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Review

# The Characteristics of Low-Input Grasslands

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**Abstract**

Several studies show that the global interest in health and human nutrition is continually growing. A continuous change includes also the food production systems. There are more and more papers that connect the value of agricultural production and food production system, papers that show a particular interes on the high value of products that are produced in low input agricultural systems./ On grassland canopy, these systems have a high diversity of floristic species. At European level, this concept has been extrapolated also to the farms, being a major concern regarding the quantification of inputs, aspect pursued along this paper.

*Keywords:* biodiversity, Apuseni Mountains, low - input, traditional management

## 1. Introduction

Accelerated economic development of the humanity from the second half of the twentieth century led to significant degradation of environmental conditions ”to a worsened condition of the environment and life of each human individual regardless of his apparent wealth” [5]. Sustainable use of our resources is one of the great challenges of our time and will become increasingly important.

This challenge is necessarily linked to local livelihoods and economic viability without the use of natural resources and therefore nature conservation cannot be managed in a sustainable way.

If development strategies would focus on local sustainable development, adding value to local, sustainable tourism, agriculture and sustainable forest management, traditional and cultural ”landscape extraordinarily beautiful, including all its natural resources, "will be maintained for present and future”.

## 2. Low-input farms

Low input farms in the EU were identified in different projects using the Farm Accountancy Data Network- FADN [11]. Low input livestock systems were first quantified in the project European Livestock Policy Evaluation Network – ELPEN – [12]. For IRENA (Indicator Reporting on the integration of environmental concerns into Agricultural policy) the ELPEN typology work was further elaborated to show trends in intensity of farming in all sectors (fig. 1, [13]).

From the IRENA typology and the mapping of the results it becomes clear that in 1990, low-input farms managed 26% of the agricultural area

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and this share increased to 28% in 2000 (for EU - 12 only). The intensity of farming in terms of low -, medium - and high - input systems was defined by using the expenditure on selected inputs (fertilizers, crop protection and concentrate feedstuff), as this is the only information available at farm level.

The global breakdown of expenditure on inputs for all farms in EU - 15 in 2000: 22 % of the expenditure is on fertilizers, 18 % on crop protection and 60 % on concentrate.

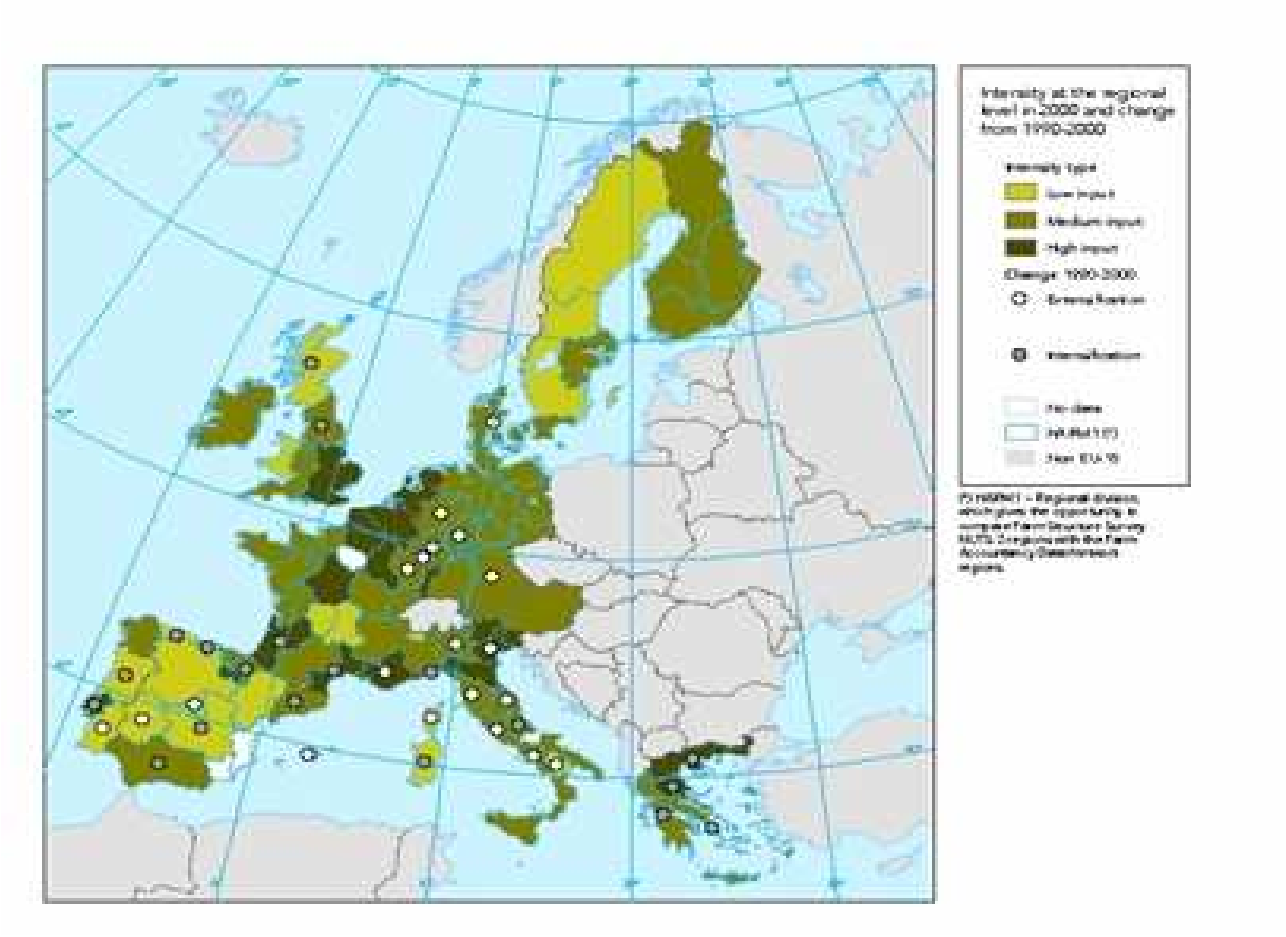

**Figure 1.** Regional importance of low-input, medium-input and high-input farm types and the trend 1990-2000 (after Elbersen and Andersen, 2008, [3])

The intensity of farming in terms of low-, medium- and high-input systems was defined by using the expenditure on selected inputs (fertilizers, crop protection and concentrate feedstuff), as this is the only information available at farm level.

The global breakdown of expenditure on inputs for all farms in EU-15 in 2000: 22% of the expenditure is on fertilizers, 18% on crop protection and 60% on concentrate feedstuff [13]. Data derived from FADN-DG [3].

It was also estimated in the IRENA fact sheet that this means that an average low-input farm uses 19 kg of nitrogen per hectare per year, whereas the same figure for the medium- and high-input farms are 69 kg and 126 kg respectively.

The average use of pesticides on a low input farm equals to an average of 0.2 kg active ingredients per hectare per year, whereas the same figure is 1.4 for medium-input farms and 3.7 for high - input farms [13].

**Note:**

*Extensification* = a decrease of more than 15% in the average regional expenditure per ha of agricultural land on inputs

*Intensification* = an increase of more than 15% in the average regional expenditure per ha of agricultural land on inputs.

## 3. Advantages of low-input systems

Table 1. Study from Raumberg-Gumpestein, Austria [4]

| Elements | **Necessities/consequences/advantages** |
|---|---|
| Reduction of external resources (concentrates, mineral fertilizers especially mineral nitrogen, pesticides, fossil energy) | Improve forage quality, legume based forage systems, enhance manure efficiency, mechanical and biological weed control, use of renewable energy. |
| Maximization of grazing | Full grazing systems, harmonization of lactation time with vegetation period, improve forage conversion efficiency, synchronization of calving; animal welfare and health reduce forage conservation costs, natural hay drying systems. |
| Optimized animal husbandry | Low replacement rate of dairy cows, high life-performance, site adapted local breeds - lightweight animals to avoid sward damage. |
| Cheap and labour extensive animal housing systems | Free-range husbandry, wooden stable houses and farm buildings, stable co-operations. |
| Reduction of costs for farm machinery and other farm equipment | Use of machinery rings, inter-farm co-operations, management co-operations for larger areas (valleys). |

## 4. The importance of low-input systems

It is known that low inputs are beneficial for the environment, but there is a lack of knowledge to the low starting level of these inputs has negative consequences for the environment [3]. Use of high input agriculture was the major cause leading to loss of farmland biodiversity [2, 10, 7].

Higher input use is one of the main factors of the intensification process and it usually leads to an increase in the level of production per unit of land, per livestock unit and per agricultural working unit. Intensification often goes together with an increase in efficiency of the agricultural production process but also with negative externalities on the environment especially in terms of loss of habitat quality through pollution of soil, water and air and even direct poisoning and loss of food supplies for certain species [3].

On the other hand not only intensification but also abandonment shows a heavy impact on farmland biodiversity [6].

This process of polarization, in which abandonment and an increase in stocking density both occur and sometimes within short distances, poses a threat to biodiversity especially in semi-natural areas created by extensive livestock farming. It was estimated by the European Environment Agency in 1998 that during the 20$^{th}$ century, semi-natural habitats declined by over 90% in most parts of Europe as a consequence of such polarization. The IRENA indicator 33 (Impact on habitat types and biodiversity) showed that 80 % of all agricultural Prime Butterfly Areas (PBAs) in EU-15 experience negative impacts from intensification, abandonment or both [8].

From all agricultural sites 43% suffer from intensification, whereas abandonment is a significant problem in 47 %. Both impacts occur simultaneously in 10%.

Some interesting information was also provided by Birdlife International on the new Member States [9]. They estimated that of the 571 International Important Bird Areas in these countries 27% were negatively affected by abandonment and 33% by intensification.

It is important to realize that abandonment and intensification have gone and still go together with the disappearance of low input traditional farms [3, 1, 14].

The disappearance of these systems is a result either of a shift towards more intensive and specialized farming and/or abandonment of whole farms or only the lower productive parts. There is a clear coincidence between the places where farmland biodiversity has remained relatively stable and where the low input farming systems have continued to exist, while the opposite is true for the decline in farmland biodiversity and the shift towards more intensive and efficient farming systems [2, 10].

By using low inputs on grasslands to maintain biodiversity and have created these high nature value farming systems, known in Europe ”Grassland with High Natural Value (HNV) - Conservative meadows High Value”. Although HNV farms have not (yet) like organic farms been officially recognized in Council Regulations, nor are there official certification schemes for HNV farming, the concept of HNV farmland has become a growing policy priority in recent years. Article 22 of Rural Development Regulation (1257/1999) states that support shall be given to ”the conservation of high nature value farmed environments which are under threat”. Also the ”Message from Malahide” an outcome of a conference on ”Biodiversity and the EU - Sustaining Life, Sustaining Livelihoods” jointly organized by the Irish presidency and the European Commission in Malahide (Conference May 2004 Objective 5.2) formed the basis for future priority action in reaching the 2010 EU target of

halting the loss of biodiversity (the Gothenburg objective).

One of its targets was that ”high nature value areas should be identified, and measures to address the threats to these areas be provided” [3].

## 5. Conclusion

At the European level, after a relatively long period of intensive use of land, is increasingly promoted low-input farming system. Low - input farming system maintains a high diversity, is not aggressive to the environment and the agricultural products obtained are accepted by customers thanks to their value.

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