

Indonesia: Changes in Wealth and Natural Capital

Summary

1. **Indonesia's wealth per capita expanded 42%** from 1995 to 2014, outperforming lower middle-income countries globally.
2. **As a middle-income country with strong agricultural roots, Indonesia's share of natural capital at more than twenty percent is higher than the global average.** In which more than half are renewable sources (67%), mostly cropland. Future growth will depend on further improved productivity and sustainable management of its natural capital.
3. **Indonesia's growth story between 1995 to 2014:**
 - Produced capital grew significantly.
 - Croplands and protected areas expanded.
 - Gains in renewable natural capital were driven mainly by the growth of value in cropland (both per capita and per square km).
 - A vast wealth growth of energy resources, mainly coal.
4. **Indonesia's forests and pastureland declined** in land area and per capita asset value.
5. **Some trends suggest that Indonesia's growth may not be as negative as it initially appears.** The evolution of composition of wealth from 1995 to 2014 suggests that Indonesia has built a somewhat balanced portfolio of assets that is likely to support strong economic growth in the future, at the cost of the environment. The trajectory from low-income to middle-income starts with an abundance of natural capital and uses this to invest in education and health (human capital). At middle-income levels, human capital becomes the main asset.
6. **Critical natural capital like fisheries and water are not yet included in wealth accounts.** Including these assets would increase national wealth, and, more importantly, make it possible to identify opportunities for growth through better management of natural capital.
7. **Gains of natural capital, and thus in total wealth, are likely to be overestimated** because agricultural and forest land degradation, including the loss of ecosystem services, are not captured in the wealth accounts at this time. The potential impacts of climate change are also not factored into valuation of natural capital. As an indication of the sensitivity to agricultural land management, a simple scenario analysis for cropland was carried out. **Under a scenario that assumed no future gains in crop productivity, the value of crop land per capita falls by nearly half, from \$4,182 to \$2,194 in 2014.**

Why we measure wealth?

National income and well-being are underpinned by a country's assets or wealth—measured comprehensively to include produced capital, natural capital, human capital, and net foreign assets. In Indonesia, sustained long-term economic growth requires investment and management of this broad portfolio of assets. Although a macroeconomic indicator such as GDP provides an important measure of Indonesia's economic progress, it measures only income and production and does not reflect changes in the underlying asset base. Used alone, GDP may provide misleading signals about the health of its economy over the long term. It does not reflect depreciation and depletion of assets, whether investment and accumulation of wealth are keeping pace with population growth, or whether the mix of assets is consistent with Indonesia's development goals.

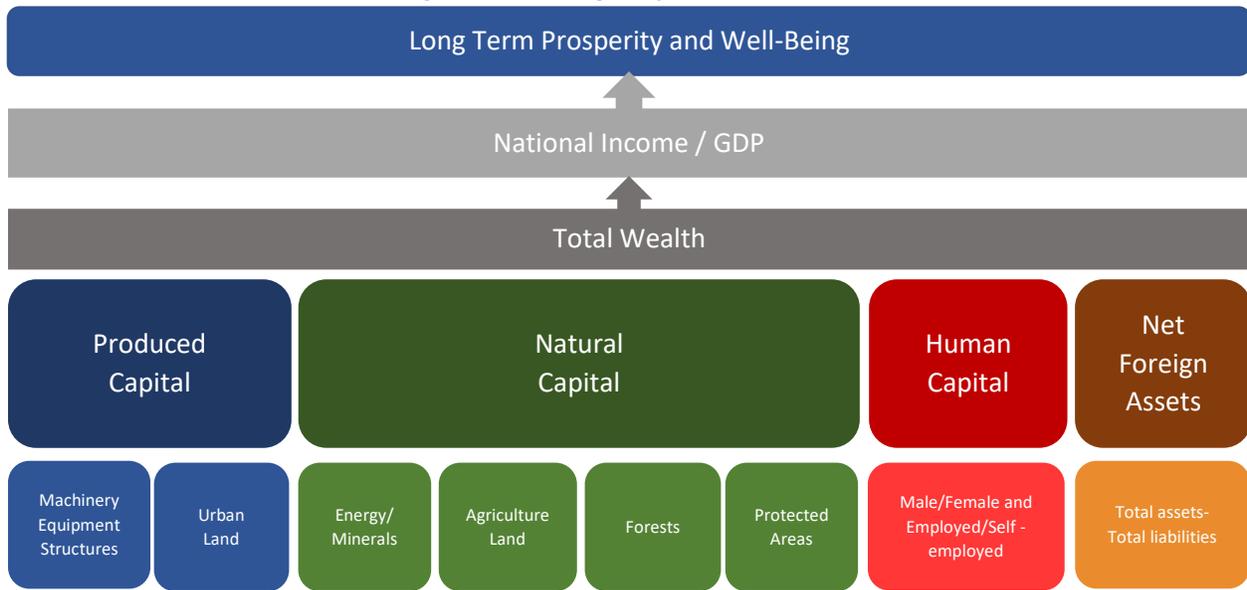
Wealth, by its nature, concerns the future—the flow of income that each asset can generate over its lifetime. Without a forward-looking indicator, it is difficult to conclude that economic progress can be accurately measured. Measuring changes in wealth permits us to monitor the sustainability of development, an urgent concern today for all countries. GDP indicates whether a country's income is growing; wealth indicates the prospects for maintaining that income and its growth over the long term. They are complementary indicators. Economic performance is best evaluated by monitoring the growth of both GDP and wealth. This case study will estimate Indonesia's national wealth, to track the country's growth trajectory. While keeping in mind that the data are the best available from global data sources, and more detailed country information may exist through institutions in Indonesia, such as BPS (Central Statistics Agency) and BAPPENAS (Ministry of Planning).

Measuring national wealth and changes in wealth is part of an ongoing effort by the World Bank to monitor the long-term economic well-being of nations. *The Changing Wealth of Nations 2018* builds on two previous World Bank reports and provides wealth accounts for 141 countries, including Indonesia, for the period 1995 to 2014. (Lange, Wodon, & Carey, 2018) All data are estimated from globally available datasets, such as those provided by FAO or the Penn World Tables and may be less accurate than more detailed information available within a particular country. Wealth accounts include the following asset categories, all measured in market prices and converted to 2014 US\$ using market exchange rates:

- Produced capital and urban land: machinery, buildings, equipment, and residential and nonresidential urban land, measured at market price. For brevity, the term produced capital is used to include produced capital and urban land.
- Natural capital:
 - Nonrenewables: 14 types of minerals and fossil fuels
 - Renewables: cropland, pastureland, forest timber, forest services (an estimate of NTFP, watershed services, recreation values), protected areas (value estimated as the opportunity cost of converting to agriculture)
- Human capital: human capital disaggregated by gender and employment status (employed, self-employed). Human capital is measured as the discounted value of earnings over a person's lifetime.
- Net foreign assets: the sum of a country's external assets and liabilities

Figure 1 illustrates how these assets and capitals come together to form a measurement of total wealth which supports national income and the potential future prosperity and well-being of a country.

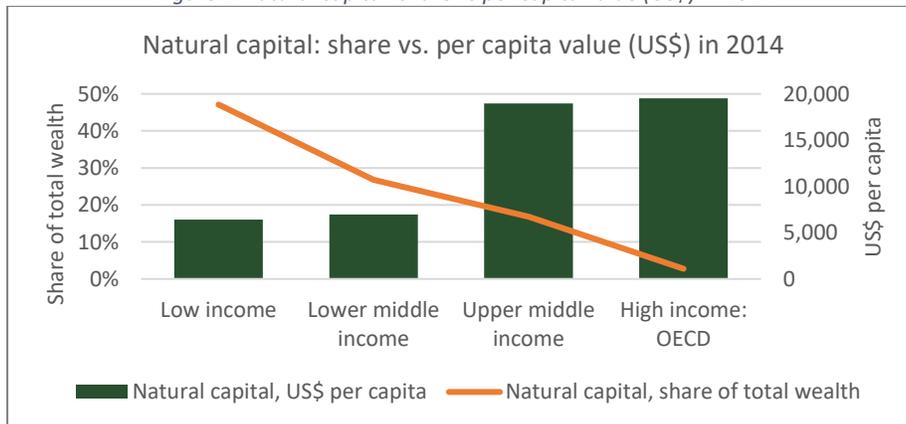
Figure 1—Asset categories for wealth accounts



East Asia and Pacific region context: Natural capital and development

Natural capital is the most important asset for low-income countries, averaging 47 percent of total wealth in 2014, and 27 percent in lower-middle income countries (Figure 2). Natural capital has been the most abundant asset available to all countries at one point in their development. For example, in Indonesia it was 21 percent of total wealth in 1995. At low incomes and some lower middle income, the economies are built around this relatively abundant asset, mainly the renewables. They can only move beyond subsistence production of food and shelter to manufacturing and services with the addition of scarce capital--human capital, infrastructure, other produced capital. Though development is not about liquidating natural capital to build other assets; it's about more efficient use of natural capital. Natural capital remains important even as countries grow and develop. Natural capital per capita is highest in upper middle and high-income OECD countries (Figure 2). While the share of natural capital declines with development, the absolute value per capita grow rapidly. In high-income OECD countries, the value of natural capital is three times that in low income countries.

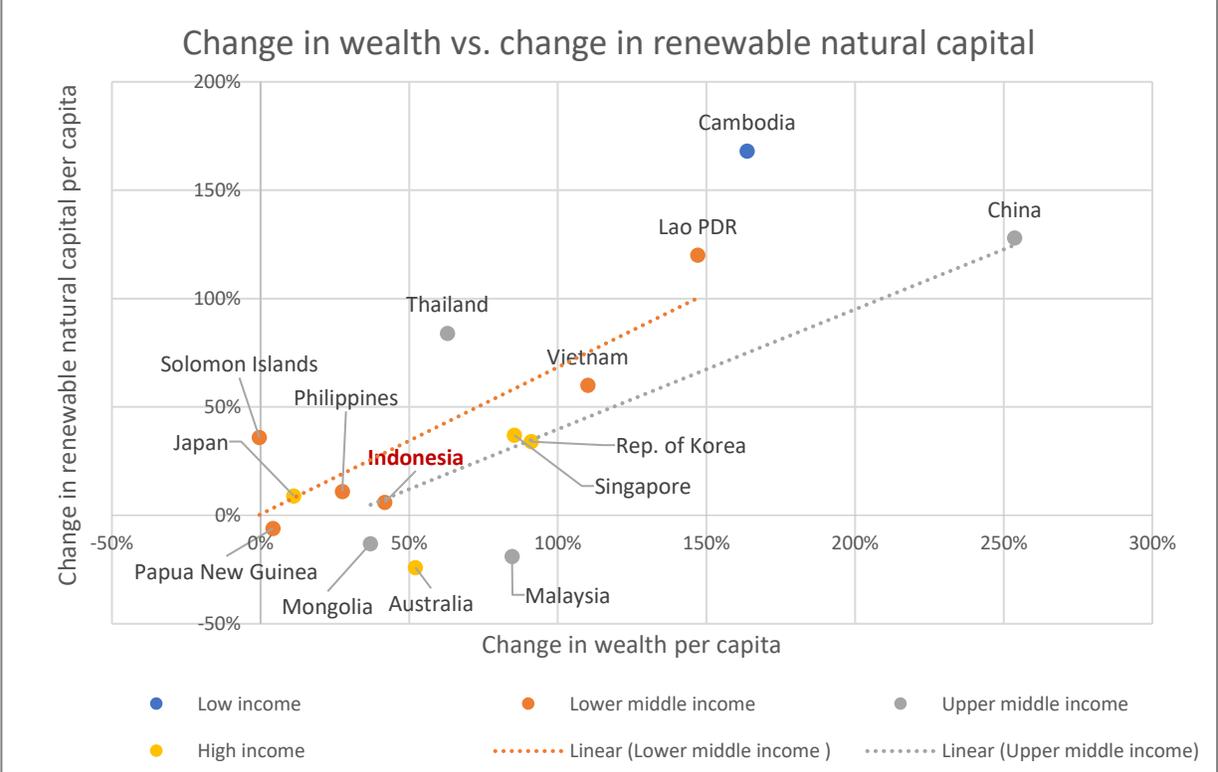
Figure 2—Natural capital: share vs per capita value (US\$) in 2014



Source: (Lange, Wodon, & Carey, 2018)

The value of renewable resources can increase by bringing more land into productive use or by using the resource more productively, for example, improving crop yields or developing nature-based tourism on forest land. Indeed, on a per capita basis, growth of total wealth (and by implication GDP) is positively correlated with growth in renewable natural capital (Figure 3). In East Asia and Pacific (EAP) region, most countries show this growth of both total wealth and renewable natural capital per person, and none show total wealth and renewable natural capital both declining. The trends for EAP countries are dominated by China. Countries like Malaysia, Mongolia, Australia and Papua New Guinea achieved growth while depleting renewables, but this typically applies to resource rich countries that depend heavily on non-renewables for economic growth, large energy and mineral resources.

Figure 3-Change in wealth per capita vs. renewable natural capital per capita in East Asia and Pacific (%), 1995 to 2014

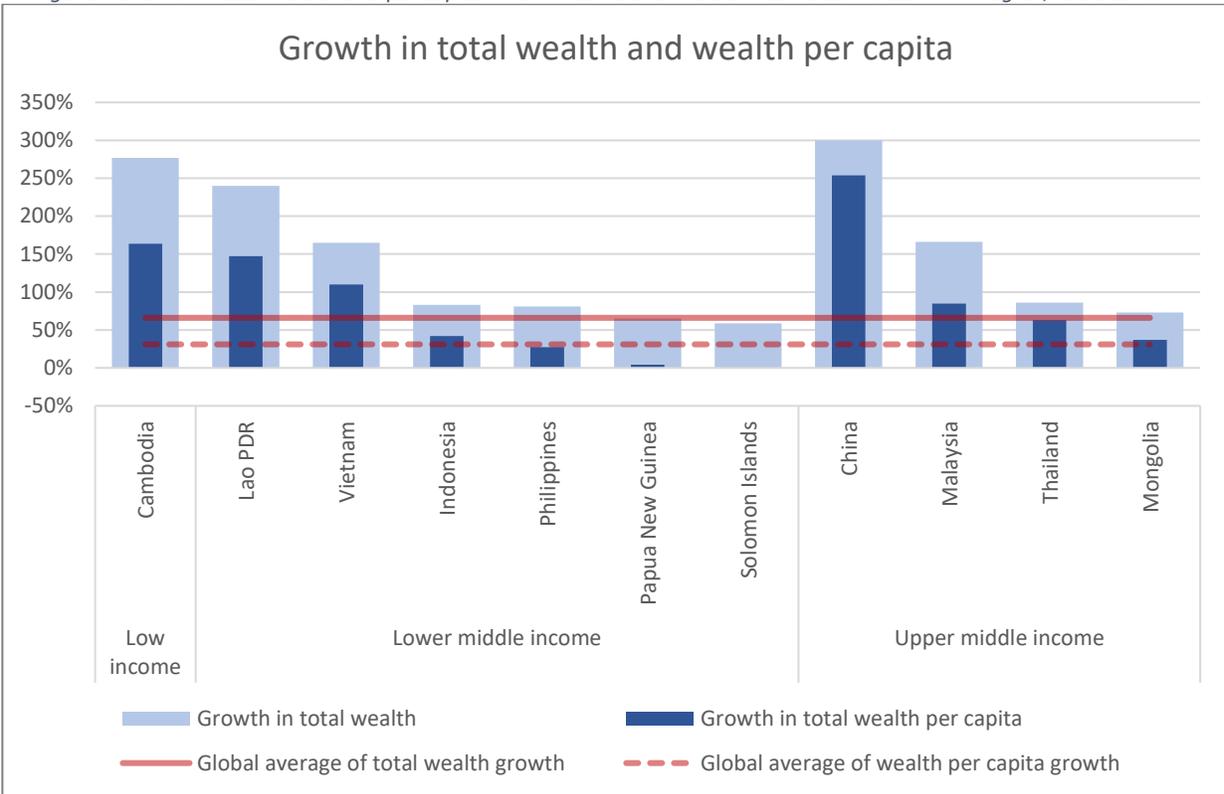


Source: (Lange, Wodon, & Carey, 2018)

For most low and middle-income countries in the East Asia and Pacific region, growth in total wealth between 1995 and 2014, was high compared to the global average (Figure 4). China’s total wealth tripled, Cambodia and Lao PDR doubled, and other country’s wealth grew at least 50% within the 20-year period. This is not astonishing since most of EAP¹ countries are low or lower-middle income countries that need to invest very rapidly to catch up, faster than the global average. Even countries with strong gains in wealth saw a much smaller increase in *per capita* wealth due to steady population increase. While population growth can be a benefit to development, rapid investment is needed to secure the change in age structure. Without providing sufficient capital for each person, productivity declines and growth slows.

¹ When referring to East Asia and Pacific region, it includes only low and middle-income countries of that region.

Figure 4-Growth in total wealth and per capita in low-income and middle-income countries in EAP region, 1995 to 2014



Source: (Lange, Wodon, & Carey, 2018)

Indonesia's national wealth

Indonesia – a diverse archipelago nation of more than 300 ethnic groups, the largest economy in Southeast Asia, has charted impressive economic growth since overcoming the Asian financial crisis of the late 1990s. For the past decade, Indonesia has sustained an annual growth rate of about 6 percent, driven largely by harnessing a variety of natural resources to propel the country forward as a vibrant, middle-income economy. This strong growth has resulted in a halving of the national poverty rate to about 11 percent (2014) and a GDP per capita of US\$3,510. Today, Indonesia is the world's fourth most populous nation, the world's 10th largest economy in terms of purchasing power parity, and a member of the G-20.

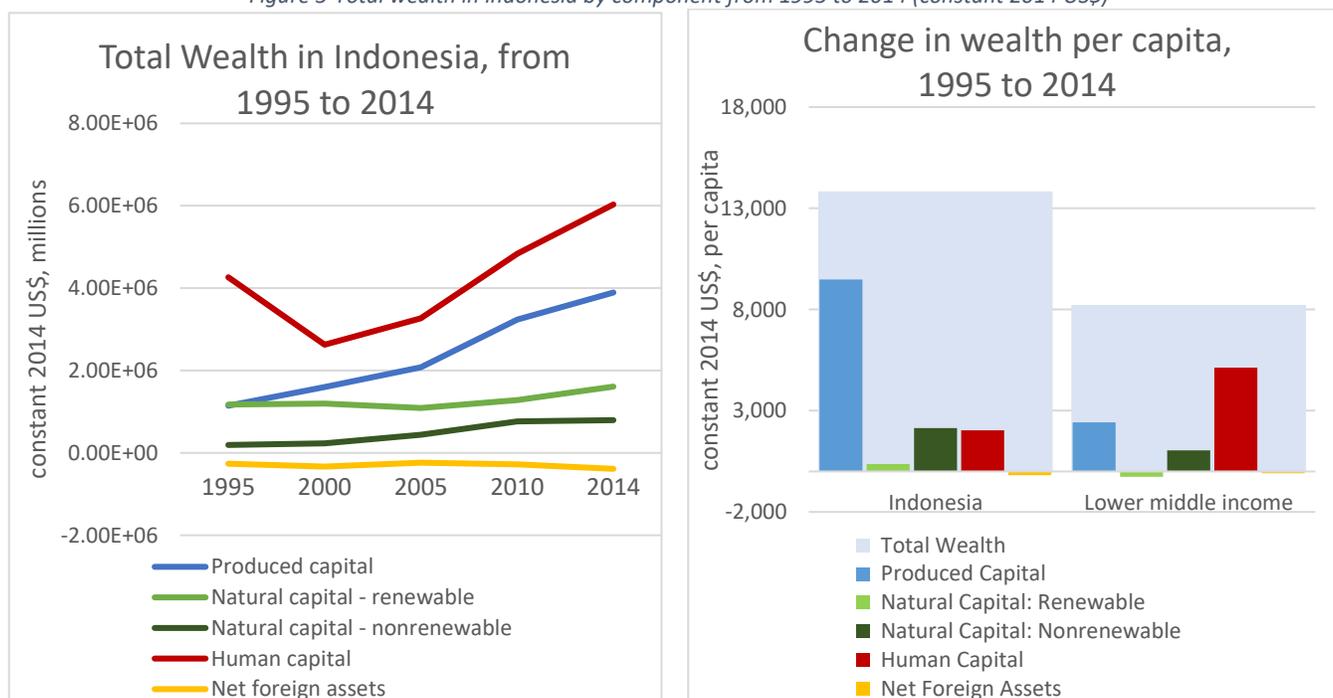
Indonesia belongs to a group of 14 global countries (CWON dataset) that remained lower middle-income over the 20-year period from 1995 to 2014, compared to 32 countries that were lower middle-income in 1995 and developed to upper middle-income or higher by 2014. Indonesia is an average performer and its wealth per capita falls in middle of the EAP countries. During this 20-year period, Indonesia's total wealth increased 83% and per capita wealth increased by 42% (Figure 4). Its growth also surpassed the global average of growth in both total wealth (66%) and per capita wealth (31%).

A closer look shows how wealth has changed in Indonesia during this 20-year period (Figure 5). The country's main engine of wealth growth, both total and per capita, in this 20-year period was produced capital, opposite of lower-middle income countries. The gains in wealth (per capita) in this global income group were due to human capital, followed by produced capital and nonrenewable natural capital. The

economic gains in Indonesia were achieved through complementary investments in produced capital such as roads and transport, water and energy supply, and communications. There are huge infrastructure needs in Indonesia, and other lower-middle income countries. In addition, to improving the productivity of agriculture and other natural capital, as well as investing in human capital.

Human capital is Indonesia’s main asset of total wealth. Human capital wealth increased by 41 percent in the 20-year period. Human capital wealth was measured for the first time as the present value of the future earnings of the labor force using household surveys for 141 countries (CWON 2018). This measure factors in not only the number of years of schooling completed by workers, but also the earnings gains associated with schooling (which implicitly factors in the quality of the learning taking place in school) and how long workers can work (which implicitly accounts for health conditions through life expectancy, among others). While human capital grew fast from 2000 to 2014, it decreased from 1995 to 2000, possible factors can include the Asian market crisis in the late 1990s, lowering unemployment rate and fall in real wages.

Figure 5-Total wealth in Indonesia by component from 1995 to 2014 (constant 2014 US\$)



Source: (Lange, Wodon, & Carey, 2018)

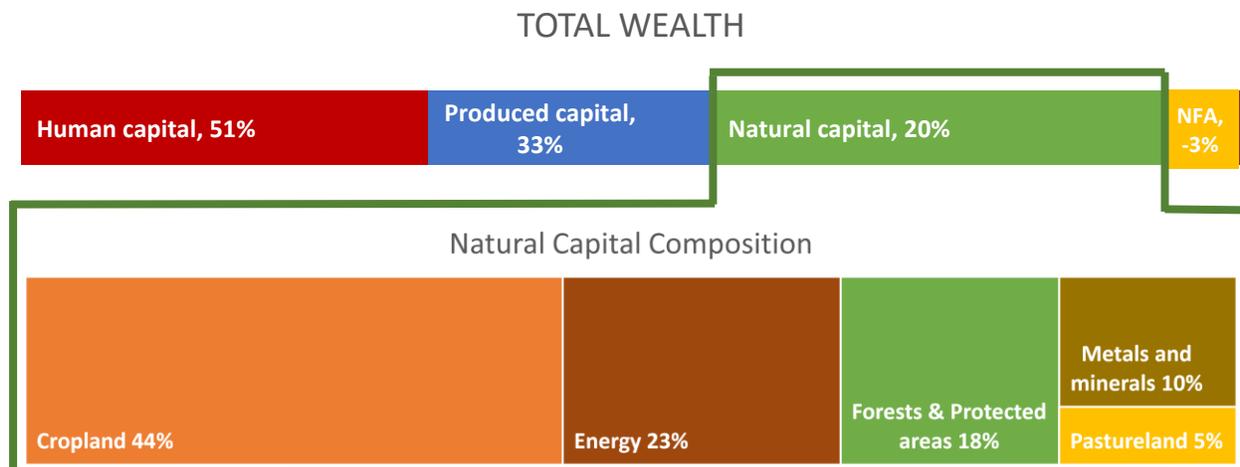
Indonesia’s wealth per capita is double the average of global lower middle-income (LMI) countries but is half the average of EAP countries in 2014 (Table 1). Indonesia’s renewable asset endowment (\$6,321/person) are higher than the average of global lower-middle income countries (\$5,006/person), but lower than the average of EAP countries (\$9,782/person). The gap in wealth between Indonesia and global lower-middle income countries results from Indonesia’s high levels of human capital and produced capital. The net foreign asset position of Indonesia reflects the indebtedness of the country, and as of 2014, Indonesia is in debt more than global LMI countries and EAP countries. It is calculated as the value of assets that Indonesia owns abroad minus the value of domestic assets owned by foreigners.

Table 1-Wealth per capita in Indonesia, lower-middle income countries and East Asia and Pacific, 2014
(constant 2014 USD per capita)

	Indonesia	Average of global lower-middle income countries	Average of East Asia & Pacific countries
Total wealth	\$46,919	\$25,948	\$91,581
Produced capital	15,299	6,531	24,018
Natural capital	9,433	6,949	13,772
Renewables	6,321	5,006	9,782
Nonrenewable	3,112	1,944	3,989
Human capital	23,701	13,117	53,387
Net foreign assets (NFA)	-1,524	-650	404
Population (millions)	254	2,725	1,939

As of 2014, the share of natural capital in Indonesia’s overall wealth is higher than the global average. More than 20 percent of Indonesia’s share of total wealth was natural capital, in which more than half are renewable sources (Figure 6). Renewable sources account for 67% of Indonesia’s natural capital, where its primary composition is cropland. Forests and protected areas account for 18% and pasturelands for 5% of its natural capital. The remaining 33% of Indonesia’s natural capital consists of nonrenewable sources, such as energy, accounting for 23%, includes oil, natural gas, coal (all grades), and 10% is metals and minerals. Critical natural capital like fisheries and water are not yet included in wealth accounts, including these assets would increase national wealth and make it possible to identify other opportunities for growth through better management of natural capital.

Figure 6-Indonesia's share of total wealth and natural capital composition in 2014

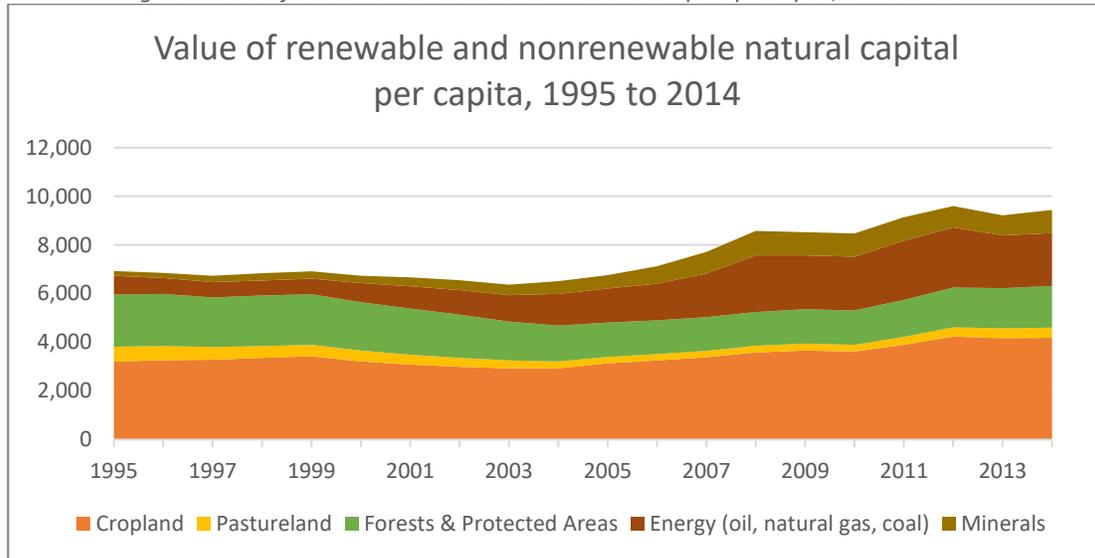


Source: (Lange, Wodon, & Carey, 2018)

Natural resources were another important driver for wealth growth in Indonesia in this 20-year period. It turns out that Indonesia was not just liquidating its natural resources to build other assets. On the opposite, the value of natural capital increased by 75 percent. Although the wealth accounts seem to indicate slow but steady progress, there are some cautions to this picture. There was a shift of value for total nonrenewable and renewable natural capital from 1995 to 2014 in Indonesia. In 1995, the value of renewables accounted for 86% of its natural capital, whereas nonrenewable accounted for 14%. By 2014, this shifted to 67% to 33%, respectively. This growth mainly reflects an enormous increase in wealth of

energy resources, mainly coal. While the gains in renewable resources, cropland, increased 30% from 1995 to 2014 (Figure 7). In addition, the value of cropland remained Indonesia’s main renewable asset during this period. However, the opposite is true for Indonesia’s other renewable source (pasturelands, forests and protected areas), while they were depleted, decreased in value.

Figure 7-Value of renewable and nonrenewable natural capital per capita, 1995 and 2014



Source: (Lange, Wodon, & Carey, 2018)

We can better understand the change in asset value between 1995 and 2014 by examining the three components of this change (Figure 8), and possibly determine some of the driving forces:

$$\begin{aligned}
 \text{Change in per capita value} = & \\
 & + \text{change in land area exploited} \\
 & + \text{change in land value per hectare (calculated as land area/land value)} \\
 & - \text{population growth (termed a 'population dilution effect')}
 \end{aligned}$$

Forests: Per capita forest value declined (32%) due to losses in forest land (16%), despite a modest increase in value per sq. km (4%), combined with a population growth of 29%. Indonesia is largely a commodity driven economy with palm oil being a main driver of large scale deforestation. Current wealth accounts are undervaluing the natural assets that Indonesia holds, and are unable to comprehensively cover the cost of inaction, or the limits of commodity driven growth. This is because forest degradation is not yet captured in the FAO data used to construct the forest asset account, so the loss of forest natural capital is likely greater than estimated in the wealth accounts for Indonesia.

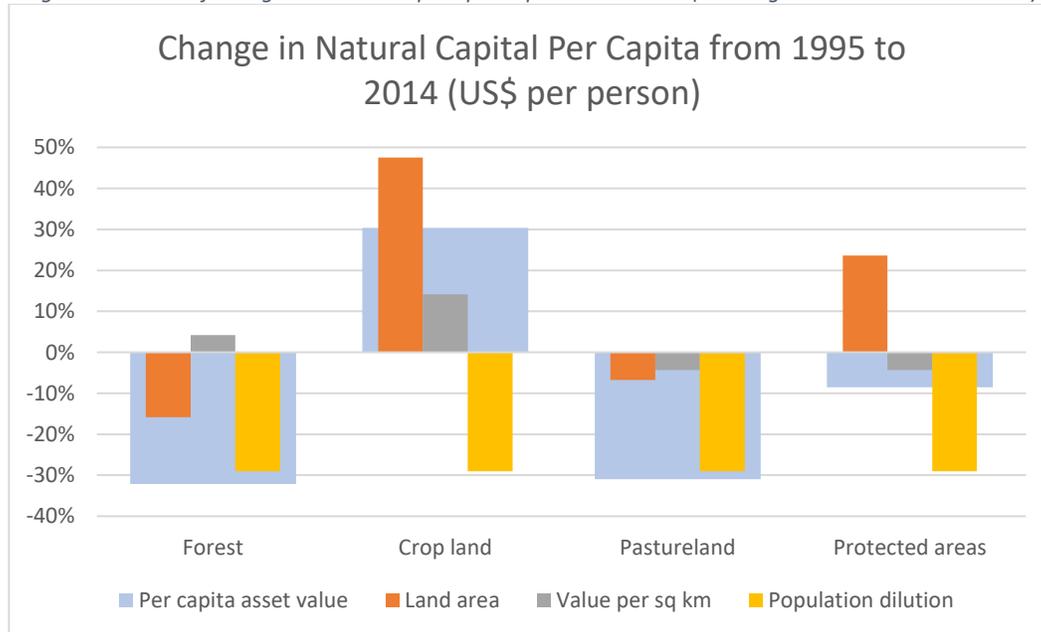
Since 2000, the national production of oil palm in Indonesia increased fourfold and is expected to double to 40 m tons by 2020. In addition to oil palm, other tree crop plantations have been promoted, such as planted forest for fiber/pulp production, coffee, and cocoa, offering economic opportunities for settlers from Indonesia’s remote outer islands. This expansion of industrial plantations, as well as logging, are the main drivers of deforestation and lowland degradation. During the last four decades, demand for timber, oil palm and other industrial crops had a significant impact on deforestation and land conversion in Indonesia. Beyond its use in the food industry, demand for palm oil continues to be driven up further by the increasing biofuel production targets set by the Government of Indonesia

(Gol). Other major drivers of lowland deforestation and land degradation are the use of fire for land clearing, fiscal disincentives to agricultural intensification and more efficient land use, and a weak land governance framework, resulting from competing and conflicting GoI sectoral policy objectives, complex and competing laws and regulations on land classification and land rights, and fragmented institutional arrangements leading to uncoordinated spatial and land use planning.

Protected areas: Despite the expansion in land area, value of per capita asset and per sq. km both decreased by -9% and -4%, respectively. Protected areas for conservation and preservation of ecosystems² provide a range of services to Indonesia. They can provide many economically valuable services from biodiversity and tourism, a growing industry in Indonesia, to ecosystem services like watershed protection (World Bank, 2018).

Pastureland: Pastureland did not outweigh the population dilution effect, where land area, values of per capita asset and per sq. km all decreased.

Figure 8-Sources of change in Natural Capital per capita in Indonesia (% change between 1995 and 2014)



Source: (Lange, Wodon, & Carey, 2018)

Note: The broad blue bar represents percent change in asset value while the thinner bars represent the components of change: change in land area, change in value/hectare, and population dilution effect (the population growth rate).

Cropland: The area under cultivation expanded by 48% within the 20-year period, partly due to the conversion of forest land. Land value increased through a combination of i) expansion of land are under cultivation together with ii) increasing the value of crops produced per sq. km. The value of cropland per sq. km grew 14%. The gains in per sq. km yields may indicate gains in crop productivity from 1995 to 2014, a change to higher value crops and/or other improvements. However, such gains will be temporary if the

² An ecosystem account for peatlands in Indonesia has been drafted, and is currently under the final stages of revision, and will soon be available. The study applies the SEEA EEA framework to develop and monitor the changes of peat ecosystems and economic activities concerning their physical and monetary values in Indonesia.

land is not managed sustainably. Currently the land is effectively being mined for its nutrients and the resulting land degradation is intense.

To understand how concerns about degradation asset value, let's take a closer look at what goes into the calculation of land value per hectare. Land value is calculated as the discounted sum of the rent it is expected to generate over its lifetime (in effect, in perpetuity). So, the value of land depends, among other things, on assumptions about productivity, the yield per hectare, in the future: if productivity stays the same as in 2014 the value per hectare will remain constant, all else remaining equal; if productivity continues to increase, land value will grow in the future, but if productivity decreases, the value will decline. Given the documented land degradation, together with the risks from climate change, it is not prudent to assume that productivity will continue to increase.

A simple scenario analysis was conducted for cropland to test the sensitivity of the cropland value estimates to assumptions about productivity, that is crop yields. The first scenario assumes no future gains in crop productivity after 2014.³ Under this scenario, the value of crop land per capita in 2014 falls by nearly half, from \$4,182 to \$2,194. A more extreme scenario, which might occur under the impact of climate change assumes a decline in productivity of 1% annually. This further reduces that value of cropland by nearly 60% to \$1,772/person.

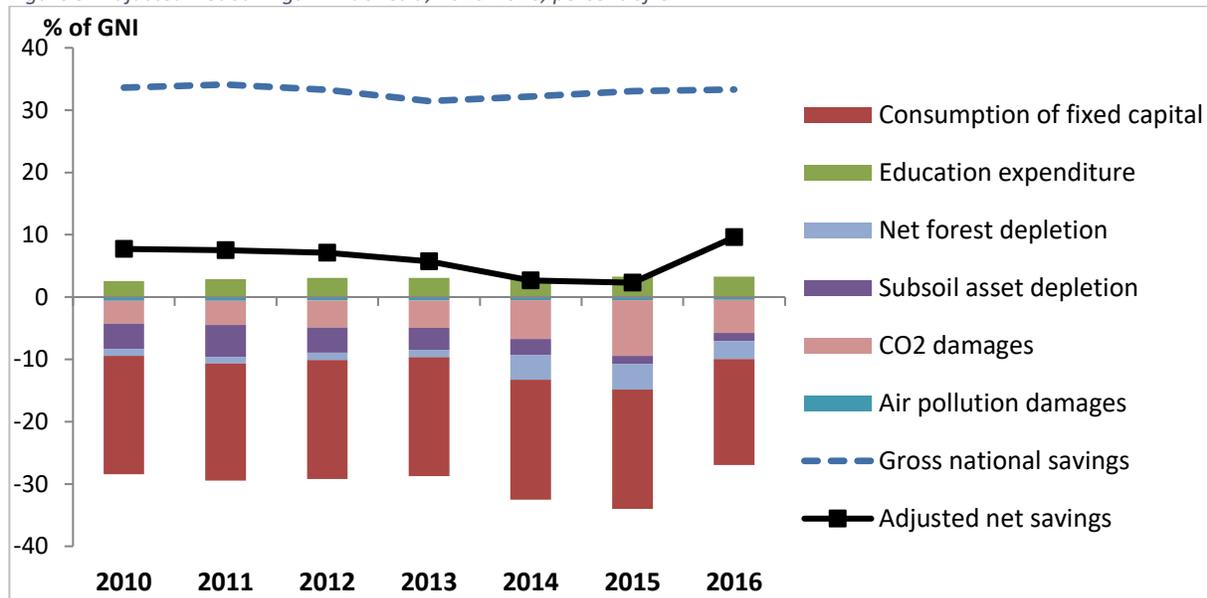
Another look at how wealth changes: Adjusted Net Saving for Indonesia

How wealth changes over time is critical to understanding Indonesia's prospects for sustainable development. While the comprehensive wealth accounts are only now becoming more regularly available, Adjusted Net Savings (ANS) was developed as an indicator to approximate the change in wealth of countries and has been updated annually by the World Bank for more than 20 years. It is based on an economic theory in which savings equals investment, and investment equals the change in wealth. ANS offers a more inclusive picture of changes in the set of assets that constitutes a nation's wealth base, and is derived from the standard national accounting measure of gross national saving with four additional adjustments: (1) deduction for the depreciation of produced capital, measured by the consumption of fixed capital; (2) addition of investments in human capital, measured by current public expenditures on education; (3) deduction for the depletion of natural capital, including minerals, energy, and timber resources; and (4) deduction for the damages from pollution, including carbon emissions and exposure to PM2.5 and ozone. Positive ANS indicates an investment in the future—that a nation is accumulating the assets needed to build up its wealth and ensure its economic growth over the longer term. Years of negative saving, on the other hand, can be an indication of declining national wealth and unsustainable development.

Figure 9 below shows Indonesia's ANS from 2010-2016, with the stacked bar columns illustrating the adjustments from gross national savings (blue dotted line) to arrive at ANS (black marked line).

³ In calculating land value, as the present value of future rents from production, the wealth accounts assume productivity growth of 1.94%. This scenario assumes zero growth, that is, crop yields continue at current levels.

Figure 9- Adjusted Net Savings in Indonesia, 2010-2016, percent of GNI



Source: World Bank staff calculations, based on data from World Bank's World Development Indicators and Indonesia data sources (Sisnerling)

While Indonesia's gross savings during this period are quite high, averaging 33 percent of GNI, the gap between gross savings and ANS is substantial, with an average ANS of 6 percent. ANS even dipped down to 2 percent in 2014 and 2015, indicating that Indonesia's national savings just barely covered the depreciation and depletion of its assets in those years. The main driver of Indonesia's low ANS is its significant consumption of fixed capital, averaging 19 percent of GNI. The second largest driver are damages from CO2, especially due to emissions from peat fires and LULUCF (land use, land-use change, and forestry). These land use practices also impact the estimates of net forest depletion, which averaged 2.2 percent during this period.

With low ANS suggesting weak wealth formation for Indonesia, a few policy levers can be considered in improving the savings available for investment and wealth generation. With Indonesia's high consumption of fixed capital, the country should look to improving its quality and maintenance of built capital, in order to achieve longer lifetime and improved resilience. Increased investment in education and innovation, as well as improvements to air quality, would increase human capital. Lastly, land use management and practices, especially regarding peat lands and CO2 emissions, have a negative impact on the country's asset base and should be assessed through this lens.

ANS measures national savings, a key element in how wealth changes from one year to the next, adjusted for gains (spending on education) and losses (consumption of fixed capital, depletion of minerals and forests, air pollution). An example of the calculations for Indonesia in 2014 can be seen in **Error! Reference source not found..** However, it is important to note that ANS, while relatively easy to estimate, is an incomplete indicator of the changes in Indonesia's assets; ANS emphasizes the factors that deplete wealth (depreciation, depletion, air pollution damages) over factors that might increase wealth, partly due to data challenges for ANS and partly due to the System of National Accounting conventions for measuring savings and investment.

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