GOAL 12

Ensure sustainable consumption and production patterns

Photo: Shutterstock/KYTan

SDG 12 deals with a broad range of issues relating to sustainable consumption and production, at all stages of the demand and supply chain. It highlights the need to promote a shift towards more efficient and less wasteful consumption, as well as to encourage producers to invest in cleaner, greener production techniques and technologies.

How do ecosystems and biodiversity support this SDG?

Biological resources and natural products form the basis of many commodities and consumptive items, and also provide raw materials which feed into more complex production processes—from basic outputs such as food, building materials and medicines, and inputs such as land, water, energy and genetic materials, through to enabling services such as climate mitigation, water regulation and disaster risk reduction. At the same time, biodiversity and ecosystems are heavily impacted by commodity extraction, manufacture and trade. Land conversion, unsustainable harvest or use of resources, and air, land and water pollution, for example, pose some of the biggest threats to ecosystems across the world. These pressures are intensifying in the face of rapid population growth and escalating demand, technological, industrial and urban expansion, and increasing market integration and widening trade networks. Optimizing the contribution of biodiversity and ecosystems to production and consumption at the same time as managing the impacts of market demand and supply on the natural environment will be critical to sustaining future economic growth and development in a sustainable fashion.

How does UNDP's work **support** this SDG?

Case study: Enhancing the sustainability of palm oil production in Indonesia

Palm oil is used in the manufacture of thousands of products, including foods, cosmetics, pharmaceuticals, detergents, biodiesel, and a wide variety of household and industrial items. Demand is huge and growing. Over the last two and a half decades, global palm oil consumption has quintupled and it now accounts for almost a third of total vegetable oil trade. Indonesia is the world's largest producer and exporter of palm oil. In 2015, palm oil production was estimated to be around 33 million tonnes, or around 54 percent of the world's total. The oil palm plantation and processing industry is also a key part of Indonesia's national economy: exports comprise around 10 percent of foreign exchange earnings and the industry provides livelihood and employment opportunities for more than 20 million people.

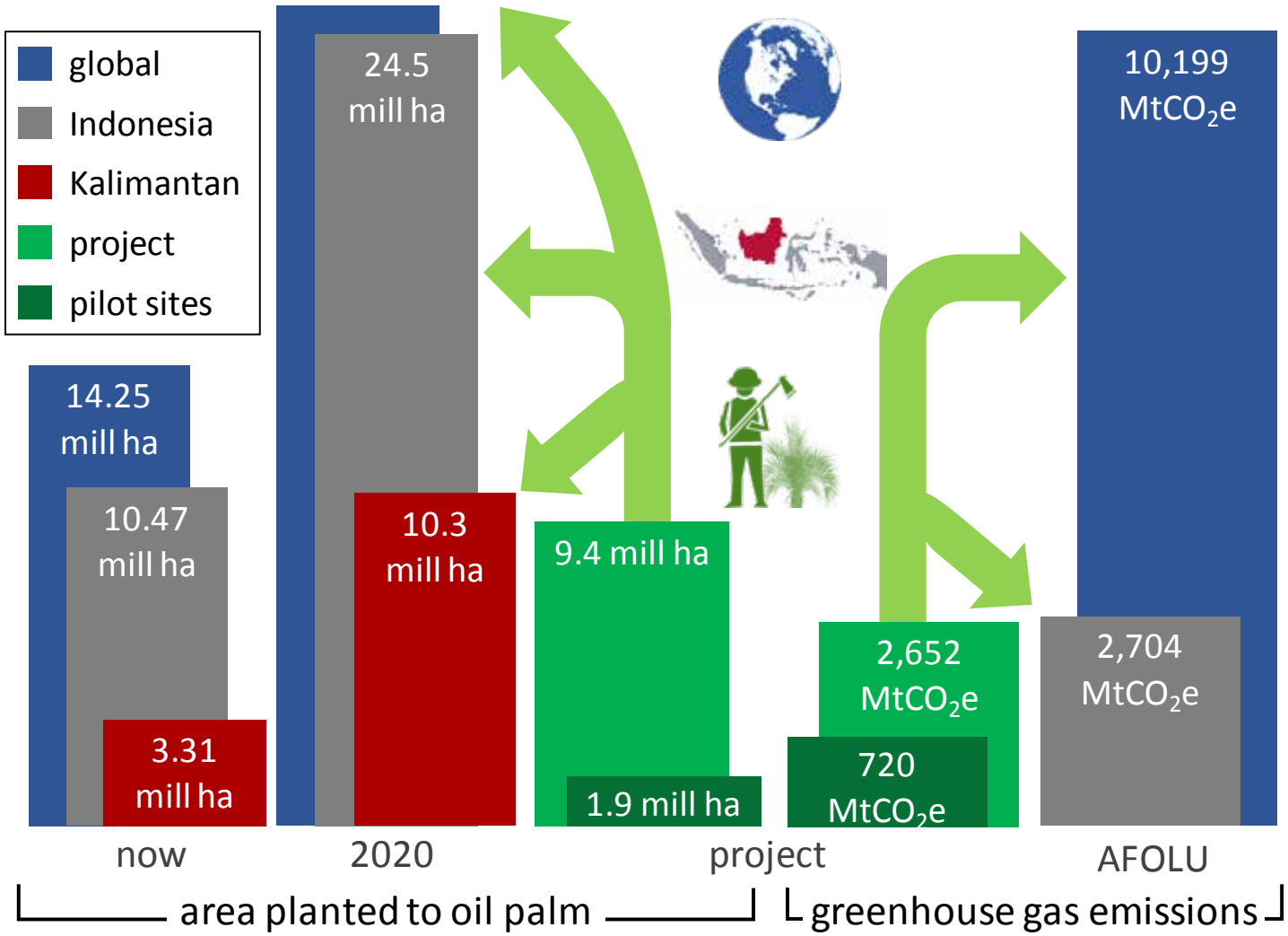
Often moving into forest areas that had earlier been opened up by logging, oil palm in Indonesia has been rapidly expanding, growing more than 40-fold since the early 1980s. It has been estimated that over 56 percent of Indonesia's oil palm is planted in areas that were formerly natural forest, with some sources suggesting that oil palm cultivation could account for as much as a quarter of deforestation between 2005 and 2010. Already one of the world's largest emitters of greenhouse gases, the majority of Indonesia's carbon dioxide emissions originate from land use change including deforestation and burning of peatlands. At the same time, forest conversion is jeopardizing globally-endangered biodiversity and reducing the supply of economically-valuable wild products and ecosystem services.

While the palm oil industry makes a substantial contribution to rural livelihoods, job creation and the growth of Indonesia's economy, there are concerns that it will lead to further environmental problems if not properly managed. The "Strengthening Forest Area Planning and Management in Kalimantan" project is working to reduce the impact of palm oil development on natural forests, with a particular focus on reducing carbon emissions from deforestation and forest degradation, and enhancing forest biodiversity conservation. The project is improving policy frameworks and institutional capacity to account for high conservation value forests in land use planning and allocation, as well as strengthening on-the-ground forest conservation through improved land use planning, stakeholder participation, financial incentives and technical support to sustainable palm oil production.

PROJECT: Strengthening Forest Area Planning and Management in Kalimantan
MAJOR DONORS: GEF, UNDP, Government of Indonesia
LOCATION: Kalimantan, Indonesia national level, Global
DATE: 2016 onwards
WEBLINKS: https://www.thegef.org/gef/project_detail?projID=6965

Nature count$: Key impacts of the project on production and consumption

UNDP's work to enhance the sustainability of oil palm cultivation in Indonesia will have a major impact on biodiversity conservation and carbon emissions at local, national and global scales, as well as influencing the production, consumption and trade of one of the world's most valuable commodities. By improving land use planning and allocation, pilot activities in Kalimantan will help to safeguard 1.9 million ha of threatened natural forest and 720 million tonnes of carbon dioxide equivalent greenhouse gas emissions. In turn, project activities are expected to result in sustainable change across 91 percent of the planned oil palm expansion to 2020 in Kalimantan, securing agriculture, forestry and land use emission reductions equivalent to 98 percent of current Indonesian levels and 26 percent of today's global levels.



This project will contribute towards implementing the 10-Year Framework of Programmes on Sustainable Consumption and Production (✓SDG Target 12.1), improving the sustainable management and efficient use of natural resources (✓SDG Target 12.2), encouraging small-scale producers as well as large and transnational companies to adopt sustainable practices and to integrate sustainability information into their reporting (✓SDG Target 12.6), promoting sustainable public procurement practices (✓SDG Target 12.7), enhancing information and awareness for sustainable development and lifestyles (✓SDG Target 12.8) and strengthening scientific and technological capacities to move towards more sustainable patterns of consumption and production (✓SDG Target 12.a).

How the economic impacts were **calculated**:

In 2015, Kalimantan accounted for around 3.31 million hectares of Indonesia's 10.47 million hectares of oil palm cultivation and 8.13 million tonnes or 30 percent of national production (BPS 2015, 2016; NPS 2014). In turn, Indonesia contributed almost three quarters of the 14.25 million hectares of global oil palm plantations (Palm Oil Research 2014) and 54 percent of crude palm oil production (USDA 2015, 2016). In 2011, palm oil was the fourth most valuable agricultural commodity in global trade flows, worth US$40.56 billion (FAO 2016). Overall, palm oil production contributes 6-7 percent of GDP in Indonesia (WWF 2012, NPS 2014), 10 percent of total exports (BPS 2016) and directly generates as many as five million jobs (EIBN 2015, SSIJ 2013, UNDP 2015) that indirectly benefit up to 15 million people (Dawson 2015).

Responding to the growth in global demand, Indonesia aims to increase palm oil production by more than a third over the next five years, to some 40 million tonnes by 2020. This is estimated to require 10.3 million

hectares of additional oil palm plantations in Kalimantan, from a total expansion potential of 24.5 million hectares (UNDP 2014). The area planted to oil palm in Kalimantan has already increased more than 300 percent since 2000 and it is estimated that only 10 percent of this expansion has occurred in non-forested areas (UNDP 2014).

Deforestation rates in Indonesia are estimated at 1.17 million hectares per year (Government of Indonesia and UNREDD, 2009, citing data generated by Forest Inventory and Mapping Centre, Forestry Department). Deforestation and forest-related land use change has a major impact on greenhouse gas emissions. About 24 billion tonnes of carbon (tC) are stored in Indonesia's vegetation and soil, with 80 percent of this (about 19 billion tC) stored in standing forest (Sari et. al 2007). Yearly emissions in Indonesia are around 3,014 million tonnes of carbon dioxide equivalent ($MtCO_2e$). Agriculture, Forestry and Other Land Use (AFOLU) alone are estimated to release about 2,704 $MtCO_2e$. Of this, land use, land-use change and forestry (LULUCF) account for 2,563 $MtCO_2e$ or 85 percent of the country's total emissions (Sari et. al 2007), including 1,115 $MtCO_2e$ resulting from deforestation and 814 $MtCO_2e$ from peat fires (National Council on Climate Change, 2010). At a global level, AFOLU emissions were estimated to be 10,199 $MtCO_2e$, of which LULUCF contributed 4,941 $MtCO_2e$ (Tubiello et. al 2014).

Oil palm cultivation leads to emissions of carbon dioxide and other greenhouse gases during three phases of the production process: initial land conversion or clearance; emission and absorption during the growth cycle of the oil palms; and transport to the refinery followed by crude palm oil and kernel production, transesterification into biofuel and further transport to the end users (Dewi et al. 2009). The extent to which oil palm increases greenhouse gas emissions or decreases the net carbon balance depends on how palm oil is produced and on what type of land cultivation takes place. Sustainable palm oil production, including targeting new cultivation to degraded or non-forested areas, has the potential to significantly reduce greenhouse gas emissions.

Clearing primary forest for oil palm production. Photo: Shutterstock/Rich Carey

The project's pilot activities will safeguard at least 1,923,802 hectares of intact natural forests targeted for palm oil development. Studies carried out as part of the project preparation process cite an average above ground carbon density of 142 tonnes of carbon per hectare (tC/ha) for forest in palm oil producing areas of Kalimantan (UNDP 2014, using data in Saatchi et. al 2011). Recent studies carried out in palm oil producing parts of Indonesia found ranges of time-averaged above ground carbon stock of land cover of 150–250 tonne of carbon per hectare (tC/ha) for natural forests, 50–150 tC/ha for tree-based systems, less than 50 tC/ha for non-tree-based systems, and an average of 40 tC/ha (ranging between 35-45 tC/ha) for oil palm, based on a typical replanting cycle of 25 years (Khasanah et. al 2012). Using these figures, the project has the potential to avoid emissions of some 196.22 million tC owing to gazettal of new High Conservation Value/High Carbon Stock forests and significant reduction of forest conversion through optimized siting of new plantations on degraded or non-forested areas (UNDP 2014, based on carbon estimates in Saatchi et al 2011). Applying a conversion factor of 1 tC = 3.67 tCO_2e, this equates to some 720.13 $MtCO_2e$.

The project estimates that oil palm expansion in Kalimantan will cover 93,840 km^2 (50 percent of forested lands, including 41 percent of Kalimantan's intact forests) by 2020 if all existing leases and land banks are utilized (UNDP 2014, based on Carlson et al 2013). Pilot activities are expected to set the stage for the enhanced protection of 26 million hectares of high conservation value lowland and montane forest landscapes in Kalimantan that are threatened by oil palm expansion. Therefore, the scaling-up of improved conservation and land use planning and allocation measures from the pilot sites could help to reduce carbon emissions by up to 2,652 million tC or 9,733 $MtCO_2e$ over the long-term.

References

BPS. (2015) *Agricultural Indicators 2014/15*. Jakarta, Subdirectorate of Horticulture, Badan Pusat Statistik (Statistics Indonesia).

BPS. (2016) *Key National and Provincial Statistics*. Jakarta, Badan Pusat Statistik (Statistics Indonesia). Available from: http://www.bps.go.id [Accessed 14 January 2016].

Carlson, K., Curran, L., Asner, G., McDonald Pittmaan, A., Trigg, S. and Adeney, J. (2013) Carbon emissions from forest conversion by Kalimantan oil palm plantations. *Nature Climate Change 3*: 283–287.

Dawson, S. (25 March 2015) Indonesia defends deforestation for palm oil on economic grounds. *Reuters*. [Online] Available from: http://www.reuters.com/article/us-indonesia-palmoil-forests-idUSKBN0ML20020150325 [Accessed 14 January 2016].

Dewi, S., Khasanah, N., Rahayu, S., Ekadinata A. and van Noordwijk, M. (2009) *Carbon Footprint of Indonesian Palm Oil Production: a Pilot Study, Bogor, Indonesia*. Bogor, World Agroforestry Centre (ICRAF), Southeast Asia Regional Program.

EIBN. (4 September 2015) Why the Palm Oil Business in Indonesia is Promising. *EU-Indonesia Business Network News*. [Online] Available from: http://www.eibn.org/en/page/news_new?269 [Accessed 14 January 2016].

FAO. (2016) *FAOSTAT*. Rome, Statistics Division, Food and Agriculture Organisation of the United Nations. Available from: http://faostat.fao.org/desktopdefault.aspx?pageid=342 [Accessed 14 January 2016].

Government of Indonesia and UN-REDD. (2009) *Indonesia UN-REDD National Joint Programme*. Standard Joint Programme Document.

Khasanah, N., van Noordwijk, M., Ekadinata, A., Dewi, S., Rahayu, S., Ningsih, H., Setiawan, A., Dwiyanti, E. & Octaviani, R. (2012) *The carbon footprint of Indonesian palm oil production*. World Agroforestry Centre (ICRAF), Southeast Asia Regional Program. Palm Oil Series, Technical Brief 25.

National Council on Climate Change. (2010) *Setting a course for Indonesia's green growth*. Jakarta, National Council on Climate Change.

NPS. (2014) *Indonesian Oil Palm Statistics 2014*. Jakarta, Sub-Directorate of Estate Crops Statistics, Badan Pusat Statistik (Statistics Indonesia).

Palm Oil Research. (2014) *Statistics, updated October 2014*. Available from: http://www.palmoilresearch.org/statistics.html [Accessed 14 January 2016].

Saatchi, S., Harris,N., Brown, S., Lefsky, N., Mitchard, E., Salas, W., Zutta, B., Buermann, W., Lewis, S., Hagen, S., Petrova, S., White, L., Silman, M. and Morel, A. (2011) Benchmark map of forest carbon stocks in tropical regions across three continents. *PNAS 108(24)*: 9899-9904.

Sari, A., Maulidya, M., Butarbutar, R., Sari, R. and Rusmantoro, W. (2007) *Indonesia and Climate Change.* Working Paper on Current Status and Policies. Jakarta, DFID and the World Bank.

SIIJ. (2013) *Indonesia's Palm Oil Industry*. Schuster Institute for Investigative Journalism at Brandeis University. Available from: http://www.schusterinstituteinvestigations.org/#!indonesias-palm-oil-industry/c1lfi [Accessed 14 January 2016].

Tubiello, F., Salvatore, M., Cóndor Golec, R., Ferrara, A., Rossi, S., Biancalani, R., Federici, S., Jacobs, H. and Flammini, A. (2014) *Agriculture, Forestry and Other Land Use Emissions by Sources and Removals by Sinks*. Food and Agriculture Organisation of the United Nations. FAO Statistics Division Working Paper Series ESS/14-02.

UNDP. (2014) *Project Document: Strengthening Forest Area Planning and Management in Kalimantan*. Jakarta, UNDP Indonesia Country Office.

UNDP. (23 July 2015) *UNDP and Solidaridad partnership to improve palm oil sustainability in Indonesian provinces*. UNDP. Available from: http://www.id.undp.org/content/indonesia/en/home/presscenter/articles/2015/07/23/undp-and-solidaridad-partnership-to-improve-palm-oil-sustainability-in-indonesian-provinces.html [Accessed 14 January 2016].

USDA. (2015) *Indonesia Oilseeds and Products Annual Report*. Washington, D.C., Global Agricultural Information Network, US Department of Agriculture.

USDA. (2016) *Oilseeds: World Markets and Trade*. Washington, D.C., Foreign Agricultural Service, US Department of Agriculture.

WWF. (2012) *Profitability and Sustainability in Palm Oil Production Analysis of Incremental Financial Costs and Benefits of RSPO Compliance*. Washington DC, World Wildlife Fund.

Photo: Shutterstock/KYTan

Empowered lives. Resilient nations.

United Nations Development Programme
Bangkok Regional Hub
3rd Floor United Nations Service Building
Rajdamnern Nok Avenue
Bangkok 10200, Thailand
http://www.asia-pacific.undp.org/

This Key Sheet is part of the *Nature Count$: Investing in Ecosystems and Biodiversity for Sustainable Development* publication. View the full publication (booklet and key sheet series) at
www.asia-pacific.undp.org/content/rbap/en/home/library/sustainable-development/nature-counts/booklet.html