield is impressive when compared to other Asian countries (Figure 6.5). Only Cambodia has experienced a larger percentage increase (170%) than Viet Nam (83%), but it started from a very low yield level. In 1990-93, rice yield in Viet Nam was about half what was achieved in Korea; in 2018-20 it was 85%. Similarly, Viet Nam's rice yield was 10% below the world average in 1990-93; now it is almost 30% higher.

Figure 6.5. Paddy rice yield in selected Asian countries, 1990-93 and 2018-20

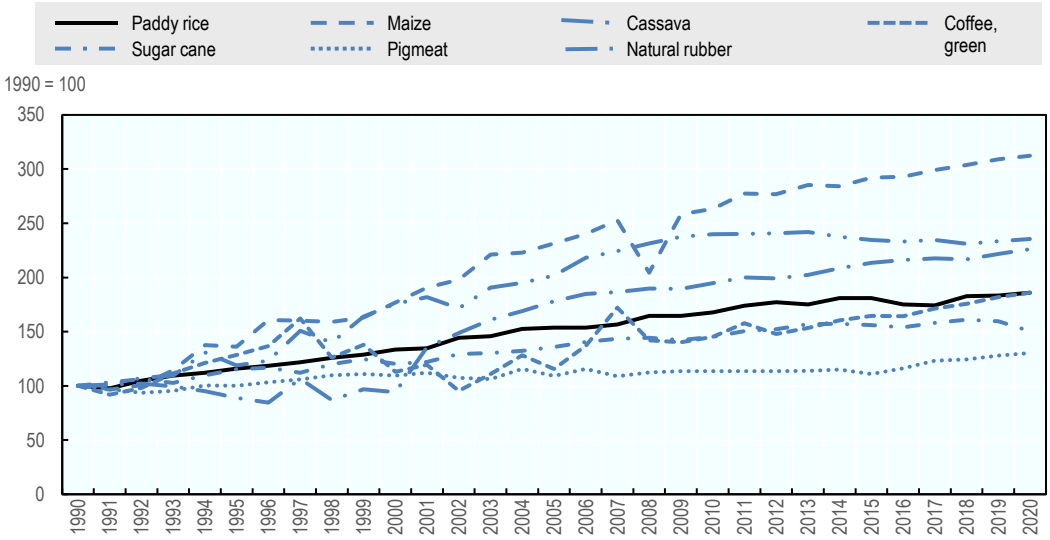
Average annual tonnes per hectare



Source: FAO (2021[3]), FAOSTAT (database) http://www.fao.org/faostat/en/#home accessed 10 January 2022.

The trend of falling productivity growth is reflected in the yields of other crop commodities as well (Figure 6.6). Yield growth rates for all the major crops slowed in 2010-20 compared to the previous decade. Of the commodities shown, it is only pig meat which experienced a higher growth in yield in 2010-20 than in the previous decade. However, this growth started from a lower base, as yield growth for pig meat was significantly lower than for crops in 1990-2010. Since 1990, yields have more than doubled for maize, natural rubber and cassava, and grown by 86% for rice and coffee.

Figure 6.6. Growth in production yields for selected agricultural products in Viet Nam, 1990-2020



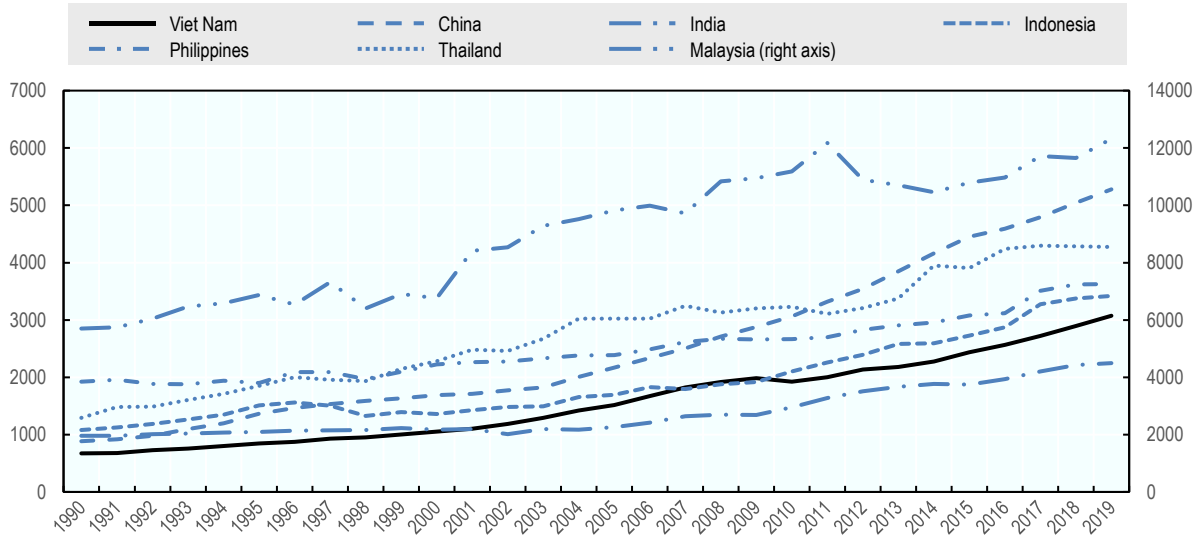
Note: Production (tonnes) per hectare for crops and per animal for pig meat.
Source: FAO (2021[3]), FAOSTAT (database) http://www.fao.org/faostat/en/#home accessed 10 January 2022.

Labour productivity

While total input use has grown at similar level over the past decade, the composition of input use has changed. In particular, there has been a fall in labour used for agricultural production. During the 1990s there was a small growth in the number of persons involved in agriculture; during the 2000s and 2010s the number of people involved in agriculture fell. In 2000 there were 26.7 million people engaged in farming; by 2019 this had dropped to 20.9 million. Farming families are diversifying out of agriculture, increasingly earning more of their total household income from the non-farm sector (Liu, 2020[116]). Mechanisation and the uptake of labour-saving inputs have enabled more people, particularly youth, to seize non-farm opportunities. Youth are increasingly well educated, enjoying a wider array of remunerative non-farm job options than their parents did. Rising employment opportunities and real wages in the non-farm rural sector is another factor. But this has also contributed to an overall wellbeing improvement of rural households.

Because of this movement of labour out of agricultural production, the value of output per worker has risen in Viet Nam at a faster rate over the past two decades than in other Asian counties except for China (Figure 6.7). But while increasingly productive, agricultural labour productivity is low relative to other countries in the region. It is also low compared with average labour productivity in the country as a whole (Eckardt, Demombynes and Chandrasekharan Behr, 2016[6]). This is one of the main reasons for the relatively low income of farming households (OECD, 2015[2]).

Figure 6.7. Agriculture value added per worker in selected Asian countries, 1990-2019



Note: Agricultural value added per worker is measured as total agricultural output (constant 2015 USD) divided by the total number of economically active persons in the sector in a given year.
Source: Own tabulation based on United States Department of Agriculture (2021[119]), USDA Economic Research Service, International Agricultural Productivity (database), https://www.ers.usda.gov/data-products/international-agricultural-productivity (accessed November 2021).

Land scarcity and the small and fragmented scale of production constrains productivity growth, including via mechanisation and the adoption of labour-saving technologies. At 0.12 hectare per capita, Viet Nam's agricultural land availability is one of the lowest in the region (and in the world more broadly). Moreover, land fragmentation increases labour input per hectare of land due, in part, to the time required to travel between plots. The dominance of rice in the use of Viet Nam's best land and irrigation capacity is also a factor, given the low value-addition to rice (World Bank, 2016[18]).

6.3. Agricultural sustainability

Over much of the past three decades, Viet Nam's government has focused on increasing agricultural production and the value of exports, with much less attention given to the environmental sustainability of the sector. Agricultural output growth has been driven by land expansion, including onto marginal land, and intensive use of intermediate inputs such as fertilisers and pesticides. This has contributed to significant natural resource degradation, including of land and water resources, and increased the sector's vulnerability to floods and droughts (OECD, 2018[75]). This is reflected in the Agri-Environmental indicators of Viet-Nam as compared with OECD countries (Table 6.3). Nutrient balances are well above the OECD average.

Table 6.3. Viet-Nam: Agri-Environmental indicators

	Viet Nam		International comparison	
			OECD average	
Environmental indicators	2000*	2020*	2000*	2020*
Nitrogen balance, kg/ha	165.6	126.5	32.1	30.0
Phosphorus balance, kg/ha	29.9	31.9	3.4	2.9
Agriculture share of total energy use (%)	1.7	2.1	1.7	2.0
Agriculture share of GHG emissions (%)	47.9	31.6	8.6	9.7
Share of agriculture in water abstractions (%)	94.3	94.8	46.3	43.7

Note: * or closest available year.
Sources: OECD Agri-Environmental Indicators statistical databases; http://www.oecd.org/agriculture/topics/agriculture-and-the-environment/.

As noted in OECD (2015[2]), Viet Nam's current strategies to develop the agricultural sector signal an important change in emphasis: from extensive development based on quantity to one focused on quality and efficiency improvement, and improved natural resources management and reduced impacts on the environment.[91] However, both the crop and livestock sectors continue to be significant sources of non-point source water pollution and GHG emissions, particularly because of overuse of fertilisers and pesticides, animal waste management practices, and the burning of crop residues (Cassou et al., 2017[90]).

Use of chemicals

Excess use of fertiliser is a significant source of water pollution and nitrous oxide emissions, and is contributing to serious land degradation (World Bank, 2016[18]). Fertiliser use has increased rapidly in Viet Nam. Between the early 1980s and late 2010s fertiliser consumption, measured in terms of active ingredients, increased 13-fold, rising from around 220 000 tonnes to 3 million tonnes per annum (FAO, 2021[3]). Fertiliser application rates have changed little over the past 20 years. At over 250 kg/ha, application rates are higher than in most countries in the region, except for China and Korea, and other major cereal producing nations in the OECD (Figure 6.8).

Vietnamese farmers spend about VND 110 000 billion (USD 4.8 billion) a year on fertiliser. Rice accounts for approximately two-thirds of fertiliser use followed by maize, coffee and rubber, which each account for between 5% and 10% of total use (FPTS, 2015[126]). Viet Nam's nitrogen and phosphorous surpluses – an indicator of the extent to which fertiliser applications are above soil and crop needs – are significantly high, indicating a high risk of soil, water and air pollution from nutrient losses (OECD, 2019[127]). Although fertiliser accounts for the largest share of production costs in key grain crops, it is estimated that crops fail to capture between one half and two-thirds of fertiliser nutrients (Nguyen et al., 2017[115]).

Excessive and inappropriate use of crop protection products, such as pesticides and herbicides, is also a significant source of water pollution. Imports of pesticides have increased around five-fold since 2000, with the level of active ingredient applied per hectare of cropland quadrupling between 2000 and 2019 (Figure 6.9). Pesticide residues have been detected at rates that exceed international drinking water standards in ground and surface water,[92] and there are reports that some intensively farmed rice fields have become 'dead zones' unsuitable for farming (Nguyen, 2017[21]). Pesticides are also widely used in violation of applicable regulations, including illegally imported, banned, and fake pesticides (McKenna, 2017[59]; Nguyen, 2017[21]). Recent census results also show that many farmers lack suitable options to dispose of or recycle used containers and their chemical residues, with some farmers discarding containers in fields, canals and streams (GSO, 2018[9]).

The livestock sector is also a rapidly increasing source of agricultural pollution, mainly associated with waste management. Pig and poultry operations generate the most waste and are a significant source of water contamination. Despite laws and regulations to address livestock waste pollution, around 36% of livestock waste is estimated to be dumped into the environment untreated, and according to Dinh (2017[128]), around 70% to 90% of minerals (nitrogen, phosphorus, potassium, magnesium and others), and heavy metals contained in feed are reportedly excreted to the environment.

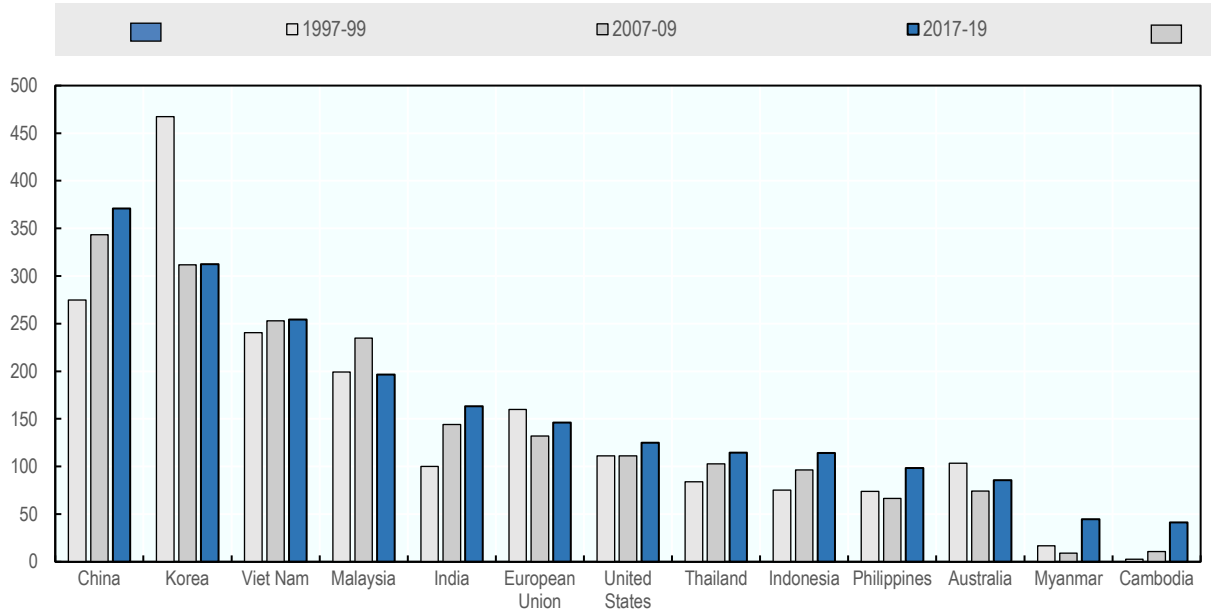
Several factors are contributing to excessive agro-chemical use and poor management practices. Land-constrained farmers are under pressure from the impacts of climate change, declining soil quality and evolving pests, resulting in high application rates of fertiliser, pesticides and other inputs to increase output or as a precaution against lower yields (ADB, 2017[95]; Cassou et al., 2017[90]; McKenna, 2017[59]). According to Nguyen (2017[21]), many farmers misunderstand the relationship between input use and crop yields, believing that higher inputs always result in higher yields. Moreover, only a minority of pesticide sellers, extension agents, and farmers understand correct pesticide use, and there is a belief that the early application of pesticides better prevents pests.

[91] Decision No. 899/2013/QD-TTg approving the plan of restructuring the agricultural sector.

[92] According to the European Commission's parametric guideline values for individual or total pesticides in drinking water

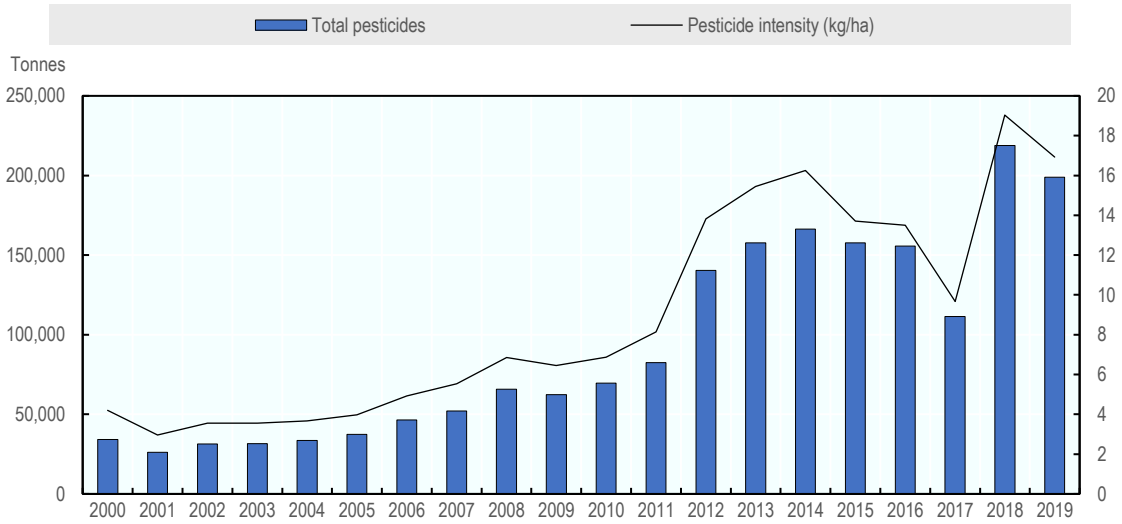
Figure 6.8. Use of chemical fertilisers in selected countries, 1997-99, 2007-09 and 2017-19

Kilogrammes of active ingredient per hectare



Note: Use of fertiliser includes nitrogenous, phosphate and potash fertilisers in nutrient terms. Cropland includes arable land and perennial crops.
Source: FAO (2021[3]), FAOSTAT (database) http://www.fao.org/faostat/en/#home.

Figure 6.9. Imports of pesticides into Viet Nam, 2000-2019



Source: FAO (2021[3]), FAOSTAT (database) http://www.fao.org/faostat/en/#home.

Small household farms can lack the requisite financial capacity, physical space, or skills and expertise to adopt certain technologies or practices and meet certain standards. Farmers also lack incentives to adopt more sustainable practices because of low levels of consumer awareness, and weak monitoring, control and enforcement in the use of fertilisers, pesticides and of agricultural pollution (World Bank, 2016[18];

Cassou et al., 2017[90]; Nguyen, 2017[21]). The widespread availability of cheap fertilisers[93] and pesticides – including banned, highly toxic pesticides – is also a factor (McKenna, 2017[59]).

Water use

Sustainable water use in agriculture is also a major challenge. According to the most recent estimates, agriculture accounts for almost 95% of freshwater withdrawals in Viet Nam, which creates constraints on other users in times of drought. Furthermore, the intensive pumping of groundwater for irrigation is contributing to local land subsidence and saltwater intrusion, which increase soil salinisation in the Mekong River Delta to (OECD, 2018[75]; Akam and Gruere, 2018[113]). As the largest user of water, agriculture determines much else in the water sector. In line with the OECD Council Recommendation on water (OECD, 2016[129]), the water allocation regime needs to coordinate agricultural diversions with other priority demands, not only hydropower, industrial and human use but also ecosystem, amenity and navigational uses (World Bank, 2019[103]).

Greenhouse gas emissions

Agriculture is Viet Nam's second largest source of GHG emissions, contributing around 29% of the country's total GHG emissions. Methane produced by rice cultivation is the largest source of agricultural GHGs, accounting for 47% of the sector's emissions (Table 6.4). Nitrous oxide emissions from the use of synthetic fertilisers increased by almost 50% between 2001 and 2019, the fastest growing source of emissions from agriculture. The raising of livestock is also an increasingly important source of GHGs, particularly related to enteric fermentation and manure management practices (Dinh, 2017[128]).

Table 6.4. Agricultural greenhouse gas emissions in Viet Nam by source, various years

Gigagrammes per year

	2001	2014	2019	Contribution to 2019 total	Change since 2001
Agriculture total	**71 713**	**79 867**	**79 106**	**100%**	**10%**
Rice cultivation	37 029	38 629	36 916	47%	0%
Enteric fermentation	10 248	11 912	12 779	16%	25%
Synthetic fertilisers	5 866	7 525	8 617	11%	47%
Manure management	5 624	6 895	5 979	8%	6%
Drained organic soils	5 590	5 587	5 283	7%	-6%
Manure left on pasture	2 058	2 492	2 996	4%	46%
Crop residues	2 130	2 790	2 667	3%	25%
Manure applied to soils	1 306	1 611	1 740	2%	33%
On-farm energy use	1 258	1 655	1 525	2%	21%
Burning - crop residues	474	534	494	1%	4%
Savanna fires	129	236	110	0%	-15%

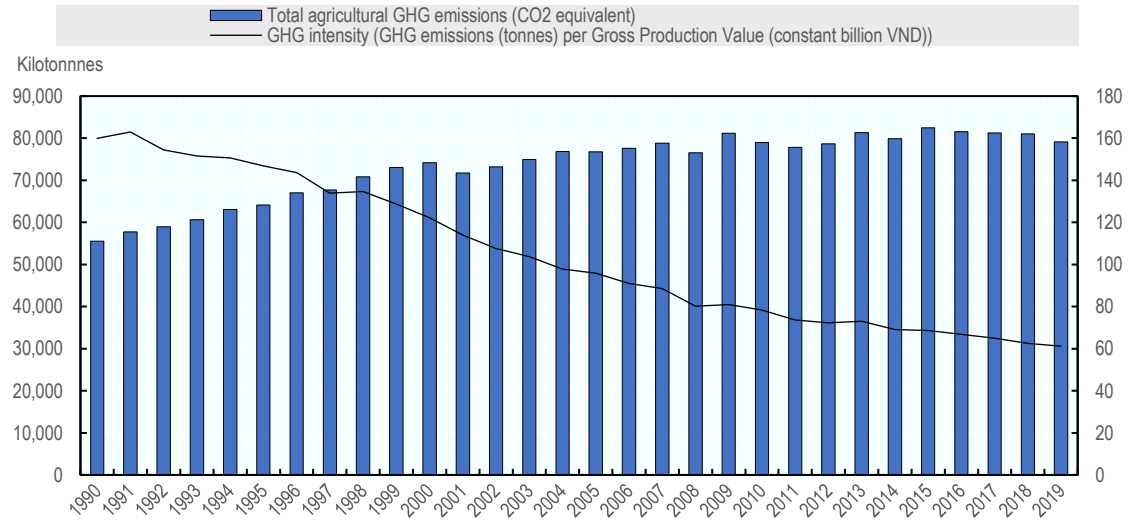
Note: GHG emissions from agriculture consist of non-CO_2 gases, namely methane (CH_4) and nitrous oxide (N_2O), produced by crop and livestock production and management activities.
Source: FAO (2021[3]), FAOSTAT (database) http://www.fao.org/faostat/en/#home.

GHG emissions from agriculture have increased from about 66 million tonnes in the early 1990s to around 80 $MtCO_2eq$ during the late 2020s (Figure 6.10). Most of the growth in GHG emissions took place during the period from 1990 to 2000. GHG emissions from Vietnamese agriculture have been relatively constant throughout the 2010s. Because the real value of agricultural output has continued to increase, GHG intensity, as measured by the level of GHG emission per value of output, has fallen. In the early 1990s

[93] Domestically produced fertilisers are largely manufactured by state-owned enterprises, which benefit from subsidised energy and preferential tax rates.

around 160 tonnes of GHG emissions were produced for every VND 1 billion (USD 45 000) of agricultural output measured in 2014-16 prices. By the late 2010s, this had reduced by more than 60% to around 63 tonnes.

Figure 6.10. Agricultural GHG emissions in Viet Nam, 1990-2019



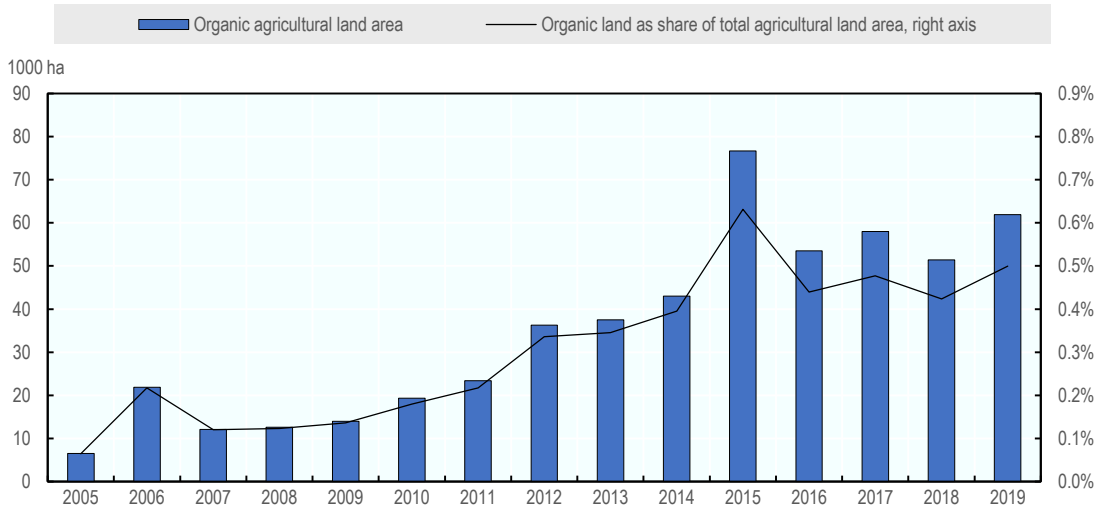
Note: Gross Value of Production is measured in constant 2014-2016 local currency.
Source: FAO (2021[3]), FAOSTAT (database) http://www.fao.org/faostat/en/#home.

Uptake of environmental production practices

Over the past 15 years there has been a steady upward rise in land under organic production in Viet Nam (Figure 6.11). In the mid-2000s there was only about 10 000 hectares of land in organic production, representing 0.1% of total agricultural land. By 2019 this had increased to over 60 000 hectares (0.5% of agricultural land). Further detailed statistics on organic production are not readily available but it is likely that most of this organic land is producing rice (other products being mainly aquaculture and vegetables), and that not all it will be certified as organic. A recent study of Vietnamese organic rice in the Mekong River Delta found 10% of organic production was not certified (Nguyen, 2021[130]).

Similarly, the share of agricultural products produced according to Vietnam Good Agricultural Practices (VietGAP and equivalent) procedures is very small. In 2016, less than 4% of tea, fruits and vegetables, and less than 1% of coffee and rice, was produced according to VietGAP standards (GSO, 2018[9]). From the supply side, the requirements of VietGAP standards are not suitable for smallholders' farming conditions, and implementation costs have constrained further adoption. On the demand side, there is low public awareness about VietGAP and limited recognition of the certificate granted to farm products that meet VietGAP standards, reflecting a lack of consumer concern for food safety (Hoang, 2020[131]). As a result, many farmers have adopted improved farming techniques and received certification, only to go back to their less-sustainable farming practices for lack of access to premium prices for higher-quality products (Nguyen, 2017[21]).

Figure 6.11. Area of organic production in Viet Nam, 2005-2019



Note: Data before 2005 is not available.
Source: FAO (2021[3]), FAOSTAT (database) http://www.fao.org/faostat/en/#home.

Annex A. Mechanisation in the agriculture, fishery and forestry sector

Annex Table Error! No text of specified style in document.**1. Number of major machines occupied by agricultural, forestry and fishery units, 2016**

Per 100 units

		By type of unit			
	Total	Enterprise	Co-operative	Household	
				Total	Of which farms
Ploughs, tractors more than 35 CV	0.30	7.57	1.25	0.30	6.46
Ploughs, tractors 12 CV to 35 CV	2.91	1.35	1.11	2.92	13.17
Ploughs, tractors 12 CV and less	4.52	1.01	0.60	4.53	2.64
Vehicles	0.67	79.41	1.74	0.64	8.21
In which: Used for agriculture, forestry and fishery activities	0.21	40.46	0.82	0.19	5.57
Electrical engines	6.43	522.00	146.54	6.11	75.41
Diesel petrol, diesel engines	5.85	79.67	29.93	5.80	30.99
Electric generators	0.83	53.85	7.28	0.81	44.78
In which: Generators used for agriculture, forestry and fishery activities	0.38	37.31	3.76	0.36	37.13
Sowing machines	0.30	0.52	12.78	0.29	2.44
Harvesters combine rice mowing machines	0.24	0.44	5.47	0.23	3.01
Other harvesters	1.85	0.34	2.91	1.85	1.48
Rice mowing machines with engine	2.69	0.29	4.79	2.69	0.71
Agriculture, forestry, fishery product dryers, ovens	0.78	18.46	2.00	0.77	1.90
Milling machines	2.04	5.30	3.66	2.04	2.49
Animal food processing machines	1.25	6.24	3.58	1.25	12.76
Aquaculture food processing machines	0.13	3.25	0.59	0.13	2.79
Aerators for aquaculture production	4.45	227.17	14.28	4.36	82.16
Water pumps for agriculture, forestry, aquaculture production	29.95	353.02	224.37	29.67	208.41
Motorised Insecticide sprayers	16.55	28.00	24.92	16.54	55.40
Incubators	0.15	13.18	1.51	0.14	7.75
Milking machines	0.10	0.68	3.63	0.10	2.00
Other machinery	4.31	19.34	3.07	4.30	49.53

Source: GSO (2018[9]).

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