Climate Change Communication in the Netherlands

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Art Dewulf
Wageningen University & Research
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Netherlands Environmental Assessment Agency
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Netherlands Environmental Assessment Agency
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Climate Change Communication in the Netherlands

Art Dewulf, Daan Boezeman, and Martinus Vink

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Summary and Keywords

Climate change communication in the Netherlands started in the 1950s, but it was not until the late 1970s that the issue earned a place on the public agenda, as an aspect of the energy problem, and in the shadow of controversy about nuclear energy. Driven largely by scientific reports and political initiatives, the first climate change wave can be observed in the period from 1987 to 1989, as part of a broader environmental consciousness wave. The Netherlands took an active role in international climate change initiatives at the time but struggled to achieve domestic emission reductions throughout the 1990s. The political turmoil in the early 2000s dominated Dutch public debate, until *An Inconvenient Truth* triggered the second climate change wave in 2006–2007, generating peak media attention and broad societal activity. The combination of COP15 and Climategate in late 2009 marked a turning point in Dutch climate change communication, with online communication and climate-sceptic voices gaining much more prominence. Climate change mitigation was pushed down on the societal and political agenda in the 2010s. Climate change adaptation had received much attention during the second climate change wave and had been firmly institutionalized with respect to flood defense and other water management issues. By 2015 a landmark climate change court case and the Paris Agreement at COP21 were fueling climate change communication once again.

Keywords: climate change, communication, the Netherlands, media, framing, public agenda, science-policy interface, social media

Introduction

Communication is what turns a scientifically complex and epistemologically distant issue such as climate change into an issue of public concern (Driessen et al., 2010). Myriad communication efforts over multiple decades have made climate change into what it has become in the early 21st century: an issue of prime importance for the future of humanity, inspiring global coordination, national policies. and local initiatives. However, this issue is now heavily debated politically and subject to considerable skepticism. In our attempt to reconstruct the legacy of climate change communication in the Netherlands, the purpose is not to take a stance on how climate change should be communicated or who should engage in climate change communication. Instead, this article aims to chart and understand the different forms and shapes that climate change communication in the Netherlands has taken since the topic first appeared in the Dutch media in 1957, in the context of International Geophysical Year.

Studying climate change communication in a country such as the Netherlands requires awareness of a number of contrasts. Jointly defending low-lying land against flooding is part of the Dutch national history and identity. The artificially constructed and intricately managed water system of polders, dykes, and canals is vulnerable to climate change impacts such as sea-level rise and extreme weather conditions, but at the same time there is a strong conviction that the national water infrastructure and expertise is up to almost any challenge (Kabat et al., 2005). The centuries-long tradition of strong mutual dependence and consensual deliberation in the maintenance and protection of polder systems against flooding has given its name to the “polder model” as a form of interactive governance (Vink et al., 2015; Torfing et al., 2012). The Dutch also pride themselves as global leaders and agenda setters in the international climate change arena, while at the same time strong economic interests have made it difficult to achieve significant reductions in greenhouse gas emissions domestically (Pettenger, 2007; Liefferink et al., 2017). This seems to resonate with a recurrent tension throughout Dutch history between the identity of a nation of “preachers,” with strong moral leadership at home and abroad, and the identity of a nation of “merchants” trading with anyone regardless of their political or religious conviction (Kickert, 2003).

Scientific studies focusing on climate change communication in the Netherlands are less abundant than one would expect for a country that has historically been active in domestic and international climate change discussions. While climate change communication in the Netherlands is often touched upon in studies on Dutch environmental policy, in studies of the science-policy interface or in international comparative research, in-depth studies of the Dutch case are scarce and the overall picture is quite fragmented. Because both modes of communication and our understanding of climate change have developed considerably since the 1950s, historical context is crucial for understanding climate change communication; however, a

systematic historical overview is lacking in current literature. The aim of this article is to review and collate the extant research that typically addresses a particular aspect of climate change communication at a particular juncture in Dutch history.

This analysis is guided by three theoretically grounded cross-cutting themes, which together provide a comprehensive picture of climate change communication in the Netherlands: (1) the framing of the issue and its priority on the public agenda; (2) the relations between science, policy and society; and (3) the rise of the network society and on-line communication.

Firstly, through climate change communication the issue is positioned on the public and political agenda and also framed in particular ways. Theories of agenda setting address the competition for public attention between climate change and a broad range of other policy issues and how this affects policy priorities (Jones & Baumgartner, 2004; Kingdon, 1995; Pralle, 2009). The cycles of attention for an issue need to be considered, but also important is how an issue is framed through processes of strategic communication (Nisbet & Huge, 2007). Different framings aim to establish different meanings of the climate change issue, through employing different language and selectively emphasizing certain aspects of the issue at the expense of others (Entman, 1993; Nisbet & Mooney, 2007), affecting decision preferences and public engagement (Nisbet, 2009).

Secondly, because of the strongly science-driven nature of the climate change issue, particular attention is paid to communication processes in the science-policy-society triangle. Here, the analysis relies on concepts such as co-production of political order and scientific knowledge (Jasanoff, 2004), politicization of science (Gauchat, 2012), and post-normal science (Funtowicz & Ravetz, 1993). The analysis deliberately goes beyond the limited focus on communication at the science-policy interface by paying attention to emerging communication practices in which citizens directly engage with scientists.

Thirdly, the rise of the network society (Castells, 2007) is a particularly relevant context for climate change communication. In the 21st century, the development of horizontal, interactive, and global online networks of communication have enabled large parts of the population to become active communicators in a new virtual public space. Starting with the blogosphere and developing into an ecosystem of different platforms, social media play important roles in climate change communication—roles different from those of mass media (Schäfer, 2012).

The combination of a broad historical overview and more focused discussion on these three cross-cutting themes aims to provide both historical context and analytical depth to our analysis of climate change communication in the Netherlands. In putting this together, choices had to be made. Most existing studies only cover a particular aspect of climate change communication for a particular historical episode, so the evidence for each of the phases had to be pieced together from a variety of sources. The analysis is mainly based on a review of peer-reviewed journal articles and book chapters, which were obtained through literature search and consultation of colleagues. To make the

analysis more complete, other sources were consulted, including a number of research reports produced at Dutch the science-policy interface. Additional media data has been extracted from Lexis-Nexis Academic to reconstruct media attention and framing over time (see Figures 1 and 2).

Both mitigation and adaptation have been included in the analysis. While the story is about mitigation of climate change through reducing greenhouse gas emissions in the first phases in the historical overview, adaptation to climate change impacts becomes a dominant theme in the later phases.

Working from a broad concept of climate change communication (Nerlich et al., 2010; Nisbet, 2009; Schäfer, 2012), our focus is on climate change communication in the public sphere on a variety of media platforms—focusing on communication by a variety of people, including scientists, politicians, administrators, journalists, businessmen, activists, and regular citizens. Climate change has been a topic of discussion frequently and at length in the Netherlands. Deliberate climate change communication efforts have been undertaken by both public and private actors, but large-scale publicly or privately driven communication campaigns on climate change are virtually absent. As it turns out, a substantial share of climate change communication in the Netherlands is linked to both national and international efforts to develop climate change policies, which is reflected in this analysis.

Historical Overview of Climate Change Communication in the Netherlands

After the discussion of relevant antecedents in the 1950s, 1960s, and early 1970s, we structured our historical overview of the period between 1978 and 2016 in six consecutive phases. Although the delineation of historical phases is always somewhat arbitrary, the start of each new phase marks a significant change in climate change communication in the Netherlands. The delineation of the phases was informed by those studies taking a long-term perspective (e.g., Duyvendak, 2011; Liefferink et al., 2017; Pettenger, 2007; Van der Sluijs et al., 2010). For each historical phase, the amount and nature of attention for climate change in media sources is discussed, in relation to developments in climate change science, national policy and politics, and international developments at the EU and UN level.

Antecedents

Before the 1970s climate change was not an issue in the Netherlands, yet climate change did occasionally surface in scientific and political discussions. Although scientific interest in carbon cycles was not big in the Netherlands (Dinkelman, 1995), G. S. Callender’s

publications on the temperature-CO_2 relationship did receive attention in (popular) scientific media and caused some controversy. In the context of the 1957 International Geophysical Year, scientists of the Dutch Royal Meteorological Organisation (KNMI) addressed the issue in various lectures, as well as during a talk on national radio. The KNMI installed a CO_2 measuring station in 1957, following international agreements. During this period, the issue gets framed in various different terms (Duyvendak, 2011, p. 18): ranging from climate improvement, to climate variability and a "dangerous carbonic acid blanket." The question whether coal and oil (a large reserve of natural gas would be discovered in the northern part of the Netherlands in 1959) would lead to temperature changes was still open. Press coverage of the climate issue would almost be as much about the possibility of global cooling than of global warming until the early 1970s (Van Eijndhoven et al., 2001).

The issue of climate change was first raised in the Dutch political arena in 1970, when two members of parliament with a scientific background wanted to know "what is known about the greenhouse effect? Is it really alarming?. . . Do scientists agree?" (Boersema, quoted in Van der Sluijs et al., 2010, p. 16). Although these questions were raised, answers were not vigorously pursued within the political arena. Climate change received permanent yet passive attention mostly in scientific circles, more as a phenomenon than as a problem up until the 1980s. Climate change research was still rather underdeveloped in the Netherlands at the time (Dinkelman, 1995).

Important for understanding the initial debates on climate change are two issues. First, the 1972 *Limits to Growth* report by the Club of Rome became a bestseller in the Netherlands. Remarkably, and following in line with the report, local thermal pollution was given as much prominence as the greenhouse effect in Dutch policy documents. Second, the 1973 oil crisis hit the Netherlands. Both events are influential in reframing the energy issue away from the self-evident and cheap supply of fossil fuels, as was evident in a governmental television campaign to promote dealing sensibly with energy in 1974. The emergence of the Dutch debate on climate change should be understood against the background of the oil crisis, the subsequent energy diversification strategy, and the fierce societal resistance against nuclear energy. Environmental NGOs campaigned actively against nuclear energy but were reluctant to engage with the climate change issue because it was hard to reduce the issue to human proportions, and climate change also risked enlistment in pro-nuclear arguments.

It is amidst this political and societal controversy that the climate change issue was first raised publicly. Environmental policy lifted off in the early 1970s, yet remained mainly a matter of keeping the environment clean (*Milieuhygiëne*, literally "environmental hygiene") at that time (Boezeman et al., 2010; Keijzers, 2000). The first environmental memorandum in 1972 (*Urgentienota milieuhygiëne*) followed the Club of Rome's analysis, referring to the "anti-ecological nature of cultural patterns," yet was optimistic about solving the environmental problems in 5 to 10 years. Climate change was not addressed with policy measures.

A New Issue Rising on the Environmental Agenda (1978–1986)

The late 1970s and first half of the 1980s can be characterized by two streams. First, scientific interest in climate change was growing, but Dutch scientists would not become actively involved in international climate debates until the mid-1980s (Van Eijndhoven et al., 2001, p. 123). Second, political communication would center around carbon dioxide, yet mostly in the sideline of discussions on the energy problem. From the mid-1980s framing would shift to the more encompassing "greenhouse effect," gaining status as an issue in its own right.

From 1978 onward, various advisory councils started signaling the significance of climate change for the Netherlands. The anthropogenic greenhouse effect had become an issue of science policy in 1979, when the memorandum on the annual science budget stated that the underdeveloped climate research should be stimulated. A few years later, resources from the National Research Program on Coal were invested into research into carbon dioxide. While signaled by a report of the Scientific Council for Government Policy in 1977, the 1981 Vossers Committee for Meteorological and Oceanographic Research in the Netherlands was a particularly important first step toward advancing the cause of climate change on the Dutch scientific agenda. The 1983 and 1986 authoritative reports by the Health Council, the most important advisory organ for environmental issues at the time, were important for translating scientific discourse into societally relevant terms. The two-part first report dealt with the carbon cycle and with the societal consequences. The second report elaborated on other GHGs and concluded sea level would rise up to 77 cm and water management would be domestic adaptation issues related to climate change. Although the Health Council stressed the seriousness of the problem, the council emphasized uncertainties and was pessimistic about the possibilities of "prevention" on political and economic grounds (Dinkelman, 1995). The international Villach conference of 1985 proved an important turning point in the Dutch scientific community becoming active in international research (Van Eijndhoven et al., 2001). Although research into the global climate system itself was relatively insignificant in the Netherlands, Dutch scientists (notably Pier Vellinga) were internationally well established on the impacts and adaptation side. During the Villach conference the Netherlands would offer to organize a European conference on climate impacts in Noordwijkerhout and a related Western European Ministerial conference in Noordwijk in 1987.

Societal and political debates were still dominated by nuclear energy in the Netherlands at that time. The political intentions of the Biesheuvel and following Den Uyl administrations to generate half of Dutch electric energy use by nuclear power in 2000 on the one hand and the large societal resistance by the growing antinuclear movement on the other hand led to a political-administrative deadlock at the end of the 1970s. In 1978 the minister of economic affairs announces plans for a broad national debate on (nuclear) energy (*Brede Maatschappelijke Discussie*). Dinkelman (1995, pp. 167–168) argues that carbon dioxide had only an indirect role in the broad national debate, concluding that although attention for anthropogenic greenhouse effect was growing, it did not affect the

energy policy agenda at that time. Environmental NGOs were reluctant to pick up climate change, framing it as an CO_2-energy issue with effects for agriculture in 1980s (Pleune, 1997). The liberal-conservative political party VVD, a proponent of nuclear energy, raised CO_2 at various occasions and filed a joint political motion with the progressive PPR (a predecessor of the Greens) to invite the cabinet to take a stance on CO_2 in 1979. Nevertheless, coal policy was not influenced by CO_2 but rather by issues related to sulphur, dust and waste (Dinkelman, 1995, p. 167). Following the aforementioned Health Council reports the Dutch started following a "three-track policy": to promote international awareness raising, to conduct scientific research, and to take policy measures (both adaptive and preventive). The two former tracks were far more important than the latter. In 1986, when chairmen of various political parties asked questions on climate change during the debate on the environmental budget, environmental minister Nijpels promised a policy memo on the "CO_2 issue."

The First Climate Change Wave and the Difficulties of Policy (1987–1993)

The public attention for climate change peaked for the first time in the period from 1987 and 1989, an episode that was coined the "first climate change wave" (Duyvendak, 2011, p. 33), although it was part of a larger environmental consciousness wave (Pettenger, 2007). The Netherlands' reputation as an ambitious player and international advocate for climate policy can be traced to this period (Liefferink et al., 2017). In 1987, the minister of environment (Nijpels) presented the promised policy document on "climate change by carbon dioxide and other trace gasses" (*Klimaatverandering door CO_2 en andere sporegassen*) framing the problematic nature of the greenhouse effect in terms that would be dominant for the periods to come. The issue was complicated because of its global character, (expectedly inherent) large uncertainties, long-term character, and interwovenness with large scale societal developments that are difficult to steer (Dinkelman, 1995, p. 185). Nevertheless, because climate change was said to be internationally still in a "signaling phase," the "three-track policy" was continued, claiming it was too early for domestic preventive policies.

The Netherlands took an active international role in two domains. On the one hand, Dutch environmental minister Nijpels actively opted to politicize the climate issue (Van Eijndhoven et al., 2001; Duyvendak, 2011), trying to reorient the 1988 Toronto International Conference on the Changing Atmosphere in a more political direction. The minister attended the conference and supported the closing statement of developing a climate agreement and cut CO_2 emissions by 2005 with 20%. Also, he announced that the Netherlands would take the initiative to organize an international ministerial conference in Noordwijk in 1989. Internationally, the greenhouse effect was also on the agenda of the G7 meeting a few days later in Toronto, and NASA's Jim Hansen had given testimony in Congress on the 1988 droughts being first signals of climate change. On the other hand, knowledge supply also influenced the pioneering role of the Netherlands, with Dutch

scientists playing prominent roles in Integrated Assessment Modelling first for acid rain and later on the greenhouse effect (Van der Sluijs, 2002): the IMAGE model, developed in the second half of the 1980s at the Netherlands National Institute of Public Health and Environmental Protection, not only influenced domestic policy but was also foundational for the IPCC emission scenarios. Dutch scientists would become more active internationally, with Pier Vellinga becoming vice chair of the IPCC Working Group "response strategies." The role of knowledge supply is also illustrated by the fact that, domestically, a few days after the Toronto conference, the Central Council for Environmental Protection (*Centrale Raad voor de Milieuhygiëne*) presented a report on anthropogenic emissions and the need for preventive action, even before international agreements (Dinkelman, 1995). Various research institutes became more actively involved, supported by policies in the "second track": the National Research Programme on Global Air Pollution and Climate Change was initiated in 1989, effectively making fragmented research to become more coherent (Van de Kerkhof & Leroy, 2000). In addition, the environmental ministry funded environmental organizations for developing European policy goals for climate change, following a resolution in the European Parliament in 1986 (Dinkelman, 1995, p. 187). This should be understood in view of the environmental ministry's strategy to strengthen its support base in the battle against other ministries (Duyvendak, 2011), and the professionalization of the environmental movement in what became a broad discourse coalition of science, government, industry, and the environmental movement around reformist principles of ecological modernization in the Netherlands (Van der Heijden, 2000, p. 86). It would lead environmental NGOs to finally embrace the issue (Pleune, 1997).

Meanwhile, attention for environmental issues peaked in the Netherlands (Boezeman et al., 2010). Several international and national environmental accidents, the influential Brundtland report, the alarming domestic scientific report Concern for Tomorrow (*Zorgen voor Morgen*) published in 1988 by the National Institute for Public Health and the Environment (*Rijksinstituut voor Volksgezondheid en Milieu*) claiming Dutch CO_2 emissions would have to be cut with 80%, and a Queen's Christmas speech in which she claimed "slowly the earth is dying," led to an enormous societal momentum. The report Concern for Tomorrow was particularly important for reframing the scale and scope of "modernized environmental policies" (Keijzers, 2000, p. 186) from local and regional pollution and health issues to the functioning of ecosystems at a global scale. The Brundtland report advanced thinking in terms of the "precautionary principle" in the environmental and climate debate (Van der Sluijs et al., 2010, p. 18). In this national mood, the first *National Environmental Policy Plan: To Choose or To Lose* was presented by the cabinet, in which climate change was the first of the central issues. Importantly, this plan was internationally the first to introduce a goal for the stabilization of carbon dioxide emissions: around 183 Mton in 2000. The plan's rhetoric was ambitious but policy was not. Before the report was presented, the administration had to resign over its plan to abolish a commuters tax cut when the liberal-conservative party VVD withdrew support for its own ministers. It fueled "the greenest election campaign the world has ever seen"

in 1989 (Economist, quoted in Pettenger, 2007, p. 58) and the follow up National Environmental Policy Plan in 1990 formulated a more ambitious carbon goal. The 1991 Memorandum on Climate Change would make an all-gasses approach the basis for policy.

The Dutch environmental policy community played an active role in setting the agenda in the runup to the Rio conference in 1992 and tinkered with new policy concepts to realize the formulated goals (Liefferink et al., 2017). With other member states it pushed for an EU-wide CO_2 tax, investigated emission trading, explored what would later be called "Carbon Capture and Storage" and was active in the discussion on (and later participation in) doing emission reductions abroad via the Clean Development Mechanism and Joint Implementation. In 1991 a national greenhouse communication campaign saw daylight stating, "We can no longer deny that there is a greenhouse effect." A nationwide energy-efficient light bulb campaign aimed at the installation of 3.5 bulbs per household, supported by subsidies, quality standards, consumer advice centers, and a deposit-return system (Wynne, 1993). In 1992 municipalities found "Klimaatverbond," a daughter of the international Climate Alliance, to promote local climate action.

At the same time, skeptical sounds started penetrating both the Lower House (far right) and the Senate (social democrats) in the early 1990s (Van der Sluijs et al., 2010, p. 20). The environmental minister responded that scientific uncertainties were an argument to engage in action, following the precautionary principle. However, action would prove tough in the episodes to come.

International Breakthroughs and Domestic Policy Struggles (1994–2001)

In 1994 the United Nations Framework Convention on Climate Change entered into force after enough countries had ratified it. This started a cycle of yearly Conference of the Parties meetings (COPs) as an international arena for negotiation and decision making on climate change targets and measures (Van der Sluijs et al., 2010). The COPs are also occasions for periodically putting climate change back on the national public agenda and functioned as triggers for increasing communication on climate change. In the runup to the 1997 Kyoto Treaty, the Netherlands held the EU Council Presidency. The Dutch environmental minister played a key role in forging a common EU opening offer for Kyoto: a reduction of emissions by 15% in 2008–2012 (relative to 1990), a "triptych" approach for burden sharing, and the conditionality upon the commitment of other industrialized countries to comparable reductions (Liefferink et al., 2017). While the final Kyoto agreement included only an 8% emission reductions for the EU, this was considered far too radical by some of the other ministers in the cabinet (Duyvendak, 2011).

Notwithstanding the environmental policy ambitions of the late 1980s and early 1990s and the active role played internationally, domestic implementation would prove far more difficult for at least two reasons. First, climate policy became part of an effort to move responsibilities from government to private actors. Earlier than in the rest of the EU,

market mechanisms and voluntary agreements became important. The 1997 Environment and Economy Memorandum proposed benchmarking covenants for energy efficiency, in return for the abandonment of plans for a GHG emissions tax. Waves of liberalization limited the competencies of government for direct intervention Second, negotiations had to be done with the economically important and energy-intensive industry and transport sectors in the Netherlands. Within government, the environmental, economic and transport ministries had conflicting goals. Economic Affairs started cutting subsidies for energy savings and sustainable energy, while the Transport and Water Ministry invested in energy-intensive transport infrastructure. This led to ongoing struggles; and with a cabinet primarily focused on creating employment, climate change action was not being prioritized.

The period 1995–1997 marked a change in Dutch political communication on climate change. First, following critical questions in parliament, a Temporary Committee Climate Change was founded in parliament to get more insight into scientific knowledge. The committee concludes that according to science, high levels of CO_2 lead to dangerous climate change, and the committee advises internationally coordinated reduction efforts (Van der Sluijs et al., 2010). Second, the Kyoto Protocol with its emission rights and reduction targets closed the domestic policy debate on targets. These two events shifted the political debate to one about how to reach the targets. The participatory “national dialogue” (1999–2001) of the Dutch scientific project “Climate OptiOns for the Long Term” (COOL) is a prime example thereof (Van de Kerkhof, 2004), in which policymakers, business, NGOs, and scientists assessed long-term climate policy to achieve the “given” goals. At the same time, the covenants with industry and measures in the building sector enhanced energy efficiency but did not reduce absolute emissions. Hardly any policy measures were in place for transport, and renewable energy production showed slow growth rates (Liefferink et al., 2017). Reducing emissions abroad, an option included in the Kyoto Protocol through Joint Implementation and Clean Development Mechanism projects, became the preferred strategy. The 6th COP in The Hague in 2000 led to increased media attention, but the United States withdrawal and rejection of the Kyoto Protocol was received as a major setback for the Dutch climate change strategy (Pettenger, 2007).

The ambitious Fourth National Environmental Policy Plan (2001) took a global perspective on environment and development issues and introduced the idea of “transitions” (i.e., toward a more sustainable energy system). Although this was a potentially powerful idea, it was criticized for “its strong technological bias, its continued (and therefore contradictory) dependence on the fossil fuel industry, and the prevalence of the short-term efficiency goals of the energy liberalization agenda over long term sustainability objectives” (Liefferink et al., 2017; see also Kern & Howlett, 2009). According to Pettenger (2007), the Fourth NEPP emerged at a difficult time in Dutch politics, when GHG were rising rather than declining, the government was investing in airport

expansion, and issues of unemployment and economic recession were dominating the agenda.

In parallel with (yet largely disconnected from) mitigation debates, attention for adaptation to climate change was rising in the water sector, particularly in relation to flood safety. In the 1990s several climate impact studies were done (e.g., for major rivers such as the Rhine) (see Kwadijk & Rotmans, 1995; Middelkoop et al., 2001) and the Meuse (see Wesselink et al., 2009). At the same time, several (near) flooding events of rivers in 1993 and 1995 exposed the relative negligence of river dikes (Tol & Langen, 2000) and fueled discontent with the disconnect between water management and spatial planning in the Netherlands. It informed the ongoing “spatialization” in water management (De Vries & Wolsink, 2009) as well as the rise of a “water accommodation” storyline (Van den Berg, 2013), which were linked to the developing Room for the River policy in which future climate change was accounted for (Vink et al., 2013).

The Committee Water Policy 21st Century (WB21) was installed in 1999, for which the KNMI together with hydrological institutes developed the first climate scenarios of sea level rise, river discharge, precipitation and soil subsidence: the WB21 scenarios.

A Change in the Political Climate (2002–2006)

The year 2002 shows a sharp turning point in the framing and agenda setting of climate change in the Dutch public debate. Important factors were competing issues such as the 9/11 terrorist attacks, which pushed security high on political agendas worldwide, and the turbulent domestic elections of 2002 in which the new populist political party lead by Pim Fortuyn took the lead. In Fortuyn’s campaign, he made a distinction between what the “established elites” in power had done over the last eight years and the will of the ordinary people, particularly with respect to immigration issues. Fortuyn invoked a clash between the views and issues of the establishment (left and right) and the views and issues of the people (Van Holsteyn & Irwin, 2003; Mudde, 2004). Environmental issues were framed within this strong societal polarization, with climate change portrayed as an elitist concern of the establishment.

The national shock provoked by the assassination of Fortuyn in 2002 amplified the polarization and his party LPF won the elections. Most established political parties were influenced by this “populist Zeitgeist” (Mudde, 2004) and adopted some of its rhetoric to win back legitimacy. Two consecutive right-wing cabinets cut back green ambitions and budgets, of which the replacement of an environmental minister by a state secretary was symptomatic (Boezeman et al., 2010). As other issues took over the political agenda, the state secretary felt part of a cabinet that did not have the time nor the interest for environmental issues. Environmental organizations followed this trend and showed a much less politicized attitude in the first decade of the 21st century (Duyvendak, 2011, p. 67).

Critical sounds toward climate science surfaced in the public debate. Some Dutch geophysical scholars wrote opinion articles in newspapers more regularly, placing CO_2 issues in geological perspective. Using longer timeframes, they questioned the influence of human action. Other geophysical scholars called climate science "pseudoscience," which they claimed to be informed by Calvinistic feelings of guilt rather than facts (Duyvendak, 2011, p. 111). The low priority of climate change on the political agenda, in combination with skeptical voices on climate change science made policymakers emphasize the importance of finding win-win solutions between the economy and the environment in climate policy. At the European level the Dutch pushed the "clean, clever, competitive" storyline of eco-efficiency during their 2004 EU presidency (Boezeman et al., 2010). In preparation for a follow-up to the Kyoto Protocol, parliament commissions a report to inform itself about the scientific state of the art in 2004. The report dealt with climate-sceptic questioning of climate science but was not shared by the researchers (Van der Sluijs et al., 2010, p. 26).

In the meantime, within water management the climate issue was getting mainstreamed as a flood protection issue using the water accommodation storyline. Following the Committee Water Policy 21st Century's recommendations, efforts were made to integrate water and spatial planning and to enhance policy coordination to keep the entire Dutch water system in "good order" (National Administrative Agreement Water). Local governments had to carry out a "municipal water task," obliging them to adjust water systems to cope with climatic changes (Van den Berg, 2013). Water boards had to deal with secondary flood barriers (Boezeman, Vink, Leroy, & Halffman, 2014) and the 2006 planning decision "Space for the River" anticipated on a discharge of 18.000 m3/s in 2100 (Verkerk & Van Buuren, 2013). Also, public communication on living with water in a different climate was strengthened by initiating the Netherlands Lives with Water (*Nederland Leeft met Water)* campaign in 2003 (restarted in 2008). Concerning climate change adaptation, the issue was broadened. The large national research program Climate Changes Spatial Planning was founded in 2004, advancing both the idea that climate change would determine planning decisions in the future as well as a "climate proofing" storyline (Kabat et al., 2005). A 2005 motion in the Senate urging Dutch government to incorporate climate change in long-term public investments decisions was unanimously accepted. This was also the year that Hurricane Katrina hit New Orleans, a disaster that received extensive news coverage in the Netherlands.

The Second Climate Change Wave: Rise and Fall of Climate Change as a Major Issue on the Public Agenda (2006–2011)

The movie *An Inconvenient Truth* by Al Gore released in the fall of 2006 became an unexpected success in the Netherlands and triggered the second climate change wave. Initially none of the major film distributors showed interest in the movie, but an inspired communication professional managed to bring the book, the movie, and eventually Al Gore to the Netherlands (Duyvendak, 2011). The public turned up in large numbers,

facilitated by free screenings by municipalities, foundations, and businesses. Politicians were inspired by the movie, including prime ministers Balkenende (Netherlands) and Blair (UK), who issued a joint appeal for climate change action to their EU colleagues. A group of eighty Dutch businessmen, including leaders from Shell, Unilever, and Royal Dutch Airlines (KLM), wrote a public letter to politicians asking for environmental protection in the Netherlands and worldwide (Duyvendak, 2011). Climate change was increasingly seen as a potential business concern and opportunity. New environmental organizations are founded, such as Urgenda in 2007, who played an important role in translating scientific insights into practical actions. Urgenda also proclaimed Sustainability Day and demanded less government regulation and more opportunities for new initiatives led by societal actors. In 2007 the "HIER Nederland Klimaatneutraal" campaign started, aimed at convincing one million Dutch people to become climate neutral, as well as the Green4sure campaign, a coalition of the environmental and labor movement lobbying for a climate law (Van der Heijden, 2009).

Environmental issues had played little to no role in the 2005 elections for the Dutch parliament, and a report by the Netherlands Environmental Assessment Agency (PBL) at the end of the same year on the "Effects of Climate Change for the Netherlands" did not catch the public's attention. A year or so later, the presentation of the "State of the Climate" report by the newly established Platform for Climate Change Communication (PCCC) was covered broadly in the media. Although environmental issues had been out of the public eye for a while, climate change soon became a hot topic. The first climate change wave primarily impacted policy and political agendas as part of a broader environmental consciousness wave, but this second wave had a much broader societal reach that specifically focused on climate change.

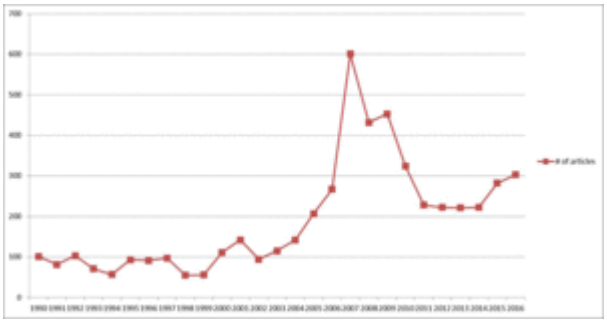

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Figure 1. Number of news articles published in the Dutch quality newspaper NRC Handelsblad containing any of the search terms *klimaatverandering* (climate change), *klimaatsverandering* (climate change), *broeikaseffect* (greenhouse effect), *opwarming van de aarde* (global warming), or *klimaatbeleid* (climate policy), between 1990 and 2015.

(*Source*: compiled by the authors based on the Lexis-Nexis Academic database).

A number of significant events fueled unprecedented levels of climate change communication in 2006 and 2007 (see Figure 1). In 2006 the combination of *An Inconvenient Truth* and the release of the Stern Review turned climate change into a relevant, serious, but manageable issue for the Netherlands. In 2007 the PCCC's State of the Climate report, the IPCC's Fourth Assessment Report, and the awarding of the Nobel Peace Prize to Al Gore and the IPCC were significant events driving climate

change communication. Hot summers and mild winters (in 2006 record breaking temperatures were observed for the Netherlands) and increasing oil prices might have made people more susceptible to recognizing climate change as an important issue. In 2007 the new Christian Democratic/Social Democratic cabinet included a minister of environment again. Minister Cramer's ambitious climate program aimed at 30% reduction in GHG emissions by 2020 (base year: 1990), a 20% share of renewable energy by the same year, and an annual energy saving rate of 2% (Liefferink et al., 2017). In 2008 the EU launched the 20-20-20 Renewable Energy Directive, setting targets for emission reductions (20%), reduced energy consumption (20%), and increased renewable energy (20%) by 2020.

In 2008 and beginning of 2009, media attention for climate faded, only to increase sharply in the runup to COP15 in Copenhagen (see Figure 1 and Van der Sluijs, et al., 2010).

With respect to the climate change adaptation issue, the fact that Hurricane Katrina had hit the low-lying delta area of New Orleans in August 2005, causing severe floods and hundreds of casualties, became an important public image. The similarities of the lowland delta area with the Dutch delta, and its history of severe floods in view of potential sea level rise, fueled debate on the Dutch flood safety in view of climate change. Newspaper articles were reporting about how Dutch engineering companies were hired for large sums of money to advise the Americans on how to increase flood safety, highlighting the potential business opportunity of climate change. In 2007 the image of Hurricane Katrina played a role in the commissioning of the Second Dutch Delta Committee to advise the government on flood safety in view of climate change (Boezeman et al., 2013). In the wake of the growing attention for the climate issue, this political advisory committee put adaptation to climate change firmly on the political agenda as a water management issue of national importance. Of the many newspaper articles that covered the committee's recommendations, only a few were critical of the drastic measures proposed by the committee, including raising the protection levels of all dike areas with a factor of 10 and raising the level of the Lake IJssel up to 1.5 meters (Verduijn et al., 2012; Vink et al., 2013). In this episode, cautiously new issues such as urban warming were added to the water-centric adaptation framing (Boezeman, 2016).

The public debate about climate change took a largely unexpected turn in the fall of 2009 and continued into 2010, marked by increasing polarization between "alarming" and "skeptical" views. The controversy that sprung from the release of e-mail correspondence between climate scientists at the University of East Anglia (now known as "Climategate") in the run up to COP15, and the subsequent identification of a number of errors in the IPCC Fourth Assessment Report—including one regarding the percentage of Dutch territory lying below sea level—contributed to this (Edwards et al., 2011; Dewulf et al., 2013; Hajer, 2012). Climate skepticism had been developing for quite a while, particularly in the blogosphere, but it was now picked up by mainstream media and also by right-wing political parties and the far-right Party for Freedom (*PVV*), a denialist voice. This skepticism would seep into the Dutch parliament. The new website *climategate.nl* was

established and quickly became a platform for Dutch climate skeptics, discussing at length the hacked e-mails and errors in the IPCC report. The reputation of the IPCC suffered considerable damage, to the extent that the cornered minister of environment stated that she would no longer accept any errors of science (Edwards, Bekkers, de Kool, & Straten, 2011, p. 10). Some political parties wanted to suspend decision making on climate policy altogether, pending an investigation into the IPCC. The 2010 elections led to a conservative minority coalition authorized by the denialist Party for Freedom (*PVV*). The new coalition dissolved the Ministry of Environment and transferred its responsibilities to the new Ministry of Infrastructure and the Environment. Climate change was hardly mentioned in the coalition agreement of the new cabinet.

From Climate Change Mitigation to Adapting the Dutch Delta to Climate Change (2011–2016)

After the climate controversy and the subsequent decline in media attention to the climate issue, climate change as a policy issue was reframed. Attention shifted away from mitigation toward climate change adaptation, which was characterized largely as a flood safety issue. Climate change adaptation became part of the Delta Program, launched in 2011 as a policy development program acting upon the recommendations of the 2008 Delta Committee. The title of the Delta Program, “Working on the Delta,” refers to addressing the flood safety issues, stressing continuity with what the Dutch have been doing for centuries. Although the public announcement touched upon increasing temperatures, sea-level rise, and extreme weather events as reasons for the policy program, climate change as such is not even mentioned (Vink et al., 2013). The focus was on maintaining prosperity in the Dutch delta by continuing to invest in water management. That the cabinet had no plans for climate change action is also illustrated by the fact that the minister of infrastructure and the environment commissions invited one of the founders of the *climategate.nl* website to review the fifth IPCC report.

Although in official communication the concept of climate change largely disappeared, climate change impacts on water management did remain a policy issue. Various water management projects such as the Delta Program and many other regional programs rely on climate scenarios in drafting policies, indicating a divide between the intentional framing of policies and the substance of policies (Dupuis & Biesbroek, 2013; Boezeman et al., 2014; Vink et al., 2015). In this case the divide between official framing and actual policy substance can be understood as the result of climate adaptation having been *mainstreamed* in existing policy fields such as water management and particularly flood protection. That the issue disappeared from official communication did not matter too much for its impact on policy, since the issue had been formalized as specific criteria for water management. However, little or no progress was made regarding adaptation issues in other sectors, or regarding climate mitigation issues.

The 2012 elections led to a new cabinet that excluded the denialist Party for Freedom, and climate change started to reappear in official communication; however, this time it was featured less prominently than in the second climate wave, and it was more ambiguously defined. Although this did not come with the societal and political momentum associated with the second climate change wave, the more ambiguous framings did allow for mainstreaming the issue in the form of sector-specific criteria sectors beyond water management and flood protection. Another sign of increasing interest in climate change was the Dutch Energy Agreement for Sustainable Growth (*Energieakkoord voor duurzame groei*) in 2013. Whereas during the first wave climate change was framed in terms of pollution, and subsequently became a matter of reducing CO_2 and other greenhouse gas emissions in the second wave, in 2013 this agreement between the government and 40 companies and societal organizations aimed at "sustainable growth." Obviously CO_2 emissions played a major role in the agreement, but the agreement was framed as a national sustainable growth agenda rather than an attempt to combat pollution or mitigate the global greenhouse effect.

The year 2015 saw two significant events in climate change communication that have contributed to increasing media attention (see Figure 1). First, a Dutch court ruled that the Netherlands must step up its efforts to reduce domestic greenhouse-gas emissions. This was the result of a landmark lawsuit filed by the sustainability movement Urgenda in 2013; Urgenda sued the government for violating human rights by failing to take adequate action to prevent the harmful impacts of climate change. Unless the government wins the appeal case, the Dutch state must cut its emissions by at least 25% by 2020 according to the ruling (Purnhagen, 2015). Second, the United Nations Climate Change Conference in Paris (COP21) led to the Paris Agreement on 12 December 2015, requiring countries to come up with increasingly ambitious national climate plans in the form of Nationally Determined Contributions. The agreement also put forward a new and ambitious global temperature target: limiting the temperature increase to 1.5 degrees Celsius above preindustrial levels. This meeting was covered widely in the press and engendered significant social media activity on climate change. As can be seen in Figure 1, media attention to climate change was on the rise in 2015 and 2016.

Discussion: Cross-cutting Themes in Research on Climate Change Communication in the Netherlands

Climate Change Framing and Agenda Setting

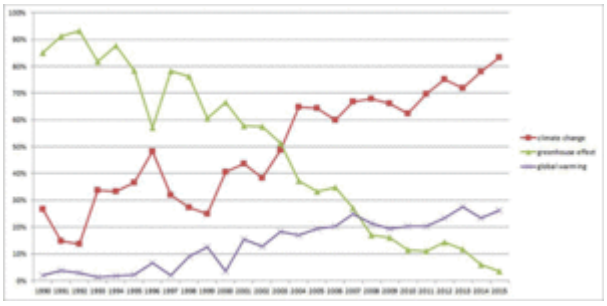
The prominence of climate change as an issue on the public agenda has gone through multiple attention cycles, driven by issue competition, framing contests, and media logic (Nisbet & Huge, 2007). Triggering or focusing events can catapult a dormant issue into public attention, generating public concern and ideas to address the problem. This shifts the framing of an issue defined in technical terms toward more dramatic terms, increasing the potential for both broad mobilization and controversy as more actors enter the debate. When the media have exhausted the dramatic elements of the issue, attention goes down again and competing issues come to the forefront. The dramatic and politicized framing of the issue may shift to a more technical and administrative framing, taken up in specialized institutionalized settings.

The two climate change waves that were identified in the Netherlands are clear examples of sharp increases in media attention, with the associated dramatic frames. The first climate change wave (1987–1989), triggered by policy reports and political meetings driven by an entrepreneurial ministry of environment, was part of a broader wave of environmental awareness. Environmental pollution became the topic of high politics, to the point of becoming the central issue in the 1989 national elections. Climate change had transformed from a technically and scientifically defined phenomenon into a political issue of broad public concern and as a global greenhouse gas emissions problem. Throughout the 1990s climate changed stayed on the public agenda but with much lower levels of public attention; the early 2000s were dominated by the rise of the rise of a new populist party and the assassination of its leader. The second climate change wave (2006–2007), triggered mainly by the movie *An Inconvenient Truth*, led to unprecedented public attention for the issue and broad mobilization in politics, business, and society. The increased attention due to the Copenhagen summit (COP15) and the public controversy about climate science triggered by Climategate were followed by lower levels of media attention during 2011–2014, although attention was still at a higher level than in the 1990s and early 2000s. The year 2015 saw another increase in media attention for climate change, which was linked to a climate change lawsuit and the Paris Agreement (COP21).

Compared to other countries, the first climate change wave came early in the Netherlands—in other countries attention for climate change was linked more closely to the 1992 United Nations conference in Rio de Janeiro on sustainable development. Media attention for climate change since 2004 can be compared with international media data

(Luedecke et al., 2016). The second climate change wave is comparable to the international pattern, with similar peaks during 2006–2007 and at the end of 2009. The controversy in 2009–2010 was prominent in the Netherlands but not to the point of resembling the "cultural wars" about climate change that can be observed in the United States, when scientific discourse starts to coincide with political discourse (Dunlap & Jacques, 2013). In the Dutch neo-corporatist tradition, political debate can be severe showing strong disagreement but remained always relatively organized and embedded in an existing institutional context. The increasing attention in 2015 can also be observed internationally. That climate change communication in the Netherlands is linked strongly to global fora is also evident in the role of the UNFCCC COP meetings in generating domestic media attention for climate change. International climate conferences with prominent roles for Dutch politicians attract relatively more attention (Breeman et al., 2009).

Taking a historical perspective also allows us to point out longer-term trends in the framing of climate change in the Netherlands. First, a shift has occurred over time in the terms used to refer to the issue (see Figure 2). In 1990 the Dutch term for "greenhouse effect" was prominent in media articles around 1990–1995, while the Dutch term for "climate change" was relatively rare. By 2015, this trend had been reversed: the term "climate change" was used prominently, and "greenhouse effect" all but disappeared. The middle point is the year 2003, when both terms are used equally frequently. The literal translation of global warming is used much less overall but has clearly increased over time. This confirms the strength of "climate change" as a historical breakthrough frame or "a discursive bridge connecting all kinds of ideas and events that were not previously understood as connected" (Brick & Cawley, 2008), including not just warmer temperatures, but also sea level rise, droughts, floods, and storms.



Click to view larger

Figure 2. Media framing of climate change between 1990 and 2015 as "global warming," "climate change" or "greenhouse effect." Based on the number of news articles published in each year in the Dutch newspaper NRC Handelsblad containing the search terms climate change (*klimaatverandering* or *klimaatsverandering)*, greenhouse effect (*broeikaseffect)* or global warming (*opwarming van de aarde)*, as a percentage of the total number of climate articles per year given in Figure 1.

(*Source*: compiled by the authors based on the Lexis-Nexis Academic database).

Second but not unrelated to the first, a shift from sectoral problems toward an all-encompassing understanding of the climate change issue has occurred (Breeman et al., 2009). A wide array of issues, such as air pollution, carbon dioxide emission, flood risk, sea-level rise, deforestation, green energy, transport, and sustainable buildings were repackaged in terms of climate change. This has created more attention for those issues at times where climate change was high on the public agenda; but this also meant less attention on other environmental issues not connected to climate change (e.g., water pollution). Repackaging is not without risks, however: piggybacking on the success of another issue can boomerang. After 2009, as climate change became controversial not only is climate change pushed off the public agenda but so, too, were environmental issues as a whole, marked in 2010 by the dissolution of the Ministry of Spatial Planning and Environment into the Ministry of Infrastructure and Environment in 2010.

Third, a shifting emphasis can be observed from an initial focus on potential climate change impacts, to climate change mitigation through globally reducing greenhouse gas emissions, to an increasingly important nationally scaled storyline about adapting the Dutch delta to climate change impacts (Dewulf, 2013). Although reference to climate change was already made in the 1996 policy announcement of the Room for the River flood defense program, it was not until the Delta Committee's advice in 2008 that adaptation to climate change was firmly placed on the public agenda (Vink et al., 2013). The direct link made with the strongly institutionalized water management sector led to a quick translation of these ideas into the creation of a delta commissioner, a Delta Fund, and a Delta Program. In response to the controversy about climate change in 2009–2010, adaptation to climate change was reframed into a technical water management issue and also into a business case. A national "water ambassador" is employed to sell delta technology to deal with a changing climate and associated sea-level rise in delta areas around the world. Due to this quick institutionalization process, the decreasing attention for climate change after 2010 has affected adaptation much less than mitigation.

Climate Change Communication in the Science-Policy-Society Triangle

Communication on climate change has been scienticized from its early arrival on the Dutch agenda, in which international scientific and political debates have been dominant and the precautionary principle has been a leading rationale for legitimizing policy responses. Although domestic environmental and climate science developed from the start in close relation to environmental policy (Van de Kerkhof & Leroy, 2000; Van Eijndhoven et al., 2001), postmillennial shifts can be observed in the arrangements between science, politics, and society (Hoppe et al., 2013; Halffman & Hoppe, 2005). In general, the distance between science and policy is short, and expert agencies as well as issued reports sometimes function as resources in inter-departmental politics. Nevertheless, in the Dutch corporatist policy tradition, Netherlands Environmental Assessment Agency (PBL) usually plays a role of "linesman," demarcating the playing field for political actors to bargain in, while its assessments are remarkably seen as reliable, neutral, and "true" across the board (Halffman, 2009; Halffman & Hoppe, 2005). Besides assessing scientific evidence for climate policy, it monitors progress and contributes to the IPCC. Other standing boundary organizations include the Royal Dutch Meteorological Institute (KNMI) that develops climate scenarios, Deltares as an applied-science water consultancy, and Energy Center Netherlands for energy consultancy. The Rathenau institute does science and technology assessment to stimulate political and societal debate on controversial issues (e.g., geoengineering) (Riphagen & Brom, 2013), while the Scientific Council for Government Policy (WRR) has a long tradition of signaling future issues. Also, climate knowledge centers are based at Wageningen and Amsterdam universities. In addition, ad hoc commissions within parliament (e.g., the 1995 Temporary Committee Climate Change) or to advise government (e.g., the 1999 Committee Water Policy 21st Century, and the 2007 Delta Committee) (Boezeman et al., 2013), are formed to translate climate science into meaningful policy strategies.

The politicization of climate science in the Netherlands is observable but in no way comparable to its politicization in the United States. Early in 1999, the PBL came under siege when an internal expert criticized the agency in a major Dutch newspaper, which triggered a public debate on the credibility of environmental statistics that spilled over into parliament (Van der Sluijs, 2002). In line with the corporatist Dutch state tradition, authority was restored by adopting guidelines for dealing with uncertainties in 2003 (Janssen et al., 2005) and institutionalized stakeholder participation in 2007 (Hage et al., 2010). After the "climategate" controversy, the agency attempted to restore its legitimacy by inviting in skeptical scientists and citizens to weigh in via the blog CimateDialogue.org and the investigation into IPCC mistakes (Hajer, 2012; Tuinstra & Hajer, 2014) using the aforementioned guidelines.

In the 1990s, with concepts of Mode 2 (Gibbons et al., 1994) and post-normal science (Funtowicz & Ravetz, 1993), scholars pointed to the complexity and inherent uncertainties of environmental issues and suggested (among other things) a more close collaboration with societal stakeholders to strengthen both relevance and quality. Changing patterns of participation in scientific practice can also be observed in large climate research programs such as National Research Program Global Air Pollution and Climate Change I (1989–2001), Climate Changes Spatial Planning (2004–2011), Knowledge for Climate (2007–2014), and national knowledge program Water and Climate (2014) (Van de Kerkhof & Leroy, 2000; Wardenaar, 2015; Reinecke et al., 2013). Although stakeholder involvement is observed, critical remarks on both the organization and substance can be made. Regarding the former, research shows (Van de Kerkhof & Leroy, 2000, Wardenaar, 2015; Termeer et al., 2015) involvement in these programs is limited to mainly researchers and governmental policymakers—and to a lesser extent its corporatist partners: representatives of business and environmental NGOs. This is strengthened by pooling research resources along the lines of the agenda of the Top Sector water. Regarding substance, Van de Kerkhof & Leroy observed in 2000 that societal involvement was solely on “useful knowledge” on policy solutions for environmental problems framed by science and engineering. In Climate Changes Spatial Planning and Knowledge for Climate, collaboration was mainly on selecting policy issues to be addressed, while participation in knowledge production itself remained rather traditional (Termeer et al., 2015). Communication with citizens occurs via platforms. These observations are in line with general patterns observed elsewhere by Rayner (2003) and Stirling (2007). In particular for adaptation, political order and scientific knowledge are co-produced (Jasanoff, 2004), with blind spots outside dominant water knowledge (Boezeman, 2015; Bauer & Steurer, 2015).

Regarding the role of actors other than scientists and policymakers in the science-policy-society triangle, the environmental movement and members of parliament played interesting roles. The “classical” environmental movement initially had an ambivalent relationship with climate change, and were not dominant in framing the issue (Pleune, 1997). Reluctant to embrace and advance the CO_2 argument, environmental NGOs feared it would interfere in antinuclear campaigns while having key people of the movement involved in ending the nuclear energy option (Van Eijndhoven et al., 2001, p. 121); yet many organizations considered the issue too global, complex, and distant for mobilization activities. Duyvendak (2011, p. 31) claims the environmental movement, preoccupied with nuclear energy and acid rain, was surprised by the rise of the greenhouse effect issue on the political agenda. It would only later develop into one of the emblematic issues for NGOs, while only the Dutch branches of Friends of the Earth, and to a lesser extent Greenpeace, are consistently engaging the issue (Van der Heijden, 2009). Besides involvement of coalitions of “classical” environmental organizations, after 2006 other types of organizations and initiatives can be observed involving other kinds of societal actors. The “Hier” campaign involves a coalition of 40 societal organizations, while

Urgenda was founded by concerned scientists aiming at acceleration sustainability and energy transitions.

The role of politicians in advancing the issue of climate change is remarkable. Parliamentarians with a scientific background signaled the issue in the 1970s (Jaap Boersma) and regularly kept giving the issue attention, most often in relation to energy issues (Van Eijndhoven et al., 2001, p. 125). When the issue was debated in the national parliament in 1978 in relation to increasing fossil fuel use and the cabinet's intention to reintroduce coal, the minister answered on the basis of state-of-the-art knowledge and notably the 1978 IIASA conference on "Carbon Dioxide, Climate, and Society." Interestingly, policy and policy actors at that time draw upon international science (Dinkelman, 1995), as domestic climate science was underdeveloped at the time (Van Eijndhoven et al., 2001). While skeptical voices can be heard during the entire climate change episode, politicians usually aligned positions with the IPCC consensus, depoliticizing the debate (Van der Sluijs et al., 2010).

Online Communication about Climate Change in the Network Society

To understand online and social media communication about climate change, we need to consider the nature of the network society (Castells, 2007). The institutions of the nation-state gradually lost their unitary capacity to control and regulate, while the digital networking technologies of the information age powered social and organizational networks in ways that allowed their endless expansion and reconfiguration. In a society governed by a variety of public and private networks, media have become the social space where power relations are played out. Two phenomena stand out in this respect: media politics and mass self-communication. Media politics involves an intricate relation between politics and media: "What does not exist in the media does not exist in the public mind, even if it could have a fragmented presence in individual minds. Therefore, a political message is necessarily a media message" (Castells, 2007). At the same time, mass media are confronted with the mass self-communication (Castells, 2007) made possible by Internet and social media, both in its traditional and mobile forms. Individuals, groups, and networks have nearly unlimited possibilities to communicate among themselves and with a potentially global audience. Mass self-communication is "self-generated in content, self-directed in emission, and self-selected in reception by many that communicate with many" (Castells, 2007). Driven by the combined phenomena of media politics and mass self-communication through new social media, the public sphere has to a large extent shifted from the institutional realm to the new communication space. As a result, power relations as well as the processes challenging institutionalized power relations are increasingly shaped and decided in the communication space, leading to new forms of informational governance (Mol, 2006).

Early online communication in the Netherlands about Al Gore's movie *An Inconvenient Truth* took place on personal, popular culture, and journalistic weblogs (Bekkers et al., 2008). A search engine for Dutch blogs returned over 100,000 hits for the query "An Inconvenient Truth" in July 2008 (Bekkers et al., 2008). While the personal and popular culture weblogs mostly framed the movie positively, the journalistic weblogs were much more critical of climate change as being an "elite concern" of the "progressive-liberal establishment." At the time, however, weblogs were largely invisible in comparison to the prominence of traditional media, particularly for policymakers (Bekkers et al., 2008).

The peak in media attention in 2009 around the COP15 summit in Copenhagen, together with the so-called Climategate affair—and particularly the ensuing controversy about the Fourth IPCC Assessment Report—can be considered a critical juncture in climate change communication in the Netherlands (Edwards et al., 2011). The controversy has a longer history in the international blogosphere, where a number of rivaling websites (including RealClimate.org, ClimateAudit.org, Wattsupwiththat.com, and Blackboard) had been arguing for years over issues such as the hockey-stick graph with reconstructed temperatures, access to temperature data and software code, the urban heat island effect, the soundness of the peer review process in climate science, the functioning of the IPCC, and the presumed hidden agendas and reprehensible intentions of their opponents. In the Netherlands klimatosoof.nl and klimaatgek.nl were early climate-skeptic websites (Edwards et al., 2011). With Climategate, this international network of climate-skeptic blogs that had become increasingly active and organized entered into the spotlight. Although it is unclear who put the set of climate scientists' e-mails online that started Climategate, this network of blogs was effective in using quotes from the e-mails for getting more attention for their skeptical views. There was attention for the skeptics in major Dutch newspapers and on television shows as well (Hajer, 2012). The polarization of this online debate (Bekkers et al., 2013) is reflected in the names that the sides use for each other and themselves. "Alarmists" call their opponents "deniers," accuse them of links with the oil industry, and liken them with dinosaurs or people who think the earth is flat. "Deniers" call their opponents "alarmists" and accuse them of being environmental activists and liken them to fear mongers and doom prophets. Both sides call themselves "realists." The label "skeptics" is often used as a more neutral term for "deniers."

Before 2009, mass media and policymakers in the Netherlands largely ignored the online climate change debate, but this changed quickly after Climategate. Major newspapers and policymakers started to monitor online climate change communication to avoid being taken by surprise again (Edwards et al., 2011; Bekkers et al., 2013). Two scientific journalists who had been actively following the climate skeptic blogosphere started their own Dutch blog, climategate.nl, which quickly became the reference point for Dutch climate skeptics and for anyone interested in real-time discussion of developments in climate science or policy. In their mission statement they aim to provide "daily reports in Dutch on the consequences of climategate" and to "surprise the readers with original analyses," referring to scientific literature, foreign media, and climate-related blogs and websites. They framed the state of climate science in terms of manipulation of data,

exclusion of skeptic views from the scientific literature, and refusal by climate scientists to openly share data (Edwards et al., 2011). An important part of the online discussion on climate change shifted from the web forums of the written press to thematic blogs such as climategate.nl. These discussions were strongly polarized, not so much in terms of confrontations on the websites but rather in terms of differentiation between the websites (Edwards et al., 2011).

While still condemned by the international scientific community (see e.g., Editor, 2009), attempts were made in the Dutch policy world to involve and organize climate skeptic voices in climate change communication, both online and offline. The Netherlands Environmental Assessment Agency (PBL), the primary boundary organization at the climate change science-policy interface, played an important role in this process by taking a deliberative approach (Hajer, 2012). Already before COP15, in cooperation with the Dutch public news agency, they had organized a blog discussion between a climate skeptic economist and one of their own climate scientists (Strengers & Labohm, 2010). In response to the controversy on errors in the IPCC report, the PBL was asked to examine the IPCC report for more errors, which led to radio and television appearances but also to the creation of a website where the public was invited to contribute to the search for errors. They engaged directly with both climate scientists, who disagreed with the idea that the PBL was going to identify errors in their work, and climate skeptics, who accused the PBL of judging their own work as contributor to the IPCC assessment reports (Hajer, 2012). Through creating spaces for deliberation, and thereby recognizing the legitimacy of these different actors, a more structured and less polarized climate change debate became possible. This was also apparent when the initiators of climategate.nl were invited to a hearing on climate change science and policy organized by the Dutch parliament, where the tone of the debate was much more benign than in many of the online discussions. As a results, some of the climate skeptics became legitimate spokespersons for climate skeptic views in media and policy circles (Edwards et al., 2011).

More recently, mobile Internet and social media platforms have become increasingly important in climate change communication (Schäfer, 2012). The Netherlands has always been a forerunner in terms of Internet connectivity and adoption of social media platforms, starting with the Netherlands-based Hyves platform, founded in 2004 and totaling over 10 million user accounts on a population of 16 million by 2010. The network was officially discontinued in 2013, after being gradually overtaken by Facebook and Twitter. The Netherlands also ranks high on the list of countries with the most active Twitter and Facebook users, but research studies on the role of social media platforms in climate change communication in the Netherlands are rare. Indirect evidence can be found in an analysis of the global set of over 1.8 million tweets mentioning climate change or global warming (in English, German, Russian, Spanish and Portuguese) in the year 2012 (Kirilenko & Stepchenkova, 2014). The Netherlands contributed a modest 32 tweets per day, compared to 1,837 tweets per day from the United States. However, taking into account that the five analyzed languages only represent 32% of the total amount of tweets from the Netherlands, and adjusting for different degrees of Internet

and Twitter penetration, the Netherlands ranks 7th among the countries with the most discussions on climate change (Kirilenko & Stepchenkova, 2014, p. 175). Based on Twitter monitoring by the authors using Meltwater in the three weeks surrounding the COP21 meeting in Paris, some basic numbers can be distilled. Between 11 November 11, 2015, through to December 17, 2015, over 1 million English-language tweets were produced mentioning "COP21," usually in the form of the hashtag #COP21. During the same period over 10, 000 COP21 tweets were in the Dutch language, and over 20,000 COP21 tweets originated from the Netherlands.

Conclusion

This article aimed to chart and understand the variety of communication efforts since the 1970s through which climate change became an issue of public interest in the Netherlands. The cross-cutting issues of framing and agenda setting, science-policy-society relations, and online communication in the network society have guided this analysis.

Attention for climate change developed slowly and intermittently in the 1950s and 1960s, and in the early 1970s it was still not considered to be a significant political problem and mainly of popular scientific interest. In line with increasing scientific evidence and growing public interest in energy issues, the anthropogenic greenhouse effect increasingly appeared in societal and policy discussions in the 1980s. The first wave of peak attention for climate change (1987–1989), mainly driven by policymakers and part of an environmental consciousness wave, put the issue firmly on the public agenda as global greenhouse gas emissions problem. Throughout the 1990s climate changed stayed on the public agenda but with much lower levels of public attention, and the early 2000s were dominated by the rise of the rise of a new populist party and the assassination of its leader. The second climate change wave (2006–2007), triggered mainly by the movie *An Inconvenient Truth*, led to unprecedented public attention for the issue and to broad mobilization in politics, business, and society. The increased attention due to the Copenhagen summit (COP15) and the public controversy about climate science triggered by Climategate were followed by lower levels of public attention. The year 2015 saw again an increase in media attention for climate change, linked to climate change lawsuit and the Paris Agreement (COP21).

Not unlike developments in other countries (Brick & Cawley, 2008), the framing of the issue developed from an emphasis on the scientific understanding of the term "greenhouse effect" (*broeikaseffect*), as part of a broader set of environmental issues (first climate change wave), toward a more encompassing understanding captured by the term "climate change" *(klimaatverandering)*, which at its high point started to subsume other environmental issues (second climate change wave). Driven by increasing

circulation of skeptic views on climate change, climate change subsequently turned into a controversial issue and therefore of much lower political relevance.

Communication on climate change has been scientized since its inclusion on the Dutch agenda, with the precautionary principle a leading rationale for legitimizing policy responses. The increasing involvement of Dutch scientists in climate change research has contributed to the position of the Netherlands in international climate change discussions. For a long time, climate science was uncontested and translated into policy-relevant knowledge at the strongly institutionalized Dutch science-policy interface. More direct relations between science and society were present in the form of informing citizens and popularizing science but more strongly when climate science was directly contested by skeptic bloggers and journalists. Rather than challenging climate policy directly, climate skeptics that had no place in the institutionalized science-policy interface challenged the underlying climate science directly. To understand developments in the Netherlands, the notion of the science-policy interface needs to be expanded into a science-policy-society triangle, with significant interactions taking place at each side of this triangle.

Not unrelated to these developments involving a decreasing authority of science are the quickly expanding possibilities of online communications, which created a new playing field for climate change communication in the network society. The international blogosphere developed in the 2000s and became the preferred platform for climate skeptics to share information and build a case against climate science. Skeptic bloggers played a key role in fueling controversy about climate change science in the wake of Climategate, as well as gaining access to the mass media and to the science-policy interface in the Netherlands. The blogosphere has been largely overshadowed by new social media such as Twitter and Facebook in the 2010s, which seem to have become particularly active around COPs, but systematic research on the roles of these platforms in climate change communication in the Netherlands has yet to be undertaken.

This analysis is the result of collecting evidence that is fragmented across a variety of published research studies. Several topics deserve more scholarly attention so as to corroborate or challenge the present analysis with more systematic studies taking a broader chronological perspective. While the fluctuations in mass media’s attention to climate change since the 1990s could be analysed (see Figure 1), media attention in earlier decades has not been mapped quantitatively, making it difficult to systematically compare, for example, the first climate change wave to the second. The analysis should also be extended to include other newspapers whose digital archives do not go as far back in time. Changes over time in the crucial roles played by boundary organizations at the Dutch science-policy interface constitute another interesting topic for a future research agenda on climate change communication in the Netherlands. Finally, while the Netherlands has been a forerunner in terms of Internet connectivity and adoption of social media platforms, 21st-century climate change communication on social media such as Twitter and Facebook has not been well documented yet.

Suggested Readings

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Art Dewulf

Wageningen University and Research Centre

Daan Boezeman

Radboud Universiteit

Martinus Vink

Wageningen University and Research Centre