

CHAPTER 13.

CRISIS NARRATIVES FROM THE DUTCH SOYACENE: REGIONAL SUSTAINABILITY HI/STORIES AT SITES OF SOY CONSUMPTION

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Introduction

Since May 2019, the Netherlands have been caught in a peculiar crisis – and soy is crucially involved. This so-called Nitrogen Crisis was triggered by a Dutch Council of State ruling. The ruling invalidated government-issued nitrogen emission permits, because procedures to issue these permits had not complied with European Union rules for protecting designated nature conservation areas. Thousands of ongoing housing and infrastructure construction projects (which require permits for their nitrogen emissions) came to a sudden standstill. To resume construction, which was a policy priority due to housing shortages, nitrogen emissions in other sectors needed to be cut drastically. In order to do so, many actors focused on intensive animal farming, responsible for over half of all Dutch nitrogen emissions. An emergency Government Commission proposed reducing the sector by half. Others proposed reducing the nitrogen content in animal feed, noting that agriculture’s nitrogen emissions originated overwhelmingly from imported soymeal, the protein basis of the sector. Animals absorb part of soy’s protein and thus the nitrogen in their bodies and emit the rest through urine and manure, which harms biodiversity through acidification and eutrophication. Large and radicalising farmer groups protested fiercely against such ‘nature protection measures’, and warned of starving animals and the demise of their sector – which operates with extremely low profit margins. The parties have been at loggerheads ever since.¹

1 J.W. Remkes et al., *Niet alles kan overal. Eindadvies over structurele aanpak op lange termijn* (Amersfoort: Adviescollege Stikstofproblematiek, 2020); J. Schollaardt, *Factsheet Emissies en Depositie van Stikstof in Nederland* (The Hague: TNO 2019); J.W. Erisman, ‘Setting ambitious goals for agriculture to meet environmental targets’, *One Earth* 4 (1) (2021): 15–18.

The Nitrogen Crisis suggests that not only soy production regions, but also soy consumption regions deserve attention when considering histories of the Soyacene. Most current research focuses on local or global (e.g. greenhouse gas emissions) ecological changes and social conflicts at sites of soy production, predominantly in the Americas. In order to better understand production-related socioecological and international relations, that historiography studies massive deforestation, land use conflicts, pesticide pollution, child labour and more, and the complicity of agribusiness, science and innovation, international trade, politics and markets, and much more.² Conversely, historical studies of soy *consumption* have not focused on broader and intertwined social, environmental and economic changes at sites of consumption, but on the ambivalent roles of soy in human diets – as a health food and meat alternative as well as a core ingredient in processed foods (soy oil) and the meat industries (soybean meal) that undergird modern industrialised diets.³ To our knowledge, the historiography of broader regional change at sites of soy consumption, on a par with and in relation to histories at sites of production, is still in its infancy.⁴

This chapter explores such broader histories at sites of soy consumption. We speak of soy's 'sustainability histories' to denote interrelated economic, social and environmental histories regardless of whether or not historical actors use the term 'sustainability'.⁵ As the Nitrogen Crisis illustrates, soy consumption might particularly manifest in regional sustainability histories of areas with intensive animal farming. We focus on such areas in the Netherlands, which have come to host some of the most intensive animal farming in Europe and the world (witness the staggering manure emissions per hectare, see Figure 1). Dutch agricultural history tells us that cheap imported soy, processed into compound feed, was pivotal to this development – imported soy became as important to intensive animal farming as artificial

- 2 For a review, see C.M. da Silva and C. de Majo, 'Towards the soyacene: Narratives for an environmental history of soy in Latin America's Southern Cone', *Historia Ambiental Latinoamericana y Caribeña* 11 (1) (2021): 329–56.
- 3 For further references, see E. Langthaler, 'The Soy paradox: The Western nutrition transition revisited, 1950–2010', *Global Environment* 11 (1) (2018): 79–104.
- 4 F. Haalboom, 'Oceans and landless farms: Linking Southern and Northern shadow places of industrial livestock (1954–1975)', *Environment and History* (Online First 2020); E. de Hoop and E. van der Vleuten, 'Sustainability knowledge politics: Southeast Asia, Europe and the transregional history of palm oil sustainability research', *Global Environment* 15 (2) (2022): 209–45.
- 5 J.L. Caradonna (ed.), *Routledge Handbook of the History of Sustainability* (Routledge, 2018).

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fertilisers were to modern arable farming.⁶ That literature also observes the remarkable rise of intensive animal farming in this region coinciding with spiking soy imports at nearby Rotterdam Port, ‘the hub of soybean and bean product [soymeal, soy oil] trade for all of Europe and the surrounding areas’, according to the *Soybean Update* in 1983.⁷ More recently published *Soy Barometers* tell us that, by the early 2010s, Dutch soy imports ranked second only after Chinese imports (which, however, were of a different order of magnitude). By then, Dutch soy imports embodied a foreign land use of some 2.6 million hectares, roughly corresponding to no less than eighty per cent (!) of Dutch domestic land territory, and dwarfing the country’s own few hundred hectares of domestic soy production.⁸

This chapter not only highlights the Soyacene’s global sustainability history in agricultural soy consumption regions but also unpacks the diversity of relevant sustainability history narratives within such regions, thus rejecting notions of regions as monolithic entities. As we shall see, the past five decades have birthed very different, and politically conflicting, stories about the past and future of soy, animal farming, and sustainability challenges in the area under study. We here focus on four such hi/stories (i.e. narrations of the past in relation to the present and the future, by historical and contemporary actors including professional historians), which we tentatively identify as an ‘agricultural miracle’ narrative, an ‘environmental pollution’ narrative, an ‘animal suffering’ narrative and a ‘global footprint of soy consumption’ narrative.⁹ These four narratives highlight important yet distinct features of the Dutch Soyacene. Each hinges crucially on massive soymeal imports for animal feed consumption, even though focus and attention on the role(s) of soy may vary greatly.

- 6 J. Bieleman, *Five Centuries of Farming: A Short History of Dutch Agriculture 1500–2000* (Wageningen: Wageningen Academic Publishers, 2010); J. Bieleman, ‘Landbouw en milieu—een eeuwig spanningsveld’, in G. Castryck and M. Decaluwe (eds), *De relatie tussen economie en ecologie gisteren, vandaag en morgen* (Verloren, 1999), pp. 25–36.
- 7 As quoted in W. Shurtleff and A. Aoyagi, *History of Soybeans and Soyfoods in the Netherlands, Belgium and Luxembourg (1647–2015). Extensively Annotated Bibliography and Sourcebook* (Lafayette, CA: Soyinfo Center, 2015), source nr. 1414.
- 8 J.W. van Gelder, B. Kuepper, M. Vrins, *Soy Barometer 2014. A Research Report for the Dutch Soy Coalition* (Amsterdam: Profundo, 2014), pp. 11, 15, 27.
- 9 On hi/stories: E.M. Cheung, ‘The hi/stories of Hong Kong’, *Cultural Studies* 15 (2001): 564–90. Compare: William Cronon, ‘A place for stories: Nature, history, and narrative’, *The Journal of American History* 78 (4) (1992): 1347–76.

A Statue for Pigs: The Agricultural Miracle of Intensive Animal Farming

Dutch agricultural history has a long tradition of research on agricultural innovation in relation to the socio-economic fortunes of rural communities.¹⁰ As such, it interpreted the rise of soy-enabled large-scale intensive animal farming as an innovative and successful response to the postwar crisis among smallholding communities in the impoverished Southern and Eastern sandy-soil regions of the Netherlands. This narrative was especially dominant in the field of agricultural history during the 1990s and early 2000s. It focused on mass-pig and poultry farming, where soy became the dominant protein basis, on the sandy soil regions connecting the South-eastern provinces of Noord-Brabant and Limburg. The spectacular rise of intensive animal farming in this area constituted, in the words of Prime Minister Wim Kok in 1996, a veritable agricultural miracle.¹¹

We highlight four key features of this agricultural miracle narrative. First, the narrative considers the agricultural crisis of the late 1940s as the trigger for the spectacular rise of intensive animal farming. Although this post-war agricultural crisis was of course international, Dutch historiography presented the economic and social prospects in the South-eastern provinces of the country as particularly gloomy.¹² Local and provincial farmer organisations and state-employed agronomical experts spoke of a ‘Small Farmers Question’, which referred to the many unprofitable mixed-agriculture smallholders on the region’s poor sandy soils – so very different from their affluent, export-minded and internationally reputed colleagues elsewhere in the Netherlands. The numerous children on these poor family farms had no prospects of starting a farm of their own (smallholder plots could not be further subdivided) and a thorough dislike for jobs in urban industries.

- 10 Bieleman, *Five Centuries*, pp. 16–17; P. Kooij et al., *De Actualiteit van de Agrarische Geschiedenis. Historia Agriculturae Vol. 30* (Groningen/Wageningen: Nederlands Agronomisch Historisch Instituut, 2000), p. 2.
- 11 Kok used the German term *Landwirtschaftswunder*. A.H. Crijns, *Van overgang naar omwenteling in de Brabantse land- en tuinbouw 1950–1985. Schaalvergroting en specialisatie* (Tilburg: Stichting Zuidelijk Historisch Contact Tilburg, 1998), p. xiii
- 12 Ibid. and T. Duffhues, *Voor een betere toekomst: Het werk van de Noordbrabantse Christelijke Boerenbond voor bedrijven gezin 1896–1996* (Nijmegen: Valkhof Pers, 1996); J. Korsten, *Standhouden door veranderingen. De Limburgse Tuinbouwbond als behartiger van agrarische belangen 1896–1996* (Nijmegen: Valkhof pers, 1996).

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Mass unemployment and impoverishment of rural communities loomed.¹³

Second, the narrative credits the crisis response measures of regional farmer organisations, provincial authorities and state-employed agricultural consultants for the rise of affluent large-scale animal husbandry. Early measures aimed at dissolving the perceived cleavage between rural agriculture and urban industry by attracting industry to the rural area and prepping the young rural generation for new educational, employment and emigration possibilities; industrial entrepreneurship soon entered the countryside and unemployment vastly decreased.¹⁴ Other measures boosted farm productivity, profitability and scale increase through e.g. research and innovation, education and consultation, financing schemes for farmers, common agricultural sales and exports facilities, and cooperative feed, fuel and tools purchase. Meanwhile, national policies under Minister of Agriculture Sicco Mansholt strengthened Dutch exports – and so did the new European Economic Community (with Mansholt as agricultural commissioner) by establishing a common market through tariff policies, production subsidies, and a cold chain for transporting perishable products. These efforts combined, so the narrative continues, fostered an entrepreneurial and innovative attitude among sandy soil livestock farmers; a new generation of agricultural entrepreneurs established industry-scale pig and poultry farms and associated agricultural industries, astounding the nation by 1960 and EEC competitors in the 1970s and 1980s.

This narrative typically illustrates these changes with spectacular numbers on the rise in large-scale pig and poultry farming. In the province of Noord-Brabant, for example, the human population less than doubled from 1.2 to 2.1 million between 1950 and 1985, while pig numbers rose from under 300,000 to almost 5 million and poultry from 3.6 million to over 25 million. Average farm sizes increased from under ten to over 500 pigs, and from under 200 to over 18,000 chickens.¹⁵ Pig farming became iconic for the financial success of ‘non-land based’ agriculture: ‘the pig had drawn the small-scale sandy soil farmer out of his misery’ and had rightfully ‘gained itself a statue’ – referring to the bronze statue in front of the

13 Also: A. Maris et al., *Het kleine-boeren vraagstuk op de zandgronden. Een economisch-sociografisch onderzoek van het landbouw-economisch instituut* (Assen: van Gorcum, 1951); A. Maris and R. Rijnveld (eds), *Het kleine-boerenvraagstuk op de zandgronden. Ontwikkeling in de periode 1949–1958. Rapport 347* (The Hague: LEI, 1960).

14 Also: *Noord-Brabant welvaartsbalans. Ontwikkelingsplan 1965*, 2 vols (Den Bosch: Provincie Noord-Brabant, 1965).

15 Duffhues, *Voor een betere toekomst*, p.14; Crijns, *Van overgang naar omwenteling*, pp.107 and 113–38.

provincial government building in Noord Brabant, donated in 1979 by the regional Pig Farmers Association to ‘celebrate the economic development of pig farming’.¹⁶

A third feature of this narrative concerns the role of soy and agricultural feed companies in this agricultural transition. As noted, agricultural historians stated that high-protein feed was to intensive animal farming what artificial fertilisers were to arable farming, spiking productivity per hectare. Soy became the dominant protein source from the 1970s, ultimately constituting some ninety per cent of the protein base in pig and poultry farming. Our narrative elaborates that feed constituted the largest variable cost in pig and poultry farming; that agronomists researched the most cost-effective feed nutrients at experimental farms; that agricultural consultants constructed feed schemes tailored to individual farms; and that policymakers supported feed imports – under Mansholt, both the Dutch Government and EEC policies exempted feed from import tariffs. Soy (the cheapest protein source) and tapioca (a cheap carbohydrate source, replacing wheat) were massively imported by commercial and cooperative trade companies, which emerged as crucial historical agents: they negotiated, purchased, imported, processed and distributed the cheapest possible compound feed. For example, the cooperative trade firm *Coöperatieve Handelsvereniging’s* company history commemorated the art of negotiating deals with soy producers in Argentina, Brazil and Paraguay (and tapioca producers in Thailand). Domestically it offered, like its competitors did, financing schemes to farmers in return for feed contracts. By doing so, the firm incited farmers to invest in soy-based large-scale animal farming and invited the veritable ‘invasion of pigs and chickens’ in sandy soil agriculture, while simultaneously growing into one of the largest EEC players.¹⁷

Fourth and finally, socio-technical transitions are rarely straightforward and unproblematic, and the conventional agricultural history narrative typically ends with an observation of several backlashes visible to all by the 1980s. For example, mixed-agriculture smallholding, which post-war crisis measures had sought to preserve as the traditional cornerstone of regional

16 Duffhues, *Voor een betere toekomst*, p.282; Crijns, *Van overgang naar omwenteling*, pp. xii–xiii.

17 H. Siemens et al., *Terug naar de Kern. 100 jaar Cebave Landbouwbelang* (Apeldoorn: Agrifirm, 2011), p.15. Also: H. Veldman, E. van Royen and F. Veraart, *De geschiedenis van Cebeco-Handelsraad 1899–1999* (Eindhoven: SHT/ Cebeco, 1999); S.F. Van der Laan, *Een varken voor iedereen: De modernisering van de Nederlandse varkensfokkerij in de twintigste eeuw* (Utrecht: Utrecht University, 2017), pp. 69–70.

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agriculture, was unintentionally ousted by large-scale specialised pig, poultry, cattle or dairy farms. Older generations of farmers lamented the risk taking, money loans and loss of core farming values ('true farmers' should have land *and* animals) of the new generation of agricultural entrepreneurs and their industry-scale farms and agricultural industries. Individual farmers are quoted as saying, for example, that 'we should leave space for smaller farms' and that 'our gamble with pig farming paid off, but gambling can be addictive, and some people cannot stop'.¹⁸ Farmer organisations, agricultural experts and provincial authorities agreed to halt unchecked growth of the sector, but found themselves unable to do so.

The second backlash was environmental: intensive animal farming's environmental pressures grew as the sector grew, and newspapers and policymakers fiercely debated a national 'manure problem' by the 1980s.¹⁹ The conventional agricultural history narrative typically casts this problem as 'the next challenge', coming to the farming community in the form of 'public perceptions', 'social critique', and 'insensitive new environmental policies', now calling for a severe *reduction* of the sector. The narrative documents farmers' protests against these 'external pressures', and suggests that the long-term solution is not reducing the number of animals, but empowering the farming community to tap into its proven capacity of 'innovating to survive': organisational and technological innovation would turn agrarian entrepreneurship into 'agrarian stewardship' while transitioning toward a more sustainable future.²⁰ This interpretation, however, was fiercely challenged by a second narrative to which we now turn.

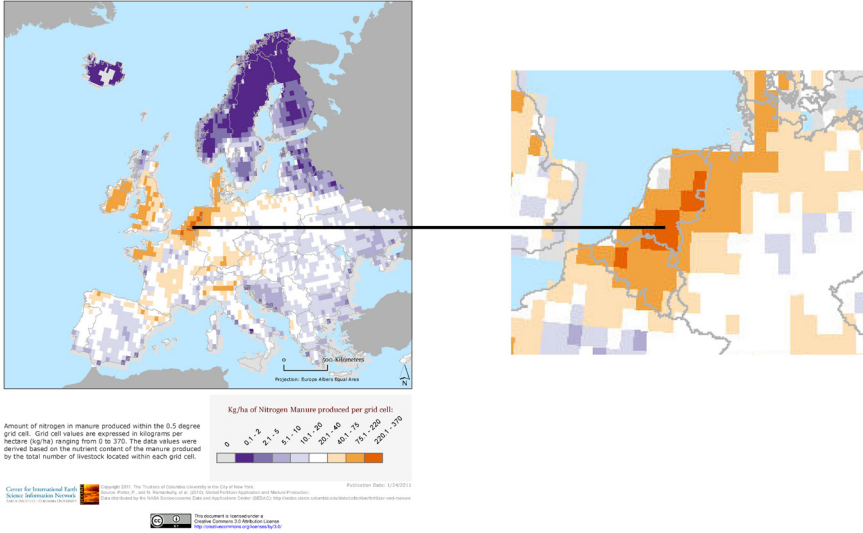
18 Cited in Crijns, *Van overgang naar omwenteling*, p.104 (also pp. 90–91).

19 From 0–2 newspaper articles per year before 1982 to >100 per year in 1985–1994 according to the national publication database. www.delpher.nl, keyword search on 'mestprobleem OF mest-problematiek' (consulted 29 Nov. 2021).

20 Crijns, *Van overgang naar omwenteling*, p. 220; Diffhues, *Voor een betere toekomst*, pp. 323–26; Korsten, *Standhouden door veranderingen*; Bieleman, 'Landbouw en milieu'. Also L.G. Horlings, *Duurzaam boeren met beleid: innovatiegroepen in de Nederlandse landbouw* (Nijmegen: Katholieke Universiteit Nijmegen, 1996), p. 18.

Europe Nitrogen in Manure Production

Global Fertilizer and Manure, Version 1



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pollutants, notably nitrogen (which as protein was the very reason for importing soy), but also phosphorous and potassium. This narrative is highly concerned with exposing and explaining persistent policy failures to curb domestic agricultural pollution – from the first in-house agricultural research and policy debates thereon in the 1960s to the present-day Nitrogen Crisis. Thus, whereas agricultural histories especially studied and voiced the perspectives of agricultural organisations and policy, this second narrative focused on inconvenient truths and irresponsible agricultural policies and practices that – in the prosaic words of investigative journalists of *Follow the Money* – ultimately turned the country into the ‘dung heap of Europe’.²³ This narrative also spilled over into the emerging fields of Dutch environmental and sustainability history, which identified intensive animal farming as a key contributor to landscape, environmental and ecosystem degradation.²⁴ Here, we again elaborate on four aspects of this environmental pollution and policy narrative.

First, the narrative prominently mentions scientific knowledge about intensive animal farming’s environmental implications for land, water and air. It mobilises such knowledge claims to emphasise the scale and urgency of the problem, and also to criticise and dismiss recurring policymaker and farmer arguments that the problem had been unknown to them, thus preventing them from taking action earlier (a typical *story of awakening*²⁵ that obscures and depoliticises the long history of environmental problems). Thus, the narrative spotlights how agricultural research institutes investigated the use of animal manure in arable farming since the 1960s. Researchers appreciated the advantages, such as reduced purchasing of artificial fertiliser; but, from the second half of the 1960s, they also warned of future excessive distribution of manure slurry on fields and dumping of surplus slurry in ditches. Calculations and experiments predicted excessive concentrations of nitrogen, phosphorous and potassium in both soil and water. By 1970 it was known how this caused eutrophication, algal growth, oxygen lack, rotting organic materials and species reduction in surface waters, as well as species

- 23 H. Ariëns and E. Meelker, ‘De stinkende achterkant van vleesfabriek Nederland’, 8 May 2021. Available at ftm.nl (consulted 28 July 2021).
- 24 J.L. van Zanden and S.W. Verstegen, *Groene geschiedenis van Nederland* (Utrecht: Spectrum, 1993), pp. 63–92; H. Lintsen et al., *Well-being, Sustainability and Social Development: The Netherlands 1850–2050* (Cham: Springer Open, 2018), pp. 397–416.
- 25 C. Bonneuil and J.B. Fressoz, *The Shock of the Anthropocene: The Earth, History and Us* (London/ NY: Verso Books, 2016), p. xiii.

reduction in ecosystems that require nutrient-poor soils.²⁶ When animal holdings boomed in the 1970s and 1980s, aerial ammonia emissions caused a penetrating stench that became a familiar fact of life to rural citizens – and was allegedly recognised by foreign visitors as a characteristic smell of the Dutch countryside.²⁷ In the early 1980s, agricultural researchers also connected aerial ammonia emissions to acid rain and the local acidification of soils and waters by nitric acid: agriculture was held responsible for almost half of the acid rain problem.²⁸ Meanwhile drinking water companies worried about nitrates threatening ground water quality.

A second observation on this narrative concerns the role of soy in environmental pollution. Here, we find a paradox. On one hand, soy is central to the narrative as a transcontinental pollutant carrier – especially of nitrogen, the most debated pollutant from intensive animal farming. Soy also carried phosphorous and potassium, but it shared those honours with large quantities of imported carbohydrate sources such as tapioca and maize. On the other hand, however, contributions to this narrative rarely mentioned and elaborated the role of soy explicitly. Instead, our narrative typically black-boxes the foreign sources of domestic pollution. The oft-heard phrase was that ‘we import the feed, export the pigs, and are stuck with the mess’;²⁹ the Dutch environmental pollution narrative focused on the how and why of this ‘mess’, but made remarkably little effort to unpack the imported feed sources of domestic pollution (or, for that matter, the domestic and foreign consumption of pig meat). As a result, it also remained oblivious to associated social and environmental conditions at foreign sites of feed production. As such, it is the direct opposite of the fourth narrative that we discuss below.

Third, concerning the domestic ‘mess’, the environmental pollution narrative spares no effort to detail and document the persistent failure of policymakers and farmers to address domestic pollution problems. It interprets this failure as ill-will, fraud and policy system failure. Agricultural journalist Frits Bloemendaal’s 1995 book already presented the preceding decades of Dutch agricultural pollution policies as a history of deception.

26 S. Algra, ‘De invloed van de landbouw op het natuurlijk milieu’, *Landbouwkundig Tijdschrift* 84 (4) (1970): 155–64.

27 Van Zanden and Verstegen, *Groene geschiedenis*, pp. 84–85.

28 N. van Breemen et al., ‘Soil acidification from atmospheric ammonium sulphate in forest canopy throughfall’, *Nature* 299 (1982): 548–50. Quantitative contribution to acidification: Horlings, *Duurzaam boeren*, p. 18 table 1.1.

29 Minister of Agriculture Cees Veerman (2003) cited in Lintsen, *Well-being*, p. 403.

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Two decades later, prominent newspaper columnist Tom-Jan Meeus (who had published on the manure crisis since 1990) called it a ‘scandal that had been allowed to persist for 50 years’, characterised by a repetitive pattern of scandals, political response, further animal farming sector growth, further scandals and so on: ‘I would not know a similarly dark policy history with a similar lack of progress.’³⁰

This history of scandals starts with the ‘denial’, ‘silencing and neutralizing problem signals’, and ‘delaying tactics’ by the farmer-policy maker alliance throughout the 1970s.³¹ The narrative highlights the experiences of prominent agricultural researcher Chris Henkes. In interviews, he repeatedly commemorated how his early findings had consistently been suppressed: ‘those who claim that the Ministry of Agriculture lacked knowledge of the effects of manure surpluses until the 1980s, denies reality’.³² It also highlights faulty claims by the Ministry of Agriculture, e.g. that the growth of intensive animal farming had already stopped, or that detergents in household sewage and industrial waste, not agriculture, were to blame for environmental eutrophication.³³ A third example is that the Commission appointed by the Ministry to examine manure issues insisted on basing its calculations on national manure production averages, deliberately obscuring local or regional manure surpluses in pig farming regions (a practice for which it was reprimanded later).³⁴

In the mid-1980s, the first law to constrain pig and chicken farming expansion was issued; this feat is generally interpreted as a breakdown of the alliance between the Ministry of Agriculture and farmer organisations. With this breakdown, a second phase commenced in the ‘history of scandals’, featuring repeated cycles of fraud, policy response, new frauds and so on. Already in the late 1980s, the Ministry of Agriculture tacitly allowed farmers to use legal loopholes to expand their animal holdings (the Minister

30 Bloemendaal, *Het mestmoeras*, pp. 7 and 235 ff.; T.J. Meeus, ‘Het schandaal dat 50 jaar kon voortbestaan’, *NRC* 15 Nov. 2018, p. 2.

31 Bloemendaal, *Het mestmoeras*, pp. 9–18; Frouws, *Mest en Macht*, pp. 75–82; Hermans, *De Mest-marathon*, pp. 10–11.

32 Henkes, cited in Ariëns and Meelker, ‘De stinkende achterkant’. Also ‘De geschiedenis van het mestprobleem’, *Argos*, VPRO Radio 15. Jan. 1993. Available at <https://www.vpro.nl/argos> (accessed 29 Nov. 2021).

33 Bloemendaal, *Het mestmoeras*, pp. 14–15.

34 *Ibid.* p. 13.

was forced to step down in 1990 for this and other scandals).³⁵ The policy deception story continues to this day, and includes recent exposures (winning a Dutch award for ‘best investigative journalism’ in 2017) of systemic farmer fraud in the Southeastern provinces, illegally and massively distributing excess manure on fields instead of paying for delivery to a manure processing plant. The most recent example is the invalidation of the government accounting policy based on which nitrogen permits were issued, which triggered the current Nitrogen Crisis.³⁶

Fourth and finally, this environmental history narrative typically ends on a half-hearted note of hope regarding prospects for a more sustainable future. On one hand, from the 1980s until today, authors observe how public outrage over environmental degradation and political failure creates initiatives looking to transcend past habits and initiate solutions for more sustainable futures. On the other hand, they simultaneously note how hopeful developments are already countered and watered down by farmer interests before they are even realised. Considering the long track record of avoiding measures addressing root problems (notably: reducing absurdly high concentrations of animals) and of favouring temporary, fraud-sensitive, end-of-pipe administrative and technological fixes (e.g. manure accounting systems, stables emission filters, or manure processing plants), developments towards more sustainable futures remain uncertain at best.³⁷

Pigs in Despair: Animal Welfare and Animal Rights

A third important narrative on the sustainability history of the Dutch Soyacene focuses on its implications for animals and changing animal-human relations. It is well-represented by historian Dirk-Jan Verdonk’s impressive *Vegetarian History of the Netherlands* (2009), which we use as the basis to discuss this narrative.³⁸ Inscribed in the historiographical tradition of animal history and multi-species history, vegetarian history is a research strategy

35 Ibid., p. 15.

36 J.P. Dohmen and E. Rosenberg, ‘Het mestcomplot’, *NRC.NEXT* 11 Nov. 2017; J.W. Erisman et al., *Stikstof: de sluipende effecten op natuur en gezondheid* (Uitgeverij Lias, 2021).

37 Bloemendaal, *Het mestmoeras*, pp. 231–36; Hermans, *De Mestmarathon*, pp. 40–43. On ammonia filter fraud: G. Jansen and H. de Jonge, ‘Namaak luchtwassers bij varkensboeren zorgen juist voor meer stankoverlast’, *NOS Nieuwsuur* (14 July 2018, 17:14), available on www.nos.nl (Accessed 5 Dec. 2021).

38 D.J. Verdonk, *Het Dierloze Gerecht. Een vegetarische geschiedenis van Nederland* (Amsterdam: Boom, 2009). Another example of multispecies history: A.F. Haalboom, *Negotiating Zoonoses: Dealings*

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to problematise human-centric agricultural and food histories that ignore animals or see them as mere resources for human lives.³⁹ Indeed, the ‘agri-cultural miracle’ and ‘environmental pollution’ narratives centred on human lives and environmental concerns external to the agri-food sector. The third narrative, by contrast, brings to the fore changing farm animal experiences (notably animal suffering) and relations between ‘humans and other animals’.⁴⁰ Here, we shall discuss animals’ changing living conditions; human actors’ diverse understandings of the problem of animal suffering, of who speaks for the animals and of envisaged futures; and the role played by soy in all this.

With regard to animals’ living conditions in intensive animal farming, this narrative unpacks how animals were turned into increasingly effective machines for producing meat, milk and eggs. Verdonk colourfully illustrated what this looked like for the animals concerned. For example, chicken, pigs and cows were now confined to indoor spaces that often barely exceeded the (combined) size of their residents; their bodies had been scientifically bred to grow and mature exceedingly fast, and their feed content and feeding schemes were designed solely for maximised weight increase, regardless of associated cardiovascular and skeletal dysfunctions. Similarly, daylight management schemes stimulated growth or milk and egg production, causing, for example, ocular dysfunction. Animals were slaughtered at an increasingly young age thanks to faster growth; body-parts such as beaks and tails were clipped to prevent animals from mutilating others in response to overcrowded stables; and they were deprived of having sex, as artificial insemination allowed the farmer to control the reproduction cycle. Intriguingly, artificial insemination also necessitated that pig farmers learn the skill of sexually arousing sows manually: multispecies history indeed.

A second feature of this narrative concerns diverse human interpretations of the problem of animal suffering, of solutions and better futures, and of who could speak for the animals in the first place. The animal suffering narrative, like the environmental pollution narrative, observes that agricultural authorities and farmers did not wholeheartedly voice and address animal suffering: as in the case of environmental pollution, they ignored or actively suppressed knowledge about animal suffering in the 1960s and

with Infectious Diseases Shared by Humans and Livestock in the Netherlands (1898–2001) (dissertation, Utrecht University, 2017).

39 Historiographical embedding: Verdonk, *Het Dierloze Gerecht*, pp. 15–29 and 409–10; F. Dieteren, ‘Review of *Het Dierloze Gerecht*’, *Low Countries Historical Review* 126 (3) (2011): 118–20.

40 Verdonk, *Het Dierloze Gerecht*, p. 19.

1970s – unless productivity was directly threatened by animal suffering. Farmers were locked into the methods of intensive animal farming if they were to stay in business, and staff of the Ministry of Agriculture allegedly argued that ‘[intensive animal farming] was an inevitable development, a necessity, an economic necessity ...’⁴¹ Neither did researchers raise their voice on animal suffering. Agricultural scientists were employed and funded by the Ministry, and Verdonk noted that scientists’ norms of positivist science made studying animal inner wellbeing difficult. If, by exception, scientists did speak up, the Ministry tried to intervene, just as it had in the pollution case. For example, ethologist Gerrit van Putten studied and filmed pigs in stables and on transport from the late 1960s, and observed that the animals suffered severely. Van Putten would later be nationally and internationally lauded, but working for a Ministry research institute in the 1970s, he was issued repeated gag orders, and reports and film material were locked away. This practice was exposed when a public television broadcaster retrieved such film material by court order, broadcasting it with the warning that ‘those who have seen this video will no longer enjoy their steak’.⁴²

From the early 1970s, and in liaison with such scientists, activists increasingly voiced their concerns over animal suffering. Their trigger was the new *Flevohof* educational theme park, opened in 1972 and displaying agricultural innovation. Appalled by industrial farming’s treatment of animals, a band of youngsters established the action group Tasty Animal [*Lekker Dier*] and organised playful actions to make animal suffering visible and political. Their initial concerns resonated with Ruth Harrison’s *Animal Machines* (1964) on animal suffering in the UK; soon, however, the Australian ethicist Peter Singer’s *Animal Liberation* (1975) became the main source of inspiration: as suffering beings, animals should not be submitted to abusive human will. Henceforward the action group worked for animal rights, as opposed to merely improving animal welfare under industrial conditions. Animal welfare and animal rights discourses co-existed and collided, but did not gain widespread prominence in public debates until the outbreak of swine-fever in 1997, which involved the enforced killing of over eleven million pigs and

41 Expressed by E.H. Ketelaar, in documentary: C. Tromp, Y. Nijland, C. Samson and M. Euwe, ‘Episode 593: Lekker Dier’, *Andere Tijden* (11 July 2013). Available at: <https://anderetijden.nl/afl levering/593/Lekker-Dier> (accessed 25 July 2021).

42 Verdonk, *Het Dierloze Gerecht*, p. 311. Gerrit van Putten was interviewed for the documentary ‘Lekker Dier’; for Verdonk, *Het Dierloze Gerecht*; and for Crijns, *Van Overgang naar Omwenteling*.

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three million piglets.⁴³ After this major blow to agricultural productivity, agricultural policymakers and farmer organisations agreed that intensive animal farming needed to change – if only to prevent similar catastrophes in the future. The animal welfare problem definition, not the animal rights perspective, dominated: research and legislation sought to improve animal welfare in various ways – but always in line with the production-oriented definition of animal welfare that had emerged in science and policy, namely that ‘welfare is understood as living in reasonable harmony with the environment from a physical and ethological perspective ... The environment therefore needs to be such that it meets the adaptive capacity of the animal.’⁴⁴

The animal rights perspective did not disappear, however. By 2002, continued public outrage had birthed a new political party, the Party for the Animals [*Partij voor de Dieren*]. The party soon gained seats in Parliament, providing it with a prominent stage to voice animal rights issues. The party sought – and still seeks – to defend animals’ rights, de-centre human interests and work for systemic transformation towards nature-centred, not human-centred, sustainability that stretches far beyond how animals are treated within the Netherlands.⁴⁵ In addition, vegan animal rights movements mushroomed (sometimes as local chapters of international NGOs), including Animal Rights, People for the Ethical Treatment of Animals (PETA), Anonymous for the Voiceless, Bite Back and Proveg.⁴⁶ These organisations also approach animals as sentient beings that ought to have rights. Unlike the dominant discourse within government and among meat-eating publics, they argue for a future in which animals are no longer part of the food production system.

Third and finally, we observe that the role of imported soy in this animal suffering narrative is – similar to the pollution narrative – simultaneously

43 B. Elzen, F.W. Geels, C. Leeuwis and B. van Mierlo. ‘Normative contestations in transitions “in the making”’: animal welfare concerns and system innovation in pig husbandry’, *Research Policy* 40 (2) (2011): 263–75.

44 Citation from Verdonk, *Het Vleesloze Gerecht*, p. 306, based on NRLO, *Rapport van de Commissie* (Den Haag, 1975).

45 R.L. Langeveld, *Het leven op aarde gaat niet alleen over mensen: Een kritische vergelijking van de ecocentrische belangenbehartiging van de Partij voor de Dieren en Greenpeace Nederland in de Nederlandse parlementaire democratie, 1992–2018*. (MA Thesis, Utrecht University, 2020).

46 Animal Rights, ‘Animal Rights’. www.animalrights.nl (accessed 12 Dec. 2021); PETA, ‘Dieren zijn niet van ons om op te experimenteren, te eten, te dragen, te gebruiken voor amusement of te mishandelen op welke manier dan ook’. www.peta.nl (accessed 12 Dec. 2021); Anonymous for the Voiceless, ‘Become an animal rights activist’. www.anonymousforthevoiceless.org/join (accessed 12 Dec. 2021); Bite Back, ‘Dierenrechtenorganisatie’. www.biteback.org (accessed 12 Dec. 2021); ProVeg, ‘ProVeg Nederland’. www.proveg.com/nl (accessed 12 Dec. 2021).

crucial and often black-boxed. Verdonk's *Vegetarian History* is a case in point. It acknowledges the global footprint of Dutch animal farming, citing how feed production for Dutch agriculture requires no less than five times Dutch land territory (according to the 2014 Soy Barometer discussed earlier, soy would account for just under a fifth of this),⁴⁷ and lamenting global deforestation from an animal perspective: 'we eat them, as meat eaters, and lay claim to their habitat, mostly for feed production'.⁴⁸ Subsequently, he regrettably limits the study to Dutch developments, explicitly eschewing a transcontinental 'entangled history' and subscribing to methodological nationalism.⁴⁹ The resulting invisibility of foreign soy cultivation and trade seems to have carried over to domestic soy uses; even the soy-based *bloated chicken* [*plofkip*] – broiler chicken on an excessive protein diet to grow (and suffer) excessively, a prominent campaigning symbol of activists – is absent from his work. Looking beyond Verdonk's pivotal work, we observe that soy barely features in the future visions of those who advocate animal wellbeing without substantial changes in intensive animal farming, but that it does feature in the future visions of those who wish for a major overhaul or eradication of animal farming in the form of drastic reductions in soy imports and consumption. For example, soy has featured explicitly in the Party for the Animals narrative since the party's inception, arguing for abolishing the import of soy for animal feed as a stepping-stone toward a future in which the sustainability challenges associated with its cultivation and the problems associated with intensive animal farming are simultaneously addressed.⁵⁰

Pigs as Embedded Soy: Dutch Agriculture and American Ecosystems

A fourth narrative on sustainability in the Dutch Soyacene adds to the previous narratives in two important ways. First, it is explicitly and primarily concerned with Dutch agriculture's environmental and social footprint at sites of soy cultivation, notably in Latin and North America. Second, as

47 van Gelder et al., *Soy Barometer 2014*, p. 40.

48 Verdonk, *Het Vleesloze Gerecht*, pp. 13, 404 (n. 10).

49 Ibid., p. 23.

50 Partij voor de Dieren, *Verkiezingsprogramma 2006*. https://www.partijvoordedieren.nl/downloads/2014/08/1408630865_Verkiezingsprogramma_2006.pdf (accessed 11 Dec. 2021); Partij voor de Dieren, 'Duurzame sojateelt'. <https://www.partijvoordedieren.nl/standpunten/sojateelt> (accessed 1 Dec. 2021).

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such, this narrative explicitly places soy centre stage. This shows in the names that its makers, developmental and environmental NGOs, chose for their collaboration between 2003 and 2018 – the *Dutch Soy Coalition* – and key publications such as the ‘soy barometers’. The latter intriguingly presented Dutch intensive agriculture and its transnational supply and product lines in explicit soy-terms. For example, exported pig meat or eggs were represented as quantitative equivalents of ‘embedded soy’. Below, we first trace the historical origins of this ‘global footprint of soy consumption’ narrative, and then take a closer look at the perspectives, problem definitions and solutions presented in the soy barometers. We end with a reflection on current public debates on soy triggered by two documentaries on deforestation in the Amazon and the Cerrado aired on Dutch national television.

First, with regard to the historical origins of this narrative, the Dutch Soy Coalition itself situated its roots in 1981 when it looked back on its work in 2018.⁵¹ In 1981, developmental NGO Solidaridad and environmental NGO Friends of the Earth Netherlands [*Milieudefensie*] co-published a report entitled ‘Soy-yes soy-no: large-scale production: the consequences for poor farmers in Brazil and for ourselves’.⁵² This report dismissed big business and government claims that soy was ‘the answer’ to the world’s food problem, as a protein- source for both animals and humans; instead, it emphasised a wide diversity of socio-ecological implications of soy production, and that the amount of protein available for human consumption already exceeded global needs. As the title suggests, the report traced the soy supply chain from Brazilian cultivation to Dutch consumption, warning Dutch consumers ‘not to forget the interests of 3rd world inhabitants’.⁵³ Among the follow-up reports, a 1994 Friends of the Earth Netherlands report argued that Dutch per capita meat consumption should decline by fifty per cent to halt soy- and tapioca-induced soil exhaustion in Thailand, the US and South America, as well as to avert the domestic manure crisis.⁵⁴ Over the years, environmental NGOs’ campaigning on soy intensified. Greenpeace protested against the import of soy produced with harmful socio-ecological effects at sites of

51 De Nederlandse Sojacoalitie, *Na 15 jaar eind aan Nederlandse sojacoalitie* (2018). https://www.bothends.org/uploaded_files/document/Sojacoalitie.pdf (Accessed 9 Dec. 2021).

52 Solidaridad and Milieudefensie, *Soja soene, produktie op grote schaal: de gevolgen voor arme boeren in Brazilië en voor ons* (1981).

53 *Ibid.*, back cover.

54 Milieudefensie, *Vlees op de korrel: pleidooi voor een duurzame produktie en consumptie van vlees en zuivel*. (Milieudefensie, 1984).

production.⁵⁵ Friends of the Earth demanded abolition of animal suffering and environmental damage in the Netherlands and at feed production sites, advocating for fair, local and circular food systems.⁵⁶ Both Ends joined the Latin American *Rios Vivos Coalition* that protested the canalisation of the Paraguay-Paraná river system for soy transport. In 2003, these NGOs, and others, established the Dutch Soy Coalition to jointly address the negative effects of soy production and the role of the Netherlands therein. Activities of this coalition included multi-stakeholder seminars, public campaigning, finding international allies, negotiating measures with social, corporate and policy partners, and, of course, researching and exposing the soy supply chain. The Coalition was disbanded in 2018, allegedly because its members felt that ‘soy should no longer be seen as a single issue’ and should be integrated in broader ongoing debates on deforestation, intensive agriculture, human rights, protein transition and more.⁵⁷ Individual members continued to collaborate on specific soy-related activities and publications.

Second, this transcontinental perspective on Dutch soy, including its interpretations of the main problems and solutions involved, was elaborated, deepened and represented in the Coalition’s key publications – the Dutch ‘soy barometers’ of 2009, 2012 and 2014. These were followed up by European ‘soy monitors’ of 2017, 2018 and 2019, which represent a continuation of the same narrative although they were published by one of the Coalition’s members, IUCN-NL, together with the Sustainable Trade Initiative (IDH). Most research and writing of the first four reports was done by a small group of people of the Amsterdam-based research bureau *Profundo*.⁵⁸ As noted, an intriguing feature of this research was its thorough quantitative mapping of

55 Greenpeace, ‘Sporen van criminele soja’. <https://www.greenpeace.org/nl/natuur/4324/sporen-van-criminele-soja/> (Accessed 12 Dec. 2021)

56 Milieudefensie, ‘Archief: Burgerinitiatief ‘Stop fout vlees’’. <https://milieudefensie.nl/archief/burgerinitiatief-stop-fout-vlees/> (Accessed 12 Dec. 2021); Milieudefensie, ‘Onderwerpen: Voedsel’. <https://milieudefensie.nl/onderwerp/voedsel> (Accessed 12 Dec. 2021). Noteworthy is Milieudefensie’s ‘travellog of a soy bean’, which beautifully illustrates socio-ecological challenges at sites of soy production in relation to the consumption of soy by animals for meat and dairy in the Netherlands: Milieudefensie, ‘Actueel: Reisverslag van een sojaboon’, <https://milieudefensie.nl/actueel/reisverslag-van-een-sojaboon> (Accessed 12 Dec. 2021)

57 De Nederlandse Sojacoalitie, *Na 15 jaar eind aan Nederlandse sojacoalitie*, p. 1 and 3–10.

58 A. Herder (Profundo), T. Mohr (Both Ends), G. van der Bijl (Solidaridad), E. van Wijk and E. Herman (Fairfood International), *Sojabarometer 2009: Soja die je niet ziet* (Amsterdam: Nederlandse sojacoalitie, 2009); IDH and IUCN-NL, *European Soy Monitor: Insights on the European Supply Chain and the Use of Responsible and Deforestation-free Soy in 2017*. (Amsterdam, 2019). Researched by B. Kuepper and M. Riemersma of Profundo. Coordinated by N. Sleurink of IDH and H. van den Hombergh of IUCN-NL.

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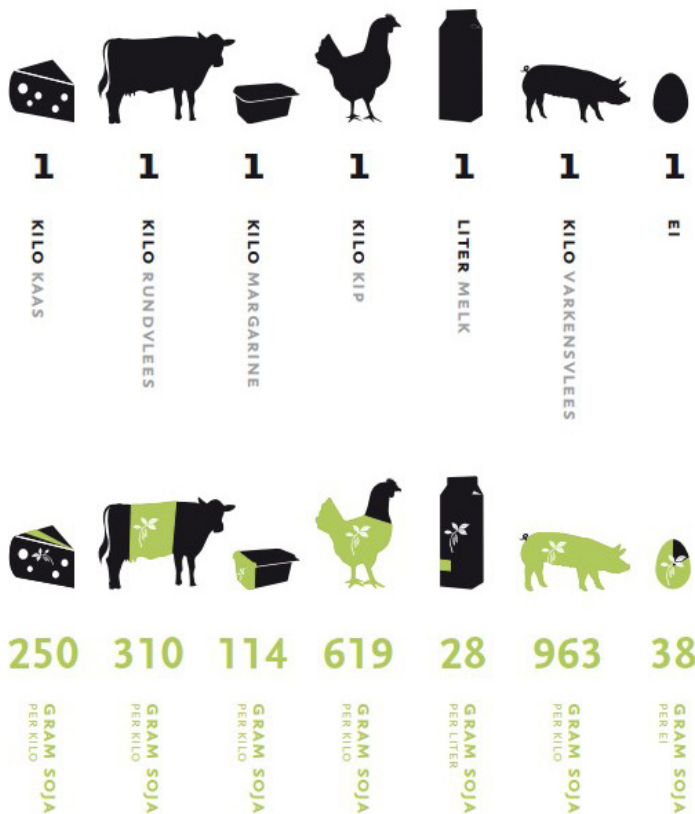


Figure 2.

Visualisation (*avant la lettre*) of the concept of 'embedded soy'. Here, one kilo of pork equals 963 grams of embedded soy.⁵⁹

soy supply chains. The reports amply discuss the databases, difficulties and methodologies involved to produce the 'best available data'. In a nutshell: in 2013 this data involved some 276 million metric tons of global soybean production, some 174 million tons of global exports, 8 million tons of

59 Herder et al., *Sojabarometer 2009*, p. 2.

soybean and soymeal imports (of which 6.5 million tons originated from Latin America), making the Netherlands the second largest importer after China. Some 3 million tons of imported soy was domestically crushed in large plants into soymeal (and oil) and added to the 4.7 million tons of soymeal imports. Most soymeal was exported as feed on EU markets, under 3 million tons were processed or consumed domestically – mostly by animals. Finally, soy was consumed by humans or exported in the form of processed products (meat, eggs, dairy products and so on). These processed products, too, were quantified in soy equivalents: for example, some 1.4 million tons of domestically consumed meat had a ‘soybean equivalent’ of 0.5 million tons, corresponding to 174 thousand hectares of foreign land use.⁶⁰ Later European soy monitors called this ‘embedded soy’ – the amount of soy needed to produce products (Figure 2).⁶¹

Concerning the main problem at stake, these soy barometers and monitors are univocal: Dutch agriculture’s use of soy wreaks havoc in the Americas. The 2009 barometer highlights ‘negative consequences of soy production’ such as large-scale deforestation and soil degradation, (often violent) land use conflicts, food insecurity, slavery, and the use of GM crops and pesticides.⁶² The 2014 barometer elaborates on, and quantifies whenever possible, threats to ecosystems and social justice in specific key cultivation hotspots: the South American Amazon rainforest; the Cerrado wooded grasslands and Gran Chaco woodlands; a variety of wetlands in such as the Pantanal (Brazil, Paraguay and Bolivia) and the Parana Delta (Argentina); and the North American Great Plains.⁶³ Remarkably, and in stark contrast to the previous narratives, the implications of soy consumption in the Netherlands (pollution, animal suffering, and also health effects of processed foods that are particularly consumed by low-income groups) are absent here. This is remarkable given the narrative’s claim of highlighting ‘sustainability issues in the soy value chain’⁶⁴ and the elaborate mapping of ‘embedded soy’s’ trade- and consumption trajectories.

This absence of sites of consumption features similarly in the envisioned solutions. Like for the previous narratives, the problem definition entails a

60 van Gelder et al, *Soy Barometer 2014*, p. 40.

61 IDH and IUCN-NL, *European Soy Monitor 2017*, p. 15.

62 Ibid. p. 5.

63 Van Gelder et al., *Sojabarometer 2014*, pp. 17–26.

64 IDH and IUCN-NL, *European Soy Monitor 2017*.

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specific set of envisioned solutions. The overall strategy of the Soy Coalition and its individual members included diverse solutions: responsible cultivation of soy, replacing soy in animal feed with alternative protein sources and reducing the consumption of meat. However, the soy barometer and soy monitor reports focus almost exclusively on the solution of making soy cultivation ‘responsible’ through certification. The 2012 Barometer explains this selective focus: most stakeholders in the Netherlands – also agricultural stakeholders – could agree that imported soy should be cultivated ‘responsibly’, so that Dutch agriculture and consumers would no longer contribute to social and ecological damage at sites of soy production. As such, the 2014 Barometer spends 25 pages on diverse soy production certification schemes and the introduction of certified soy in the Netherlands, versus only three on soy replacement options, and none on reducing meat consumption (the latter solution, which threatened meat farming, was explicitly excluded from these reports, that were clearly consensus-oriented).⁶⁵ Notably, after the Dutch Soy Coalition disbanded in 2018, and authorship of the European Soy Monitors changed (Dutch) hands (to the Sustainable Trade Initiative IDH and research bureau Schuttelaar and partners), the discussion of governing responsible soy cultivation broadened: it now included national legislation and sustainability initiatives (such as the Amazon Soy Moratorium, an agreement between diverse partners in Brazil) at sites of production, and initiatives that seek to influence production practices from the demand-side, predominantly through certification.⁶⁶

Third, we end our discussion of this narrative with a recent challenge to the dominant solution of certification of responsible soy cultivation. After Dutch importers switched to certified soy, farmers and retailers assured their customers that milk, cheese and meat did not contribute to deforestation and social exploitation. However, two documentaries aired on Dutch television in December 2019 and in November 2021 shattered that illusion.⁶⁷ The latter

65 Herder et al., *Sojabarometer 20*, pp. 16–17; Van Gelder et al., *Sojabarometer 2014*, pp. 1 and 42–67.

66 IDH and Schuttelaars and Partners, *European Soy Monitor: Insights on European Responsible and Deforestation-Free Soy Consumption in 2018* (Amsterdam, 2020). Contributions by R. Hiel, V. Geling, and T. de Vries (Schuttelaar & Partners) and C. Lan and N. Sleurink (IDH); IDH, *European Soy Monitor: Insights on European Responsible and Deforestation-free Soy Consumption in 2019*. (Amsterdam, 2021). Prepared for IDH by Schuttelaar & Partners.

67 R. Rietveld, D. van der Wilde and F. Glissenaar, ‘Bord vol Ontbossing’, *Zembla* (25 Nov. 2021). Available at: <https://www.bnnvara.nl/zembla/artikelen/bord-vol-ontbossing> (accessed 12 Dec. 2021); R. Rietveld and F. Glissenaar. ‘Ramp in het regenwoud – deel 2’, *Zembla* (12 Dec. 2019).

traced the origins of imported certified, 'deforestation-free' soy, revealing that most imported soy had involved large-scale deforestation, land grabbing, violence and more. A complex system of trading certificates resulted in a situation in which the actual soy imported in the Netherlands could not be traced back to production sites that meet the certification criteria. Besides, the earlier 2019 documentary had already pointed out that, even if Dutch imports had stemmed from certified plots, certification would not stop large-scale deforestation to provide room for soy cultivation for export elsewhere; the Dutch reliance on demand-side measures to 'change the system' hence seems misplaced, and at the very best clears Dutch consumers' conscience regarding their own footprint.⁶⁸ Despite this latter observation, the Dutch animal feed industry – applauded by the WWF – has responded to the revelations by committing to direct supply chains, so that only deforestation-free soy reaches the Netherlands.⁶⁹ More radical (and not necessarily more effective) threats expressed by European supermarket chains in May 2021 to boycott all agricultural produce (including soy) from Brazil in response to a bill that would legalise private occupation of publicly owned lands in Brazil, have not, at the time of writing, been turned into action.⁷⁰

Conclusions

This chapter argued that the sustainability history of the Soyacene must not only take global and local developments produced at sites of soy cultivation and trade into account, but also local and global sustainability developments produced at sites of (agricultural) soy consumption. To do so, it studied areas in the Netherlands with some of the world's most intensive animal farming, which is highly dependent on large quantities of cheap imported soy. Besides arguing that regions of soy production and consumption harbour diverse narratives of the Soyacene, this chapter also argues that similar diversity exists *within* such regions. As such, we identified and presented four (hi)

Available at: <https://www.bnnvara.nl/zembla/artikelen/ramp-in-het-regenwoud-deel-2> (accessed 12 Dec. 2021).

68 Rietveld, 'bord vol ontbossing'.

69 J. Lamers, 'FrieslandCampina en Agrifirm gaan voor ontbossingsvrije soja', *NieuweOogst*, 23 Nov. 2021. <https://www.nieuweoogst.nl/nieuws/2021/11/23/frieslandcampina-en-agrifirm-gaan-voor-ontbossingsvrije-soja> (Accessed 12 Dec. 2021).

70 RetailDetail, 'Europese voedingsretailers dreigen met boycot Braziliaanse producten', *RetailDetail*, 6 May 2021. <https://www.retaildetail.nl/nl/news/food/europese-voedingsretailers-dreigen-met-boycot-braziliaanse-producten> (Accessed 12 Nov. 2021).

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stories that emerged in the past five decades or so about the past and future of soy, animal farming and sustainability challenges in the region under study.

We interpret these narratives as simultaneously contradictory and complementary: while they imply very different politics of problem definition and proposed solutions, jointly they bring into view diverse aspects of a broader regional Soyacene history. The 'agricultural miracle' narrative highlights how massive imports of cheap soy through the nearby Rotterdam harbour provided a protein basis for the emergence of internationally competitive industrial animal farming in sandy soil regions, sparking a veritable socio-economic transformation that brought affluence to impoverished rural communities. An 'environmental pollution' narrative and an 'animal suffering' narrative regarded this transformation as generative of intense pollution and intensive animal suffering, with an important role for soy – i.e. carrying nitrogen across the Atlantic that became involved in eutrophication and acidification and in the protein-intense lives of farm animals. A 'global footprint' narrative mapped how Dutch soy use was implicated in ecological and social problems at overseas sites of soy production in the Americas. Given time and space, we could have added other narratives. For example, an environmental sciences research narrative on methane emitted in intensive animal farming has recently gained prominence. Methane constitutes a significant share of Dutch greenhouse gas emissions, and this narrative therefore provides an important addition to research on the greenhouse gas contributions of soy, which usually draws its system boundaries around soy cultivation, transport and processing, excluding consumption.⁷¹

To end, we argue that the diverse narratives presented in this chapter, and those that feature in other chapters of this book, jointly highlight the need to open up ways of thinking about the future to address the manifold challenges in which soy plays the role of critical enabler in an equitable manner. These diverse soy challenges, we argue, are all part and parcel of the shaping of the Soyacene, which stretches across the globe from sites of production to sites of consumption. The historical narratives presented in this chapter typically implied future visions based on a specific soy-enabled socio-ecological challenge in isolation from other challenges, and most highlight technological and organisational innovation (from emission-free and animal-friendly stables to agricultural stewardship and soy certifica-

71 N. Escobar et al., 'Spatially-explicit footprints of agricultural commodities: Mapping carbon emissions embodied in Brazil's soy exports', *Global Environmental Change* 62 (2020): 102067.

tion) as a key solution, although innovation has only provided partial and temporary solutions so far, in practice. This includes Dutch' actors reliance on certification as the means to soy sustainability, including the recent initiative in the Netherlands of setting up direct value chains of certified soy. Here, 'sustainability' means that Dutch consumers can trust that their milk and meat has not contributed to deforestation (as WWF activist Natasja Oerlemans recently put it)⁷² while Dutch agricultural industries proceed their business more-or-less as usual, and large-scale deforestation continues in the Amazone, the Cerrado and other sites of production. The dominant focus on such single-issue solutions crowds out space for alternative, more equitable and more sustainable modes of living across the globe. Imagining plural, more inclusive and more sustainable futures requires us to engage anew with the diverse histories of soy presented throughout this book, by bringing into mutual conversation these diverse historical narratives within and between distant regions.⁷³

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72 Rietveld et al., 'Bord vol Ontbossing'.

73 De Hoop and van der Vleuten, 'Sustainability knowledge politics'.

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