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Review

The Integrated Approach to Nitrogen in the Netherlands: A preliminary review from a societal, scientific, juridical and practical perspective

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ABSTRACT

In north-western Europe, deposition of atmospheric nitrogen is one of the main obstacles to maintaining or restoring natural habitats to a favourable conservation status. The Integrated Approach to Nitrogen (PAS) of the Netherlands is a national plan that combines generic source measures to reduce nitrogen emission levels and ecological restoration measures in Natura 2000 areas, while creating room for economic development. The aim of the PAS is to ensure that conservation objectives can be achieved, while further economic development is facilitated around Natura 2000 areas within strict environmental limits. In this way, the PAS connects economy and ecology. This paper examines the PAS from a societal, scientific, juridical and practical perspective, based on a study of the literature, juridical cases and first experiences of the programme. Our review indicated that the PAS is a comprehensive approach to the nitrogen issue, aiming for a balance between the societal, scientific, juridical and practical perspective. However, the programme has not yet been in force long enough to observe actual results in the field.

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1. Introduction

With the Birds and Habitats Directives, the EU Member States aim to halt the loss of biodiversity in the EU (European Commission, 2011; European Union 1992, 2009). Natura 2000, the European network of protected nature areas, is the main instrument to achieve this objective. For each Natura 2000 area, Member States have set specific goals for the conservation of species and habitats. Nitrogen emissions from agriculture, industry and traffic appear to be a major problem for achieving these goals (Fig. 1) (European Environment Agency, 2014, 2015; Hicks, Whitfield, Bealey, & Sutton, 2011; Sutton et al., 2011), especially in the Atlantic biogeographical region (Whitfield & McIntosh, 2014). Over the years, some north-western European countries have implemented policies and regulations to deal with the nitrogen problem (Whitfield & McIntosh, 2014).

The Netherlands has to address the excess deposition of nitrogen, as well (Ministry of Economic Affairs & Ministry of Infrastructure and the Environment, 2015a; Wereld Natuur Fonds, 2015). Nitrogen emissions in the Netherlands have about halved since the mid 1980s (CBS, PBL, Wageningen UR, 2014). Still, at many locations, deposition levels are way above the critical load for nitrogen (Wamelink et al., 2013). This is not only a problem for achieving nature goals, but it also has implications for economic developments around Natura 2000 areas. In accordance with the Birds and Habitats Directives, the Dutch Nature Conservation Act 1998 prohibits new activities or the expansion of existing economic activities with a negative impact on Natura 2000 areas. Thus, the issuing of permits for the development of farms, industries and roads that would involve additional nitrogen deposition became impeded (Ministry of Agriculture, Nature and Food Quality, 2010). Its negative impact on economic development also resulted in a bad reputation for EU nature regulations in Dutch society and a rather polarised relationship between ecological and economic stakeholders (Beunen, van Assche, & Duineveld, 2012; Buijs, Langers, Mattijssen, & Salverda, 2012).

To tackle the nitrogen issue, the Netherlands are now taking a new and very different approach. The national government and the twelve Dutch provinces, in consultation with economic partners and nature conservation organisations, have developed the Integrated Approach to Nitrogen (Programmatische Aanpak Stikstof, PAS) (Ministry of Economic Affairs & Ministry of Infrastructure and the Environment 2015a). The PAS is a national plan combining generic source measures to cut nitrogen emission levels and ecological restoration measures in the Natura 2000 areas, while creating room for economic development. The aim of the PAS is to ensure that conservation goals can be achieved, while economic development is facilitated around Natura 2000 areas within strict environmental limits. The concept of room for economic development can be compared to the concept of a safe operating space for humanity within planetary boundaries (Rockström et al., 2009) and the concept of environmental utilisation space or 'ecospace' (Opschoor, 1995).

After six years of development, the programme came into force on 1 July 2015. In order to be successful, the PAS has to be feasible and robust from both a societal, scientific, juridical and practical perspective. This paper, after an introduction on the approach, presents a review of the PAS from each of these perspectives, based on a study of the literature and juridical cases.

2. The Integrated Approach to Nitrogen

The conservation goal of the PAS is to avoid (further) deterioration of the conservation status of protected habitats in the short term (cf. Habitats Directive art. 6.2), and to contribute to achieving a favourable conservation status in the long term (cf. Habitats Directive art. 6.1). To achieve this goal, two types of measures are taken: generic source measures to reduce nitrogen emissions and ecological restoration measures in Natura 2000 areas.

The source measures include implementation of the existing Dutch and European policies on nitrogen. These policies mainly focus on the sectors of agriculture, industry and traffic and transport, targeting emissions of both ammonia (NH_3) and nitrogen oxides (NO_x). Furthermore, especially for the PAS, an additional package with generic agricultural measures has been agreed with the agricultural sector (Ministry of Economic Affairs & Ministry of Infrastructure and the Environment 2015a; Ministry of Economic Affairs, LTO, Netherlands, NZO, Nevedi, NMV, NVP, NVV and CUMELA Netherlands, 2014). This package involves measures on animal housing (e.g. gas scrubbers), feed and management, and manure application techniques. These measures together should further reduce agricultural emissions, at least 10 kt/yr by 2030, compared to the situation of 2013 (-9%).

Ecological restoration within the framework of the PAS focuses on the 118 Natura 2000 areas in the Netherlands that contain nitrogen-sensitive habitats. These habitats are defined as habitats with a critical load of less than 2400 mol/ha/yr (van Dobben, Bobbink, Bal, & van Hinsberg, 2014). Restoration may involve measures to remove nitrogen from ecosystems, such as removing topsoil layers (sodding). It can also involve more generic measures to make ecosystems more resilient against the effects of nitrogen, such as hydrological measures. The PAS contains 69 restoration strategies, each containing a package of measures (Jansen, van Dobben, Nijssen, Bouwman, & Bal, 2014; Smits & Bal, 2014; Smits, Adams, Bal, & Beije, 2014). For the authorities concerned, implementation of the measures is a statutory requirement.

Under the PAS, part of the reduction in nitrogen deposition is made available for economic development. The political decision was made that this 'room for deposition'[1] should allow for increases in emissions that are related to an annual economic growth of 2.5% (ECN & PBL, 2010; Verdonk & Wetzels, 2012). In addition, 50% of the emission reduction accomplished by the generic agricultural measures may be specifically used for development by the agricultural sector (Ministry of Economic Affairs, LTO Netherlands, NZO, Nevedi, NMV, NVP, NVV & CUMELA Netherlands, 2014).

[1] The 'room for deposition' of the PAS is subdivided into four parts: a reservation for autonomous developments, a reservation for notifications, a reservation for priority projects and a free amount of room for deposition that project initiators can apply for (Ministry of Economic Affairs & Ministry of Infrastructure and the Environment, 2015a). The last two parts are called 'room for development'. This paper does not distinguish between the four parts and uses the overall term 'room for deposition'.