Assessing HNV farms from FADN. Linkages between HNV level of farming intensity and farm support

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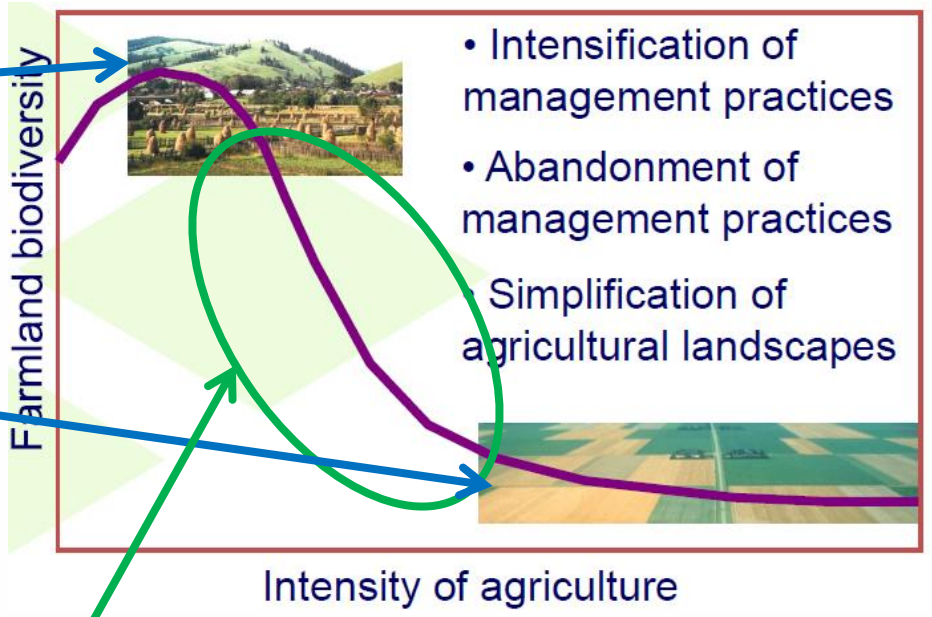
Main topics of our explorative analysis

- Use of already existing database (e.g. FADN) for classification and assessment purposes of HNV farming systems
- Comparison of alternative HNV classifications (approach followed by Anderson et al. 2003 vs. approach based on score)
- Description of the evolution of HNV farming through panel data (FADN over 6 years) with spatial distribution
- Analysis of the correlation between farm support and intensity of farming
- Analysis of trade-off between less accuracy and more record-keeping in using proxy indicators:
  - further potential database development through links with IACS/ LPIS
  - request for additional information from FADN sample

Biodiversity and Farming Intensity

- Highest biodiversity coincides with low agricultural inputs
- Biodiversity decreases when the intensity of farming increases
- The agriculture-related biodiversity is under high pressure

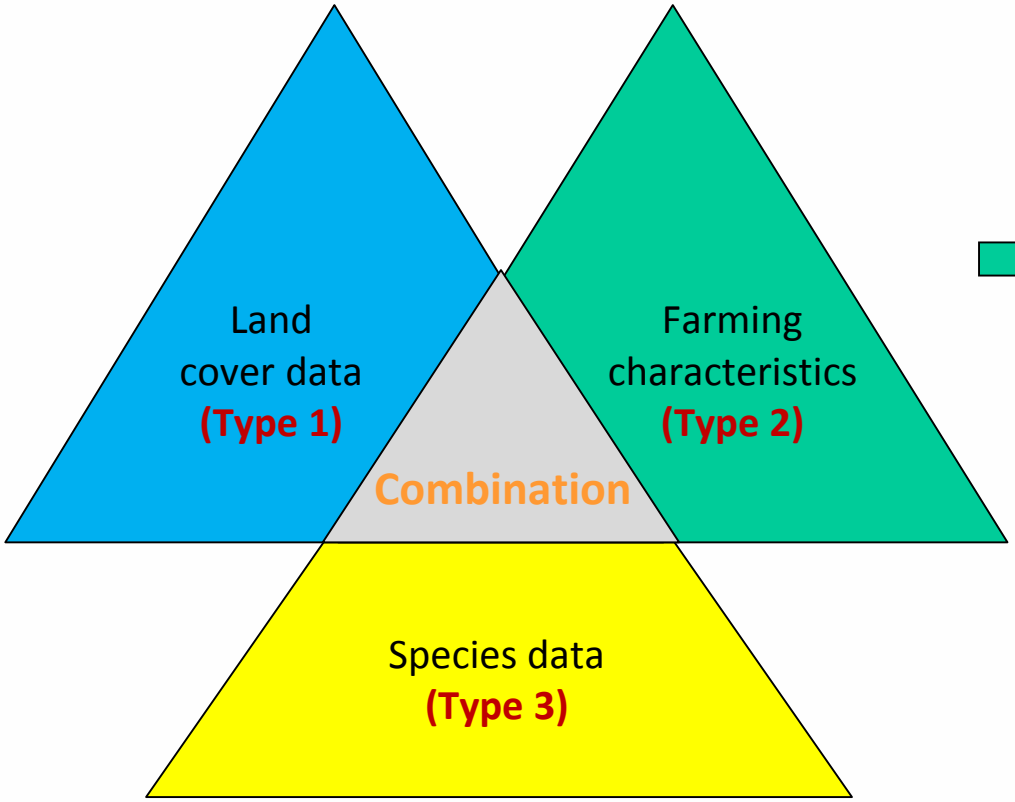


Source: Hoogeveen Y.R., Petersen J.E. & Gabrielsen P. (2001)

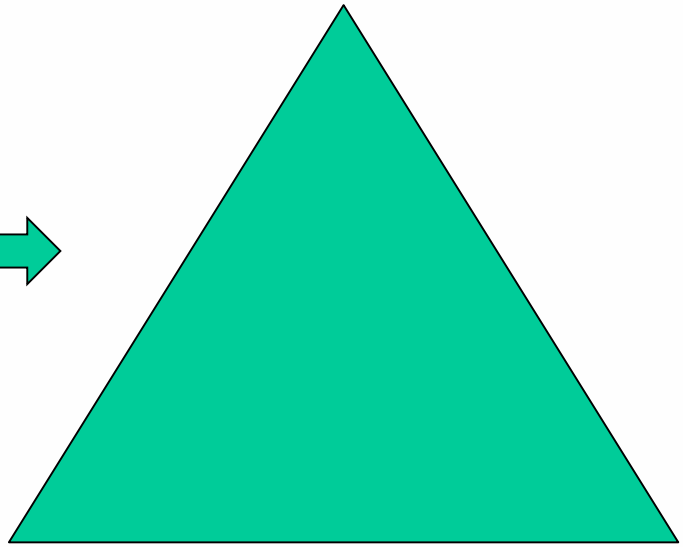
Between these two opposite points there is a continuum along which a variety of interactions grade from one to another

From Identification of HNV farmland to Farm-Level Analysis

Identification of typologies of HNV farmland



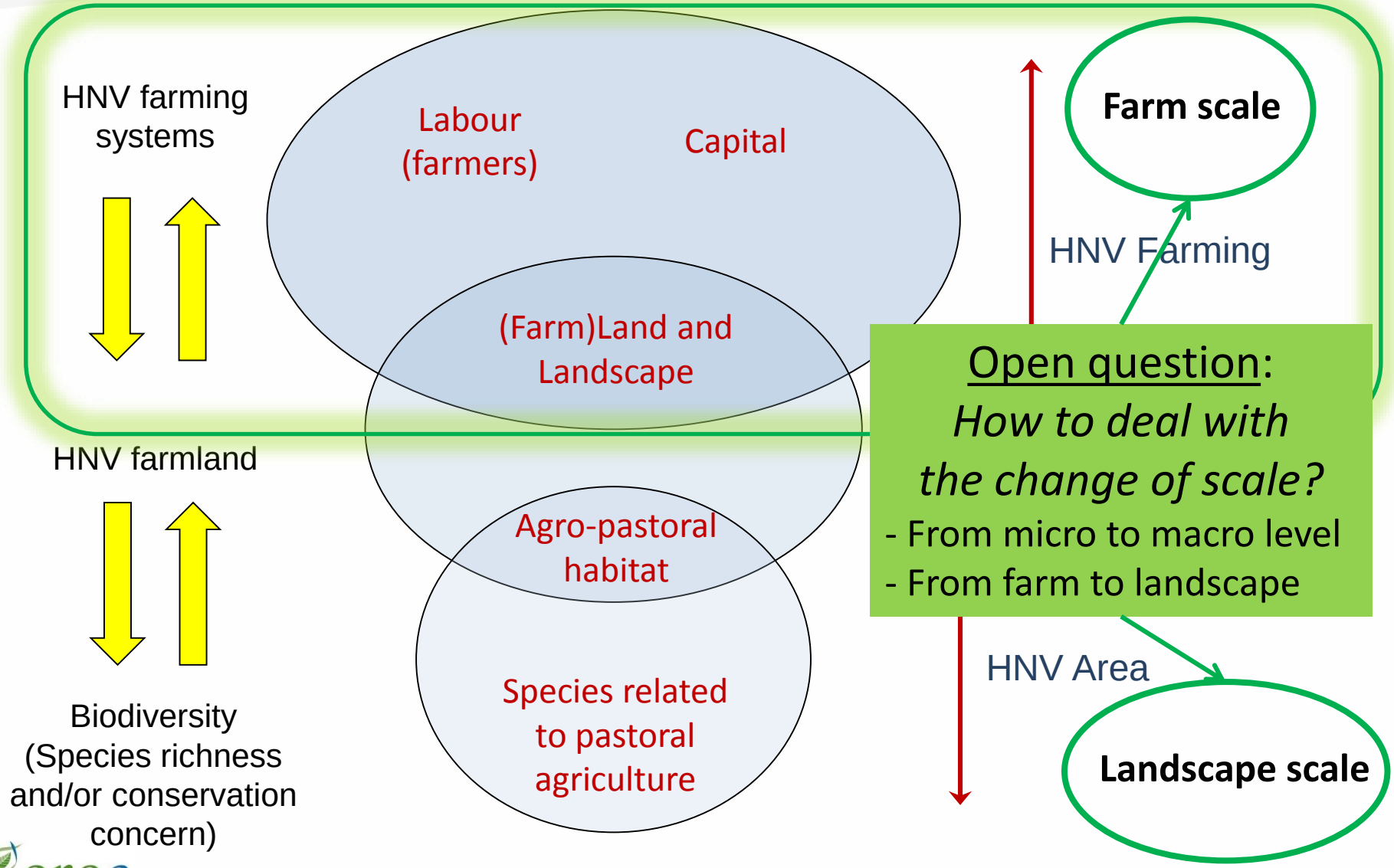
Focus on farm-level analysis



Socio-economic characterisation of HNV farms

Farmer = Decision maker

HNV farming systems → HNV farmland → Conservation of species



Source: Adapted from Cooper et al. 2007; Poux and Pointerau, 2014

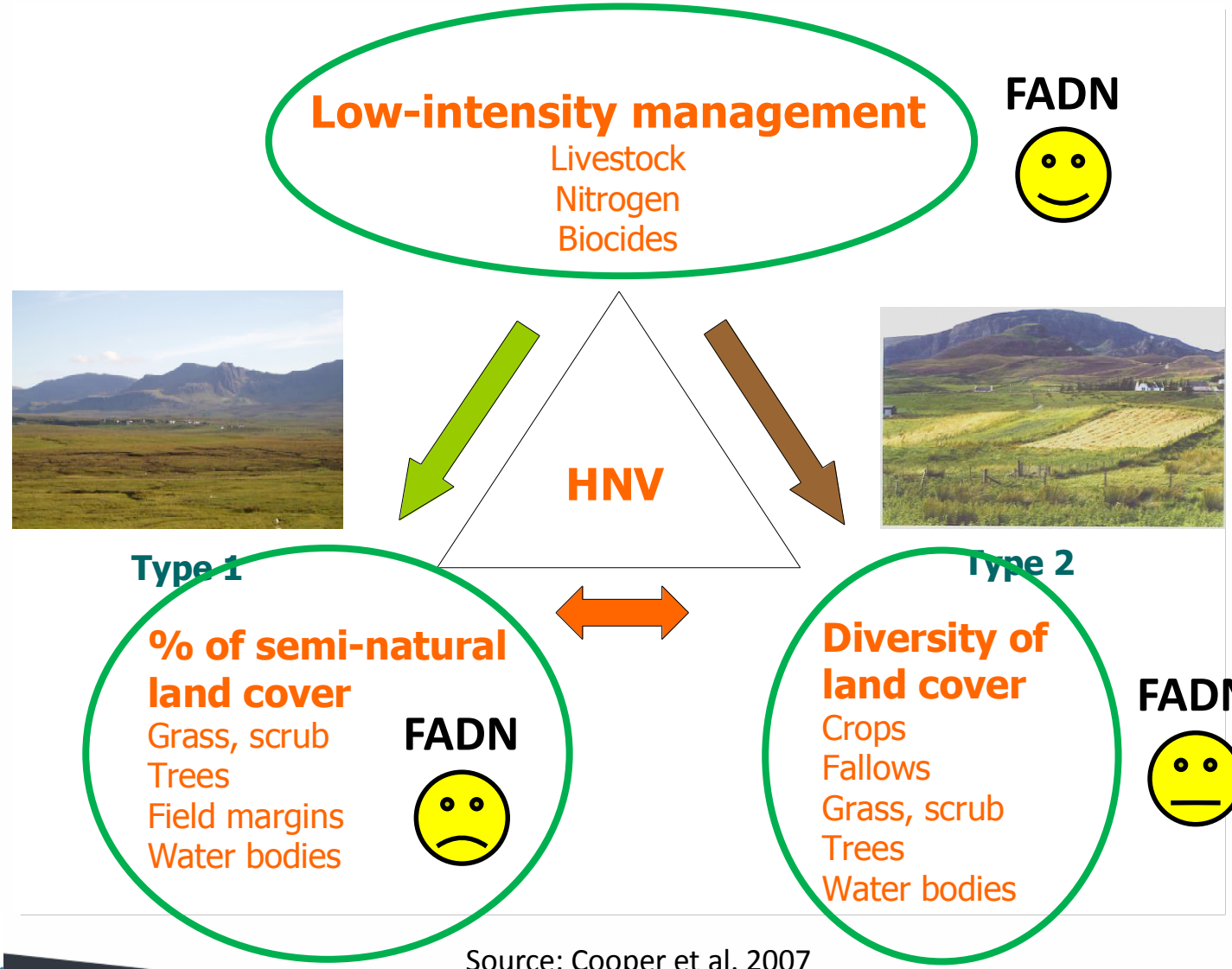
Classification of farms in terms of “HNV degree”

- Method proposed by Andersen et al. 2003
  - use of FADN database
  - only few parameters (input cost; livestock; grassland; irrigation; set-aside)
  - classification based on thresholds (yes/no)
- How to deal with the continuum of the different variety of the interactions between farming systems and biodiversity ?
- Are there any already existing databases at farm level useful for this classification purposes ?
- Choice of **FADN**
  → potential to replicate the analysis at NUT2 level all over EU
  → distinction in comparison groups (participant/non participant)
- Calculation of a score that summarise the «HNV degree» of each farms

Methodology for the classification of HNV fs

- Based on multi-criteria approach where assessment criteria has been converted into measurable indicators
  - some references (AgriEnvironment Footprint; Dialecte)
- Identification of farm-level indicators all “made in FADN”
  - sample of around 7-800 farms in Veneto (North-East of Italy)
  - 9 indicators
- Conversion of indicator values into scores
  - normalisation → categorical scale (to avoid the extreme effects)
- Aggregation of indicators with assignment of weights
  - reflecting the relative importance to the environmental issues
- Calculation of the index (final score)
  - with possible creation of HNV classes (arbitrarily chosen)

Criteria for combination of HNV farming



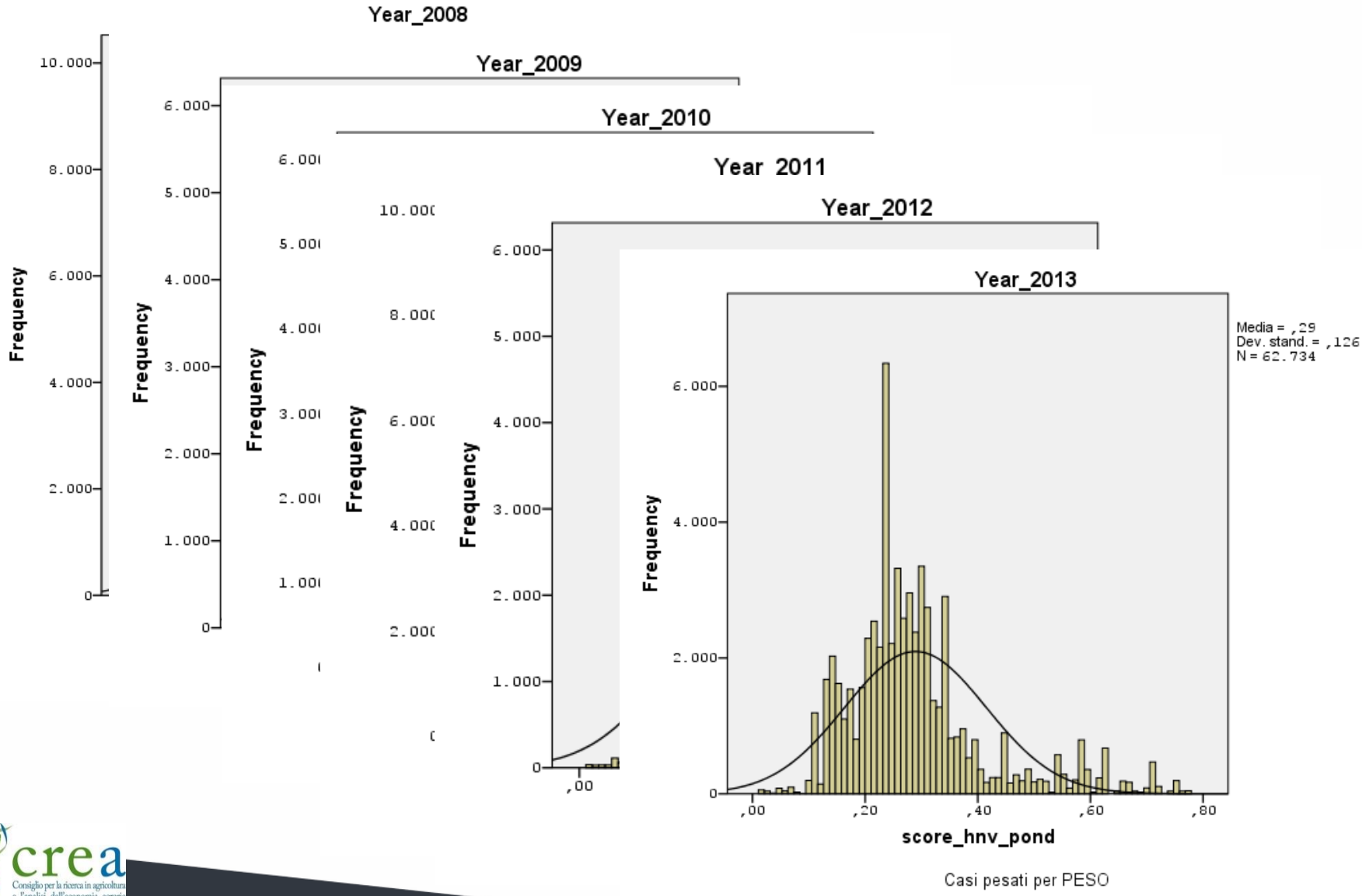
Source: Cooper et al. 2007

The selection of the 9 base indicators

Indicators	Weight	Mean	Stand. Dev.
Permanent grassland (% of UAA)	0,24	9,6	26,0
Livestock Units per forage area	0,13	1,5	25,7
Irrigated UAA (% of UAA)	0,10	35,0	42,4
Fertilizer expenses per hectar (euros)	0,07	409	1.462
Pesticide expenses per hectar (euros)	0,08	296	707
Feed expenses per hectar (euros)	0,10	433	4.410
Organic farm (dummy Y = 1, N=0)	0,08	0,02	0,1
Number of crops	0,14	2,4	1,3
Set aside (% of UAA)	0,06	2,0	9,1

High variability of the indicators (not influencing the score if a categorical normalisation has been used)

The distribution of final score

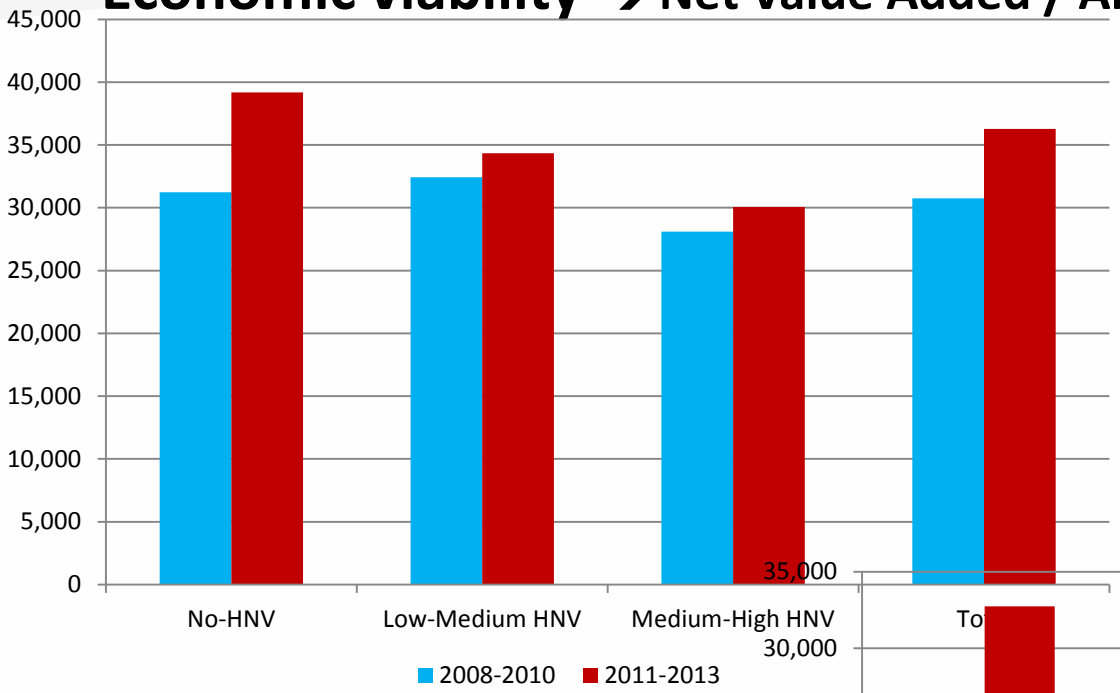


Distribution of HNV typologies (%)

There is a slight decrease of the score between 2008-2010 and 2011-2013

	No-HNV	Low-Medium HNV	Medium-High HNV	Total
	Average 2008-2010			
No. farms	56,1	21,5	22,4	100,0
Utilised Agricultural Area	42,6	24,1	33,3	100,0
Annual Work Units	59,7	17,0	23,3	100,0
Farm Net Value Added	60,6	18,0	21,4	100,0
Subsidies	50,7	23,8	25,5	100,0
	Average 2011-2013			
No. farms	58,9	21,7	19,4	100,0
Utilised Agricultural Area	50,0	24,4	25,7	100,0
Annual Work Units	60,9	18,4	20,7	100,0
Farm Net Value Added	65,9	17,0	17,1	100,0
Subsidies	52,5	23,5	24,1	100,0

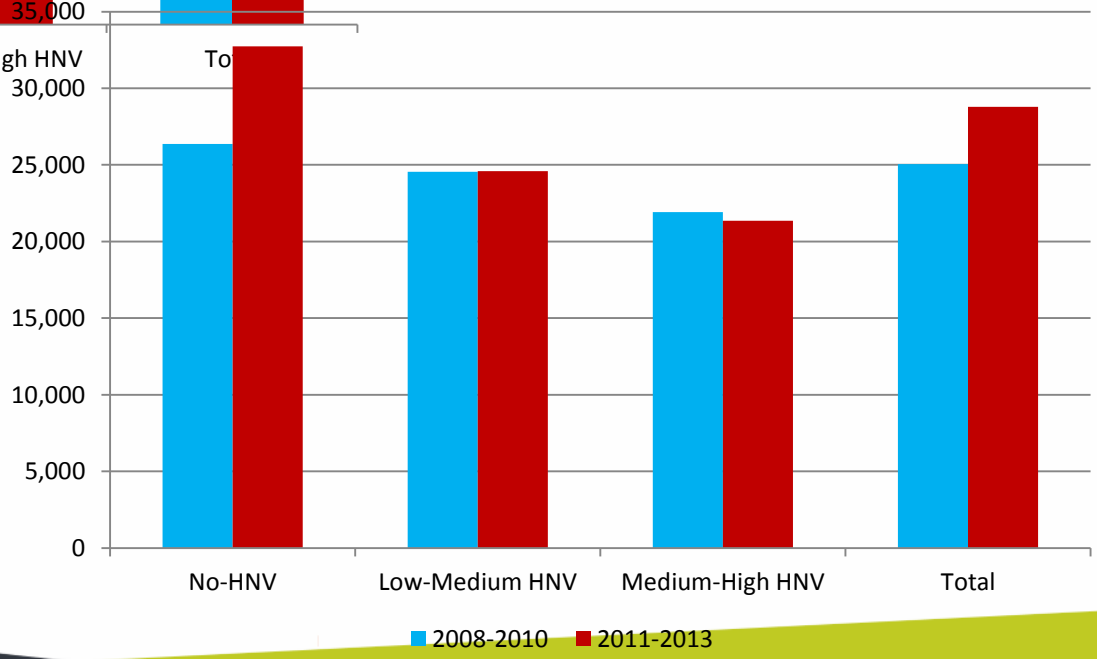
Economic viability → Net Value Added / Annual Working Unit (euros)



Differences between
No-HNV and Medium-high HNV
from -10% in 2008-10
to -23% in 2011-13

minus Subsidies / AWU

Differences:
from -17% in 2008-10
to -37% in 2011-13



CONCLUSIONS

- Integrated data assembling on micro level has large advantages → FADN provides a basis for collecting sustainability information
- Potential access to EU databases (FSS, FADN, IACS/LPIS) with detailed information could facilitate monitoring of sustainability
- Increasing availability of new and more detailed data (e.g. semi-natural features) BUT they may require additional data collection and processing
- Be aware of the difficulties to depict the full range of effects in complex fields of environmental phenomena of biodiversity loss
- Challenge of up-scaling from micro level (e.g. georeferencing FADN, how to create representative spatially explicit distribution?)