

Sustainability Knowledge Politics: Southeast Asia, Europe and the Transregional History of Palm Oil Sustainability Research

Evelien de Hoop and Erik van der Vleuten

The field of sustainability history, which only gained traction recently despite pioneering work since the early 1990s, attracts our sympathies but also raises major historiographical points of concern.¹ We appreciate how the emergent field invites historians of different stripes to engage head-on with today's omnipresent debates, particularly in the global North, about sustainable futures, including



Global Environment 15 (2022): 209–245

© 2022 The White Horse Press.

OPEN ACCESS (CC-BY-4.0-NC-ND)*

* Restrictions may apply to the reuse of images

doi: 10.3197/ge.2022.150202



policy programmes such as the UN Sustainable Development Goals and booming research fields such as sustainability transition studies. Historical studies of sustainability transitions, energy transitions and urban mobility transitions, for example, have recently argued that these debates urgently need robust historical knowledge, contextualisation and critical reflection on their identification of problems, their causes and solution pathways.² Doing so would enable ways of thinking about pathways for the future that challenge and stretch beyond today's dominant imaginaries.³ We also appreciate how, in engaging with these debates, sustainability history explicitly positions itself as interdisciplinary history: if we may take the *Routledge Handbook of Sustainability History* (2018) as a benchmark, the field seeks to exploit its 'broad' sustainability concept to research 'complex interactions' between highly diverse economic, social and environmental sustainability issues often studied separately in economic, social and environmental history, thereby addressing important yet often overlooked dynamics in the historical shaping and emergent futures of our contemporary world-in-crisis.⁴

However, the emergent field also raises major historiographical concerns. Two features in particular are at odds with the postcolo-

¹ J.L. Caradonna, 'The historiography of sustainability: An emergent subfield', *Economic- and Ecobistory* **11** (11) (2015): 7–18.

² S. Arapostathis and P. Pearson, 'How history matters for the governance of sociotechnical transitions', *Environmental Innovation and Societal Transitions* **32** (2019): 1–6; R. Fouquet and P. Pearson, 'Past and prospective energy transitions: Insights from history', *Energy Policy* **50** (2012): 1–7; U. Hasenöhr and J.-H. Meyer, 'The energy challenge in historical perspective', *Technology and Culture* **61** (1) (2020): 295–306; F. Schipper, M. Emanuel, R. Oldenzel, 'Sustainable urban mobility in the present, past, and future', *Technology and Culture* **61** (1) (2020): 307–317.

³ E. de Hoop and S. Arora, 'Material meanings: 'Waste' as a performative category of land in colonial India', *Journal of Historical Geography* **55**: 82–92; R. Bendor et al., 'Looking backward to the future: On past-facing approaches to futuring', *Futures* **125** (2021): 1–12.

⁴ J.L. Caradonna (ed.), *Routledge Handbook of the History of Sustainability* (London: Routledge, 2018); E. van der Vleuten, 'Technology, societal challenges, and global sustainability history', *Icon* **24** (2018): 34–52.

nial Anthropocene sensitivities explored in this special journal issue.⁵ First, sustainability history has scarcely addressed how diverse sustainability challenges across the globe may interact in inequitable ways. Social science sustainability studies have begun to conceptualise and study sustainability interactions across continents through all sorts of ‘sustainability telecouplings’.⁶ By contrast, sustainability history – as the recent Handbook acknowledges – has predominantly focused on either rather generic histories of sustainability ideas and social movements, or on situated sustainability histories in (mostly) nationally or locally delineated societies.⁷ The former insufficiently address specific, diverse and inequitable histories across the globe; the latter tend to exogenise and black-box developments elsewhere. Bridging the gap between the global/generic and the local/specific in sustainability history is long overdue.⁸

This concern is aggravated by a second problem. In our view,

⁵ E. de Hoop et al., ‘Historicising entanglements: Science, technology and socio-ecological change in the postcolonial Anthropocene’, *Global Environment. A Journal of Transdisciplinary History* **15** (2) (2022): 194–208.

⁶ J. Liu et al., ‘Framing sustainability in a telecoupled world’, *Ecology and Society* **18** (2) (2013); C. Friis and J.Ø. Nielsen (eds), *Telecoupling: Exploring Land-Use Change in a Globalised World* (London: Palgrave Macmillan, 2019).

⁷ Caradonna, *Routledge Handbook*, p. 12. Pivotal works in the former tradition: U. Grober, *Sustainability: A Cultural History* (Cambridge: UIT Cambridge Ltd, 2012); J.L. Caradonna, *Sustainability: A History* (New York: Oxford University Press, 2014); P. Warde, *The Invention of Sustainability: Nature and Destiny, c. 1500–1870* (Cambridge: Cambridge University Press, 2018). Examples of the latter: H. Lintsen et al., *Well-Being, Sustainability and Social Development. The Netherlands 1850–2050* (Gewerbestrasse: Springer, 2018); and most contributions to M. Emanuel, F. Schipper and R. Oldenziel (eds), *A U-Turn to the Future: Sustainable Urban Mobility since 1850* (New York: Bergahn, 2020).

⁸ G. Massard-Guilbaud, ‘From the history of sources and sectors to the history of systems and transitions. How the history of energy has been written in France and beyond’, *Journal of Energy History* **1** (2018); F. Veraart, J.-P. Smits and E. van der Vleuten, ‘Connected by oil: a framework to analyze the connected sustainability histories of the Niger and Rhine Deltas, 1950–2015’, *The Extractive Industries and Society* **7** (1) (2020): 50–67; F. Haalboom, ‘Oceans and landless farms: Linking Southern and Northern shadow places of industrial livestock (1954–1975)’, *Environment and History* (Online First 2020).

sustainability history has insufficiently addressed the highly politicised character of the concept of sustainability and, by extension, the field of sustainability history itself. To be sure, virtually all sustainability history authors acknowledge the political pertinence of their research, either pledging unwavering support to making the world more sustainable or urging for critical historiographical reflection on policy making's linearities, teleologies and blind spots. But they have scarcely studied the politics of sustainability knowledge-making itself: scholarly choices of which and whose (sustainability) problems, causes and solutions to study make some issues visible (and potentially actionable and governable), while obscuring others. Which and whose meanings, concerns and responsibilities were historically prioritised and sidelined in sustainability research? Who was, implicitly or explicitly, made responsible for the historical causing and future solving of sustainability challenges? Such questions on the knowledge politics of sustainability research are especially salient if we consider sustainability histories' transnational interconnections.⁹ After all, the field of postcolonial history has amply shown how academic knowledge orders may configure inequitable transnational relations across the globe.¹⁰

If these two shortcomings are not adequately addressed, sustainability history risks (rightful) dismissal as yet another unreflective projection of 'Global North' concerns as global ones. In this study, we therefore address both problems in conjunction and do so for one of the most prominent controversies in contemporary global sustainability history: the controversy on palm oil sustainability. The economic history of palm oil tells us that, by 1970, the so-called Southeast Asian palm oil export cluster had ousted its West-African

⁹ On knowledge politics research traditions: J.-P. Voß and R. Freeman (eds), *Knowing Governance: The Epistemic Construction of Political Order* (Gewerbestrasse: Springer, 2016), pp. 7–11; J.S. Jensen, M. Cashmore and P. Späth (eds), *The Politics of Urban Sustainability Transitions: Knowledge, Power and Governance* (London: Routledge, 2018).

¹⁰ This is of course a large and varied literature. On epistemic differences, see e.g., Sanjay Krishnan, 'The place of India in postcolonial studies: Chatterjee, Chakrabarty, Spivak', *New Literary History* 40 (2) (2009): 265–80.

competitor on the global market, and that European actors and markets had been pivotal to this process (though European imports have since been overtaken by Indian and Chinese imports).¹¹ Existing research also tells us that actors from these two regions in particular have engaged in a political palm oil sustainability controversy that lasts to the present day. A telling example is the narrative frame that advocates for Southeast Asia's 'right to development' against 'neo-colonial' green European NGOs and protectionist EU politicians' concern for 'sustainability' that ignores Europe's own history of deforestation, carbon emissions and biodiversity loss.¹² In this historical and political context, this paper investigates how academic research on palm oil sustainability has variously enacted what is historically problematic about palm oil and by whom this is to be redressed in present and future, with particular focus on how such research has (re)configured relations in and between Southeast Asia and Europe from roughly the 1970s to the 2010s. First, we discuss a strategy to investigate global historical knowledge politics of palm oil sustainability research; next we empirically explore what sorts of insights this approach can yield.

Connected histories and mixed methods

Studying how palm oil sustainability research configured relations within and between two distant regions, Southeast Asia and Europe, is neither self-evident nor unproblematic for two reasons. The first pertains to the historiographical use of regions as spatial research categories; the second to studying a vast body of scientific

¹¹ V. Giacomini, 'The transformation of the global palm oil cluster: Dynamics of cluster competition between Africa and Southeast Asia (c. 1900–1970)', *Journal of Global History* 13 (3) (2018): 374–98; Id., 'The emergence of an export cluster: Traders and palm oil in early twentieth-century Southeast Asia', *Enterprise & Society* 19 (2) (2018): 272–308.

¹² O. Pye and J. Bhattacharya (eds), *The Palm Oil Controversy in Southeast Asia: A Transnational Perspective* (Singapore: Institute of Southeast Asian Studies, 2013), p. 3.

palm oil literature in which not all relevant voices may be equally represented. Let us briefly discuss both issues.

To sensitively investigate transregional palm oil sustainability knowledge politics, we draw on the connected history approach to global history. For over two decades, connected history has sought to transcend the gap between the generic patterns of ‘globalisation history’ and what Sanjay Subrahmanyam called the ‘methodological fragmentationalism’ of area studies – a task akin to the first challenge to sustainability history that we identified above.¹³ It did so by studying how the diverse and specific histories of distant regions nevertheless developed in mutual interaction through all sorts of connections. The historiography and anthropology of such connections, too, has long dismissed assertions of deterministic and unifying influences, and instead made the frictional encounters of ‘connectors’ and ‘that which was connected’ an open-ended research question.¹⁴ Given our research questions and case study, we focus on the question of how relations between particularly Southeast Asia and Europe (‘the connected’) were mediated by palm oil knowledge infrastructure and the palm oil sustainability research that it hosted (a pivotal ‘connector’, next to trade and finance).

While connected history thus conceptualised transregional history, it also warned against essentialising regions such as ‘Asia’ or ‘Europe’ as singular universals. It builds on, but also critiques, early post-

¹³ S. Subrahmanyam, ‘Connected histories: Notes towards a reconfiguration of early modern Eurasia’, *Modern Asian Studies* 31 (3) (1997): 735–62, at 745. Also: C. Douki and P. Minard, ‘Global history, connected histories: A shift of historiographical scale?’, *Revue d’histoire moderne et contemporaine* 54/4 (5) (2007): 7–21; S. Conrad, *What is Global History?* (Princeton: Princeton University Press, 2016). Compare the ‘relational history’ of A. Epple, ‘Calling for a practice turn in global history: Practices as drivers of globalization/s’, *History and Theory* 57 (3) (2018): 390–407.

¹⁴ R. Wenzlhuemer, ‘Connections in global history’, *Comparativ* 29 (2) (2019): 106–21. Also: A.T. Lowenhaupt, *Friction: An Ethnography of Global Connection* (Princeton: Princeton University Press, 2011); G. Hecht, *Being Nuclear: Africans and the Global Uranium Trade* (Cambridge MA: The MIT Press, 2012); P. Högselius, A. Kaijser and E. Van der Vleuten, *Europe’s Infrastructure Transition: Economy, War, Nature* (London: Palgrave Macmillan, 2015).

colonial studies in the footsteps of Edward Said and others: the early study of academic knowledge orders that undergirded power relations between distant regions was criticised for reproducing monolithic and ahistorical us-them binaries ('the West' producing knowledge to represent and dominate 'the rest'). To avoid this pitfall, connected history authors emphasised the plurality of connections within and between regions. Indeed, whether and how the 'unevenly connected pluralities' that we habitually call 'regions' can become meaningful objects of historiographical knowledge is considered a research question that should not be presupposed but asked to source.¹⁵ In our palm oil case, we therefore made efforts not to assume, but to critically assess, whether and how our sources configured transregional politics of difference between Southeast Asia and Europe.

This leads us to the second issue, which is how to deal with the sources involved. Historically studying the vast academic literature on palm oil and palm oil sustainability is tricky in several ways. To engage these abundant sources meaningfully, we draw on digital history insights. First, we follow the suggestion to use hybrid, mixed-method research strategies combining big data analysis and 'distant reading' with close reading.¹⁶ To sensibly tease out the knowledge orders (re)produced in this literature in its entirety as well as in specific publications, we iteratively alternated between zooming out and zooming in: 'zooming in' here denotes close reading and interpretation of specific publications, while 'zooming out' refers to consulting the scientific publication database Scopus and its analytics functions

¹⁵ S. Schaffer, 'Origins and barriers: Reflections on Subrahmanyam', *Modern Asian Studies* 50 (1) (2016): 52–60, at 52; S. Subrahmanyam, *Europe's India: Words, People, Empires, 1500–1800* (Cambridge MA: Harvard University Press, 2017), pp. xi–xii; I. Chatterjee, 'Connected histories and the dream of decolonial history', *South Asia: Journal of South Asian Studies* 41 (1) (2018): 69–86; E. van der Vleuten and T. Feys, 'Borders and frontiers in global and transnational history', *Journal of Modern European History* 14 (1) (2016): 29–34. On (post) Saïdian approaches: D.M. Varisco, *Reading Orientalism: Said and the Unsaid*, 2nd edition (Seattle, WA: University of Washington Press, 2017).

¹⁶ G. Zaagsma, 'On digital history', *BMGN-Low Countries Historical Review* 128 (4) (2013): 3–29.

to make quantitative observations for large numbers of sources. We pragmatically selected the Scopus database because it holds significantly more records than Web of Science and provides more analytical possibilities than Google Scholar.

Digital history insights also urge us to contextualise and examine which and whose voices are represented in digital datasets. This is particularly relevant given our research questions: from a postcolonial critique perspective as well as a scientometrics perspective, we might expect an overrepresentation of authors affiliated with European research institutions defining palm oil sustainability issues in Southeast Asia, and an underrepresentation of ‘research produced in non-Western countries, non-English language research, and research from the arts, humanities, and social sciences’, as one prominent scientometric commentator recently phrased it.¹⁷

Quantitative analysis of our datasets cannot reveal knowledge politics at work, but it does allow for a rough check on the spatial distribution of author affiliations. Scopus holds about 27,000 English-language publications on palm oil (that is, practically speaking, featuring ‘palm’ and ‘oil’ in the title, abstract or keywords) since 1884, and some 2,500 publications on palm oil combined with the term sustainability since 1980.¹⁸ Compared to these numbers, Scopus-listed publications in German, French and Bahasa seem marginal, as does a literature in Bahasa that exists outside Scopus.¹⁹

Our affiliation-check showed a strong presence of voices affiliated with Global North-based as well as with Global South-based

¹⁷ J. Tennant, ‘Web of Science and Scopus are not global databases of knowledge’, *European Science Editing* 46 (2020): e51987. Also: P. Mongeon and A. Paul-Hus, ‘The journal coverage of Web of Science and Scopus: A comparative analysis’, *Scientometrics* 106 (2016): 213–28.

¹⁸ www.scopus.com search string 1: TITLE-ABS-KEY (palm AND oil): 27,270 results. Search string 2 TITLE-ABS-KEY (palm AND oil AND sustainab*): 2,500 results, (consulted 25 Jan. 2021).

¹⁹ ‘Palmöl’ and ‘Huile de Palme’ returned under 40 Scopus records each since 1840. ‘Minyak sawit’ resulted in 208 Scopus records since 2006, and 1,000 records in a Google Scholar search on Harzing’s Publish & Perish (last consulted 11 Feb. 2021). Only English-language records were close-read.

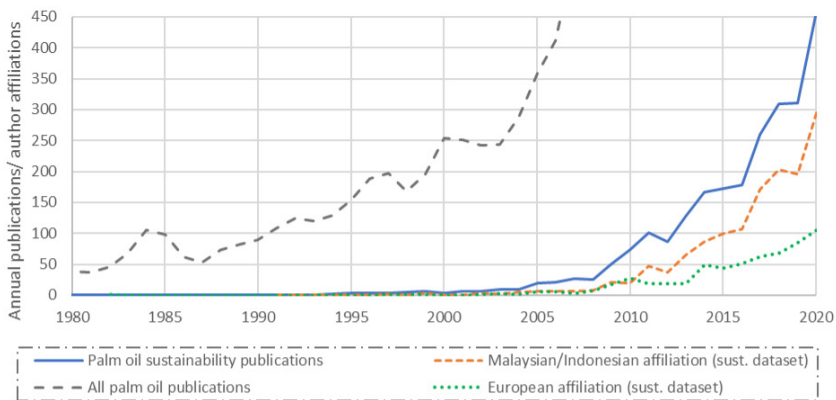
research institutes in palm oil sustainability research. For the smaller Scopus dataset on palm oil sustainability, some 42 per cent of nearly 3,500 contributing authors with known affiliations were affiliated with a research institute in Malaysia or Indonesia. Approximately 25 per cent were affiliated with a research institute in Europe or North America. Institutes such as the *Universiti Putra Malaysia* and *Universiti Teknologi Malaysia*, and sponsors such as the Malaysian Ministry of Education, topped their respective lists; the first research institute outside Southeast Asia (Wageningen University & Research, the Netherlands) only ranked #8 in number of author affiliations. The dataset's Global North–South distribution, if we may use those tricky terms for the purpose at hand, does not display major changes through time: before 2005, a third of the publications originated from Europe or North America, and this percentage decreased slightly thereafter. The spatial distribution of the larger dataset of all 27,000 palm oil publications was not fundamentally different.²⁰

The temporal distribution of publications in these Scopus datasets is much more uneven. Annual palm oil publications grew from dozens per year during the 1970s and 1980s, to about a hundred per year throughout the 1990s, to thousands per year during the past few years. Specific publications on palm oil ‘sustainability’ display a comparable temporal distribution: annual publication numbers were low (under ten) before 2005, then grew to hundreds throughout the 2010s (Figure 1). The implication for our inquiry was that for the period prior to 2005, we needed to complement analysis of the palm oil sustainability dataset with records from the larger dataset in order to contextualise tentative findings.

This leads us, finally, to a word about our research procedure. The empirical findings presented in the next sections result from multiple zooming-out zooming-in iterations. Exploratory quantitative

²⁰ In the dataset of 27,000, Malaysian and Nigerian author affiliations topped the table with jointly 35% of 555 known affiliations in 663 records in the 1980s. Overall the Global North–South distribution was about 50/50. In 2020, Malaysian and Indonesian affiliations topped the table with 44% of 4,223 known author affiliations in 2,905 records.

Figure 1. Spatio-temporal distribution in Scopus publications on palm oil sustainability 1980–2020



Source: www.scopus.com search string 2: TITLE-ABS-KEY (palm AND oil AND sustainab*) (consulted 25 January 2021).

database queries combined with explorative reading of hundreds of abstracts across time provided tentative insights into the chronological, spatial and thematic dynamics of palm oil sustainability research. Subsequent, more targeted, dataset queries helped identify specific sets of publications for close-reading: We analysed these either in chronological order, or – in case of excessively large numbers of records – in order of citation scores. Of course, citation scores are a contested indicator, and overlook alternative, less-frequently cited, lines of argumentation and investigation. We therefore complemented the analysis by seeking publications on palm oil in less-frequently cited fields to identify their key lines of investigation. We used a data extraction form to systematically record findings about each selected publication concerning articulations of (a) research aim; (b) the palm oil practice studied; (c) sustainability challenges; (d) problem ownership; (e) solution(s); (f) who would need to change which practices to achieve solution(s); (g) inter-, intra- and extra-regional spatial categories; and (h) authors’ disciplinary and geographical affiliations.

We continued processing additional publications until reaching a saturation point where additional readings no longer added significant insights. These data extraction forms formed the basis for identifying historical patterns, which were then further articulated through additional database queries and close reading.

The following section discusses our empirical findings for the period when palm oil sustainability research slowly emerged; next follows a discussion of the accelerated growth period from 2005 onward.

Early palm oil sustainability research, 1970–2004

By the 1970s, when the Southeast Asian export cluster had definitively ousted the West African ‘palm belt’, a palm oil research infrastructure had long been established.²¹ Indeed, the global economic history of palm oil tells us that scientific research had played a major role in the competition and collaboration between the two export clusters. Already by the mid-1920s, West-African colonial officials and agronomists had observed that research and innovation gave Malaysian and Indonesian palm oil a productivity and quality advantage: the agricultural experimental station AVROS on Java and the Serdang Agricultural Department in Malaya, amongst others, studied plant breeding and pathology, oil press mechanisation, laboratory quality control and more. The Kuala Lumpur-based Incorporated Society of Planters and its journal disseminated findings to plantations. In response, West African agronomists built their own research infrastructure. Over time, however, West-African postcolo-

²¹ Giacomini, ‘The transformation of the global palm oil cluster’; Id., ‘The emergence of an export cluster’; F. Veraart, ‘Catalysing socio-ecological change: the extraction and processing of edible oils, 1910–1940’, *Global Environment. A Journal of Transdisciplinary History* 15 (2) (2022). For intra-Asian transnational palm oil historiography, see J.H. Drabble and K.T. Joseph, ‘A note on “Agricultural History” of Peninsular Malaysia: Contributions from Indonesia by K.T. Joseph [with Response]’, *Journal of the Malaysian Branch of the Royal Asiatic Society* 82 (1) (2009): 113–19.

nial turmoil (notably in Nigeria) and Southeast Asian scientific employee attraction policies (especially in Malaysia) had driven many researchers eastward, helping seal the Southeast Asian export cluster's dominance. This historical legacy aligns with the strong presence of Southeast Asian institutes in palm oil research that we noted in the previous section.

Did such transregional politics also emerge within academic knowledge on palm oil 'sustainability'? Our datasets allow for several observations on the early years of such research. With regard to *when* palm oil sustainability research emerged, we observe that very few publications explicitly and prominently discussed the 'sustainability' of palm oil at all in this early period. Our Scopus query merely returned about sixty publications explicitly studying 'palm oil' in relation to 'sustainability' (that is, using these terms in their title, abstract or keywords) out of over 3,600 publications on palm oil in 1970–2004. Among these publications, sustainability research was absent in the 1970s, sparse between 1980 and 1993 (a mere five records), and thereafter gained a slightly more structural presence. Sustainability-related terms like 'habitat', 'ecology', 'nature' or 'environment' were used *either* equally marginally, or in irrelevant meanings ('the nature of the problem'), or referred to themes we already identified in our dataset.²² Apparently sustainability talk made very slow headway in palm oil research – even after the 1987 Brundtland report and the 1992 Rio Declaration on Environment and Development had supposedly sparked worldwide attention for 'sustainable development'.

Early palm oil research thus marginalised sustainability issues to the advantage of other themes. A superficial probe of the Scopus dataset of all palm oil publications for the 1970s alone (227 records) suggests that agricultural, chemical and, to a lesser extent, medi-

²² Scopus search (16 Feb. 2021) TITLE-ABS-KEY (palm AND oil) AND PUBYEAR AFT 1969 AND PUBYEAR BEF 2005: 3,643 records. Combined with 'sustainab*' (61), 'biodiversity' (20), 'habitat' (31), 'Climate Change' (13), 'ecolog*' (52), 'Nature' (93), 'forest*' (166), 'pollution' (101), 'waste' (233), 'environment*' (225).

cal science research overwhelmingly dominated the scene. Though disciplinary categories often overlapped in specific publications, a pattern is clearly discernible. Agricultural research focused mostly on improving palm oil cultivation and yields through the study of e.g., soil nutrients, pollination, tree growth, fruit bearing productivity, tree health, pest control and so on. Chemical research mostly focused on processing – palm fruit milling, crude oil refining and processes in the food and oleochemical industries. Health studies discussed a rather broad variety of human health problems or remedies that related to palm oil intakes or palm oil plantation labour. Most research focused on tropical areas where cultivation, most processing and part of the usage took place. Discussions of nutrition, health and opportunities for oleochemical industries referred to European and North American contexts as well.

When palm oil ‘sustainability’ research emerged, it latched itself onto these existing research lines. Most palm oil sustainability publications in our dataset addressed ‘sustainability’ in relation to palm oil *cultivation* in ‘tropical climates’, and to a lesser degree in relation to processing and use. The limited number of records allows for close examination of what and whose ‘sustainability’ issues were highlighted in each publication.

Concerning palm oil cultivation, our bottom-up examination revealed an overall pattern featuring two prominent sustainability discourses, which performed partly converging, partly diverging, knowledge politics. On one hand, most publications addressed indigenous agricultural problems and solutions in specific regions or countries (in Malaysia and Indonesia but also the Amazon and Cerrados in Brazil, the Adja Plateau in South Benin, Southern Nigeria, Colombia etc). The authors usually worked at research institutions in these same countries, sometimes collaborating with foreign researchers. We therefore identify this research line as a ‘domestic sustainability’ narrative. In these publications, the term ‘sustainable’ predominantly referred to sustaining agricultural activity, notably smallholder palm oil cultivation and small ruminant farming. These activities faced problems of soil nutrient exhaustion, low productivity and insufficient farmer family or community income. ‘More

sustainability' accordingly meant improving the organic matter balance (e.g. by integrated palm oil and ruminant farming where palm waste served as animal fodder) and increasing 'technology uptake' to boost yields and generate predictable incomes.²³ In Malaysia, the global palm oil export leader, 'sustainability' also referred to sustaining palm oil sector growth in the national economy: in anticipation of future labour and land shortages, research and innovation were deemed crucial to increase yields and sustain the flow of the country's 'green gold' to downstream domestic refining and oleochemical processing industries.²⁴ A different but telling example of this 'the environment sustains economic activity' discourse is that palm oil plantations unexpectedly proved attractive to pythons and therefore, according to the researchers, boosted the long-term 'sustainability' of the commercial snake leather trade (from Northern Sumatra to Australia in this case).²⁵

On the other hand, palm oil cultivation research affiliated with research institutes in high-income countries or international organisations tended to foreground how economic activity threatened universalised 'global' environmental concerns. Endangered ecosystems in turn threatened – in equally universalised wording – 'human welfare' and 'human needs'. We therefore identify this research line as a 'global problems' narrative. These publications drew their problem definitions directly from Global North agencies and international organisations such as the Food and Agriculture Organisation, the World Bank, the 1992 UN Rio Conference, or the

²³ V. Koudokpon, J.H.A.M. Brouwers, M.N. Versteeg and A. Budelman, 'Priority setting in research for sustainable land use: The case of the Adja Plateau, Benin', *Agroforestry systems* **26** (2) (1994): 101–22; C.U.B. Pinheiro and J.M.F. Frazão, 'Integral processing of babassu palm fruits: Village level production in Maranhão, Brazil', *Economic botany* **49** (1) (1995): 31–39.

²⁴ G.K.A. Parveez et al., 'Transgenic oil palm: Production and projection', *Biochemical Society Transactions* **28** (6) (2000): 969–72; J. Othman, M.H. Alias and M. Jusoh, 'Sustainability of growth in the Malaysian oil palm farm subsector', *Journal of International Food & Agribusiness Marketing* **16** (2) (2004): 85–101.

²⁵ R. Shine, H.P.S. Ambariyanto and Mumpuni, 'Ecological attributes of two commercially-harvested python species in northern Sumatra', *Journal of Herpetology* **33** (2) (1999): 249–57.

International Tropical Timber Organization. The first palm oil sustainability publication in our dataset illustrates the way of thinking that later authors followed: John Spears (1980) was introduced to readers of the FAO forestry journal *Unasylva* as a World Bank Forestry Adviser (though expressing ‘personal views’). Spears discussed how to combine sustainable farming and forestry for diverse crops including the oil palm in Malaysia. He drew his problem definition from ‘environmental agencies’ in the United States and FAO global deforestation estimates, which suggested that the bulk of tropical forest ecosystems would be ‘irreversibly lost’ by the mid-twenty-first century unless trends were reversed. Spears was explicit about where the problem resided (‘tropical developing countries’) and what and who would suffer from the problem: the victims were ‘genetic diversity’ and overall ‘human welfare’, which would suffer from loss of drugs and medicines available from tropical woody plants.²⁶ Late 1990s authors would add climate change to the list of global problems, highlighting that rainforests and peat bogs constitute important carbon sinks (for which they cited the 1992 Rio Declaration and Conventions as their source).²⁷

Spears and his successors were also univocal about who was responsible for causing and solving these global problems. For all crops combined (and palm oil was considered exemplary), the ‘root cause’ was the slash and burn tactics of some 200 million migrant subsistence farmers practising ‘shifting agriculture’. This definition of the problem cause prefigured the proposed solution: subsistence farmers should move from ‘extensive’ shifting agriculture to ‘intensive’ small-holder plantations. They should abandon migratory life for stable settler communities and employ techno-scientific tools to establish

²⁶ J.S. Spears, ‘Can farming and forestry coexist in the tropics’, *Unasylva* **32** (128) (1980): 2–12.

²⁷ R. Härdter, W.Y. Chow and O.S. Hock, ‘Intensive plantation cropping, a source of sustainable food and energy production in the tropical rain forest areas in southeast Asia’, *Forest Ecology and Management* **91** (1) (1997): 93–102; M.N. Salleh, ‘Sustainability: The panacea for our forestry ills?’, *Journal of Sustainable Forestry* **4** (3–4) (1997): 33–43; W. Gerritsma and M. Wessel, ‘Oil palm: Domestication achieved?’, *NJAS Wageningen Journal of Life Sciences* **45** (4) (1997): 463–75.

sustainable agriculture ‘in harmony with tropical ecosystems’. In this socio-ecological imaginary, palm oil plantations were cast as sustainable solutions, not the sustainability problem cause that they became in some later research (see below). Furthermore, this ‘Global problems’ discourse also presented Global South governments as bearing key responsibilities: according to the authors, these should organise plantation support services (e.g. fertiliser and seeds provision, agricultural research, feeder roads, marketing outlets) and introduce forest protection measures. The plantation support services and environmental plans for biotic reserves of the Malaysian government counted as exemplary best practice.²⁸ Global North markets and actors (users, traders, investors) were remarkably and utterly absent in discussions about who was responsible for causing and solving sustainability problems. The exception was scientists raising awareness and producing relevant knowledge. Even powerful players such as the World Bank, in Spears’ words, ‘can only be marginal ... the main impetus must come from within the developing countries themselves’.²⁹

Despite their differences, the ‘domestic sustainability’ and ‘global problems’ narratives converged in equating ‘more sustainability’ with introducing intensive palm oil cultivation for most of this early period. In tropical reforestation programmes, palm oil plantations were even heralded as ‘the best possible substitutes for the rain forest i.e., intensive tree crop plantation that is both economically attractive and environmentally sound’.³⁰ However, at the turn of the millennium several publications started casting large plantations as the *source* of, not the solution to, sustainability problems. This reversal had been brewing in the 1990s: landscape ecology studies had suggested that in West Kalimantan, the supposed ‘root cause’ of shifting agriculture had lower environmental impacts than plantations.³¹

²⁸ J.A.N. Wallis, *Intensified Systems of Farming in the Tropics and Subtropics* (Washington, DC: World Bank, 1997).

²⁹ Spears, ‘Can farming and forestry coexist’, 14.

³⁰ Hårdter et al., ‘Intensive plantation cropping’, 94.

³¹ D.L. Peart and D.R.M. Leighton, ‘The impact of shifting cultivation on a rainforest landscape in West Kalimantan: Spatial and temporal dynamics’, *Landscape Ecology* 13 (3): 135–48

Studies of the 1997 'Southeast Asian haze crisis' further shifted the 'root cause' label towards large palm oil companies burning forest not only because it was the cheapest and fastest way to clear land but also to forcibly acquire land from local smallholders who refused to sell – supported by (especially Indonesian) government policies for boosting plywood and palm oil exports.³² By the time the Roundtable for Sustainable Palm Oil (RSPO) and its voluntary certification scheme were established (see next section), the sustainability knowledge politics of palm oil cultivation were certainly in motion.

We conclude this section with some brief observations on sustainability research addressing palm oil processing and use. These, too, adhere to the two dominant discourses identified above. As for processing, a number of early palm oil sustainability publications discussed sustainability in terms of local pollution by palm oil mills and crude oil refineries. These studies adhered to the 'domestic sustainability' narrative and were dominated by Malaysian authors. By the late 1990s, several publications concluded that Malaysian government regulations (e.g. mandatory Environment Impact reports) and innovation (e.g. ponding systems) had by and large solved these environmental pollution problems, and had thereby made the palm oil sector 'sustainable' – a remarkable consensus in the light of later debates that we discuss in the next section.³³ Also note that an additional query of the dataset containing all palm oil publications revealed a substantial body of Malaysian palm oil mill pollution research from the mid 1970s; this research line used the term 'sustainability' only incidentally. Oil mill pollution was much more important to domestic actors than our source selection based on the search term 'sustainability' would suggest.

Concerning palm oil uses, some research focused on using palm oil as fuel: The 'sustainable production of fuels and chemicals from

³² M.A. Kasmó, 'The Southeast Asian haze crisis: Lesson to be learned', *WIT Transactions on Ecology and the Environment* **64** (2003):1263–71; U. Scholz, 'Oil pest in the rainforest?', *Geographische Rundschau* **56** (11) (2004): 10–17.

³³ S. Gurmit, 'The Malaysian oil palm industry', *Industry and Environment* **22** (2–3) (1999): 45–48, at 45; A.R. Abdullah, 'Environmental pollution in Malaysia', *TRAC Trends in Analytical Chemistry* **14** (5) (1995): 191–98.

plants' referred to substituting fossil oil with a renewable source to prevent the worldwide collapse of civilisation (sic!).³⁴ Such research clearly inscribed itself in the 'global problems' narrative. Similar to the case of palm oil milling pollution, there was also a larger body of Malaysian research on domestic energy produced from palm oil waste ('soft energy', 'alternative energy' or 'renewable energy') that was only incidentally labelled as 'sustainability' research – at least until the Malaysian government introduced renewable energy policies in the new millennium.³⁵ Such research resonated with the 'domestic sustainability' narrative. Research on domestic Malaysian use of plantation waste in pulp and paper industries also resonated with this narrative, equating sustainability with 'sustainable resource use' and making the domestic paper industry self-sufficient.

Finally, palm oil consumption was addressed in nutrition and health research. Research that explicitly uses the term 'sustainability' adhered to the 'global problems' narrative and focused on the 'global development problem' of child mortality in 'developing countries'. Red palm oil consumption counted as a cheap and viable solution to the problem of vitamin A deficiencies and associated diseases. Crude palm oil contains fifteen times the carotene content of carrots and could be added to baking industry products if taste issues could be solved. Researchers contributing to this field were scattered across the globe and employed 'sustainability' in the sense of palm oil being 'generally available and not subjected to acute seasonal shortages'.³⁶

Our scoping of the broader palm oil literature revealed two oth-

³⁴ M. Seibert et al., 'Fuel and chemical co-production from tree crops', *Biomass* 9 (1) (1986): 49–66.

³⁵ W.K. Keong, 'Soft energy from palm oil and its wastes', *Agricultural Wastes* 3 (3) (1981): 191–200. TITLE-ABS-KEY ('palm oil') AND PUBYEAR < 005 searched for 'energy' (231 records), 'diesel' (71), 'fuel' (105); 'biofuel' (16). (Search date: 3 March 2021).

³⁶ E.F. Amoafu, 'Planning a national food-based strategy for sustainable control of vitamin A deficiency in Ghana', *Food and Nutrition Bulletin* 22 4 (2001): 361–65; N. Scrimshaw, 'Nutritional potential of red palm oil for combating vitamin A deficiency', *Food and Nutrition Bulletin* 21 (2) (2000): 195–201.

er substantial strands of health research outside the palm oil ‘sustainability’ dataset that nevertheless deserve mentioning. Whereas research on palm oil plantation workers health (e.g., parasitic and bacterial infections) resonated with the domestic sustainability narrative, a large body of research on tropical oils and cardiovascular disease echoed the global problems discourse. The latter research strand studied the hypothesis that saturated fatty acids in ‘edible tropical oils’ (notably including palm oil) increase cardiovascular disease risks of ‘man’ or ‘humans’. Even though such risks indeed apply in both the Global North and South, this research clearly echoed North American and European concerns and researchers in this historical context. The hypothesis itself was greatly promoted through research sponsored by the American Soybean Association, which also petitioned US politicians to halt imports of ‘unhealthy’ foreign competitors to its domestic soy produce. The hypothesis was contested and later rejected by research that found no adverse health effects. Today the tropical oils controversy is known as an instance of misusing science for commercial purposes.³⁷

The growth and consolidation of palm oil sustainability research, 2005–2016

We have seen that palm oil sustainability research was slow in the making, even though the 1987 Brundtland report and especially the 1992 Rio Declaration and its Biodiversity and Climate Change Conventions had created a sustainability buzz in the international policy scene and problematised tropical deforestation. And yet, palm oil sustainability research only started booming from 2005 and especially since 2008. Global palm oil production and consumption had increased vastly by then. Also, transnational NGOs had prominently voiced concerns about palm oil’s biodiversity impacts,

³⁷ D.J. McNamara, ‘Palm oil and health: A case of manipulated perception and misuse of science’, *Journal of the American College of Nutrition* 29 (3 Suppl) (2010): 240S–244S; J.O. Osaretin, S. Ofori and O. Maduka, ‘Palm oil and the heart: A review’, *World Journal of Cardiology* 7 (3) (2015): 144–49.

particularly in Europe. In response, the World Wildlife Fund for Nature (WWF) and major palm oil buyers and retailers (e.g. Unilever and the Malaysian Palm Oil Association) jointly set up the Roundtable of Sustainable Palm Oil (RSPO) in 2004, a transnational governance mechanism that operates on the basis of a voluntary sustainability certification.³⁸ And in the context of European energy policy, in 2009 the EU renewable energy directive (EU RED) set sustainability criteria and ‘sustainable’ biodiesel blending requirements for European automobile fuels.

Our inquiry of this period focused on three datasets: (1) research on palm oil sustainability published between 2005 and 2007, when research on palm oil sustainability first started growing (68 documents); (2) research on palm oil sustainability relating explicitly to Southeast Asia, Malaysia or Indonesia published between 2008 and 2016 (343 documents); and (3) research on palm oil sustainability relating explicitly to Europe, the Netherlands, France, Germany and/or the UK published between 2008 and 2016 (63 documents, of which one-third also related explicitly to Southeast Asia). All titles and abstracts were analysed. In-depth reading of full publications was performed until we reached saturation, resulting in analysing all publications published between 2005 and 2007; the 100 most-cited publications from the 2008–2016 Asia dataset; and the thirty most-cited for the 2008–2016 Europe dataset). In addition, we explicitly looked for counter-voices among less-frequently cited publications in each dataset.

This inductive procedure led us to identify four major thematic lines of palm oil sustainability research for this period: research on Malaysia’s oil palm biomass abundance and associated pollution, on the sustainability impacts of cultivating palm oil, on governing palm oil cultivation (predominantly RSPO-focused), and on biofuels for Europe. Cutting across these research strands, we observe that authors scarcely blamed specific actors for the sustainability problems at hand explicitly. Instead, the attribution of blame now became rather

³⁸ O. Pye, ‘The biofuel connection – transnational activism and the palm oil boom’, *The Journal of Peasant Studies* 37 (4) (2010): 851–74.

implicit in the problems and solutions articulated, as our discussion below shows. Let us briefly discuss these four research strands.

Malaysia's polluting oil palm biomass: promises and problems

The question of what to do with the abundant and polluting presence of oil palm biomass that remained once oil had been extracted from the fruits remained a key research theme during the 2005–2016 period, particularly among chemical engineers based at Malaysian research institutes. Although some had declared the problem of water pollution from oil palm mills to be 'solved' in 1995, the problem turned out to be rather persistent.³⁹

This body of research presented oil mill pollution as an ecological problem in itself, or as a threat to local rivers' ecologies and to those who depend on these rivers. These studies typically presented the non-use of palm oil biomass waste (i.e., for renewable energy, building materials and fermentation media) as a missed opportunity for Malaysia's economy and for the mitigation of greenhouse gas emissions. As such, residual biomass was positioned as *the* obstruction to creating an ecologically and economically sustainable Malaysian palm oil industry capable of supplying the global palm oil market.⁴⁰ These studies thus investigated how to turn palm oil waste into bio-energy, building materials and fermentation media, and to how to render the respective industries in which these are used more sustainable.⁴¹ The tone was not univocally positive – this research (which included only a small number of publications by European

³⁹ See above.

⁴⁰ This is voiced most clearly and explicitly by T.Y. Wu et al., 'A holistic approach to managing palm oil mill effluent (POME)', *Biotechnology Advances* **27** (1) (2009): 40–52.

⁴¹ S.-H. Kong et al., 'Biochar from oil palm biomass: A review of its potential and challenges', *Renewable and Sustainable Energy Reviews* **39** (2014): 729–39. M.K. Lam and K.T. Lee, 'Renewable and sustainable bioenergies production from palm oil mill effluent (POME): Win–win strategies toward better environmental protection', *Biotechnology Advances* **29** (1) (2011): 124–41.

scholars) regularly observed that Malaysia's oil palm biomass-based industries remained small and fragmented.⁴² Either way, this research called upon Malaysia's government to produce supportive policies and R&D funding, but did not issue recommendations for actors outside Malaysia. In its articulation of problems, solutions, and responsibilities, it echoed the domestic sustainability discourse that we identified in the previous section.

'Impacts' of palm oil cultivation

A second research line also flourished: environmental scientists based at institutes in the global North, often in collaboration with (rarely first!) authors based in the global South, massively investigated the 'impacts' of palm oil cultivation. The actor-term 'impact' reflected a unidirectional causal understanding of the relationship between palm oil cultivation practices and socio-ecological and socio-economic dynamics in production areas (as opposed to, for example, studying this relationship in terms of 'mutual shaping' or 'co-construction'). In contrast to 'domestic sustainability' research that targeted oil palm biomass pollution and waste as the main sustainability challenge, this scholarship presented the accumulated global ecological effects of tropical land use change following palm oil cultivation as the main concern.⁴³

As such, this work represents a continuation of the 'global problems' discourse identified during the previous period. Much effort went into mapping and modelling palm oil-induced land use change

⁴² M.S. Umar, P. Jennings and T. Urmee, 'Generating renewable energy from oil palm biomass in Malaysia', *Biomass and Bioenergy* **62** (2014): 37–46; Id., 'Sustainable electricity generation from oil palm biomass wastes in Malaysia', *Energy* **67** (2014): 496–505. U.E. Hansen and I. Nygaard, 'Sustainable energy transitions in emerging economies: The formation of a palm oil biomass waste-to-energy niche in Malaysia 1990–2011', *Energy Policy* **66** (2014): 666–76.

⁴³ V. Subramaniam et al., 'Life cycle assessment of the production of crude palm oil (Part 3)', *Journal of Oil Palm Research* **22** (2010): 895–903; S.B. Hansen et al., 'Trends in global palm oil sustainability research', *Journal of Cleaner Production* **100** (2015): 140–49.

at specific locations as well as aggregated scales, and into quantifying the effects thereof on the familiar ecological problems that were presented as ‘global’ – rising greenhouse gas levels in the atmosphere and biodiversity decline, the latter caused by the destruction of ecosystems and species habitats.⁴⁴ Based thereon, most publications argued for ‘better’ (that is, informed by their scientific findings) and stricter land-use planning and certification standards, and for the development of methods to repair damage already done (such as reforestation). Scholars for example modelled how much expansion of ‘sustainable’ palm oil plantations would still be possible if these scientific recommendations were put into practice.⁴⁵

While doing so, this research and its recommendations typically continued to ignore, and thus render comparatively invisible, the diversity of Indonesian and Malaysian perspectives and politics regarding land use and desirable development pathways. Moreover, by conceptualising global problems as being singularly caused by palm oil cultivation, these studies trained all attention on how to change cultivation practices and ignored the role of e.g. the global agricultural commodities trade and its sustainability implications – this latter subject only attracted a handful of studies.⁴⁶ And so, even when these ‘global problem’ studies made recommendations to (European) demand-side policy actors, they proposed policies that did not require demand-side actors to reduce trade or consumption. Instead, they foregrounded certification, commodity roundtables, moratoria and

⁴⁴ Mapping land use change: e.g., B. Wicke et al., ‘Exploring land use changes and the role of palm oil production in Indonesia and Malaysia’, *Land Use Policy* **28** (1) (2011): 193–206. Biodiversity assessment: e.g., D.S. Wilcove and L.P. Koh, ‘Addressing the threats to biodiversity from oil-palm agriculture’, *Biodiversity and Conservation* **19** (4) (2010): 999–1007.

⁴⁵ E. Sumarga and L. Hein, ‘Mapping ecosystem services for land use planning, the case of Central Kalimantan’, *Environmental Management* **54** (1) (2014): 84–97; D. Afriyanti, C. Kroeze and A. Saad, ‘Indonesia palm oil production without deforestation and peat conversion by 2050’, *Science of the Total Environment* **557–558** (2016): 562–70; J. Pirker et al., ‘What are the limits to oil palm expansion?’, *Global Environmental Change* **40** (2016): 73–81.

⁴⁶ A. Chaudhary and T. Kastner, ‘Land use biodiversity impacts embodied in international food trade’, *Global Environmental Change* **38** (2016): 195–204.

zero-deforestation pledges that primarily required changes of practices by production-site actors. As before, scholars predominantly based at global North research institutes by-and-large displaced the responsibility for addressing 'global' problems away from those who trade and consume palm oil towards those who cultivate palm oil; they usually did so implicitly, and rarely engaged in discussions of whose interests their recommendations might or might not serve.⁴⁷

Zooming in on the main 'culprit' of palm oil producers, our sources stressed that, during the 2000s, the most rapid expansion of oil palm cultivation took place among smallholders. Global problems research accordingly studied the effects of smallholder cultivation practices on socio-economic and ecological parameters.⁴⁸ This knowledge was presented as useful to inform 'better' local land-use planning and to develop and stimulate the use of more ecologically-friendly cultivation methods. Scholars argued and lamented that smallholders' farm-level decision-making prioritised economic profitability over ecological balance, and suggested developing (local, national and global) policy-instruments that would render these eco-friendly choices economically profitable for smallholders – as per the researchers' and planners' definitions of profitability.⁴⁹

Finally, we did identify several critical counter voices to this dominant 'global problems' narrative. For example, comparatively few studies actually investigated, rather than predefined, smallholders' socio-economic priorities. Such research showed how smallholder preferences for cultivation methods in e.g. Sarawak, Malaysia were

⁴⁷ R. Tsujino et al., 'History of forest loss and degradation in Indonesia', *Land Use Policy* 57 (2016): 335–47.

⁴⁸ J.S.H. Lee et al., 'Oil Palm smallholder yields and incomes constrained by harvesting practices and type of smallholder management in Indonesia', *Agronomy for Sustainable Development* 34 (2) (2014): 501–13. J.J. Kessler et al., 'Biodiversity and socioeconomic impacts of selected agro-commodity production systems', *The Journal of Environment & Development* 16 (2) (2007): 131–60.

⁴⁹ J. Drescher et al., 'Ecological and socio-economic functions across tropical land use systems after rainforest conversion', *Philosophical Transactions of the Royal Society B: Biological Sciences* 371 (1694) (2016): 20150275; Y. Clough et al., 'Land-use choices follow profitability at the expense of ecological functions in Indonesian smallholder landscapes', *Nature Communications* 7 (1) (2016): 13137.

shaped by the political balancing of interests of a wide variety of stakeholders – an insight often missed in top-down global problems research.⁵⁰ Also the Malaysian domestic sustainability research that we discussed above can be interpreted as a counter voice to much of the ‘global problems’ literature; rather than starting from the understanding that palm oil cultivation has undesirable global sustainability implications and needs to be improved, these publications posited that palm oil cultivation in Malaysia is sustainable thanks to proper land management and technological innovation allowing for highly productive plantations (although from the perspective of ‘global problems’ research conventions, the empirical evidence-base to make such claims tends to be rather limited).⁵¹

Governing palm oil

In the context of rising societal and academic concern with the ‘impacts’ outlined in the previous section, scholars affiliated with global North institutes, sometimes collaborating with global South-based authors, also massively engaged in the study of the governance of palm oil (un)sustainability as an important topic in its own right. This work focused almost exclusively on the transnational Roundtable for Sustainable Palm Oil (RSPO) certification scheme, established in 2004 by the World Wildlife Fund in collaboration with key palm oil producers and traders.⁵² Up until today, this initiative claims to seek reduction of palm oil-induced deforestation and to protect both workers’ and landowners’ rights, while its critics have

⁵⁰ R. Soda, Y. Kato and J. Hon, ‘The diversity of small-scale oil palm cultivation in Sarawak, Malaysia’, *The Geographical Journal* **182** (4) (2016): 353–63.

⁵¹ Y. Basiron, ‘Palm oil production through sustainable plantations’, *European Journal of Lipid Science and Technology* **109** (4) (2007): 289–95; Lam and Lee, ‘Renewable and sustainable bioenergies’.

⁵² As an exception, the following paper compares the effectiveness of Indonesia’s, Malaysia’s and Thailand’s domestic governance of the palm oil sector: I. Mukherjee and B. Sovacool, ‘Palm-oil based biofuels and sustainability in south-east Asia: A review of Indonesia, Malaysia, and Thailand’, *Renewable and Sustainable Energy Reviews* **37** (2014): 1–12.

argued that the RSPO primarily serves to safeguard the palm oil industries' reputation.⁵³

Research on the RSPO's ecological performance usually followed the global problems discourse: it typically sought to assess the scheme's (lack of) effect on reducing the identified 'global' sustainability impacts of palm oil cultivation. It often found that overall success has been limited, and in response recommended more precise and/or stringent and/or diverse (i.e. with different provisions to protect different kinds of native vegetation) certification criteria, combined with improved monitoring and compliance measures.⁵⁴ To achieve cultivator compliance with RSPO priorities, this research for example suggested to better align RSPO ambitions with cultivators' interests (i.e. by offering more financial compensation); reducing the leeway for interpreting the agreed-upon sustainability criteria; developing external compliance control systems; integrating certification criteria in the socio-politico-legal context of the country of production (that is, adapting to Indonesia's 'underdeveloped state capacity' and 'lack of accountability among state officials' as some researchers phrased it); and financially supporting local bodies of government.⁵⁵

In addition, several authors suggested recommending a wider set of interventions that better took into account local cultivator needs.⁵⁶ Moving away from the idea that efficient and large-scale plantations pave the way towards a more sustainable palm oil industry, such research for example argued that smallholders' long-term compliance

⁵³ <https://www.rspo.org/about> (accessed 22 March 2021). Pye, 'The biofuel connection'.

⁵⁴ R.D. Garrett et al., 'Assessing the potential additionality of certification by the round table on responsible soybeans and the roundtable on sustainable palm oil', *Environmental Research Letters* **11** (4) (2016): 045003.

⁵⁵ D. Ruysschaert and D. Salles, 'Towards global voluntary standards: questioning the effectiveness in attaining conservation goals', *Ecological Economics* **107** (2014): 438–46; J. McCarthy and Z. Zen, 'Regulating the oil palm boom: Assessing the effectiveness of environmental governance approaches to agro-industrial pollution in Indonesia', *Law and Policy* **32** (1) (2009): 153–79.

⁵⁶ P. Oosterveer et al., 'Global sustainability standards and food security: Exploring unintended effects of voluntary certification in palm oil', *Global Food Security* **3** (3–4) (2014): 220–26.

required a better balancing of ‘the ethical aspects of sustainability’ with the ‘interests of the (*Southern*) farmers’ [emphasis added].⁵⁷ Such research also studied how to make the certification scheme more accessible to smallholders – not by adapting the scheme’s sustainability criteria (as these were to be set by the Roundtable members), but by providing smallholders with adequate administrative support.⁵⁸

By comparison, research that questioned the ‘normative superiority’ underpinnings of RSPO certification remained scarce. RSPO legitimacy often was upheld even by studies that demonstrated the scheme’s failure to safeguard landowners’ and labourers’ rights. The same applies to work that critiqued the scheme’s reliance on modernist notions of evidence that eclipse local cultivators’ epistemologies and governance practices.⁵⁹ In our search for (less frequently cited) counter voices to this dominant RSPO acceptance-in-principle, we only found a handful of studies that questioned the scheme’s overall legitimacy. Such work argued, among others, that the RSPO certification scheme served to *depoliticise* labour and resource politics at sites of cultivation, consumption at the other end of transcontinental supply chains, and privileged consumers’ interests over distant producers’ interests, and to *greenwash* the present organisation of the palm oil sector.⁶⁰

⁵⁷ N.K. Hidayat, P. Glasbergen and A. Offermans, ‘Sustainability certification and palm oil smallholders’ livelihood: A comparison between scheme smallholders and independent smallholders in Indonesia’, *International Food and Agribusiness Management Review* **18** (3) (2015): 25–48.

⁵⁸ C. Brandi et al., ‘Sustainability standards for palm oil: Challenges for smallholder certification under the RSPO’, *The Journal of Environment & Development* **24** (3) (2015): 292–314.

⁵⁹ McCarthy and Zen, ‘Regulating the oil palm boom’; L. Silva-Castañeda, ‘A forest of evidence: Third-party certification and multiple forms of proof—a case study of oil palm plantations in Indonesia’, *Agriculture and Human Values* **29** (3) (2012): 361–70.

⁶⁰ M. Pichler, ‘Legal dispossession: State strategies and selectivities in the expansion of Indonesian palm oil and agrofuel production’, *Development and Change* **46** (3) (2015): 508–33; R.K. Larsen et al., ‘Towards “hybrid accountability” in EU biofuels policy? Community grievances and competing water claims in the Central Kalimantan oil palm sector’, *Geoforum* **54** (2014): 295–305. O. Pye, ‘Deconstructing the roundtable on sustainable palm oil’, in Arnaud Kaba (ed.), *The Oil Palm Complex* (Singapore: National University of Singapore Press, 2016), pp. 409–11.

Interestingly, from 2014 onward, a small band of scholars based at global North research institutes focussed on the Indonesian Sustainable Palm Oil (ISPO) scheme, launched by the Indonesian government in 2011. This research line presented the ISPO as an Indonesian government response to the RSPO, presenting ‘Southern Standards’ for sustainability in an attempt to regain control over the domestic palm oil industry as well as global palm oil market developments: the Indonesian government considers the palm oil industry as being of major importance for the national economy.⁶¹ The authors considered these ‘Southern Standards’ as a weak alternative to the RSPO, because they were arguably less stringent and less detailed. Accordingly, they called for studies to assess and compare the ISPO’s environmental ‘impacts’ to those achieved by the RSPO: which of the two performed better at addressing the global problems of climate change and reduced biodiversity? Concerned with the ISPOs potential ineffectiveness while highlighting the importance of taking the Indonesian governments’ take on the RSPO seriously, this work recommended that public authorities from palm oil producing countries (from the global South) more prominently participate in the RSPO Roundtable.⁶²

As critical readers investigating the knowledge politics manifest in palm oil sustainability research, we observe that RSPO research, even if it brings in so-called ‘Southern’ perspectives, still reproduced key features of the global problems discourse on palm oil sustainability: this research still situates the prime causes and solutions for global sustainability problems in places of palm oil production. The possible role(s) of ‘unsustainable’ industries, lifestyles and policies

⁶¹ G. Schouten and V. Bitzer, ‘The emergence of southern standards in agricultural value chains: A new trend in sustainability governance?’, *Ecological Economics* **120** (2015): 175–84; O. Hospes, ‘Marking the success or end of global multi-stakeholder governance? The rise of national sustainability standards in Indonesia and Brazil for palm oil and soy’, *Agriculture and Human Values* **31** (3) (2014): 425–37; A. Wijaya and P. Glasbergen, ‘Toward a new scenario in agricultural sustainability certification? The response of the Indonesian National Government to private certification’, *The Journal of Environment & Development* **25** (2) (2016): 219–46.

⁶² Hospes, ‘Marking the Success’.

in the global North were by and large left out of the equation. As a result, while at least some European researchers studied how to include what they termed ‘Southern’ perspectives and representatives in implicitly Northern debates on how to change Southern stakeholder practices, the reverse question was scarcely addressed in our sources – that is, the question of how perspectives and actors from both North and South could help address the rather persistent sustainability challenges in Europe and North America.

Biofuels for Europe

Finally, researchers across the globe investigated the (un)sustainability of using palm oil for biodiesel in Europe (56 publications out of no less than 7,218 publications combining the terms ‘palm oil’ and ‘sustainab*’ with ‘biodiesel’, ‘biofuel’, ‘bio-fuel’ or ‘bio-diesel’ between 2008 and 2016). Issues that figured prominently in wider societal and academic debates on the EU biofuel policy, such as the food versus fuel controversy, are by and large absent in this dataset, surprisingly.⁶³ Instead we found that the vast majority of studies in this dataset investigated the global environmental impact, once again following the global problems discourse outlined above. However, this literature did not focus on palm oil cultivation, but took the palm oil biodiesel lifecycle as its unit of analysis. It typically compared palm oil biofuel sustainability impacts to impacts of biodiesels based on other feedstocks, such as rapeseed, sugarcane or organic waste.⁶⁴ Based on such comparisons, researchers, especially those based at institutes in palm oil cultivating countries, often claimed that biodiesel from palm oil performed better than biodiesel produced from European rapeseed.⁶⁵

⁶³ Pye, ‘The biofuel connection’; Lam and Lee, ‘Renewable and sustainable bioenergies’.

⁶⁴ S. de Vries et al., ‘Resource use efficiency and environmental performance of nine major biofuel crops, processed by first-generation conversion techniques’, *Biomass and Bioenergy* **34** (5) (2010): 588–601.

⁶⁵ K.F. Yee et al., ‘Life cycle assessment of palm biodiesel: revealing facts and benefits for sustainability’, *Applied Energy* **86** (2009): S189–96.

This lifecycle approach resonates with the 2009 EU Renewable Energy Directive's (EU RED) sustainability criteria, which sought to ensure that the transition from fossil fuel to biodiesel met the sustainability objectives of the EU RED. Similar to the foregoing strands of investigation, voices raising the possibility of not using biodiesel at all remained comparatively silent. The great majority of publications by scholars from across the globe set out to benchmark the environmental impacts of (palm oil-based) biodiesel lifecycles against EU RED criteria, so as to investigate or demonstrate how a particular biodiesel production process could meet – or be made to meet – the criteria.⁶⁶ Others assessed the EU RED sustainability criteria themselves: were these appropriate, considering the environmental impacts of biodiesel lifecycles measured in practice?⁶⁷

Similar to the case of the RSPO literature, again we identified less frequently-cited counter voices challenging the dominant trend. Incidentally, researchers did challenge the normative desirability and rationality of the EU RED sustainability criteria and the capacity of its policy instruments to reduce emissions inside Europe.⁶⁸ Another study produced data in support of Malaysia's attempts to set its own biodiesel sustainability standard.⁶⁹ Iterating between arguments in specific papers and queries of the entire data set leads us to conclude, however, that these were once again exceptions that help put the dominant pattern into perspective.

⁶⁶ H H.J. Cho, 'Life-cycle greenhouse gas emissions and energy balances of a biodiesel production from palm fatty acid distillate (PFAD)', *Applied Energy* **111** (2013): 479–88.

⁶⁷ G. Pehnelt and C. Vietze, 'Recalculating GHG emissions saving of palm oil biodiesel', *Environment, Development and Sustainability* **15** (2013): 429–79.

⁶⁸ A. Pols, 'The rationality of biofuel certification: A critical examination of EU biofuel policy', *Journal of Agricultural and Environmental Ethics* **28** (4) (2015): 667–81.

⁶⁹ C.J. Verbanic, 'Biodiesel fuels – Panacea or Pandora's Box', *Fuels and Lubes International* **13** (4) (2007): 32–34.

Conclusions

Critically researching the diverse and differentially enacted social and environmental challenges of our times requires transcending several scholarly boundaries at once: temporal, spatial and disciplinary divides, as well as the divide between research and politics.⁷⁰ The field of sustainability history is especially geared to transcending disciplinary (economic–social–environmental) and temporal (past–present–future) boundaries, but hitherto has insufficiently interrogated questions of inequitable global sustainability narratives and entanglements between academic research and politics. We addressed both omissions simultaneously by studying the global knowledge politics of academic sustainability research for the controversial case of palm oil, with particular focus on Europe–Southeast Asia relations. We would like to conclude this paper with some observations on our mixed-methods approach – transcending methodological boundaries is also part of the exercise – as well as the empirical insights that it helped produce.

Our mixed-methods approach, we feel, facilitated meaningful analysis of vast amounts of sources through careful iterations between scientific database queries, scanning abstracts and close-reading of full publications. These iterations proved crucial to understanding the knowledge politics at play in expected, but also unexpected, ways: the transregional politics of palm oil sustainability research were not configured by inequalities in the number of research contributions between authors with European and Southeast Asian research affiliations (which contradicts the dominant pattern in most fields of research).⁷¹ Instead, systematic and important transregional asymmetries played out within the different lines of investigation that our approach helped identify (which we discuss below).

Also pertaining to our research approach, we argued that it was

⁷⁰ E. van der Vleuten, ‘History and technology in an Age of “Grand Challenges”’: Raising questions’, *Technology and Culture* **61** (1) (2020): 260–71.

⁷¹ Q. Gui, C. Lui and D. Du, ‘Globalization of science and international scientific collaboration: a network perspective’, *Geoforum* **105** (2019): 1–12.

crucial to avoid *a priori* regional essentialism while investigating transregional politics of difference between Southeast Asia and Europe in palm oil research. Instead, we studied whether and how our sources used such regional spatial categories such as ‘Southeast Asia’ or ‘Europe’ – which the sources rarely did. Other spatial categories dominated the scene both descriptively and normatively/politically: research on palm oil production and processing spatially delineated its research object most often descriptively, as located in specific countries or micro-regions (The Malaysian Jenka triangle, West-Kalimantan, the Brazilian Cerrados, the Adja Plateau in South Benin, Southern Nigeria, etc). We also found much research guided by blatant and normative universals of ‘global’ issues affecting ‘all of humanity’ or pitching ‘developing countries’ or ‘Southern’ situations and perspectives against ‘developed’ or (implicitly) Northern perspectives; such research was usually affiliated with European, North American or Australian research institutes or international organisations. However, we also looked beyond how historical actors themselves articulated their spatial units of analysis or concern, and identified less obvious, but not less important, Southeast Asian-European politics of difference at work in the sources analysed.

This leads us to the sort of empirical insights on global sustainability knowledge politics that our approach brought to the fore. We identified two different and politically-charged discourses that dominated palm oil sustainability research throughout the period under investigation. On the one hand, we encountered (micro) regional and national studies of sites of palm oil production that focused on the direct and locally tangible economic and ecological sustainability gains and challenges of setting up plantations, reducing oil milling pollution and avoiding unproductive waste of biomass residues. In this ‘domestic sustainability’ research line, domestic (local, micro-regional, national) problems were usually addressed by domestic researchers (though regularly collaborating internationally), and this research usually suggested solutions to domestic actors. In its early days this research line was thematically and geographically diverse; however, from 2005 onward, when the

palm oil sustainability research boom ignited, it was increasingly dominated by Malaysian research on Malaysia's palm oil biomass waste challenges.

On the other hand, a 'global problems' research line was predominantly affiliated with and led by research institutes in Europe and the United States and international organisations. This research line is not uniquely voiced by actors based in the global North, however: such work is not uncommonly conducted in collaboration with researchers with a 'global South' research affiliation. This work typically homed in on the 'global problems' of biodiversity loss and, later, rising atmospheric greenhouse gas concentrations caused by deforestation at palm oil production sites. Today, this research line's problem statements resonate with geologists' take on the Anthropocene and sustainability scientists' work as represented through for example the Future Earth programme.⁷² Such 'global problems'-oriented palm oil research (often but not exclusively performed by environmental scientists) tended to place chief responsibility for causing and solving global problems in palm oil production sites; the role for European and North American actors was chiefly to produce knowledge, including – after 2004 – knowledge about the governance of 'global problems' through instruments that claimed equally 'global' validity, most prominently the Roundtable for Sustainable Palm Oil. This contentious instrument enabled palm oil actors across the world to meddle in the domestic affairs of palm oil producing countries that were seen as the 'global problem' causers; academic research subsequently studied compliance, effectivity and justice issues related to these interventions.

While these two discourses did not speak of Southeast Asia versus Europe, their implicit and sometimes explicit (especially in the early days of this research line) definitions of problems, solutions and responsibilities did configure an asymmetrical relationship between

⁷² W. Steffen, P. Crutzen and J. McNeill, 'The Anthropocene: Are humans now overwhelming the great forces of nature?', *Ambio* 36 (8) (2007): 9; S. van der Hel, 'Science for change: A survey on the normative and political dimensions of global sustainability research', *Global Environmental Change* 52 (2018): 248–58.

the regions. We observe that ‘global problems’ research by-and-large ignored ‘domestic sustainability’ research – it was all but oblivious to issues such as water pollution by palm oil mills, for example. Conversely, the latter did repeatedly refer to the former – to the extent that it affected domestic affairs and export concerns.

Both discourses amplify and neglect some voices at the expense of others, but here we would like to dwell on the ‘global problems’ discourse that dominates much governance thinking in scholarship and practice today. Historical inquiry of global sustainability knowledge politics, we have shown, can help identify (rather than unreflectively reproduce) projections of European, North American, and international organisations’ concerns as ‘global’ and ‘all-humanity’ ones, and how these projections reduce the visibility of a broader plurality of perspectives on sustainability. Indeed, if the study of knowledge politics includes identifying which and whose histories, experiences and concerns are foregrounded and sidelined in academic knowledge production, and thereby made more or less visible and ‘governable’, then we must conclude that European and North American ‘global’ palm oil unsustainability knowledge is geared towards a particularly postcolonial mode of governing the future of palm oil’s sustainability challenges, namely transnational voluntary certification. The framing ‘palm oil cultivation creates global sustainability problems that damage everyone’s well-being’ legitimises ‘global’ governance practices by private actors targeting the behavior of palm oil producers in the global South through e.g. the RSPO. Furthermore, this research’s focus on cultivation and processing as the root cause of global problems renders palm oil production visible and governable but not palm oil trade, marketing or use. And this ‘global problem’ discourse co-emerged with an asymmetrically-applied set of normative judgements that can similarly be characterised as postcolonial, since these resonate with colonial powers’ engagements with their colonies: actors involved in palm oil production are cast as primarily interested in socio-economic wellbeing, and much less in the ecological concerns that both scholars and societal actors on the so-called international scene claim to be concerned with. This leaves out of the equation

how Europe and North America continue to import and economically profit from large amounts of palm oil, as well as ecological impacts produced more generally *in* the global North in past (e.g., large-scale deforestation) and present (e.g., greenhouse gas emissions). To illustrate the major inequalities in ecological impact produced by different actors' practices across the globe: recent research indicates that the richest ten per cent of the population has been responsible for 52 per cent of the cumulative CO₂ emissions between 1990 and 2015, while the poorest fifty per cent were responsible for only seven per cent.⁷³

Such omissions, we argue, critically shape the ways in palm oil futures are (not) envisioned. To open up more inclusive pathways for the future that challenge and stretch beyond dominant imaginaries from the global North, we encourage historical research into diverse 'global South' sustainability knowledges and narratives, and empirical studies that address and analyse sustainability knowledges and narratives in the 'global North' – which, if one looks beyond universalistic frames such as the global problems discourse identified in this paper, also turn out to be diverse, contradictory, and contested.⁷⁴ In addition, we observe that scholarly enactments of 'global problems' are underpinned by the dominance of specific reductionistic forms of academic knowledge production, notably grounded in (post)positivist epistemologies and modern development discourses. We would like to conclude by suggesting that an epistemic decolonisation of palm oil sustainability research is critical to develop more inclusive palm oil futures that take diverse stakeholders' perspectives and politics seriously. Such decolonisation cannot do without closer

⁷³ T. Gore, 'Confronting carbon inequality: Putting climate justice at the heart of the COVID-19 recovery', *Oxfam Media Briefing*, 21 September 2020.

⁷⁴ E. van der Vleuten and E. de Hoop, 'Crisis narratives from the Dutch Soyacene: Regional sustainability hi/stories at sites of soy consumption', in C.M. da Silva, C. de Majo, A. Zarrili (eds), *The Age of the Soybean: An Environmental History of the Soyacene during the Great Acceleration* (Cambridge: The White Horse Press, 2022 in press); E. van der Vleuten, 'Unpacking "Eurocentric" technology discourses "back home": Technology and societal challenges in Western Europe', in L. Perez et al. (eds), *A Global History of Technology* (Turnhout: Brepols, in press).

examination of the diverse ontologies, epistemologies and methodologies in play in academic research.⁷⁵

Acknowledgements

We thank the team of authors and editors of this special issue, masters students Cyrill Schumm (Utrecht University) and Hidde Markx (Vrije Universiteit Amsterdam) and students on the course Modern Societies in Transition (Eindhoven University of Technology) for encouragement and feedback on our ideas and earlier versions of this paper. All choices and errors remain our full responsibility. We also thank the participants in the workshop 'Resources, Infrastructures and the Anthropocene: Dialogues between the Global-North and the Global-South', hosted by the Universidade NOVA de Lisboa (18–20 September 2019) and co-financed by the Dutch Research Council NWO Internationalizing Humanities program GREASE (IG.18.036).

⁷⁵ V. Mitova, 'Decolonising knowledge here and now', *Philosophical Papers* 49 (2) (2020): 191–212.

Evelien de Hoop is based at the transdisciplinary Athena Institute (Vrije Universiteit Amsterdam, NL). With a background in Science and Technology Studies, she works with scholars from diverse disciplines and societal stakeholders to address contemporary health and sustainability challenges. Empirical foci include Indian farmers' engagements with biofuels, sustainable Dutch countryside, and inclusive food systems in deprived urban areas. She mobilises research on the historical and transnational entanglements of contemporary challenges, with a particular focus on knowledge politics, to render her contemporary work historically-sensitive and pluralise ways of thinking about the future.

Email: e.de.hoop@vu.nl

Erik van der Vleuten teaches at Eindhoven University of Technology and researches the connected histories of technology and socioecological change in an infrastructured world. Earlier works include: *Europe's Infrastructure Transition: Economy, War, Nature* (2015, with Per Högselius and Arne Kaijser) and *Engineering the Future, Understanding the Past: A Social History of Technology* (2017, with Ruth Oldenziel and Mila Davids). His current research and education focus on diverse and contested sustainability histories and futures of distant-yet-connected regions across the globe.

Email: e.b.a.v.d.vleuten@tue.nl