

FARM SIZE AND FARMING METHOD'S IMPACT ON ECOSYSTEM SERVICES: LATVIA'S CASE

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Introduction

Nowadays, new rural paradigm foresees sustainable development and the transition of agriculture and rural areas from agricultural origin goods providers to providers of various goods and services, which are based on ecosystem services, especially agroecosystem services. Ecosystem services are closely linked to biodiversity, including agro biodiversity, conservation. Biologically diverse landscapes are formed as a result of environmentally-friendly and multifunctional agricultural activities and provide the opportunity to diversify farm activities, where small (i.e. family) farms perform other important functions in addition to primary production. They provide public goods and services, as well as various social and cultural activities. The aim of the study was twofold: 1) to evaluate the impact of farm size and farming management (intensive or extensive) to provide ecosystem services, including biodiversity conservation; 2) to examine the impact of common agriculture policy and Rural Development Programme (RDP) on potentiality to ensure ecosystem services. The data from Eurostat as well as database of Central Statistical Bureau Latvia, and Latvian Rural Support Service were used. The suitable qualitative and quantitative research methods have been used in the process of the study.

Results

Since 2003 the considerable and statistically significant trend of farm number decrease is indicated in Latvia (Fig.1). Controversially, the opposite tendency is observed of agricultural land, which increases statistically significant. Both trends indicate that the decline of smaller farms is not related to the decrease of agricultural land. The number of small and medium size farms, which are grouped by land use area (ha), was decreased (Fig. 2).

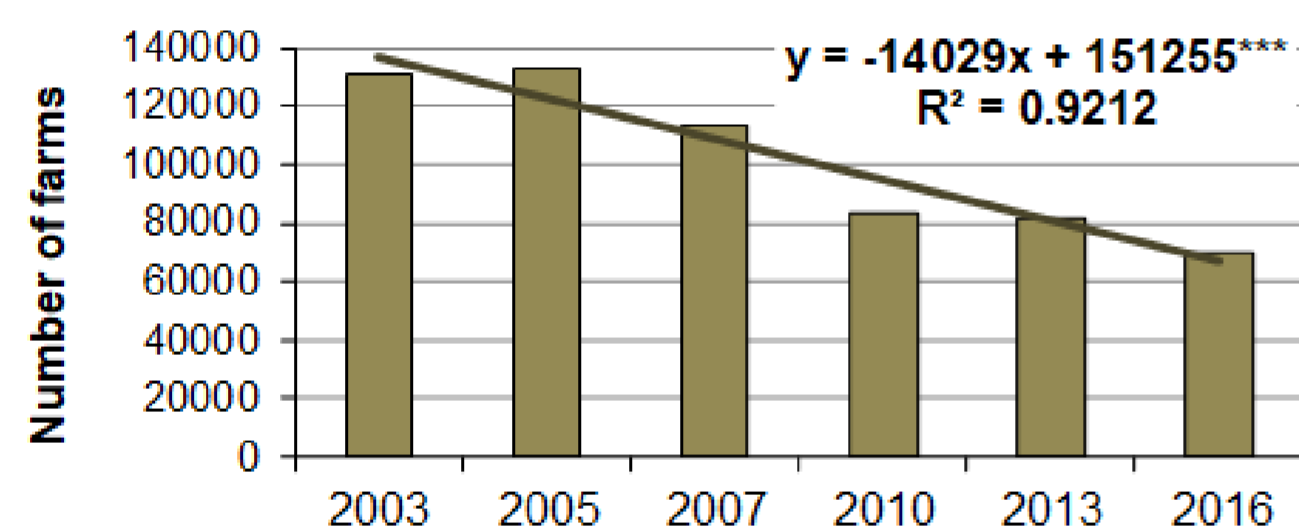


Fig. 1. Number of farms and trend of its change in Latvia, 2003-2016

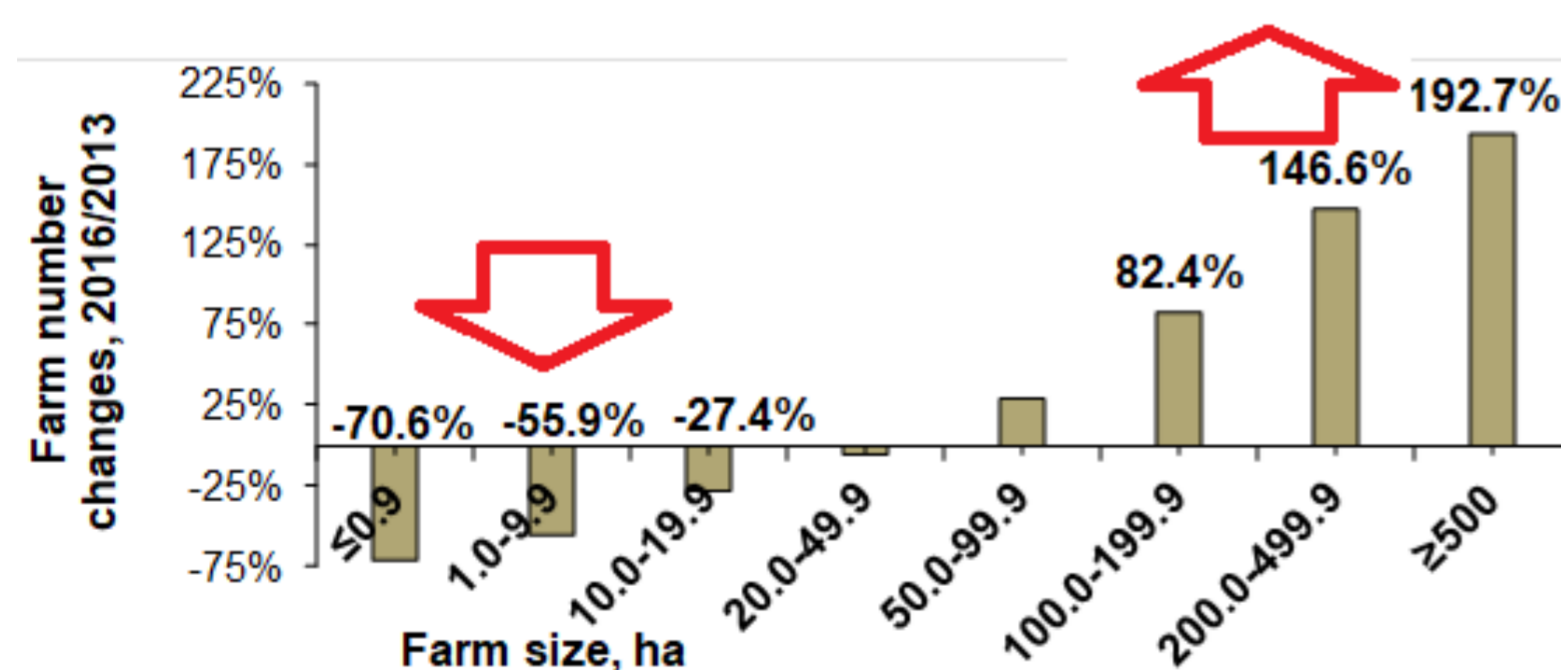


Fig. 2. Changes in number of farms by farm size group, 2003/2016

As consequence of farms size increase, which are oriented toward the intensive production, and caused undesirable consequences, e.g., increase of monocultures and agrochemicals (i.e. pesticides, mineral fertilizers) (Fig. 3); reduction the genetic biodiversity of both crops and wild plants.

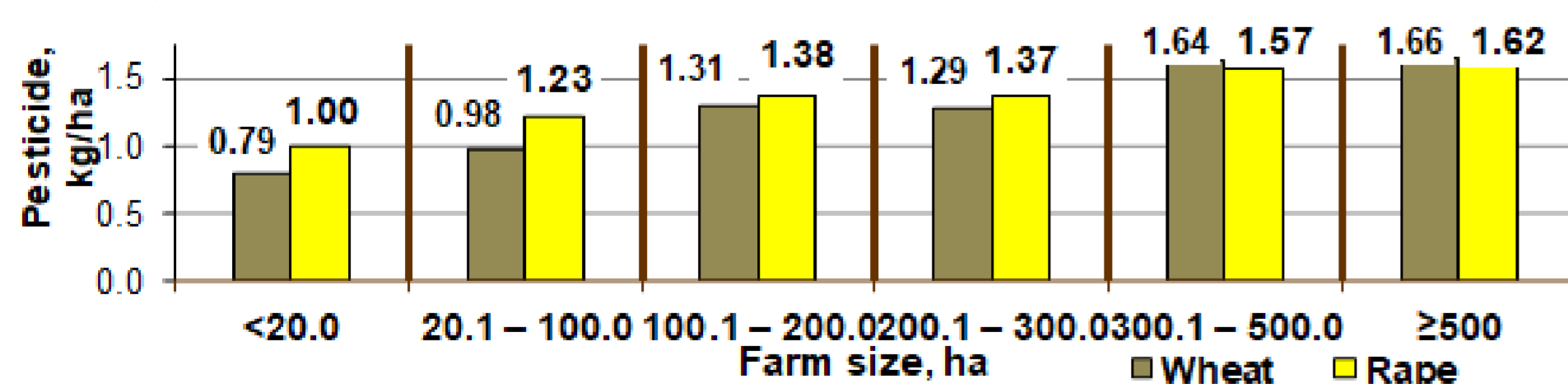


Fig. 3. Pesticides use (kg/ha) in main cereals per farms' size (area) in Latvia

Table 1. The changes of various crops area (thou ha) from 2005 to 2016

| Crop type | 2005 | 2016 | 2016/2005, % | |
|------------------|-------|-------|--------------|---|
| Winter wheat | 132.0 | 329.9 | 149.9% | ↑ |
| Rye | 39.3 | 36.3 | -7.6% | ↓ |
| Winter barley | 2.8 | 2.0 | -28.6% | ↓ |
| Winter triticale | 13.3 | 9.3 | -30.1% | ↓ |
| Wheat | 55.4 | 153.0 | 176.2% | ↑ |
| Barley | 145.9 | 94.1 | -35.5% | ↓ |
| Oat | 58.0 | 64.6 | 11.4% | ↑ |
| Buckwheat | 10.4 | 17.9 | 72.1% | ↑ |

Despite implementation of agri-environment measures under RDP, the success of its is unsatisfactory. Agro-biodiversity decreased (Table 1; Fig. 4) and noticeably increased the share of industrial/energy crops - wheat, rape and maize (Fig. 5).

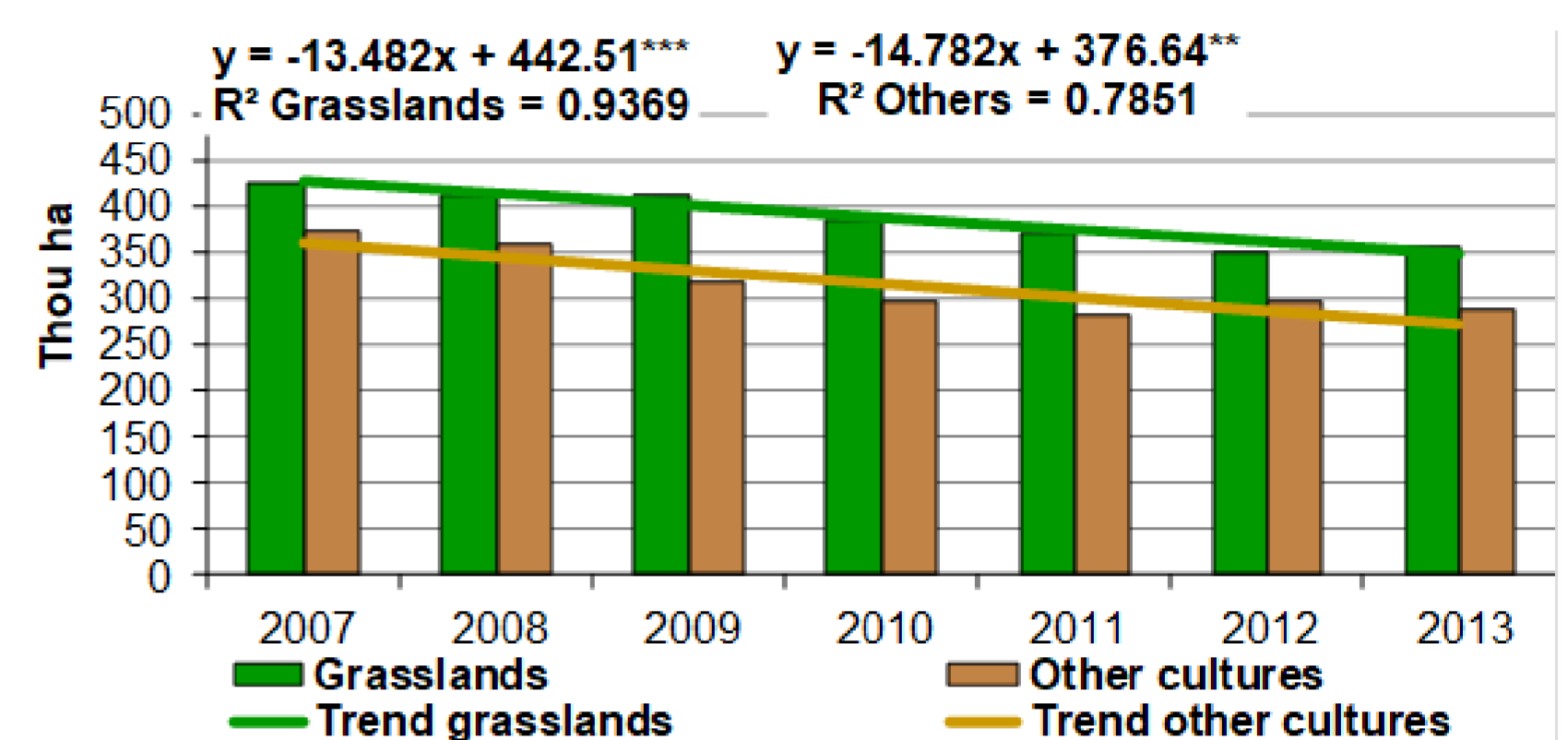


Fig. 4. Area and trends of other cultures and grasslands, 2007-2013

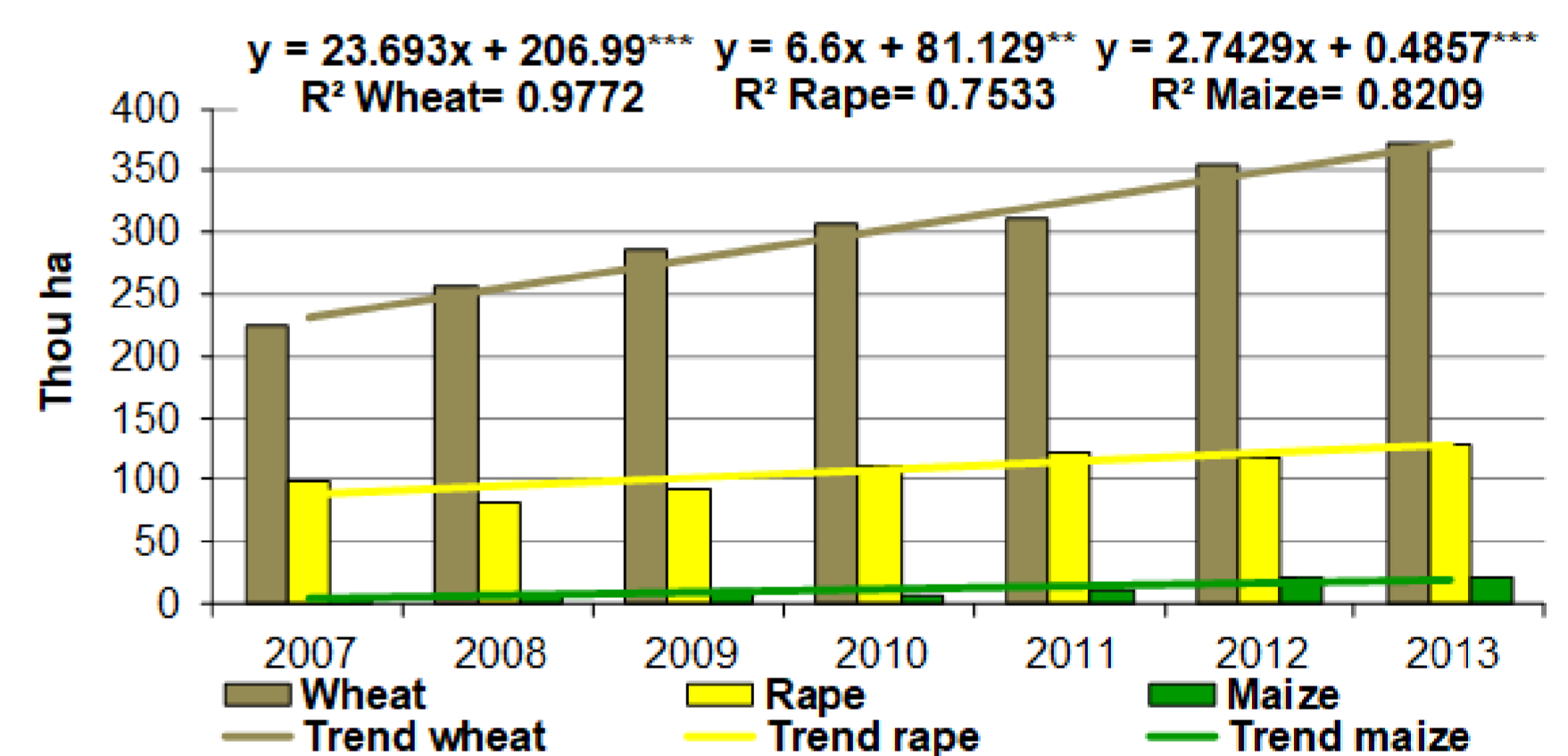


Fig. 5. Sown area and trends of wheat, rape and maize, 2007 2013

Cultural ecosystem services create the basis for farm activities diversification, and for providing other gainful activities. There is the great opportunity to develop these activities in Latvia, comparing among EU Member States' successes in this field, as well as compared to another Baltic State – Estonia (Fig. 6).

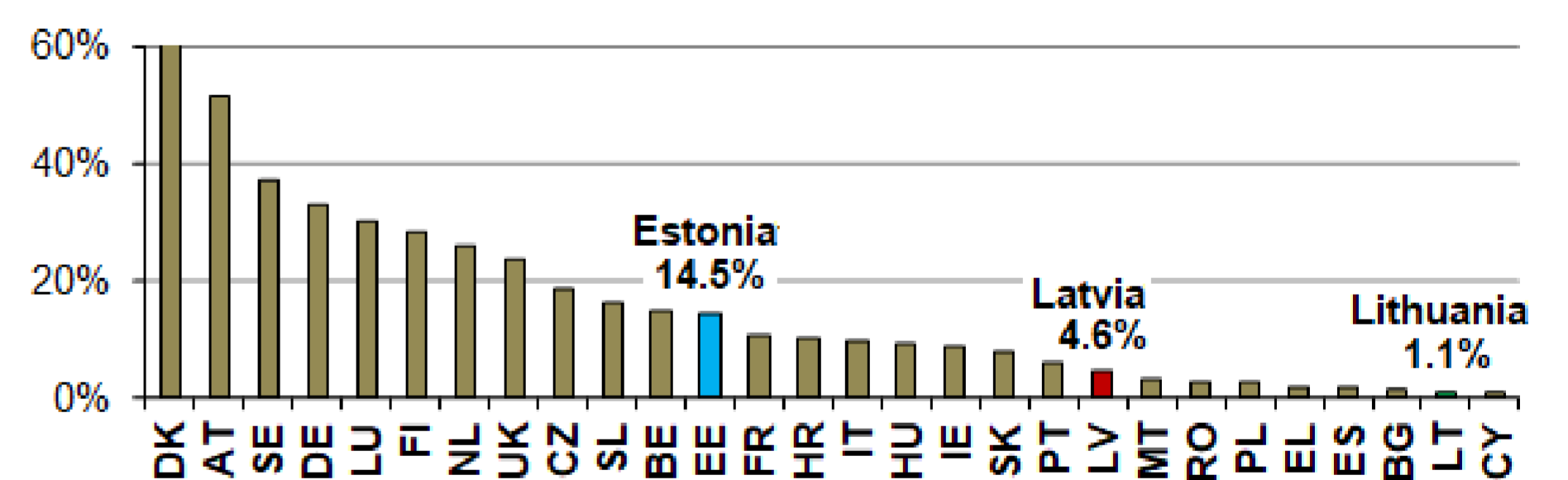


Fig. 5. Other gainful activities directly related to the farming in EU Member States

Conclusions

Land use change and land management intensification are major drivers of biodiversity loss, especially in agricultural landscapes. The decreasing of biodiversity and agrobiodiversity as well as land use changes adversely affected the main ecosystem services, including landscapes. Despite the decreasing trend of number of smaller and low-input farms, the number of its still is high. Moreover, the leading and the important role of these farms as providers and delivers of wide range ecosystem services as well as the keepers of biodiversity (i.e. agricultural and nature or wild biodiversity). In the future the support will be given to farms, particularly small and medium size farms, for enhancing the multifunctionality and diverse activities of farms, which could provide and deliver beneficial public goods and services. These services could be based on biodiversity conservation as well as ensuring the qualitative and high value ecosystem functions and services, including cultural landscapes.

Acknowledgements

This research was supported by the National Research Programme „Innovation and Sustainable Development” (SUSTINNO).