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## Pilot study to test a new Nature and Landscape Scheme (Dutch acronym: NLN) for farmers

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**Abstract**

The process of landscape erosion in agricultural landscapes is still on-going in The Netherlands. In order to turn the tide a new Nature and landscape Scheme (NLN) has been developed to stimulate farmers to contribute to the increase of landscape values and biodiversity. The most important condition of the scheme is that five per cent of the farm area is not applied for agricultural production, but set aside for landscape elements.

In 2009, the Dutch Parliament urged the Ministry of Economic Affairs, Innovations and Agriculture (EL&I) to test this scheme in a pilot study on a representative set of farms, in order to evaluate whether the NLN scheme could be part of the new Common Agricultural Policy (CAP) of the European Union from 2014 onwards. The pilot study that started in 2011 will test the systematics of the NLN scheme on 20 selected farms, with an accent on costs and benefits and its compatibility with the new Common Agricultural Policy (CAP). The duration of The project is three years.

Meetings and workshops with the farmers network in different regions will lead to a better insight in the impact of the scheme on farm management. Monitoring data on activities of the farmer and costs or set aside land and landscape management are used to asses if the payments are adequate.

Reports on the results will serve as input for workshops with farmers and their organizations and with decision makers.

## 1. Introduction

Agricultural production and intensification is thought to be one of the major drivers in the decline of biodiversity in Europe over the past decades (e.g. Donald et al., 2001; Robinson & Sutherland, 2002). This decline still continues in our days (e.g. Geiger et al., 2010) and all national and European efforts in so-called Agri-Environmental Schemes appear to have had little effect in halting this negative trend (e.g. Berendse et al., 2004; Kleijn et al., 2011). Thus, new approaches to the conservation of the landscape and biodiversity in agricultural areas is urgently needed. Several initiatives were undertaken to develop new schemes of green and blue services to reward farmers for the environmental services they provide to society (e.g. Westerink et al., 2008). At the same time, the European Commission has started the process of reforming European agricultural policies into the new Common Agricultural Policy (CAP). Part of this reform is the "greening" of European agriculture (European Commission, 2011; Hart & Baldock, 2011). National governments are currently reviewing how to put these policies into place in their national situations, and try to assess what the impact of the new CAP will be on agricultural enterprises, the landscape and biodiversity indicators. This article focusses on one (of several) Dutch approach to test possible tools and elements for the greening of the new CAP.

## 2. Research question

Landscape erosion in agricultural landscapes (by removal of e.g. hedges, tree rows, ditches, small ponds and small pieces of solitary trees, woodland) is still on-going in The Netherlands. This leads to an increasing loss of landscape values concerning cultural history, scenery as well as biodiversity. Intensification of agricultural land use requires more and more large scale landscapes, while on the other hand many people experience this to be a great loss of landscape quality.

To turn this process a new Nature and landscape Scheme (NLN) has been proposed (Stortelder et al., 2008, Kloen et al., 2009). The idea was discussed with farmers in several regions in the country. The question was: *how to stimulate farmers to contribute to the increase of landscape values and biodiversity without frustrating an efficient business operations?*

The basic idea is to have a greatly simplified implementation and financing system to develop an attractive and local nature and landscape quality. Nature and landscape standard is a simple set of six conditions to agricultural enterprises that wish to participate. The main condition is that five percent of the enterprises' surface consists of non-managed agricultural landscape elements.

In 2009, the Dutch Parliament urged the Ministry of Economic Affairs, Innovations and Agriculture (EL&I) to test this scheme in a pilot study on a representative set of farms, in order to evaluate whether the NLN scheme could be part of the new Common Agricultural Policy (CAP) of the European Union from 2014 onwards. The pilot study will test the systematics of the NLN scheme on 20 selected farms in the Netherlands (in different regions and landscapes, both organic and regular farms, with different production systems) and evaluate the outcomes in terms of practicality, nature and landscape improvements, public and political support, economic costs and benefits and its compatibility with the new Common Agricultural Policy (CAP).

### Concept of NLN

The idea of the NLN-concept is that such a scheme should:

- deliver a substantial contribution to nature and landscape quality;
- be applicable for as many farming systems as possible;
- avoid any stacking with other schemes;
- be an incentive for preservation of existing and development of new nature and landscape elements;
- be easy to administer and monitoring;
- be simple in its prerequisites;
- make the best use of the ideas of the involved farmer;
- compensate sufficiently for the income losses of the farmer.

The goal of the NLN Scheme is to strengthen nature and landscape values for a reasonable fee.

Three institutes were involved in working out the new scheme: Alterra and Applied Plant Research (Dutch acronym: PPO), both part of Wageningen University & Research Centre, and the Centre for Agriculture and Environment (Dutch acronym: CLM). In cooperation with the Ministry of EL&I, these institutes worked out the simple set of six conditions, with which farms can develop an attractive landscape. The main condition is that five percent of the farm area surface consists of non-managed agricultural landscape elements. In addition, there are conditions that not only meet the surface requirement, but also guarantee the quality of the landscape elements involved.

The Nature and Landscape Scheme consists of the following six components:

1. A minimum of 5% of the farm area consists of existing and new regional characteristic landscape elements, an area not used as production ground.
2. There is a certain diversity of crops, coming in a crop rotation of minimal 1:4 for annual crops and a diverse composition of the grassland.
3. The farmer shall ensure an active nature-oriented management of the landscape elements.
4. Organic materials (clippings, branches, etc.) resulting from the management of the landscape elements will be removed from the landscape elements and will be applied in the mineral of energy cycle of the farm.
5. Birds and other animals are provided with breeding and shelter facilities as much as possible.
6. At least 40% of the surface of the yard is spend on regional characteristic 'green' elements to guarantee an attractive combination with the buildings.

### **3. Pilot study**

On the initiative of members of the Dutch Parliament (motion Waalkens, Dec. 2009) it was proposed to test the use of the Nature and Landscape Standard (NLN) and to explore how these conditions can be implemented in a revised common agricultural policy. Alterra, PPO and CLM have clarified the conditions with this aim and have now made available resources from the Ministry of EL&I to carry out a pilot on selected farms.

In the pilot study, 20 farms across the Netherlands were selected. The pilot focuses on both prevalent and biological farms, in both areas where packages for agricultural nature management (SNL-packages) are available as well as in areas where such packages do not apply, and spread over the different Dutch physical geographical landscapes (roughly peat/sand/clay areas). Furthermore, different farm types (dairy farming, arable farming, and in addition a vegetable and a fruit farming company) have been taken into account. Some of the farms have much and others have little experience with nature and landscape management, so there can be a valuable exchange of experiences and lessons learned. For participation, we excluded farms that already meet the conditions of the NLN nature and landscape scheme.

The current pilot aims to evaluate whether farmers can work with the NLN scheme and if they are willing to support such an approach. Suggestions of the participating farmers to improve the scheme are being discussed and eventually implemented. Furthermore, the pilot is to answer whether the scheme results in significant improvements or nature and landscape values, and whether the systematics of the NLN scheme are compatible with current Dutch and European economic, political and legislative standards.



Fig.1 Map with the selected pilot farms spread over the Netherlands.

### Implementation of the pilot

The implementation of the project was started in autumn 2011. After selection of the participants, one of the first steps in the pilot was the drafting of the NLN design and management plans with the farmers. To meet the first condition of the NLN Scheme, the percentage of landscape elements (including ditches and edges) already present on the farm was estimated. The next step was to seek the farmers' views about how the landscape elements can be extended up to 5% surface area. The entrepreneur determined which elements are realized, and on what locations. Less favorable areas for farming (food production) appear to have the high potentials for biodiversity. E.g. Strips along forests and tree rows are not very productive, but the half-shadow may contain many wild flower species that are characteristic to forest fringes. Also wet places and irregular parcels are not fitting rational farming. From the farmers point of view it is better to redesign these places for other functions.

Based on a checklist during the intake, the farmers made their choice for establishing the new landscape elements and proposed a management plan, eventually with a consultant. If, over time, it proved that some planned actions were not feasible, changes were made. Revisions and adjustments of a plan can give important information about success and failure factors. The drafting of a good plan at the beginning of the trajectory remains the starting point. The process of plan formation is recorded in a short report. The establishment of the landscape elements will take some time. The aim is to achieve this in the first half of 2012. The contracts with the farmers in the pilot are valid for three years.

### 3. Costs and fees

For fulfilling the six conditions in the nature and landscape norm, the participating farmers receive in principle a fixed fee per ha/year. Based on model calculations of the Agricultural Economic Institute (LEI) this fee was established at € 160 /ha/yr, for both arable farms and dairy farms. This is the starting point for the pilot and participating farmers can count on this fee is paid for the duration of three years.

Underlying aspects and considerations:

- A fixed fee avoids a detailed system and bureaucracy (as compared to the Dutch SNL schemes)
- The fee is based on the Catalogue Green and Blue Services, which is approved by Brussels.

The fee involves costs of lost revenues (due to extra landscape elements, loss of production) and for the commitment of farmers for active and nature-oriented management. In addition, for the implementation of the landscape plans there is an one-off amount of up to 1000 euros per company available. Stacking with other fees is not allowed. If the entrepreneur gets a fee for the same landscape elements already, this fee is deducted from the NLN fee.

The construction of new landscape elements is basically not reimbursed from the budget of the NLN scheme, and probably not from the current nature and landscape fees (SNL) as well. Other funders must be found as municipalities, conservation organisations, estate owners and individuals. For some participating farmers this could be realized. The provisioning costs are heavily dependent on the choices that the farmer makes concerning the character of the new landscape elements.

An important aspect of the pilot is the monitoring of the annual costs that the farmer must face to meet the standard conditions. This relates to the number of hours spent on administrative work, contract work for management and earnings reduced by culture ground taken out of production. The costs must be justified and be kept by the farmer on a special sheet for a short report monthly.

#### **4. Monitoring**

Monitoring of the pilot is essential to assess where bottlenecks occur and how these can be solved. Depending on how the pilot develops and what results it brings, it will become clear what the policy value of the NLN-methodology will be. The Ministry of EL&I will focus on the further policy developments and considerations around the new CAP and alternatives for rewarding social services.

A strong point of the NLN should be that (for example, in comparison with the SNL) the administrative burden of the participating farmer is minimal. The farmer is asked how much time he spends in the pilot. It should be noted that in the pilot, the monitoring is more intensive, leading to a higher administrative burden for the participants than is necessary and desirable for the final scheme. The pilot must also make it clear which parts of the monitoring in the final settlement can be expired and what parts should be maintained.

Annually the landscape agreements are checked in the field with the farmer. It is an option to invite representatives of regional Agricultural Nature Associations at the field inspections. In the final NLN system, they could be a possible partner in the control of the implementation of the plans. The field visit is combined with a conversation with the farmer about his experiences and progress with the NLN conditions. Will he remain motivated or are there any points that are difficult to achieve? Suggestions for improvements are reported and possibly the plans are being adapted. Also, the farmer is asked to what extent the NLN in his opinion contributes to its image in the region.

Reinforcement of the nature and landscape values is the main motive to get started with the NLN. At the same time this is a pilot with a duration of only three field seasons. Modified management of vegetation will only after several years reveal visible effects on landscape and species composition. In the last year of the pilot, an overview is made of the main results of the pilot in terms of new landscape elements and changed management of existing landscape elements. Based on the literature and expert knowledge an extrapolation will be made of what profit the NLN scheme will yield for important species groups in five years and ten years from now.

## 5. Expected results

The pilot will result in 20 examples of farms with a plan for the establishment and management of NLN-on-farm natural areas and regional landscape elements, that keep track of their time and monetary investments, possible obstacles and shortcomings.

Meetings and workshops with the farmers network in different regions will lead to a better insight in the impact of the scheme on farm management. Monitoring data on activities of the farmer and costs or set aside land and landscape management are used to assess if the payments are adequate.

Reports on the results of the farmers, their activities and meetings, will serve as input for workshops with decision makers on how the scheme can be made compatible with the NLN new Common Agricultural Policy (CAP).

### Effects of NLN on biodiversity and landscape

In general, the introduction of the NLN will lead to a more beautiful rural area. Especially in the so called white areas where little variation is present, the creation of new elements will contribute to more space for wild plants and animals and a more attractive landscape. Landscapes will get more colour again, with more bird sounds and more spatial structure (in many places leading to more privacy). The NLN can be an important instrument in turning the tide for the process of biodiversity declining and landscape impoverishment.

The individual components of the NLN are all effective at strengthening biodiversity. But the cohesion between the conditions is a clear added value. The conditions reinforce each other if they are applied in combination. So strengthen the conditions for the variety of crops (more cereals) and measures for breeding and hiding places for birds and other small animals together lead to additional biodiversity. For example, many birds breed in landscape elements in buildings or in the yard if they can search food in the varied fields and pastures.

The added value of the NLN scheme can be summarised as follows:

1. A minimum of 5% of the farm consists of local landscape elements and is not used for agricultural production. Effects: strong increase of biodiversity, substantial reinforcement of the landscape image, impetus for cultural history.
2. There is great diversity of crops and a diverse composition of the grassland. Effects: a wide crop rotation implies more cereals, to the benefit of various endangered birds of arable fields, and more soil fauna and insects; presence of a variety of species of grasses and herbs leads to more insects. Another effect is the increase in the amenities of the landscape.
3. The farmer shall ensure an active nature-oriented management of the landscape elements. Effects: continuity in management ensures that diverse habitats are maintained, and thus optimal biodiversity ; increasing the involvement of farmers in landscape management.
4. All organic material of the landscape elements is recycled on the farm. Effects: removal of material in the landscape elements, causes more species richness of wild plants and animals; increase of organic material in the soil leads to a more diverse soil life.
5. Birds and other animals are provided with breeding sites and shelter. Effects: better reproduction, more animals (birds), larger landscape experience.

Much attention to the yard, green by at least 40% of the surface. Effects: strengthening landscape characteristics (more attractive in relation to the buildings) and the strengthening of biodiversity. The most effective measure of the NLN in rural area biodiversity is the requirement that 5% of the operating surface is occupied by existing and new landscape elements. International research shows this is the main explanatory factor for the species richness in agricultural areas.

In de NLN, farmers are advised to link the new landscape elements to existing spatial patterns and line-shaped elements and to connect to the cultural history of the the region. Plane-shaped landscape elements are taken into account in the NLN scheme up to a maximum of 0.5 ha only, in order to ensure a wide variety of landscape elements. Research shows that the greatest diversity of herbs occurs in the boundaries of agricultural fields and along adjacent

landscape elements (ditch embankments, hedges, woodlots, roadsides and buffer strips). These herbs constitute the basis for a rich insects fauna and an ample seed production. Seeds and insects are then again food for small mammals and a rich bird life.

The choice of what type of elements is constructed lies with the farmer, though this choice is contained by a list of elements characteristic for the landscape and region of his farm. The pace and the extent to which the increase of biodiversity is to be expected, depends on the environment and the structure of the elements.

### **Effects on adjacent nature areas**

If a NLN-farm borders a nature area, this will have an added value both for nature values on the farm as for the biodiversity of the natural area. Between nature areas and the environment is an on-going interaction (see also Stortelder 2009). The farms that meet the NLN offer additional capabilities by: on average more landscape elements (so more food for wild animals), more crop rotation and therefore more insects (for example, red clover houses masses of insects). Animals in small natural areas need such an environment more urgently than animals in large natural areas. Some species have different needs in different seasons. For example, the yellowhammer eat insects in summer and seeds in winter. This species is dependent on more or less varied agricultural areas where there are weed seeds to find. In large-scale uniform agricultural areas this bird has little food to find. Other birds from the margins of natural areas also use the surrounding landscape. Examples are: shrike, stonechat and tree pipit. These species only appears if the surrounding landscape is varied with many landscape elements. Furthermore, all large predators such as goshawk, sparrowhawk, kestrel, and other predators use the varied landscapes. NLN-farms may reduce the isolation of animal populations (smaller extinction chance) and may act as a bridge between nature areas.

### **6. Other initiatives (EFA's) and NLN**

The pilot Nature and Landscape Scheme (NLN) shows many similarities with recent (12 October 2011) ideas of the European Commission that in the new CAP farmers will set aside 7% of the utilized agricultural area. We speak of EFA's (Ecological Focus Areas). Farmers will no longer use these areas for food production, but redesign these areas into landscape elements for biodiversity and environmental and climate goals. The Dutch Government believes that this measure may be promising for application in Netherlands. However, there are still many uncertainties in the plans of the European Commission regarding the goals, the ecological effectiveness, costs and benefits for farming and the relationship with the measures of the agricultural nature management.

A first prospective study is currently being conducted by Alterra and CLM. Despite that these proposals are similar to the NLN, there are also substantial differences. Striking difference with the NLN is that existing landscape features may not count, while that is the case with the NLN. The idea here is that farmers who still preserved landscape elements, instead of clearing them for the benefit of the cultivable area cannot be subordinated to farmers who have cleaned up all landscape elements. Another difference is that the condition of 7% set-aside does not apply to organic farms. The EC assumes that these companies already sufficiently contribute to the environment by other means. Also 7% coverage seems especially aimed at set-aside, while the NLN especially focusses on a variety of typical landscape elements that are sustainably managed. In the latter case the natural values are much higher than long-term set-aside only.

This should eventually lead to an attractive and cost-effective incentive for nature and landscape on farms. We do not claim that the NLN scheme is a new interpretation of the CAP policy. There are multiple pilots for the new CAP-policy, and almost daily ideas for the greening of the future EU policy appear. EL&I explores various possibilities, and the national and European politics will have their say. However, a good NLN not only offers opportunities for the new CAP, but also for regional policy, in cooperation with provinces, water boards, nature administrators, etc.

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