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## Survey of Recent Developments

# AGRICULTURE, DEVELOPMENT AND SUSTAINABILITY IN THE COVID-19 ERA

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Domestic and international mobility restrictions helped to reduce the numbers of confirmed Covid-19 cases until the end of 2021. Indonesia entered 2022 with caution, however, as Omicron cases began to rise. Recent success in managing the pandemic has coincided with what might be the start of an economic recovery, in no small part driven by high commodity prices—mainly for coal and palm oil—improving the fiscal and trade balances. The new tax harmonisation law is intended to lower the fiscal deficit to less than 3% of GDP by 2023, and a carbon tax will be implemented in April 2022—starting with a cap-and-tax scheme for coal power plants, before more sectors are included. Agriculture has played a key role in helping Indonesia to weather the pandemic, with the sector's growth supporting employment and food consumption during the crisis. A resurgence in the palm oil price, together with rising agricultural wages and a narrowing of the labour productivity gap, has helped the agriculture sector lead the recovery, but concerns remain over the sector's environmental footprint. Against recent food and environmental policy commitments, a renewed focus on increasing on-farm yields is a critical area for policy. We conclude with some reflections on the national palm oil replanting program and how better benefits might be delivered for smallholders and the environment.

*Keywords*: Covid-19, agriculture, economic growth, palm oil *JEL* classifications: Q15, Q01, Q56, E66, I18, O13

## INTRODUCTION

This Survey covers the transition from the Delta to Omicron phase of the Covid-19 pandemic, and what appears to be the beginning of an economic recovery from the second quarter of 2021. The focus of the Survey is agriculture, and we review recent trends, critical concerns for the sector during the pandemic, and the implications

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of dramatic increases in the world palm oil price. We conclude by considering how the sector might shift towards more sustainable practices, using oil palm smallholdings and the national Smallholder Replanting Program as a case study.

After peaking in July–August 2021, the increase in new Covid-19 cases slowed for the rest of the year. Case numbers have begun to surge again because of the recent holiday season and the emergence of the more contagious Omicron variant. With rising cases and a peak projected for the end of February 2022, the Indonesian government set more stringent mobility restrictions and health protocols.

There were already signs of economic recovery early in 2021, culminating in an annual economic growth rate of 3.7%. Export revenue, investment and imports also began to grow. The large Covid-19-induced budget deficit began to shrink and inflation remained very low by historical standards. It is hoped that recent tax reforms will help raise the low tax-to-GDP ratio, critical for public spending during the recovery.

Agricultural sector growth played a crucial role in helping Indonesia to weather the pandemic downturn. Supported by rising commodity prices, it has helped propel the recovery. Agriculture is still a major sector of the economy and is particularly important for jobs. Tree crops, especially oil palm, play a much bigger role than in the past, and the latter has benefited from strong demand and rapidly rising prices at home and abroad. Jobs in agriculture provided a cushion against urban job loss for some workers during Covid-19, and fears of more permanent deurbanisation do not appear to have materialised.

The current recovery has been driven by palm oil prices rising back to the record levels of 2007 and 2012, improving the fiscal and trade balances. This new boom could, however, pose a serious threat to recent environmental and climate commitments. Indonesia signed a 'no-deforestation' deal at the United Nations Climate Change Conference, COP26, held in Glasgow in late 2021, and a new carbon tax is poised to be expanded. However, there are signs that the rate of deforestation has slowed, even as palm oil production has increased. We draw attention to policy discussion around this promising recent development, especially the ongoing trade dispute with the European Union over palm oil imports.

The most straightforward way to increase agricultural production while minimising adverse environmental impacts is to increase productivity. Persistent productivity gaps indicate large efficiency gains, which could support economic development and reduce the pressure on the environment from farmland expansion. The national replanting program for oil palm smallholders could be an effective way to close yield gaps. However, there are significant opportunities to improve the design of this program. Reforming such initiatives and expanding them to other sectors with lagging productivity could help support the economic recovery, meet food security targets, and improve the overall sustainability of agriculture in Indonesia.

#### **COVID-19 UPDATE**

#### Decline in Covid-19 Case Numbers in 2021 and the Threat of Omicron

The number of new confirmed Covid-19 cases declined again during the fourth quarter of 2021, continuing the trend from the previous quarter. The number of new cases recorded in December was 50% lower than in November (200 and 400

new cases per day, respectively). The infection rate also remained low, with a 0.1% monthly average, as the testing capacity (PCR and antigen tests combined) increased from 250 tests daily per million people in mid-2021 to about 700 in December. Over the longer term, new case numbers were estimated to fall 97% year on year from 2020 to 2021. The official Covid-19 mortality rate was about 10 deaths per day during December, down from 15 per day in November. These patterns are better than was predicted (Dyer 2021) and are consistent with trends in other Southeast Asian countries, with many experiencing dramatic decreases in Covid-related mortality in the second half of 2021.

Notwithstanding the positive developments in the past year, the new and more infectious Omicron strain has brought uncertainty.<sup>1</sup> The first Omicron case was found on 16 December 2021 in Jakarta and almost 3,200 cases in total had been detected by the first week of February 2022 (Puspa Sari 2022).<sup>2</sup> Approximately 1,700 cases were 'imported' and the rest were local transmissions.<sup>3</sup> On 22 January 2022, the government announced the first two Omicron-related deaths, both in Jakarta.

Covid-19 case numbers have continued to surge into 2022 and reached a peak of more than 32,200 new confirmed cases per day on 4 February. This new record was driven by the long 2021–22 holiday season and Omicron. In the first week of February, cumulative cases reached 4.4 million, with almost 145,000 people dying.<sup>4</sup> Actual deaths were likely higher owing to underreporting and a lack of data transparency from the government, particularly in the beginning of the Covid-19 outbreak (Djalante et al. 2020).<sup>5</sup>

The Indonesian government has strived to expedite vaccination across the country, and set an end-of-2021 target of vaccinating more than 200 million eligible people with at least their first dose. The vaccination rate increased sharply in 2021 but fell short of that target. The percentage of people given their first dose reached nearly 80% and their second dose 55% (figure 1). The rollout of third doses (boosters) commenced in July 2021, with priority given to health workers. Almost 1.3 million people had received their third dose by the end of 2021, and eligibility was expanded to the general population aged 18 years and older in mid-January, with a target to give 21 million people in 244 regencies or cities their third dose in the first month. For a region to be eligible for third doses, more than 70% of its population must have received one dose and 60% two doses.

Despite increased vaccine penetration, distributional issues remain critical. By the end of 2021, major islands such as Java had a complete (that is, two-dose) vaccination rate of more than 53% in all provinces -100% of the population was fully

<sup>1.</sup> The Omicron strain was designated by the World Health Organization on 26 November 2021 as a 'variant of concern'. The new variant is still being studied to better understand differences in transmission, disease characteristics and vaccine effectiveness.

<sup>2.</sup> Omicron cases were forecast to have peaked by the end of February (GTPP 2022).

<sup>3.</sup> The local transmission of Omicron increased sharply from fewer than 500 cases at the end of January to more than 1,200 cases on 4 February 2022.

<sup>4.</sup> Data were recorded as of 4 February 2022 by the Ministry of Health, Indonesia.

<sup>5.</sup> Using excess mortality data is often considered better for estimating Covid-related deaths. A study by Elyazar et al. (2020) estimated there was 61% (16,000) of excess mortality from January to October 2020 in Jakarta only.



#### FIGURE 1 Vaccination Rates, February–December 2021 (%)

Source: Ritchie et al. (2021).

vaccinated in Jakarta, and 90% in Yogyakarta. In contrast, the rates were only 21% and 33% in Papua and West Papua. However, the problem is not simply one of vaccine availability: the vaccine stock per 1,000 people in West Papua is 421, the highest among all provinces. Local distribution within regions is a key constraint. Variation in vaccination levels across regions can also be partly attributed to differences in access to health facilities, government priorities (Suryahadi, Izzati and Yumna 2021), social acceptance and vaccine hesitancy (Solís Arce et al. 2021).

Given Indonesia's geography and regional development differences, regional disparities in health service delivery are not particularly surprising. However, these circumstances are no excuse for failing to vaccinate individuals, especially as mobility—and the potential for transmission—resumes alongside the economic recovery. Improving public health education and supply chain management for Covid-19 vaccination is likely to be key for the government to achieve its vaccination targets (Acharya, Ghimire and Subramanya 2021).

#### **Potential Need to Reimpose Travel Restrictions**

In response to Omicron (since mid-December 2021), Indonesia set restrictions on non-essential and non-critical commercial activities.<sup>6</sup> These restrictions were intended to prevent a hike in case numbers over the year-end holidays. The third level of the four-tiered restrictions on economic activity (PPKM) was introduced in all regions from 24 December 2021 to 2 January 2022, in an effort to reduce public

<sup>6.</sup> Critical sectors involve health, civic safety, energy, transportation and logistics, food and beverages, petrochemicals, cement and building materials, National Vital Objects, National Strategic Projects, construction and basic utilities such as electricity, water and waste management. Essential sectors include finance and banking, the capital market, information and communication, hotels and accommodation, and export-oriented industries.





Source: Waze (2022).

*Note:* The data show the increase or decrease in distance driven as a percent change from a baseline, over the second half of 2021 and during the new year period. The baseline is the average value, for the corresponding day of the week, during the two-week period of 11 February to 25 February 2020. These are within-region mobilisation data aggregated to the national level.

mobility and the spread of Omicron.<sup>7</sup> Domestic travel was restricted and interregional travel permissible only with a vaccination certificate or proof of a negative test result. However, commercial activities in non-essential and non-critical sectors remained freely conducted, reflecting the common gap between the purpose of regulations (Sevindik, Tosun and Yilmaz 2021) and the weak enforcement of them, which has characterised much of the pandemic response to date (Husni et al. 2021; Doly 2021). Vaccination certificates are also not required for intercity land travel, except by train. Waze mobility data recorded a remarkable increase in car traffic in December, right up to the new year (figure 2).

For international arrivals, the government extended the mandatory 7 days of quarantine, required since the first half of 2021, to 10 days, in December. A new regulation (Decree 1/2022) issued by the head of the Covid-19 Management Task Force on 1 January 2022 required travellers from countries with confirmed Omicron transmission or neighbouring states to quarantine for 14 days upon arrival. Days later, these requirements were cut to 7 and 10 days, respectively. These rules were controversial, as people remained concerned about the further spread of Omicron from undiagnosed cases.<sup>8</sup>

Completely vaccinated foreigners and non-Indonesian citizens have been allowed to enter Indonesia since 15 September.<sup>9</sup> However, international tourist

<sup>7.</sup> The PPKM encompass four levels, with level 4 indicating the most stringent set of restrictions.

<sup>8.</sup> Some epidemiologists believe that 14 days of quarantine is a better preventive measure (Virdhani 2022).

<sup>9.</sup> Based on the Ministry of Law and Human Rights Regulation 34/2021.

			Year-on-year growth							
	Contribution to GDP			20	)20		2021			
	2020	2021	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Final consumption	68.5	64.8	2.8	-5.7	-2.4	-2.8	-1.8	6.2	1.0	3.8
Households	57.7	54.4	2.8	-5.5	-4.0	-3.6	-2.2	6.0	1.0	3.6
Food and beverages	23.8	22.4	5.0	-0.7	-0.7	-1.4	-2.3	4.2	0.8	3.2
Non-profit institutions	1.3	1.2	-5.0	-7.8	-2.0	-2.1	-4.0	4.1	3.0	3.3
Government	9.6	9.1	3.8	-6.9	9.8	1.8	2.6	8.0	0.7	5.3
Gross fixed capital formation	31.7	30.8	1.7	-8.6	-6.5	-6.2	-0.2	7.5	3.7	4.5
Exports of goods & services	17.3	21.6	0.4	-12.0	-11.7	-7.2	7.1	32.0	29.2	30.0
(-) Imports of goods & services	15.7	18.9	-3.6	-18.3	-23.0	-13.5	5.4	31.7	30.1	25.9
GDP	100.0	100.0	3.0	-5.3	-3.5	-2.2	-0.7	7.1	3.5	5.1

 TABLE 1 GDP Growth by Expenditure Components, Q1 2020–Q3 2021 (%)

Source: BPS (2022f).

arrivals remained low until the end of 2021, likely in no small part because of the strong but unpredictable quarantine requirements. Indonesia scored about 63 on average in the Covid-19 Stringency Index of Our World in Data (2021) between 21 January 2020 and 7 March 2022, scoring around 70 for most of 2021. This implies that the country's policy responses to the pandemic have included moderate to high levels of restrictions compared with other countries.<sup>10</sup>

## ECONOMIC REBOUND

#### Economic Growth and the Macroeconomy

The Indonesian economy performed significantly better in 2021 than in 2020 and growth rates compared favourably with those of neighbouring countries. The 2.1% decrease in GDP in 2020 reversed to produce GDP growth of 4.7% in 2021, just lower than the annual average of 5%–6% during the 2010s. Positive year-on-year growth had returned in the second quarter of 2021 (table 1). It continued for the rest of the year at a lower rate, with Indonesia being one of the few emerging economies back to pre-pandemic GDP levels (GDP in 2021 was 101.5% of that in 2019) (Bank Mandiri and Mandiri Sekuritas 2022).<sup>11</sup> The provision of fiscal stimulus, which began in the third quarter of 2020, does not appear to have had any major immediate impact on consumption growth. But cash stimulus from the National

<sup>10.</sup> The index measures the stringency of formal regulations (see https://ourworldindata. org/metrics-explained-covid19-stringency-index). Actual enforcement of regulations will have differed.

<sup>11.</sup> Projections based on data from Our World in Data and the IMF in October 2021 estimated that the Indonesian GDP growth rate in 2021 (3.2%) was higher than that of Thailand (1%), equal to that of the Philippines and only slightly lower than the rates of Malaysia (3.5%) and Vietnam (3.8%) per annum.

Economic Recovery (PEN) program is believed to have prevented a sharp decline in household welfare (Suryahadi, Izzati and Yumna 2021). Consumption grew in the second quarter of 2021, including that of food and beverages. The third quarter marked low growth rates for the GDP expenditure components, mainly owing to higher base spending for the Covid-19 recovery program and the mobility restrictions during the July–August 2021 Delta wave.

The year 2021 marked a significant rebound of exports and imports. Recent figures emphasise the recovery of the international economy, investment and international trade, already evident in the second quarter of 2021. Imports grew 43% year on year as manufacturing recovered, with 73% of imports being raw and auxiliary materials. Investment also recovered and grew after the second quarter of 2021, mostly through building investment, which is slowly returning to pre-Covid-19 levels.<sup>12</sup>

In 2021, the GDP contributions of most sectors began to grow year on year again (table 2). The strong rebound of manufacturing, construction and wholesale and retail trade after their poor performances in 2020 is noteworthy. With the second quarter of 2021 lifting Indonesia out of a technical recession, the contributions of most sectors grew in the third quarter, with the exception of some service sectors. Activity in transport and storage, and accommodation and food and beverages, was affected by the mobility restrictions. The contributions of most sectors had grown by the fourth quarter; finance and insurance was the only exception.<sup>13</sup> The sectoral contribution of health and social work grew the most, especially between the second and fourth quarter, owing to Covid-19-related programs, including vaccination. On the other hand, public administration, defence and compulsory social security was the only sector to experience contraction, mainly because of lower personnel expenditure (BPS 2022a).

The agricultural sector's output has grown in almost every quarter since the beginning of the pandemic. It recorded the second-highest growth rate among the major sectors during 2020, behind only information and communications. Its output grew more slowly in 2021, falling to sixth position (similar to 2019) as other sectors started to recover. In terms of subsectors, tree crops contributed nearly a third of the agricultural GDP in 2021 (3.9% of total GDP) and had the fastest-growing output in the third quarter of 2021 (the only one of the three agricultural subsectors with positive growth), owing to the export performance of commodities such as oil palm and rubber (table 2).

#### **Balance of Payments**

Indonesia reported a current account surplus of \$4.5 billion (1.5% of GDP) and \$1.4 billion (0.4% of GDP) in the third and fourth quarters of 2021 respectively, following two quarters of deficits (table 3). The surplus was supported by a boom

<sup>12.</sup> Since March 2021, the Indonesian government has been providing a value-added tax (VAT) exemption for houses and apartments with values of less than Rp 2 billion. Properties between Rp 2 billion and Rp 5 billion receive a 50% VAT discount. In 2022, these exemptions will be reduced to 50% and 25%, respectively (CNBC 2022a).

<sup>13.</sup> This sector contracted mainly owing to the reduction of spread between the reference interest rate and loan interest rate, which reduced banking secondary revenue (BPS 2022a).

				Year-on-year growth							
	Contri to C	bution GDP		2020				2021			
Sector	2020	2021	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
Agriculture, forestry and fisheries	13.7	13.3	0.0	2.2	2.2	2.6	3.4	0.4	1.3	2.3	
Agriculture, livestock, hunting											
& services	10.2	9.9	-1.2	2.8	3.1	3.7	5.4	-1.2	0.7	0.2	
Farm food crops	3.1	2.6	-10.3	9.2	7.2	10.5	12.2	-8.0	-5.8	-1.8	
Horticulture crops	1.6	1.5	2.6	0.9	5.7	7.8	3.0	1.9	-5.2	3.8	
Plantation/tree crops*	3.6	3.9	4.0	0.2	0.7	1.1	2.2	0.3	8.3	2.3	
Mining & quarrying	6.4	9.0	0.4	-2.7	-4.3	-1.2	-2.0	5.2	7.8	5.2	
Manufacturing	19.9	19.3	2.1	-6.2	-4.3	-3.1	-1.4	6.6	3.7	4.9	
Electricity & gas supply	1.2	1.1	3.9	-5.5	-2.4	-5.0	1.7	9.1	3.9	7.8	
Water supply, sewerage, waste											
& recycling	0.1	0.1	4.4	4.4	5.9	5.0	5.5	5.8	4.6	4.1	
Construction	10.7	10.4	2.9	-5.4	-4.5	-5.7	-0.8	4.4	3.8	3.9	
Wholesale & retail trade, repair											
of vehicles	12.9	13.0	1.6	-7.6	-5.0	-3.6	-1.2	9.4	5.2	5.5	
Transportation & storage	4.5	4.2	1.3	-30.8	-16.7	-13.4	-13.1	25.1	-0.7	7.9	
Accommodation, food &											
beverages	2.6	2.4	1.9	-22.0	-11.8	-8.9	-7.3	21.6	-0.1	4.9	
Information & communications	4.5	4.4	9.8	10.8	10.7	10.9	8.7	6.9	5.5	6.3	
Finance & insurance	4.5	4.3	10.6	1.1	-0.9	2.4	-3.0	8.3	4.3	-2.6	
Real estate	2.9	2.8	3.8	2.3	2.0	1.2	0.9	2.8	3.4	3.9	
Business services	1.9	1.8	5.4	-12.1	-7.6	-7.0	-6.1	9.9	-0.6	0.9	
Public administration, defence											
& compulsory social security	3.8	3.4	3.1	-3.2	1.8	-1.5	-2.9	9.6	-10.0	1.0	
Education services	3.6	3.3	5.9	1.2	2.4	1.4	-1.5	5.9	-4.4	0.7	
Human health & social work	1.3	1.3	10.4	3.7	15.3	16.5	3.4	11.7	14.1	12.1	
Other services	2.0	1.8	7.1	-12.6	-5.5	-4.8	-5.2	12.0	-0.3	3.4	
GDP	100.0	100.0	3.0	-5.3	-3.5	-2.2	-0.7	7.1	3.5	5.1	

TABLE 2 *GDP Growth by Sector*, Q1 2020–Q4 2021 (%)

Source: BPS (2022e).

\*Includes large plantations and smallholder farmers that produce plantation/tree-based commodities such as oil palm, rubber, coconut and pepper, among others.

in the international prices of two export commodities, palm oil and coal, which contributed 21% of Indonesia's total exports in 2021. The prices of these two commodities continued to increase during 2021, with the price of world crude palm oil increasing by 39% and the price of coal by 34.5% from June to November 2021 (IMF 2022). The price increases were mainly due to demand from China and India (Birol 2022).

At the start of 2022, the Indonesian government banned the export of coal to ensure enough supply for the state electricity company, PLN, which is highly

		20	20		2021				
Indicator	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
Current account balance	-3.4	-2.9	1.0	0.9	-1.1	-2.0	5.0	1.4	
% of GDP	-1.3	-1.2	0.4	0.3	-0.4	-0.7	1.7	0.4	
Exports of goods & services	48.0	37.2	43.6	49.6	52.6	57.5	65.0	71.7	
Rubber	1.5	1.1	1.4	1.6	1.9	1.8	1.7	1.7	
Palm oil	4.4	3.6	4.0	5.8	5.8	5.8	8.1	6.9	
Cocoa	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	
Coffee	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.3	
% of exports	13.3	13.9	13.4	15.9	15.3	13.8	15.9	12.8	
Coal	4.5	3.3	3.1	3.7	4.4	5.3	7.4	9.3	
% of exports	9.5	8.8	7.0	7.4	8.5	9.2	11.4	13.0	
Imports of goods & services	-45.1	-35.4	-36.6	-42.7	-48.4	-52.9	-53.2	-63.3	
Primary income balance	-7.9	-6.2	-7.4	-7.4	-6.7	-8.1	-8.3	-8.9	
Secondary income balance	1.7	1.4	1.4	1.4	1.4	1.5	1.4	1.9	
Capital & financial account balance	-3.0	11.0	0.9	-0.9	5.7	1.7	6.7	-2.4	
% of GDP	-1.1	4.4	0.3	-0.3	2.1	0.6	2.2	-0.7	
Official reserves	127.7	130.0	135.8	134.4	138.0	137.4	143.0	145.4	
Exchange rate (Rp/\$)	14,754	14,731	14,708	14,308	14,295	14,425	14,391	14,293	

TABLE 3 Balance of Payments, Q1 2020–Q4 2021 (\$ billion)

Source: Bank Indonesia (2022b); BPS (2022b); Ministry of Trade (2022).

dependent on coal (coal generated about 64% of Indonesia's electricity in 2020). The high world coal price had encouraged Indonesian companies to sell into international markets, placing domestic energy security at risk. Indonesia's domestic market obligations and price cap regulations (\$70 per tonne) had also not been effective at securing coal inputs for Indonesia. In December 2020, the domestic market obligations achieved only 10% of the goal to secure 25% of domestic coal for Indonesian buyers. The government responded by banning coal exports on 1 January 2022 for one month (as stated in Ministry of Energy and Mineral Resources letter B-605/MB.05/DJB.B/2021). However, the ban had been rescinded by 12 January 2022 owing to domestic opposition (from business associations and coal workers, for example) and international pressure.<sup>14</sup> This allowed companies that had met their domestic market obligations or were willing to pay a fine for failing to meet their domestic market obligations to export coal.

<sup>14.</sup> The Philippines, Japan and South Korea publicly urged Indonesia to lift the ban (Rangga Prakoso 2022; Dela Cruz and Nangoy 2022). The export ban shocked the global coal market, since Indonesia is the world's largest exporter of coal (IEA 2021).

#### FIGURE 3 Inflation, 2020–21 (year-on-year, %)



Source: BPS (2022c); compiled from monthly Bank Indonesia (2022a) data.

#### Inflation

Indonesia's inflation rates have been lower during the Covid-19 pandemic than in recent years. Between 2015 and 2019, inflation was steady at 3% - 3.5% per year. However, during the pandemic, the average inflation rate has been 1.8% (figure 3). Compared with other countries, Indonesia's inflation rate was low in 2021 (inflation was 7% in the United States, 5% in the European Union, 3.2% in Malaysia and 2.2% in Thailand). While inflation has been low, the increase from 2020 to 2021 reflects the slow increase in consumer demand in Indonesia compared with overall GDP growth (table 1) and the increasing propensity to consume (Bank Indonesia 2021b).

Food, beverage and tobacco prices have increased significantly during the pandemic. In 2020 and 2021, they rose by 3.6% and 3.1%, respectively—twice the rate of general inflation, and contributed to 72% of total inflation in December 2021. These increases were driven mostly by the increased prices of chillies, cooking oil and eggs. Cooking oil has been one of the biggest contributors to inflation, with its price rising 19.5% quarter on quarter in the last quarter of 2021. As with coal, the increased price of cooking oil led to several policies attempting to secure domestic supply of crude palm oil, again including domestic market obligations, domestic price obligations and related export restrictions.

### **Fiscal Policies**

As discussed in previous *BIES* Surveys, the government temporarily relaxed the fiscal ceiling of 3% of GDP for the annual budget deficit until 2023 to cushion the economic impacts of the pandemic.<sup>15</sup> Some have questioned whether the stimulus administered under the PEN program was enough to help boost economic growth

<sup>15.</sup> This was stipulated in Law 2/2020 on State Financial Policy and Financial System Stability for Handling the Covid-19 Pandemic. See Suryahadi, Izzati and Yumna (2021) for a discussion of the amount of spending allocated to social and economic programs, and the prospects of the government getting the deficit back under the mandated 3% ceiling by 2023.

2020	2021
216.6 (14.4)	171.0 (11.4)
12.3 (7.5)	116.2 (7.7)
62.6 (4.2)	198.5 (13.2)
19.1 (7.9)	67.6 (4.5)
65.2 (4.3)	_ `
_	105.3 (7.0)
509.6 (38.4)	658.6 (43.9)
	116.6 (14.4)         112.3 (7.5)         62.6 (4.2)         119.1 (7.9)         65.2 (4.3)

 TABLE 4 Realisation of Budget for Economic Stimulus, 2020–21 (Rp trillion)

Source: Ministry of Finance (2022).

Note: Figures in parenthesis are in \$ billions.

and jobs, as the realisation of the program's budget was just 88.4% for 2021, or Rp 658.6 trillion out of Rp 744.7 trillion (table 4) (Avisena 2021; *Bisnis* 2022).

Although the budget deficit reached 6.1% in 2020, the Ministry of Finance announced a deficit of 4.7% in 2021, thus approaching the target of 3% or less for 2023.<sup>16</sup> Indonesia's 2022 budget notes estimate that the budget deficit for 2022 will be 4.9%. Achieving a deficit under the mandated fiscal ceiling is considered important for managing perceived economic risk for the country. The government appears optimistic that the 2022 deficit will be closer to 4% (Bank Mandiri and Mandiri Sekuritas 2022).

The government stimulus in 2021 focused on stimulating businesses, particularly small and medium enterprises (SMEs), while in 2020 it focused on minimising the economic impacts of Covid-19 on poor and vulnerable groups. The impact of the stimulus in 2021 can already be seen, with loan growth bouncing back early in the year (figure 4). Working capital loan value grew from June onwards and investment loan value had begun growing by 3.5% year on year by November (3.2% in December). The positive growth in working capital loans was driven by loans for agriculture, particularly palm oil (Bank Indonesia 2021a).

Realisation of the 2021 budget reached 102.4%, as the government had ramped up expenditure after the second semester, when only 40.7% of the budget had been realised. The health sector budget increased drastically in 2021, especially to fund vaccinations and respond to the peak of the Covid-19 Delta variant. Social protection expenditure decreased as the economy recovered and people returned to work. The unemployment rate decreased from 7.1% in August 2020 to 6.5% in August 2021 and poverty fell from 10.2% in September 2020 to 9.7% in September 2021 (BPS 2022g).

As shown in table 4, the allocation for economic incentives was higher in absolute terms in 2020 than in 2021. However, this allocation was used primarily to help keep businesses afloat (for example, businesses accepted interest and wage subsidies). In 2021, the focus of the economic stimulus shifted to business recovery and expansion. Support provided to SMEs was steady across 2020 and 2021, while

<sup>16.</sup> The budget deficit estimated for 2021 was 5.8%, higher than the realisation figure of 4.7%.



FIGURE 4 Nominal Loan Growth, 2018–2021 (year-on-year, %)

Source: Bank Indonesia (2022b).

the allocation of corporate financing and business incentives was much lower in 2021, reflecting the government's priority of supporting informal sectors that have limited safety nets.

#### Tax Reforms

One policy prepared by the Indonesian government to help return the budget deficit to 3% of GDP or under by 2023 is Law 7/2021 on the Harmonization of Tax Regulations (UU HPP)<sup>17</sup>. The regulation's goals are to increase revenue through (1) improving tax governance; (2) providing an avenue for new taxes, such as the carbon tax; (3) removing tax exemptions such as in the value-added tax (VAT), and adding new items for taxation such as in tax excise; and (4) changing tax rates and brackets (for example, for personal income and corporate tax). The tax governance changes include the synchronisation of the national identification numbers with the national tax identification numbers, and changes in penalties. The law also introduces a new personal income tax bracket where annual incomes of Rp 5 billion or above will be taxed at a rate of 35%—in the past the highest tax bracket was assigned to incomes of Rp 500 million or above, which were taxed at a rate of 30%. The corporate income tax rate will return to 22% in 2022 (it had been expected to decrease to 20% in 2022). The government also plans to remove exemptions for certain commodities under the VAT and to increase the VAT rate from 10% to 11% in 2022 and 12% by 2025 (Ministry of Finance 2021a).

The UU HPP has also regulated Indonesia's second tax amnesty.<sup>18</sup> This amnesty is set to run for six months from 1 January 2022 for both personal and corporate tax payers who want to declare assets undeclared between 2016 and 2020.

<sup>17.</sup> The law was ratified on 29 October 2021 after discussions in the third quarter.

<sup>18.</sup> The policy covers two participant groups: (1) personal and corporate tax payers of the first tax amnesty (held for nine months in 2016–17), who are taxed at rates of between 6% and 11% depending on the type of asset declared; and (2) personal tax payers (non-participants

By 9 March 2022, more than 20,500 taxpayers had participated in the second tax amnesty and had declared more than Rp 26.8 trillion (\$1.8 billion) in assets, resulting in income tax of Rp 2.8 trillion (\$0.2 billion) (CNBC 2022b).

While the tax amnesty increases revenue in the short term, in the long term it may lead to non-credible threats for taxpayers and may not increase tax compliance if they expect a future amnesty (Waluyo 2017; Shevlin, Thornock and Williams 2017). While the new regulation and policies of the UU HPP have the potential to improve tax governance and increase the tax base, as well as the tax rate, these reforms may not have much effect on Indonesia's low rate of taxation (9%–10% of GDP). Moreover, Indonesia must be wary of policies from international economies returning to 'normal', such as increasing interest rates (Basri et al. 2021).

#### A Carbon Tax

The UU HPP introduced a carbon tax to help Indonesia achieve its goals to reduce greenhouse gas emissions by between 29% and 41% by 2030, and to achieve net zero emissions by 2060 or sooner. The goals are covered in Indonesia's Nationally Determined Contribution strategy, which was first submitted to the United Nations Framework Convention on Climate Change in 2016 and was updated in 2020. The carbon tax, which will be applied from April 2022 onwards with an initial focus on coal-fired power plants, is not expected to generate significant revenue for Indonesia but is intended to accustom the market to carbon pricing, and to strengthen Indonesia's commitment to addressing climate change. The next step is to apply the tax to more sectors and to prepare regulations for each sector (Ministry of Finance 2021b).

Using a cap-and-tax design, Indonesia will impose the carbon tax on a coal-fired power plant if the plant's emissions exceed the carbon allowance after trading.<sup>19</sup> The tax is set at a minimum of \$2 (Rp 30) per tonne of carbon dioxide and can be higher if the price rate in the carbon market for the coal-fired power plant is higher than the minimum tax rate.<sup>20</sup> This tax rate is well below the Paris Agreement's recommended rate of \$40–\$80 per tonne of carbon dioxide to limit global warming to less than two degrees Celsius by 2100 (World Bank 2021). However, it is comparable to the starting rates in other countries; for example, Japan (\$2.7 per tonne of carbon dioxide) and Singapore (\$3.5 per tonne of carbon dioxide) (World Bank 2022). Slow adoption of emission-reducing technology could increase the cost of producing electricity, so the government should cover this extra cost through a subsidy or by compensating the state electricity company, PLN, which could negatively affect the fiscal balance since the initial tax is not likely to generate much revenue.

of the first tax amnesty), who are taxed at rates of between 12% and 18% depending on the type of asset declared.

<sup>19.</sup> The carbon tax has a cap-and-tax design in which the tax mirrors the penalty in the European Union's carbon market, where the penalty is imposed on the party who has exceeded its allowance after trading.

<sup>20.</sup> The plan is to link the carbon tax rate to the carbon price resulting from the carbon market.

#### The New Capital City Law

On 18 January 2022, the House of Representatives ratified Law 3/2022 on the Capital City. The law covers moving the capital from Jakarta to Kalimantan to alleviate the burdens of Java's high concentration of population and economic activity, water crisis, increased land conversion, urbanisation, traffic and disasters (Bappenas 2019).<sup>21</sup> The new capital area is estimated to cover 256,000 hectares, with the city itself to cover more than 56 hectares and contain up to 1.5 million people (KSP 2019; Bappenas 2021). The move to the new capital is scheduled to begin in 2024 and infrastructure is set to be developed until 2045 under the concept of 'smart, green, beautiful and sustainable'. The new megaproject is estimated to cost Rp 466 trillion (\$31 billion), with 53.5% of the cost to be covered by the state budget and 46.5% by public-private partnerships, and private and state-owned enterprise funds (CNBC 2022c). The state budget will be used for basic infrastructure (road access), housing (for civil servants, police and the army), the state palace, and strategic police and army buildings. Private funds will be used to build basic infrastructure and utilities, non-toll and toll roads, airports, education infrastructure, shopping malls, public housing and universities. Funding for the new capital city will be specified in the 2022 state budget, with 39% (Rp 178 trillion, or \$11.8 billion) of the 2022 PEN budget allocated to the project.

The rest of this Survey looks at the changing role of agriculture in the national economy and some key issues during the pandemic. The final section looks forward to how the sector might resolve some of its persistent sustainability challenges as Indonesia enters what might be the next phase of its resource-led development.

## **RECENT TRENDS IN AGRICULTURE**

Agriculture in Indonesia remains a large sector of the economy and an important source of livelihoods, especially in rural areas and for the poor. The sector has played a key role in driving recent economic growth and poverty reduction (Edwards 2019a) and was an important buffer against effects of the 1997–98 Asian financial crisis (Suryahadi, Hadiwidjaja and Sumarto 2012). Recent agricultural growth, however, has not been driven by food crops and farm yields, as was the case in the past (Fuglie 2010; Gollin, Hansen and Wingender 2021). Rather, the recent transformation of the sector has been driven by the sectoral expansion of tree crops, particularly oil palm.<sup>22</sup> Demand for palm oil for food has been competing with demand for the oil for energy (Moioli et al. 2018; Halimatussadiah et al. 2021), as the global demand for and production of biofuel, particularly biodiesel, more than doubled from 2010 to 2020.<sup>23</sup>

Agriculture accounts for about 13% of Indonesia's GDP each year.<sup>24</sup> It remained at this level during 2010–20, with a brief dip to 12.4% in 2018–19. The sector maintained

<sup>21.</sup> Plans to move the capital city to Penajam Paser Utara district and part of Kuta Kartanegara district, East Kalimantan, were announced on 26 August 2019.

<sup>22.</sup> Other agricultural subsectors have also expanded but with much less magnitude.

<sup>23.</sup> Biodiesel production increased from about 20.5 billion litres per year in 2010 to 43.2 billion litres per year in 2020 (IEA 2022).

<sup>24.</sup> Including forestry and fisheries but excluding agricultural processing, which is counted as manufacturing.



FIGURE 5 Production of Selected Food Crops and Tree Crops, 2001–20 (million tonnes)

its relative contribution by growing at an average annual rate of 3.6%, with this growth driven by horticulture, plantations, livestock and fisheries. Their respective contributions were 1.5%, 3.8%, 1.5% and 2.2% to GDP in 2021. No major change has occurred over the past decade.<sup>25</sup> The situation for farm food crops is quite different, accounting for 3.1% of GDP and being more volatile economically (annual growth ranged from -1.7% to 4.3% and averaged 1.5% during 2011-21).

Figure 5 illustrates two decades of change in the production of key food and tree crops. Recent changes in production have been driven by an expansion of farmland and shifting cultivation patterns, particularly for tree crops. Paddies have long been the most important in terms of production volume, and maize production has almost doubled over the past two decades, mainly owing to a doubling of yields.<sup>26</sup> Official policies still emphasise the unrealistic goal of rice self-sufficiency, which is accompanied by high levels of import protection.

Oil palm production will likely surpass that of paddies if current trends continue. The area of oil palm plantations has tripled in the past two decades.<sup>27</sup> The growing share of oil palm in the agriculture sector partly explains rising wages and labour productivity, discussed further below. Although official data show that productivity has increased for some crops, particularly maize and oil palm, Indonesia still has a huge challenge to close its yield gaps so that productivity reaches its potential (table 5) (Global Yield Gap Atlas 2022).

Source: BPS (2022d); Ministry of Agriculture (2022).

<sup>25.</sup> The fisheries sector has long been an important source of protein for lower-income Indonesians.

<sup>26.</sup> Note that data on food crops are known to be particularly susceptible to reliability issues. Some figures may be overstated—see Rosner and McCulloch (2008).

<sup>27.</sup> Generally, the areas used for other crops (for example, rubber, soy, cocoa and coffee) appear to have grown modestly or not at all. However, the data on planted areas are highly imperfect, which has significant implications for productivity estimates.

Crop	Relative yield gap (%)					
Irrigated maize	44.3					
Irrigated rice	62.7					
Rain-fed maize	38.3					
Rain-fed oil palm	38.3					
Rain-fed oil palm large plantations	40.1					
Rain-fed oil palm smallholders	34.3					
Rain-fed rice	50.0					

 TABLE 5 Percentage of Actual Yield to Potential Yield

Source: Global Yield Gap Atlas (2022).

#### AGRICULTURE AND THE PANDEMIC

While agriculture accounts for only 13% of GDP, it accounts for 28% of total employment (BPS 2022g). This section examines recent labour market dynamics (with a particular focus on agriculture), urban–rural migration and food security.

#### Agricultural Employment, Labour Productivity and Wages

Data from the National Labour Force Survey (Sakernas) show that for some years prior to the Covid-19 pandemic, agriculture had been shedding jobs both in total numbers and as a share of total employment (table 6). Agricultural employment was declining from about 2005 (Manning and Purnagunawan 2014) until the pandemic hit. The sector lost close to 1 million, or 1%–3%, of jobs each year, and the share of agriculture in total employment also fell. This is not surprising for a country at Indonesia's stage of development, and it occurred despite the steady increase in agriculture has remained lower than in most non-agricultural sectors. For example, annual labour productivity was Rp 126 million per worker in manufacturing and 83 million per worker in the economy overall.

Higher output per agricultural worker coincides with the decline in employment leading up to the pandemic. From 2015 to 2020, output per employed worker in agriculture grew by almost 16% in constant prices. That upturn occurred because some workers left the sector, some switched to producing higher-productivity crops (including oil palm), and technical change took place. Improved productivity is likely to be associated with increased real wages in agriculture and wage equalisation across sectors from 2015 through to the Covid-19 period.<sup>28</sup> Indeed, wages in agriculture grew by 61.3% from 2015 to 2019, a higher rate than the national average of wage growth (40.8%) and indicating convergence. However, during the pandemic (2019–21), agricultural wages fell by 4.4%, which is more than the average decrease for all sectors (1.9%). This suggests excess supply of agricultural workers during the pandemic, leading to lower incomes per worker.

<sup>28.</sup> For example, in 2018 the average real wage in agriculture was 72% of the average wage across all sectors in the economy, rising from 60% in 2015. Historically, greater wage equalisation between agriculture and other sectors has commonly been observed in rapidly growing economies of East Asia, as they have transformed from agricultural to industrial and service-based economies (Manning and Purnagunawan 2014).

Pre-Covid-19						Covid-19	
2015	2016	2017	2018	2019	2020	2021	
37.7	37.8	35.9	36.6	35.5	38.2	37.1	
	22	-1,846	654	-1,128	2,774	-1,093	
32.9	31.9	29.7	29.0	27.5	29.8	28.3	
1,171	1,211	1,258	1,307	1,354	1,378	1,404	
31	32	35	36	38	36	38	
1,266	1,542	1,762	1,825	2,041	1,989	1,958	
1,731	2,180	2,547	2,591	2,748	2,726	2,768	
2,026	2,367	2,723	2,742	2,853	2,837	2,799	
1.9	3.2	4.3	4.5	3.4	1.2	1.0	
0.5	-0.9	-2.0	-2.5	-1.5	1.0	-0.3	
1.2	1.2	1.2	1.2	1.2	1.1	0.5	
8.2	7.7	7.3	6.9	6.6	7.9	7.6	
14.1	14.0	13.5	13.1	12.6	13.2	12.5	
11.1	10.7	10.1	9.7	9.2	10.2	9.7	
	2015 37.7 32.9 1,171 31 1,266 1,731 2,026 1.9 0.5 1.2 8.2 14.1 11.1	Pro           2015         2016           37.7         37.8           22         31.9           1,171         1,211           31         32           1,266         1,542           1,731         2,180           2,026         2,367           1.9         3.2           0.5         -0.9           1.2         1.2           8.2         7.7           14.1         14.0           11.1         10.7	Pre-Covid           2015         2016         2017           37.7         37.8         35.9           22         -1,846           32.9         31.9         29.7           1,171         1,211         1,258           31         32         35           1,266         1,542         1,762           1,731         2,180         2,547           2,026         2,367         2,723           1.9         3.2         4.3           0.5         -0.9         -2.0           1.2         1.2         1.2           8.2         7.7         7.3           14.1         14.0         13.5           11.1         10.7         10.1	Pre-Covid-19           2015         2016         2017         2018           37.7         37.8         35.9         36.6           22         -1,846         654           32.9         31.9         29.7         29.0           1,171         1,211         1,258         1,307           31         32         35         36           1,266         1,542         1,762         1,825           1,731         2,180         2,547         2,591           2,026         2,367         2,723         2,742           1.9         3.2         4.3         4.5           0.5         -0.9         -2.0         -2.5           1.2         1.2         1.2         1.2           8.2         7.7         7.3         6.9           14.1         14.0         13.5         13.1           11.1         10.7         10.1         9.7	Pre-Covid-I9           2015         2016         2017         2018         2019           37.7         37.8         35.9         36.6         35.5           22         -1,846         654         -1,128           32.9         31.9         29.7         29.0         27.5           1,171         1,211         1,258         1,307         1,354           31         32         35         36         38           1,266         1,542         1,762         1,825         2,041           1,731         2,180         2,547         2,591         2,748           2,026         2,367         2,723         2,742         2,853           1.9         3.2         4.3         4.5         3.4           0.5         -0.9         -2.0         -2.5         -1.5           1.2         1.2         1.2         1.2         1.2           8.2         7.7         7.3         6.9         6.6           14.1         14.0         13.5         13.1         12.6           11.1         10.7         10.1         9.7         9.2	$\begin{array}{c c c c c c c c c c c c c c c c c c c $	

TABLE 6 Changes in Agricultural Labour, Population and Poverty from 2015 to 2021

*Source:* Figures for employment, wages, population growth and poverty were estimated from Sakernas data; output data are from BPS (2022e).

#### **Urban-Rural Migration and Poverty**

People may have temporarily moved to rural Indonesia during the height of the pandemic to cope with its effects. However, persistent deurbanisation would be a serious concern. Movement of vulnerable people from cities to the countryside would see some of the Covid-19 burden shift to areas with weaker health systems. Warr and Yusuf (2021) offered a preliminary investigation of this issue and modelled its potential effects. They highlighted a fall in non-agricultural employment of 3.1 million and an increase in agricultural employment of 2.8 million from August 2019 to August 2020. From this, they inferred significant population movement to the countryside, assuming people could not afford to remain unemployed in urban areas. They modelled the general equilibrium effects of this potential movement and found that, after taking these dynamics into account, the negative economic impacts could be larger for rural households.

More recent data from Susenas show a slight increase in urban population, although the rise was much smaller than it had been before the Covid-19 period. The urban share of the population rose from 56% to 57% from March 2020 to March 2021 after no major change from 2019 to 2020. Thus, urbanisation slowed but never reversed (see table 6 for urban population growth rates). The rural population

grew in the first semester of 2020 but quickly started to decline again in 2021, as the economic recovery began. Also interesting is that the usual seasonal decrease in agricultural employment from February to August—shown in the Sakernas data for those months most years—became smaller during the Covid-19 period, as agriculture absorbed some excess labour in 2020. However, a larger seasonal decrease in employment returned in 2021, as the economy began to recover. These trends indicate that most of the worst impacts of the crisis may have been short-lived.

A key concern with urban–rural migration during the pandemic has been the shift of Covid-19 impacts from cities to the countryside, as predicted by Warr and Yusuf's (2021) modelling. The pandemic did coincide with higher poverty in both urban and rural areas, increasing by 1.3 and 0.6 percentage points, respectively, from 2019 to 2020 (table 6). But the rates of both urban and rural poverty are now nearly back to pre-pandemic levels, and the gap in the rates, which has always been large, has continued to narrow. The poverty impacts of the pandemic, relative to those of the Asian financial crisis, were also likely attenuated by better safety nets for the rural poor—for example, the National Health Insurance scheme introduced in 2014 to bring Indonesia closer to universal coverage, the 2014 Village Law and related fiscal transfers, and better welfare cash targeting through, among other measures, the Unified Database.

#### **Food Security**

The Australian government commissioned an assessment of food systems in the Indo-Pacific, including Indonesia, focusing on the first six months of the pandemic (Robins et al. 2020). The chapter on Indonesia argued that access to higher-quality food and rural welfare had decreased, and that the pandemic would have detrimental effects on nutrition. We used two data sources to examine changing dietary patterns. The first was the National Socio-economic Survey (Susenas) for the period of March 2019 to March 2020. The second was a series of online surveys conducted by the Institute for Economic and Social Research (LPEM) at Universitas Indonesia for May to June in 2020. The surveys aimed to capture the socio-economic impacts during the first year of the pandemic and generally found that the decline in expenditure and switching of consumption to different goods was widespread but not as large as early survey data had suggested (LPEM 2021). Differences between the sample frames might be the cause. Susenas is representative of the whole population, while the LPEM survey is biased towards urban areas.

We found interesting changes in diet, particularly in protein consumption. Susenas recorded a decrease of 0.2% in average daily per capita calorie consumption, with a decrease of 0.5% in urban areas and an increase of 0.1% in rural areas. For protein type, there was an average 2.5% decrease in meat consumption and a 0.8% decrease in fish consumption. The consumption of chicken, however, increased by 3.9%. These changes were seen mostly in urban areas. The same pattern can be found in the LPEM survey data: a general reduction in the consumption of fish (82% to 74%) and meat (77% to 59%) but an increase in the consumption of fruit (79% to 82%), and vegetables and vitamins/supplements (43% to 79%). The LPEM survey also revealed a 40.1% increase in eating-related spending.

#### Another Palm Oil Boom?

The most significant recent development in Indonesian agriculture is the palm oil price boom. Figure 6 shows recent palm oil price trends. The crude palm oil price



FIGURE 6 Palm Oil Price, 2010–21 (\$ per tonne)

Source: IMF (2022).

of \$1,280 per tonne at the time of writing is similar to the peak in February 2011 of \$1,249 per tonne. The 2011 peak was followed by a decrease to \$444 per tonne by November 2018 and a steep increase afterwards. As discussed, the price boom during the pandemic increased output and export values, improved the trade balance and generated much needed fiscal revenue. However, between 2015 and the pandemic period, the potential fiscal impacts of a higher palm oil price were somewhat muted. Before 2015, the government taxed exports of crude palm oil at a rate of 7.5% when the oil's price was above the threshold of \$50 per tonne.<sup>29</sup> From 2015, the revenue from crude palm oil exports was collected in two ways: through a fixed rate of \$5 per tonne,<sup>30</sup> and a new export levy of \$50 per tonne.<sup>31</sup> The export levy was introduced to generate revenue for the Palm Oil Plantation Fund Management Agency (BPDPKS), which has subsidised mostly biodiesel production (Halimatussadiah et al. 2021).<sup>32</sup> Although the BPDPKS is a government body, the government cannot use the subsidy fund as if its revenue comes from an export tax, in which case the revenue would go directly into the government budget (consolidated revenue).

The expansion of palm oil farming in Indonesia in the 2000s captured political and international media attention and transformed landscapes across the country.

<sup>29.</sup> Ministry of Finance Regulation 128/PMK.011/2013 (https://jdih.kemenkeu.go.id/fulltex t/2013/128~PMK.011~2013Per.HTM).

<sup>30.</sup> Ministry of Finance Regulation 136/PMK.010/2015 (http://jdih.kemenkeu.go.id/fullText /2015/136~PMK.010~2015Per.pdf).

<sup>31.</sup> See Ministry of Finance Regulation 30/PMK.05/2016 (http://www.jdih.kemenkeu.go.id/ fullText/2016/30~PMK.05~2016Per.pdf). The regulation has been changed several times since then.

<sup>32.</sup> The crude palm oil subsidy was criticised as it was given mostly to the biodiesel industry, which comprises mainly large producers of oil palm, and not to smallholders (*Kompas* 2019). Concerns were also raised that the export levy would decrease the fresh fruit bunch price for smallholders (*Bisnis* 2021).

The locus of agricultural production shifted from food to export crops and from Java to the outer islands. The development effects of the expansion have been carefully studied, and the literature paints a reasonably consistent picture. Edwards (2019a) showed how the expansion explains different regional development trajectories over this period and how it has lifted millions out of poverty through rising returns to labour and land, investment, and rural economic and social infrastructure. Gehrke and Kubitza (2021) took a similar approach to estimate sizable declines in fertility. Edwards (2019b) documented urbanisation and structural change in villages around new palm oil factories – patterns explained by economic linkages, infrastructure and economies of scale in production. Kraus, Heilmayr and Koch (2021) extended Edwards's (2019b) work to find that local plantation booms had increased the sales and productivity of manufacturing plants, which shifted towards tradeable goods owing to improved market access from local road upgrades. Thus, the recent increases in prices and production are also likely to lead to faster economic development and poverty reduction in oil palm producing regions, strengthening the economic recovery further.

#### AGRICULTURE AND SUSTAINABILITY

The new phase of the oil palm boom and the government's recent environmental commitments re-emphasise unresolved agricultural sustainability challenges, of which palm oil production has long been at the centre. A wealth of studies document land conversion for palm oil production (for example, Austin et al. 2019; Gaveau et al. 2016). Edwards (2019a) empirically characterised the trade-offs between development and the environment, with a focus on poverty, deforestation and fire. Importantly, both the construction of new palm oil mills and expansion of farmland have been shown historically to be a function of prices (Hsiao 2022). If current trends continue and forecasts are correct, there will be strong incentives to expand production, placing more strain on land resources and the environment.

#### **Environment and Climate Policy Developments**

In November 2021, the Indonesian president, Joko Widodo, signed a commitment to 'no deforestation' by 2030. The pledge was made at the United Nations' COP26 meeting in Glasgow among more than 100 world leaders.<sup>33</sup> Indonesia also submitted its *Long-Term Strategy for Low Carbon and Climate Resilience 2050* to the United Nations Framework Convention for Climate Change—a report that represents a more ambitious climate target than that of the country's Nationally Determined Contribution.<sup>34</sup> The forestry and land-use sector plays a key role as a carbon sink. Without proper measures for this sector to absorb emissions from other sectors, net zero emissions will very likely not be achieved. While some policies align with the climate target, some do not, leading many to doubt that the government will keep its long-term commitment to achieving its climate targets (*Jakarta Post* 2021).

<sup>33.</sup> At the COP26 meeting, the government claimed that Indonesia's climate change control had shown remarkable improvement (Cabinet Secretariat 2021).

<sup>34.</sup> The strategy sets a long-term climate target to be achieved by 2050. It also states Indonesia's intention to achieve net zero emissions by 2060.

Moreover, since making the pledge, the government has tried to walk back its commitment to 'no deforestation', arguing that the deal is inappropriate and unfair (Reuters 2021a).

Indonesia's palm oil moratorium—enforced since 2018—ended in September 2021. The government has not signalled that it will be extended (*Climate Home News* 2021; GAPKI 2021; Reuters 2021b). At the same time, market pressure from international counterparts concerned about sustainability issues has continued. For example, the European Union's ban on what it deems as unsustainably sourced palm oil for biofuels has continued to put pressure on Indonesia to sell its palm oil in the domestic market (Ministry of Foreign Affairs 2019; *Borneo Post Online* 2019). The restriction, stipulated under the European Union's recently recast Renewable Energy Directive, and enforced gradually since 2020, will stop the Union's member states from importing palm oil biofuel from 'unsustainable' sources by 2030.

#### **Decreasing Deforestation and Increasing Palm Oil Production**

In the past, expansion in palm oil production coincided with deforestation and forest fires (Edwards 2019a). From 1990 to 2016, Indonesia and Malaysia's combined palm oil production—which made up more than 80% of global production at the time—was responsible for about 5% of global emissions (Hsiao 2022). However, the proportion of oil palm plantations replacing forests decreased significantly from 54% in 1995–2000 to 18% in 2010–15 (Austin et al. 2017).<sup>35</sup>

We present recent deforestation data from government and non-government sources in figure 7.<sup>36</sup> Deforestation has continued but at a much lower rate than in the past. Specifically, the government data show that, on average, more than 700,000 hectares of deforestation occurred annually during 2012–15. The rate of deforestation then appears to have declined from 2016. Similarly, data from the World Resources Institute show that the rate of deforestation peaked in 2016, then declined, with the rates of both primary forest loss and total tree cover loss almost halving in 2017, and then trending downwards to 2020. These trends could mark a shift from the preceding era of more rapid deforestation. They are interesting because they took place while palm oil production expanded particularly rapidly.

#### Smallholder Oil Palm Productivity

The oil palm sector provides a helpful case study of the developmental and environmental gains that can be realised by improving yields. This issue merits more attention, given the recent increases in palm oil prices, ambitious national production targets, and the central government replanting program that forms an important part of the Covid-19 recovery package.

Indonesian oil palm farms can be categorised into three sectors: private industrial plantations, state-owned plantations and smallholdings. The smallholder

<sup>35.</sup> Austin et al. (2017) estimated that more than 30 million hectares of non-forest land was suitable for oil palm plantations. The expansion of the oil palm industry in Sumatra is thought to present less risk of deforestation than in Kalimantan—which still has an increasing trend of deforestation—and Papua, a new area for palm oil expansion (Koalisi Indonesia Memantau 2021).

<sup>36.</sup> We offer multiple sources and definitions as there are reliability concerns with government data on fire and deforestation (see, for example, Gaveau et al. 2021).



FIGURE 7 Recent Deforestation Trends (million hectares)

*Source:* Deforestation data from Ministry of Environment and Forestry (2021); tree cover loss data from Global Forest Watch (2022); primary forest loss data from the University of Maryland, the source of the Global Forest Watch data.

sector can be further divided into smallholders who take part in plasma schemes (linked to large plantations or companies and usually supported by them) and independent, unaffiliated farmers.<sup>37</sup> Figure 8 shows how the smallholder sector has grown faster than the other sectors. Most of this growth has been achieved through independent farmers. Smallholder plots today account for just under half the total area being cultivated for palm oil. However, they are responsible for a third of the total production. Not only are the productivity gaps among the sectors large, they vary immensely across locations (Ministry of Agriculture 2020). For example, in 2019, the yield of oil palm smallholders on Sumatra was 3.6 tonnes per hectare on average, whereas it was 2.6 tonnes per hectare on Kalimantan (Ministry of Agriculture 2020). On other islands, yields commonly do not reach 2 tonnes per hectare. Similar variation can be observed within provinces. For example, in East Kalimantan, the average yields of oil palm smallholdings ranged from 1.7 tonnes per hectare to 3.8 tonnes per hectare across districts within that province in 2019 (Ministry of Agriculture 2020).

The potential economic gains from improving the yields of oil palm smallholders are not trivial. For example, a recent input–output simulation of a potential replanting program found gains to regional GDP of 0.2% to 2.8%, depending on the replanting-size scenario, with an output multiplier ranging from 1.1 (in Central Kalimantan) to 1.5 (in Riau). Poverty was also estimated to fall by 1.6 to 2.1 percentage points in the areas targeted by the program, depending on the replanting-size

<sup>37.</sup> Data from the 2013 Agricultural Census show that smallholder plots vary in size, from less than a hectare to hundreds of hectares, but the median plot size is just over two hectares (BPS 2013). It is most practical to classify all non-industrial plantations as smallholdings, even though some can be quite large.



FIGURE 8 Palm Oil Cultivation Area by Sector

Source: Directorate General of Estate Crops (2022), reproduced from Edwards (2019a).

scenario (Halimatussadiah et al. 2020). These simulations are consistent with the broader evidence on how changes in agricultural production have affected local economic development. They point to the role that an inclusive and large smallholder sector can play in mediating such effects.

#### The Importance of Seed Quality

The productivity gap between smallholdings and plantations has long been a feature of Indonesia's various plantation sectors. Nucleus–plasma and subsequent partnership approaches were conceived as solutions to these challenges, where smallholders linked to plantations were provided with higher-quality inputs (for example, better seeds and fertilisers) and guidance on farming practices. According to an LPEM (2019) survey, supported oil palm smallholder farmers tend to have higher yields and incomes than unsupported independent smallholders, who also receive lower prices for their fruit.

What explains the yield gap between smallholdings and plantations? The yield profile of an oil palm increases sharply 2–4 years after planting, peaks 7–10 years after planting, and then declines to half its peak over the next 20 years (Hsiao 2022). Seed quality at planting is the primary determinant of yield on a given plot for the next 20–30 years (Corley and Tinker 2016).

Other contributors to the yield gap include inappropriate fertiliser use and a failure to adopt good agricultural practices (Daemeter Consulting 2013). All correspond to low levels of certification adoption, and these compliance gaps limit access to formal markets and certification facilities. Although there are various strategies to improve smallholder productivity, we believe that targeting seeds—ensuring plots are planted with the yield-maximising variety, then addressing other margins—is likely to be the most cost-effective, scalable and technically feasible

intervention. This is worthy of serious consideration owing to the environmental externalities, information asymmetries and other market failures facing smallholders, and broader spillovers associated with non-adoption of this technology.

#### The Need to Rethink the Priority Replanting Program

The national palm oil replanting program is a strategic priority. Administered by the BPDPKS, the program's aims include increasing productivity, crude palm oil supply, farmer welfare and value-added, while minimising environmental problems. Replanting is a lumpy upfront investment, and farmers with low productivity are more likely to have limited capital and liquidity. The BPDPKS provides a subsidy of Rp 30 million per hectare to each eligible farmer in the program for replanting. The farmers must fund the rest of replanting (about Rp 30 million) either by themselves or with bank loans. The program also aims to encourage land certification, good agricultural practices and the adoption of high-quality seeds (Nurfatriani et al. 2019).

Most evidence and experience to date suggests that without some support most smallholders are unlikely to begin complying with the Indonesian Sustainable Palm Oil (ISPO) scheme, which is Indonesia's oil palm certification standard and the focal instrument for sustainability in the sector.<sup>38</sup> The government introduced the ISPO scheme in 2011 with participation by smallholders being voluntary. It was recast as mandatory for plantation firms in 2015 and for all plantation owners in 2020.<sup>39</sup> To date, only 5.8 out of 15 million hectares have been certified, with just 760 certifications issued to wealthier sector participants (746 companies, 10 independent cooperatives and 3 plasma cooperatives). The main barriers for smallholders to adopt certification are costs and a lack of knowledge (LPEM 2019).

To be eligible for the replanting program, farmers need to have land certificates and become members of a cooperative. Independent smallholders usually have neither, and the probability of having either increases with yields and incomes. This means that farmers who self-select into the program or are targeted by it are those who need it the least: just 9% of independent smallholders surveyed are replanting, compared with 24% of plasma farmers (LPEM 2019). If certification remains a barrier to participation, the government could reconsider amnesty over titles in issuing certificates. In any case, the program needs to redouble its focus on targeting disadvantaged farmers with lower productivity and should certainly not exclude them during scale-up.

As Indonesia recovers from the Covid-19 crisis, effective yield-improving interventions for oil palm smallholders provide helpful examples of the types of policies that could be considered for a pro-poor economic recovery in agriculture and other sectors. The issues of technology access, market power, marketing and supply chains that face oil palm smallholders are not unique. They are faced by most farmers: whether on plantations or farms for cash crops, food or otherwise. It is these subsectors where productivity has tended to be more stagnant and farmer incomes lower than for oil palm. What is needed is crop-specific policies coordinated at

<sup>38.</sup> Land tenure certificates are a persistent challenge for smallholders as well, which limits access to credit and farmers' ability to engage with firms or government programs.

<sup>39.</sup> The ISPO scheme typically provides less stringent sustainability requirements and overall protection than the Roundtable for Sustainable Palm Oil (Efeca 2015; Yaap and Paoli 2014).

the national level, but this is difficult when responsibility for agriculture remains devolved to local governments.

While the oil palm sector clearly remains one of the most important sectors, it would be misplaced to neglect the others. We hope this Survey prompts a discussion revisiting the modernisation of food and export-oriented agricultural value chains in Indonesia, starting with the farm.

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