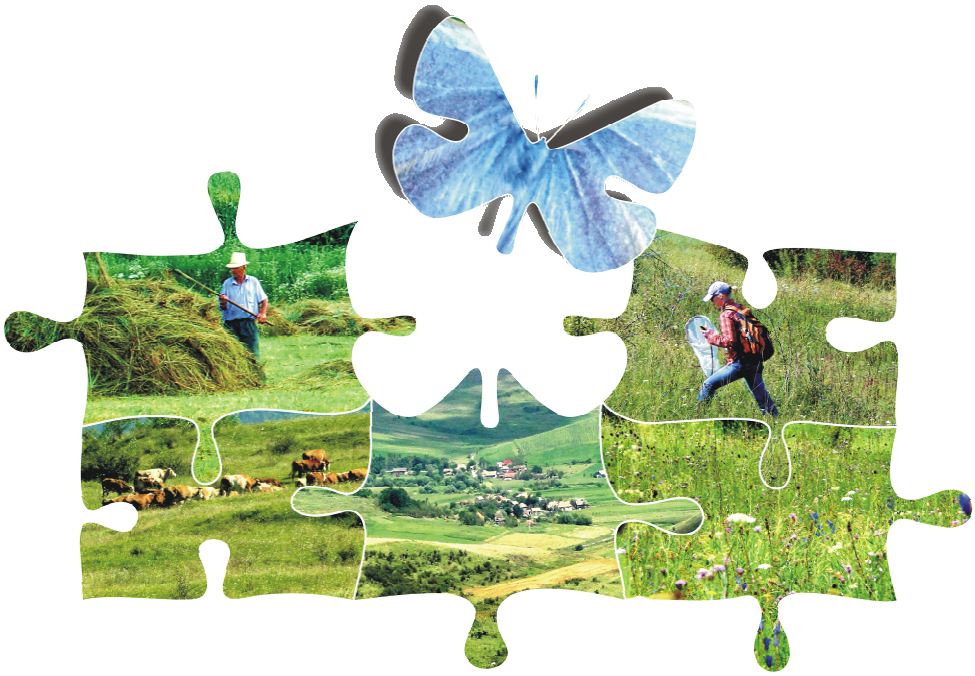
Grassland conservation through CAP instruments - A Transylvanian case study

2010 and 2011 summary report of the Mozaic Project



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The authors would like to thank the mayors and town hall staff of Borşa, Dâbăca, Aşchileu Mare and Vultureni, who kindly shared their detailed knowledge about ownership, land use and subsidies with us. Sincere thanks also to the APIA officers involved. An important source of information but also of motivation for our work are the inhabitants of Borşa and Dâbăca communes, whom we want to thank for their inspiring openness and hospitality. Last but not least we want to express our gratitude to our colleagues from the Mozaic Project for their support and to Gwyn Jones of EFNCP for adding important aspects to our work, as well as for his inspiration and encouragement.

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1. Introduction

1.1. Research area

The research area is situated about 40 km north of Cluj-Napoca (Transylvania), the fourth largest city in Romania. The core area consists of two communes: the commune of Borşa extends over an area of 62 km^2, and has about 1560 inhabitants in 5 villages, while the commune of Dăbâca has ca. 1700 inhabitants in 3 villages and an area surface of 50 km^2 (Figure 1.1).

Geographically, the area belongs to the so-called "Hills of Cluj", the south-eastern part of the Someş Plateau, which borders on the Transylvanian Depression. As the name implies, the region is characterised by hill chains with average heights of between 450 and 550 m, whereas the valleys of the left bank tributaries to the "Little Someş" are between 250 and 400 m high (Pop 2001). In the research area the valleys are orientated NW-SE, leading often to distinctive characters on the north and south facing slopes.

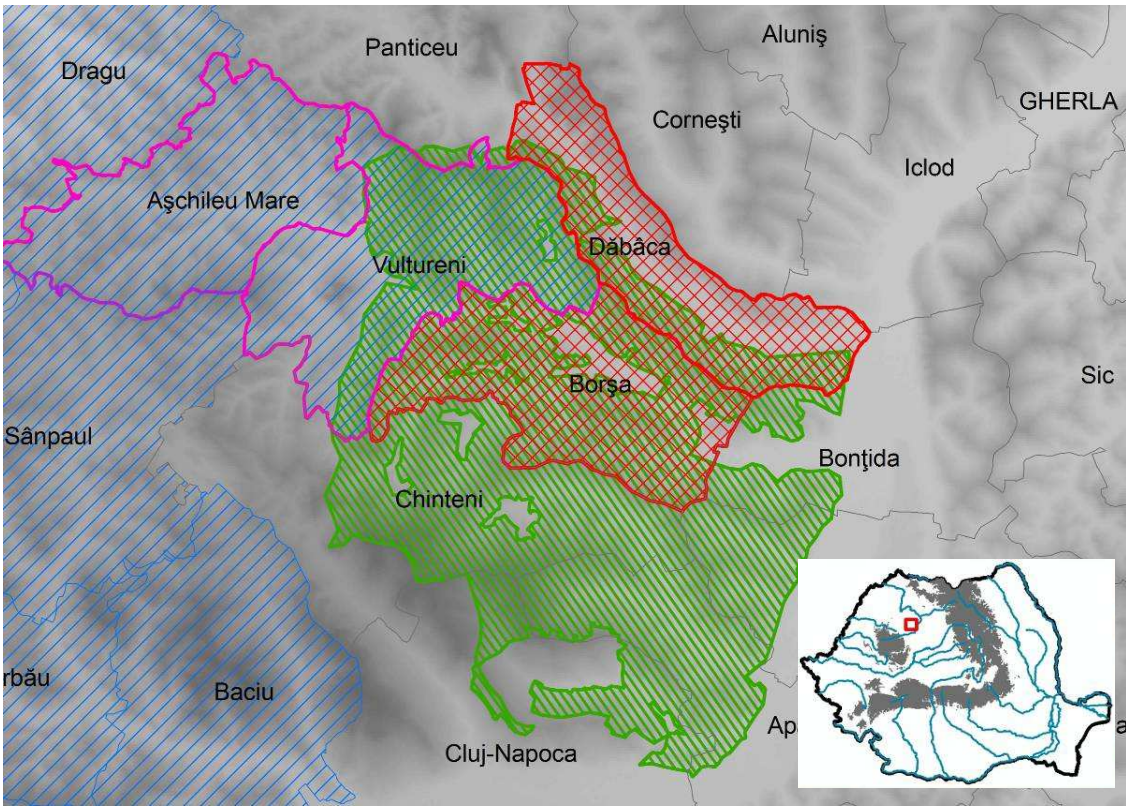

Figure 1.1 Map of the study area

Cross-hatched (red) - communes of core area; pink outline – communes included in subsidy study; hatched (green) - Natura 2000 site SCI "Eastern Hills of Cluj"; hatched (blue) - agri-environment payments available. Background: SRTM-map Romania.[1]

[1] http://srtm.csi.cgiar.org, see also Reuter et al. (2007) and Jarvis et al. (2008)

The soils belong to two zonal soil groups: podsolized illuvial soils (argiluvisol) and chernozemic soils (mollisol) on marl and argillaceous marlstone (Pop 1996). Landslide phenomena can be observed in the area – both the so called "slumping hills" characteristic of Transylvania and active superficial landslides on some slopes.

The mean annual temperature is 8-9 °C, with average temperatures of 18-20°C in July and 3-4°C in January. The annual mean precipitation reaches 600-700 mm (Pop 2001).

Most of the woodland in the study area is oak-hornbeam forest (belonging to Natura 2000 habitat types 91G0 and 9160) (Pop 1996), but in the eastern part of the Hills of Cluj there are few woody patches left; only about 12% of the research area is forested. The forests were replaced by arable land, pastures and meadows. Here and there these are dotted with shrubs, which creates habitats which can mostly be classed as sub-continental peri-Pannonic scrub (Natura 2000 habitat type 40A0*).

The proportion and spatial distribution of the land cover types changed markedly several times over the last 100 years or so, the dynamic of the last decades being one of the issues covered in this report. Compare to the wider EU, the landscape has an extreme patchiness, especially of arable land, which is in numerous small plots, and a high proportion of fallow or abandoned arable land.

The research area forms an important part of the Eastern Hills of Cluj Site of Community Interest (SCI), designated under the EU-Habitats Directive in 2011[2]. Important Features of Community Interest on the site are the butterfly species of the genus *Maculinea*, with all the five European species occurring in the same area – the only case known so far in Europe.

1.2 Farming background

The agriculture of the research area is characterised by subsistence and semi-subsistence holdings, which in general own several small arable and grassland parcels scattered over the commune. As well as arable farming, sheep and cattle keeping are carried out.

The agriculture of the area is characterised not only by change (detailed below), but by contrasts: the co-existence of low-input and more intensive systems, of mechanised and manual farming activities, the existence side by side of valuable and less valuable semi-natural habitats (though even the latter may be still valuable on a pan-European scale).

The reasons for these patterns lie in the past. If we look at the development of farming and the rural landscape in the research area during the last hundred years or so, several events and processes in both Romanian and Transylvanian history have resulted in major changes to farming, property and land use structure.

The first was the agrarian and land reform of 1921, when large areas of the great estates were reallocated to peasants after the joining of Transylvania to Romania, in many cases

[2] Order nr. 2387/2011 of the Minister of Environment and Forests of Romania

as a reward for soldiers returning from the war. The property structure thus established was restored after 1990 and still forms the basis of the present landscape. According to a local mayor, the increase of the number of land owners, the introduction of the iron plough and buffaloes as draft animals as well as railway construction led to both an increase in forest clearance and agricultural activities in the first decades of the 20th century and an increase in population. All the available agricultural land was farmed.

While the expropriations of the 1945 land reform gave land to even more peasants, it was closely followed by an even bigger disruption - collectivisation, which started in Romania in 1949 and eventually led to the transfer of 77% of all private land to collective farms and state farms by 1962 (OECD 2000). The increase in agricultural machinery and in the use of chemical fertilisers and pesticides and a boom in farming were all factors which led to an intensification of farming.

The fall of the communist system in 1989 initiated a process of de-collectivisation and the re-establishment of private property rights; land restitution is still not totally complete. While the farmers received back their family's land, most of the large agricultural infrastructure was destroyed after the regime change, so that many started off without any machinery. The result is that since the mid 1990s, farming activities in the study area have been in decline.

The last important process was Romania's accession to the European Union in 2007, which brought liberalisation of markets and the introduction of Common Agricultural Policy (CAP) instruments. The new conditions which this created for the farmers can present them with opportunities, but can also pose a danger for the survival of agriculture and the conservation of natural resources.

1.3 Aims of the study

This study aims to address two of the overarching aims of the project of which it forms part. Firstly, how can a harmonious co-existence between humans and nature be developed in an area which seems to be in decline in many respects and yet harbours precious remnants of diverse rural traditions, successful agriculture and High Nature Value habitats? Second, and more specifically, what role do CAP instruments have, both as regards their benefits to agriculture and the local population and their potential to maintain or support the favourable conservation status of semi-natural grasslands?

Within that context, the main objectives of this interdisciplinary study are to reveal:

- the demographic and employment situation of the local communities
- the economic structure of the households
- the former and present day land use patterns and farming structures
- the grassland types and their nature conservation value
- the types of farmers' organisations and the state of the commons
- the state of implementation of CAP instruments

2. Local communes

Agricultural activities and the extent and type of natural resource exploitation depend upon the population structure of the villages. This can also affect their ability to take up CAP payments. The aim of this element of the research was to describe the demographic and employment situation of the two communes. A quantitative analysis of statistical data was carried out focussing on: evolution of the population from a historical perspective, the demographic and ethnic structure and economic activity.

The data was taken from several sources: the locality fact sheets (*fişa localităţii*, a statistical questionnaire which the communes have to provide to the Ministry of Agriculture and Rural Development, including data about territory, population, employment and agriculture); from the latest national census, available on the website of the National Institute of Statistics; from an on-line study of ethnic and confessional statistic by Varga[3] and from the studies of Rotariu et al. (various dates).

2.1 Population change

There was a steady increase of the total population in the communes from the 1850s to a maximum during the 1940s and 1950s, followed by a steady decline (Fig. 2.1). The population of Borşa the 1850s was only 60% of the maximum reached later; by 2002 it had declined to only 40% of that maximum figure.

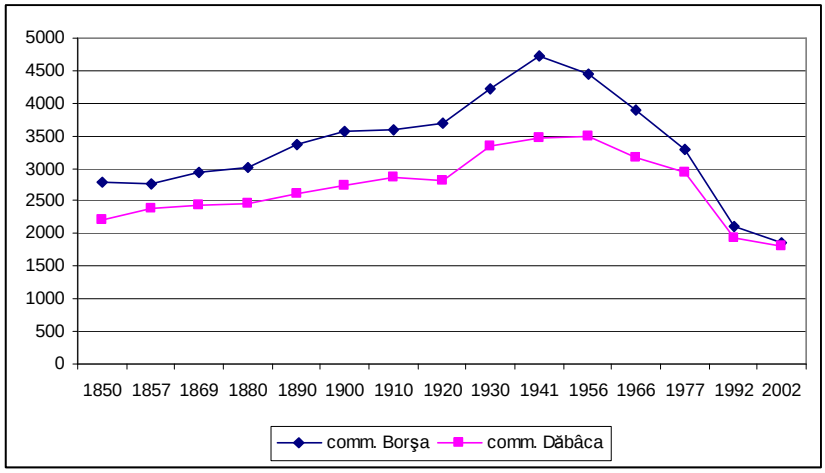

Figure 2.1: Population of the communes of Borşa and Dăbâca 1850-2002 (census data). *Source: Varga.*

Comparing the two communes, in Dăbâca both the growth and the decline are gentler. This "boom" in Borşa is also obvious looking at the actual numbers: in the middle of the 20th century the population of the commune of Borşa was almost 1400 higher than that of Dăbâca; by 2002 the difference had reduced to about 60 and currently the population of Dăbâca is more populous than Borşa (Table 2.1).

[3] http://varga.adatbank.transindex.ro

Table 2.1: Population of the communes of Borşa and Dăbâca, 1999 – 2008 (statistical data)

Year	1992	1999	2005	2006	2007	2008
Borşa	1989	1649	1625	1601	1608	1559
Dăbâca	1887	1521	1627	1616	1626	1702

Source: Locality fact sheet.

Table 2.1 shows the population size in the communes for the period of 1992-2008, according to the locality fact sheet. There is a steady decrease of the population during this period in Borşa, with the highest decline during the 1990s. But in Dăbâca the population increased again after 2006. The population densities in 2008 were: Borşa 25.3 inhabitants per km^2, Dăbâca 33.9 inhabitants/km^2.

2.2 Age pyramids

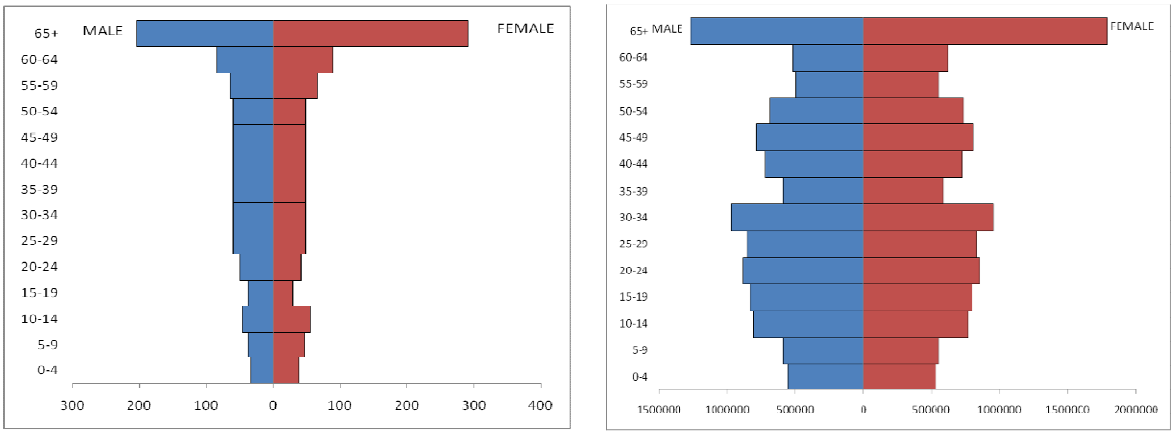

Figure 2.2: Age pyramids for the commune of Borşa[4] (left) and Romania (right) in the year 2002. *Source: National Institute of Statistics (census data).*

The age pyramid of Borşa commune (fig. 2.2 left) shows the high percentage of elderly people and the low percentage of the younger generations; the situation is similar in Dăbâca commune. Compared to the age pyramid of Romania (fig. 2.2 right), which itself indicates symptoms of an ageing population, the age pyramid of Borşa is much more extreme, with a predominantly aged population.

[4] In order to make all age groups of 5 years, the age group 25-59 has been divided by 6 for the communal data. That is why those 6 age groups are of equal length in the pyramid, even though in reality the number of people in these age groups is most likely variable. Note however the small number of young people.

2.3 Ethnic structure

The ethnic structure of Borşa commune during the period for 1850 to 2002/2010 is shown in table 2.3; the situation in Dăbâca is similar. The Romanian population was been in the majority even in the 19th century, but its proportion increased particularly after 1956 and is now more than 10 % higher than it was in 1850. Hungarians were the biggest ethnic minority in both of the communes over the whole period, but the proportion has more than halved since 1850. The German population was for most of the time less than 0.5 %, the Jewish population slightly greater, but data for Jews is inconsistent, as it is for the Roma population. The other ethnic groups are mainly of Slavic origins (Serbs, Russian-Lipovans, Armenians etc.). In general, the proportion of the other ethnic groups was highest in the 19th century.

Table 2.3: Ethnic structure of the population in Borşa commune 1850 – 2010 (in %)

Year	**1850**	**1880**	**1890**	**1900**	**1910**	**1920**	**1930**	**1941**	**1956**	**1966**	**1977**	**1992**	**2002**
Total	2781	3020	3370	3569	3602	3706	4229	4713	4457	3885	3291	2119	1865
RO	78.3	79.2	79.7	81.7	80.0	81.9	85.5	81.7	**88.9**	**86.4**	85.9	**86.4**	**88.0**
HU	17.3	17.5	**18.5**	**17.9**	**18.7**	14.3	12.5	15.8	11.3	10.0	9.3	9.6	7.7
DE	0.0	**0.3**	**0.4**	**0.5**	-	-	0.1	0.0	-	0.0	-	0.1	0.1
Jews	**1.1**	-	-	-	-	**1.3**	**1.3**	**0.6**	-	0.1	-	-	-
Rromas	**2.7**	-	-	-	-	-	0.5	1.8	-	1.8	**2.4**	1.9	**2.1**
Others	0.6	**3.0**	1.4	-	1.3	**2.6**	0.0	0.0	-	1.9	**2.4**	1.9	2.2

Source: Rotariu et al. (different years); except 2010: data provided by the Town Hall of Dăbâca. Bold figures: the three highest numbers for one ethnic group.

2.4 Employment

Table 2.4 shows the employment situation in Borşa commune up to 2008. The number of people who have a job in the communes is strikingly low – about 14.5% of the population aged over 15 (2008). The health and social work sector is the biggest employer in both of the communes, one of the reasons being the Clinical Hospital of Mental Illnesses in the Banffy castle, Borşa, which provides about 130 jobs to local residents as assistants, cooks, janitors etc. Very few people are employed in agriculture – farming is carried out mainly in small-scale family farms without employees.

Table 2.4: Employment structure in Borşa commune 1992, 1999, 2005-2008

Year	1992	1999	2005	2006	2007	2008
Total population	1989	1649	1625	1601	1608	1559
86% of pop.	1711	1418	1398	1377	1383	1341
Wage earners - total	76	181	156	165	178	195
in % of 86% of pop.	*4.4*	*12.8*	*11.2*	*12.0*	*12.9*	*14.5*
Agriculture	5	2	10	2	-	8
	6.6	*1.1*	*6.4*	*1.2*	-	*4.1*
Industry	4	8	-	-	-	12
	5.3	*4.4*	-	-	-	*6.2*
Constructions					4	9
	-	-	-	-	*2.2*	*4.6*
Commerce	9	26	24	25	25	16
	11.8	*14.4*	*15.4*	*15.2*	*14.0*	*8.2*
Transport and postal service	12	-	1	-	-	3
	15.8	-	*0.6*	-	-	*1.5*
Financial, banking & insurance	1	1	1	1	1	1
	1.3	*0.6*	*0.6*	*0.6*	*0.6*	*0.5*
Public administration	14	2	6	8	9	10
	18.4	*1.1*	*3.8*	*4.8*	*5.1*	*5.1*
Education	16	16	17	18	18	18
	21.1	*8.8*	*10.9*	*10.9*	*10.1*	*9.2*
Health and social work	10	103	94	108	109	115
	13.2	*56.9*	*60.3*	*65.5*	*61.2*	*59.0*
Other domains national economy	-	-	-	-	-	3
	-	-	-	-	-	*1.5*

In 2002 86% of the population was aged over 15 – this value was used for all the years because of lack of exact data. *Source: Locality fact sheet.*

2.5 Discussion

The population of the communes is ageing and has been declining for seven decades, notwithstanding the recent increase in Dăbâca. As a result, pressure on land is decreasing. Both growth and decline have been more extreme in Borşa.

The low proportion of the young people means a reduced number of active and physically-strong farmers, who can act as a driver for innovation in agriculture and rural life. The land often is in ownership of the older generations, who in many cases are not willing to lease it out at a reasonable rent, to the detriment of both active farming and the uptake of CAP support. The death of older landowners over the next few years is likely to result in major changes in land use patterns, but it is difficult to estimate what form these will take.

One reason for the apparent recent population growth could be the trend of migration from urban centres back to the villages which can be observed throughout Romania due to the increased cost of living. It is likely that such social change will also have indirect impacts on land use.

3. Socio-economic structure of small-scale farms

Farms and their production techniques greatly influence semi-natural grasslands, biodiversity and the rural landscape in the study area; comprehensive biodiversity and environmental protection cannot be achieved without involving farmers. The sustainability of farming is thus not only desirable but a key issue for nature - maintaining favourable ecological status must go along with socio-economic viability. The change of generations is a crucial time when continuity has to be maintained - the household must have an heir who is prepared to continue the traditional agricultural activities or some alternative which still maintains conservation status.

Over the last 50 years, Europe's rural dwellers have sought better living standards by migrating to urban areas, resulting in declining rural populations and villages with an ageing population. There is no reason to think that Romania is any different. The study therefore aims to analyse the socio-economic situation of local farming households, in order to give pointers to future models for the ecologically- and economically-sustainable development of small-scale farms, taking into account the current and likely future signals from agricultural policy.

In order to assess the economic situation of individual households in the communes, micro-economic data was collected for a representative sample (see also Poate & Daplyn 1993). A 'household' is the basic residential unit in which economic production, consumption, inheritance, child rearing, and shelter are organised and carried out (Haviland, 2003). In this study the terms 'household' and 'farm' are used as synonyms, because commercial farms were not included. Only households that used land in the agricultural year 2009/2010 were considered for the sampling. Information on the commercial farms is also being gathered, but is not reported here.

Probability sampling was used to obtaining a representative sample for the entire population. This technique has been employed on a large scale in similar research (Stevens & Olsen 2004, Petrick 2004, Jitea et al. 2011). In small populations, as in this study, sampling is typically done "without replacement". The optimal survey size was computed (see Levy & Lemeshow 2008) for every commune, based upon the data extracted from General Agricultural Registry. For Borşa, with 613 registered households (out of 650) the survey size was 43; in Dăbâca 40. The households were selected randomly from the entire population using the lottery procedure.

A questionnaire designed for similar ongoing research within the region (Jitea 2010) was adapted for this study. It investigates two main aspects:

- the household's socio-economic situation: number of persons in the household; age; relationship to each other; revenue sources; education level. The way of spending working time (in the household, in agricultural activities or outside the household as an employee); the household's monthly expenditure; the willingness of the heir apparent to continue living in the household.
- the household/commercial assets; how they are financed; crop and livestock production (level of activity; costs; subsidies; revenues; etc).

The questionnaires were completed manually at the town halls and/or the residents' houses. Only persons above 15 years were considered. The data was processed using SPSS.

3.1 Socio-economic situation of the households

Around half of the households have 2 or 3 members, 13% are one-person-households (Fig 3.1.1).

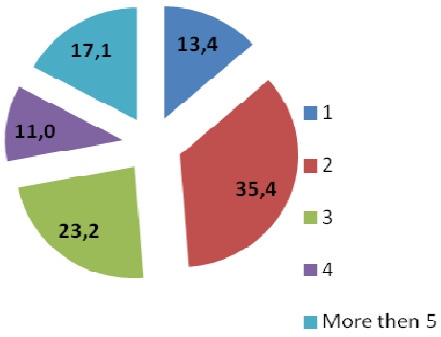

Fig. 3.1.1 No. of household members

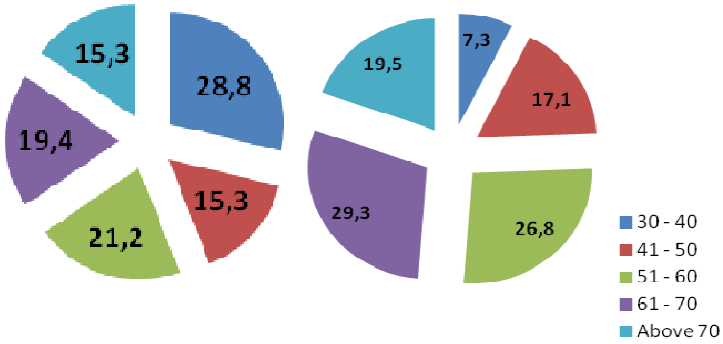

Fig. 3.1.2 Age of the household members (left) and of the head of the household (right).

44% of the household members and only 20% of the heads of household are between 30 and 50 years old. Around 2/3 of the household heads are older than 50 years, 20% are older than 70 (Fig. 3.1.2). Additional data indicates that 10% of the household heads are women and 90% men.

Pensions are the commonest source of income for households - they are received by ca. 43% of the all family members (Figure 3.1.3). Less than one third have a salaried job (the value for Borşa commune is 25.5%; compare also the data from the locality fact sheet in table 2.2.4 where the value is 14.5% in the year 2008). Around 12% obtain incomes from

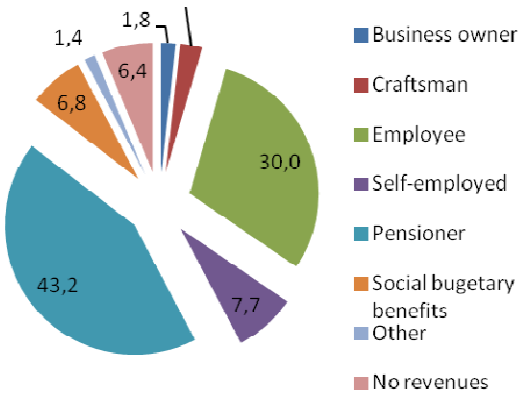

Fig. 3.1.3 Revenue source household members

entrepreneurial activities: self-employment within the household (7.7%); craftsman (2.7%) or business owners (1.8%). Around 6% of the household members reported that they had no income at all in 2010/2011; about the same share receives state benefits.

The highest mean monthly income (Fig. 3.1.4) is obtained by the local business owners (ca. €550/month). A self-employed person obtains almost the same revenue as an employee (ca. €250–200/month). The average gross nominal monthly salary in Romania was approx. €442 in 2010; the net value was €323[5]. The level of pensions is low (€140/month); this means that the overall standard of living is also low, since pensions are the most important income source overall. The monthly average household income is €440 in both communes, whereas the average monthly expenditure (for food, clothing, long term investment expenditures, transport and utilities) lies between €240 in Dăbâca and €300 in Borşa. Unsurprisingly, the biggest share of household expenditure in such low income households is on food and drink (around 40%).

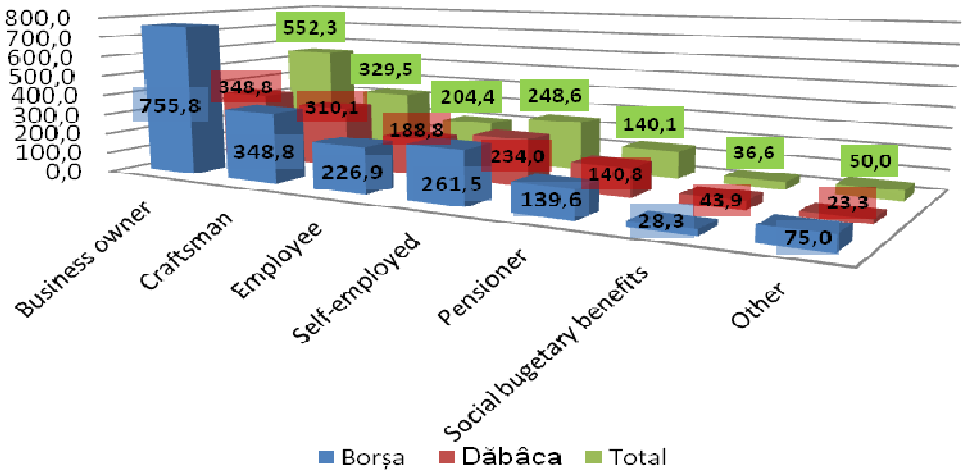

Fig. 3.1.4: Average household, by activity type (€)

About 60% of family heads reported that their heirs apparent do not want or do not know if they want to continue living in the household. This situation is alarming - it could lead to a complete abandonment of the communities, but perhaps more realistically in communes which are fairly close to Cluj, the remaining population is likely to have a low level of engagement with agriculture. People choosing to move into the communes from the town are no more likely to want to farm, and can out-compete potential farm entrants in the market for houses and land.

Heads of household were asked to select which out of a list of factors they feel would incentivise their heirs apparent to continue living in the household. In Borşa, 30% chose "creating jobs for young people in non-agricultural sectors"; 25%, "measures intended to

[5] Romanian National Institute of Statistics 2011

improve living standards" and 22%, "agriculture development" (see Figure 3.1.5). In Dăbâca improving the standard of living was the most frequently selected attractor.

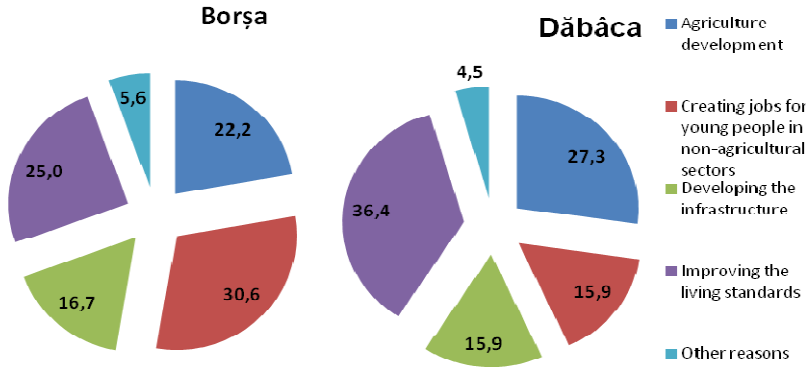

Fig. 3.1.3: What would motivate heirs apparent to remain in the household (according to the household head)

3.2 Farming, property and production

54% of the interviewees stated they had no agricultural machinery; 70% of households have no tractor. This means that a high percentage of the small-scale farmers carry out their farming activities manually or have to rent machinery or bring in contractors for any mechanised operations. Unsurprisingly therefore, hiring contractors is the biggest element in their variable costs (see Table 3.2).

Table 3.2.1: Direct costs of crop production (in €/year/household)

	Borsa		Dabaca	
	Mean	Max	Mean	Max
Salary costs	17	465	179	4186
Work by third parties	404	1977	505	8837
Machinery maintenance	206	1163	391	5814
Other	62	465	128	2791

In order to maintain permanent meadows and pastures in good agricultural and environmental conditions (GAEC), the interviewees stated that they have to invest on average around €9/ha/year for permanent pasture and €85/ha/year in the case of permanent meadows. This difference is mainly due to the fact that the farmers that declared they own permanent pastures claim areas where they do not perform any work at all. The costs for maintaining the permanent meadows (85 euro/year/ha) are mainly those of hiring mowing contractors in the cases where the members of the household do not perform this work.

Interestingly, asked about the amount of subsidies they would like to receive for the different land and animal types, the interviewees named similar amounts for pastures

and meadows: on average €141/ha of pasture and €154/ha of meadow (value for arable land: €237/ha). How much this is influenced by the actual payments available is not clear.

The percentages of households which own different types of livestock (in Borşa and Dăbâca respectively) are: dairy cows: 50/58%; breeding sows: 38/30%; fattening pigs 69/73% and sheep 55/58%. Table 3.2.2 shows the livestock owned by the households. But while more than half of the households own livestock, the number of animals per household is generally low.

Table 3.2.2: Minimum, median and maximum livestock numbers

	Borşa			**Dăbâca**		
	Min	Med.	Max	Min	Med.	Max
No. dairy cows (heads)	1	2	10	1	2	7
No. of heifers (heads)	1	2	3	1	1	6
No. of calves (heads)	1	2	5	1	1	2
No. breeding sows	1	2	15	1	1	3
No. fattening pigs	1	3	12	1	3	9
No. of ewes	3	10	120	4	11	420
No. of goats	2	2	4	1	1	3

On average, the households own 7 to 8 ha, divided in about 7 arable parcels and 3 to 4 permanent grassland parcels (Tab. 3.2.3). The minimum area owned is 0.5 ha, the maximum 72 ha. The minimum number of plots owned is 2, the maximum number of arable parcels owned is 18, of grassland parcels, 33. The parcel sizes are in general smaller for arable parcels than for grassland pastures, as shown by the minimum, mean and maximum values.

Table 3.2.3: Utilised agricultural area of the households

		Borşa			**Dăbâca**		
		Min	**Mean**	***Max***	***Min***	**Mean**	***Max***
Arabl	Size (ha)	0.38	3.93	17.90	0.20	2.92	34.20
	No. of plots	2.00	7.59	18.00	1.00	6.98	17.00
	Area/plot (ha)	0.12	0.47	1.39	0.03	0.38	2.85
Permanent pastures & meadows	Size (ha)	0.00	1.71	14.07	0.00	3.90	70.00
	No. of plots	1.00	2.56	9.00	1.00	4.47	33.00
	Area/plot (ha)	0.20	0.81	5.00	0.30	0.71	2.12
Total UAA (ha)		**0.84**	**6.97**	**27.90**	**0.52**	**7.72**	**71.80**

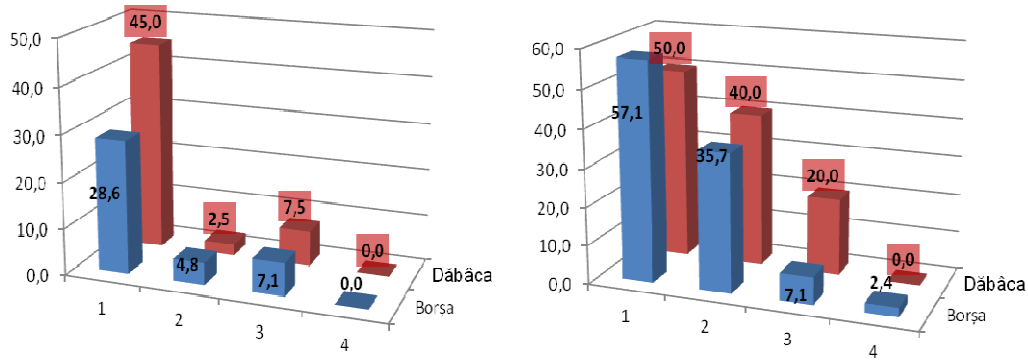

Fig. 3.2: Marketing channels for crop (left) and livestock (right) products as a % of all sales. 1: direct sale; 2: processing company; 3: wholesaler; 4: other

A high percentage of farmers (Fig. 3.2) sell their production directly (45% in Borşa and 29% in Dăbâca). Most of these sales will be to other inhabitants of the commune, as food for their livestock in the case of crop production. Similarly, those who declared that they do not sell their crops said that they use it within their own household. The small percentage of those selling their crops to an intermediary or directly to a processor is mostly due to the low levels of production; there is only a limited surplus available for sale.

Around 70% of the interviewees said that they had made investments in their holding during the last five years. In Borşa, 87% of these came from own resources and 16% from long term credits. In Dăbâca, 69% of the investments were made from their own resources, 7% from non-refundable sources and 10% through long-term credit. Figure 3.2.1 shows that most of the investments have been made into the comfort of the family members, especially in house renovation, window replacement, and expansion of the living area. About one third of the investment has been in agriculture, including the building of livestock housing, buying agricultural equipment and machinery etc.

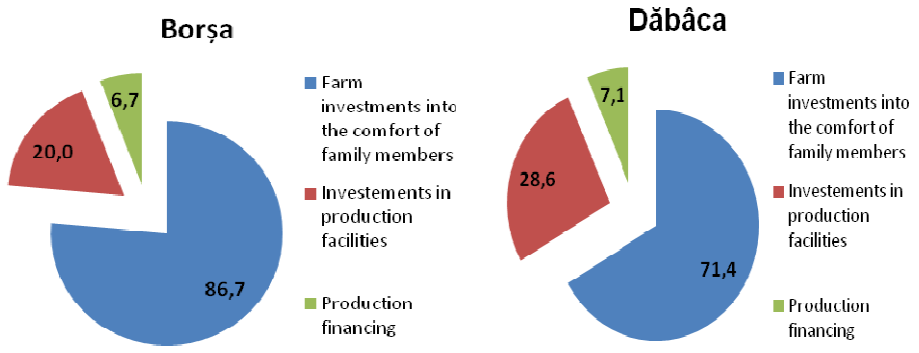

Fig. 3.2.1: Investment in the household

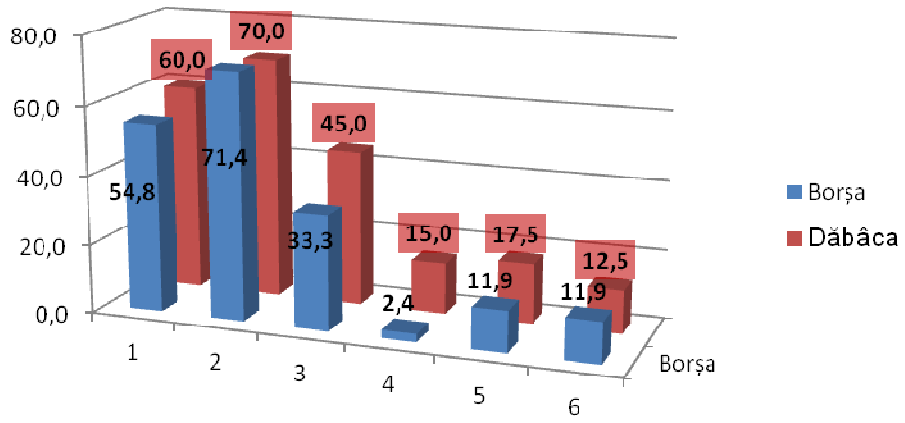

Fig. 3.2.2: Perception of development potential of different sectors. 1: sheep; 2: dairy cattle; 3: arable; 4: organic; 5: traditional products; 6: non-agricultural activities

At the end of the questionnaire, the interviewees were asked what type of activity has the highest development potential in their village. The majority saw significant development potential in livestock production (cattle more than sheep breeding), 33%-45% of the interviewees saw a potential to develop arable production. Organic farming, traditional products (sheep cheese and brandy were named) and non-agricultural activities were listed more often in Dăbâca, but in both communes much less frequently than crop and animal production. The preference for cattle-raising is interesting, because cattle numbers have declined considerably during the last two decades (e.g. in Dăbâca commune from 885 to 285 between 1992 and 2010, according to local statistics.

3.3 Size of the household farms

The economic size of holdings or farms is expressed in terms of European Size Units (ESU). An ESU is defined as a fixed amount of Gross Margin in Euros, currently €1200. It is an important criterion for many subsidies within the National Rural Development Programme (NRDP).

Consideration of Economic Size also helps put the holdings in the two communes into a wider EU context of standardised measurement. At the European level, three main classes have been suggested (Davidova 2010):

- Subsistence farms that have an economic size below 1 ESU. They are small entities in which the production is mainly used for the household consumption. Moreover, the degree of market participation is very low.

- Semi-subsistence farms have an economic size of between 1 and 8 ESU. They are bigger than the first farm type and market participation is more significant. At the upper end at least, some of these are part-time commercial farms. Semi-subsistence farms are

eligible e.g. for measure 112 of the Romanian NRDP for young farmer installation (>6 ESU).

- Professional farms that produce mainly for the market. They have an economic size above 8 ESU/year.

In order to determine the economic size, two approaches were used:

1. Economic size as estimated by the Romanian National Agency for Payments in Rural Development and Fishing[6] (RNAPRDF) – the various agricultural activities were multiplied by the standard ESU coefficients calculated on a national level. This is the standard method applied to CAP payments.
2. Estimating actual farm-specific gross margins for all the activities carried out in the farm in a particular year using data provided by the farmer on yields; prices; amount of production sold on the market and direct costs.

Table 3.3 shows the results of the economic farm size calculations using the two methods. It is striking that there seem to be considerably more semi-subsistence farms than subsistence farms – around two third of the farms are classified as semi-subsistence farms. At least 10% of the farms are even bigger than 8 ESU. The calculations using the coefficients given by the Ministry estimate the farm economic size to be larger than on-farm calculations suggests they are – it would be interesting to compare the current results, with one using the pre-2011[7] coefficients.

Table 3.3: Farm size distribution calculated using the 2 methods (in %)

	Method	**Subsistence**	**Semi-subsistence**	**Professional**
Borşa	Coefficients	19	67	14
	On-farm	38	55	7
Dăbâca	Coefficients	13	72	15
	On-farm	25	65	10

Figure 3.3 shows the ESU size value distribution of the studied households in Borşa commune according to the two calculation methods. The differences are striking. It can be observed that some households, calculated by the on-farm method to be smaller than 1 ESU, appear to have a size of 5 ESU, according to the coefficient method. In general, the variation is significant at all farm sizes. For farms between around 4 and 8 ESU (on-farm calculation) over- and under-estimates are of similar frequency and magnitude. For small economic size (the majority of households), the national system

[6] www.apdrp.ro
[7] http://www.apdrp.ro/uploads/Docu%20FEADR/Nota_calcul_UDE_M112_M121_M141.pdf

consistently over-estimates size, suggesting that either economic output is being over-estimated or variable costs are being underestimated. Estimates are likely to be very difficult at this end of the spectrum - the surplus production will vary considerably by household size, which is not a factor in the standard coefficients, for example. It is curious to note that in this small sample at least, over-estimates also seem to occur for farms of larger economic size.

Another aspect is, that even though many households are classified as being semi-subsistence, i.e. >1 ESU, only few are bigger than 6 ESU (the eligibility threshold for the support programme for setting up young farmers). However, measures 121 (modernisation of agricultural holdings), 141 (supporting semi-subsistence agricultural holdings) and 143 (providing farm advisory and extension services) are open to farms of over 2 ESU.

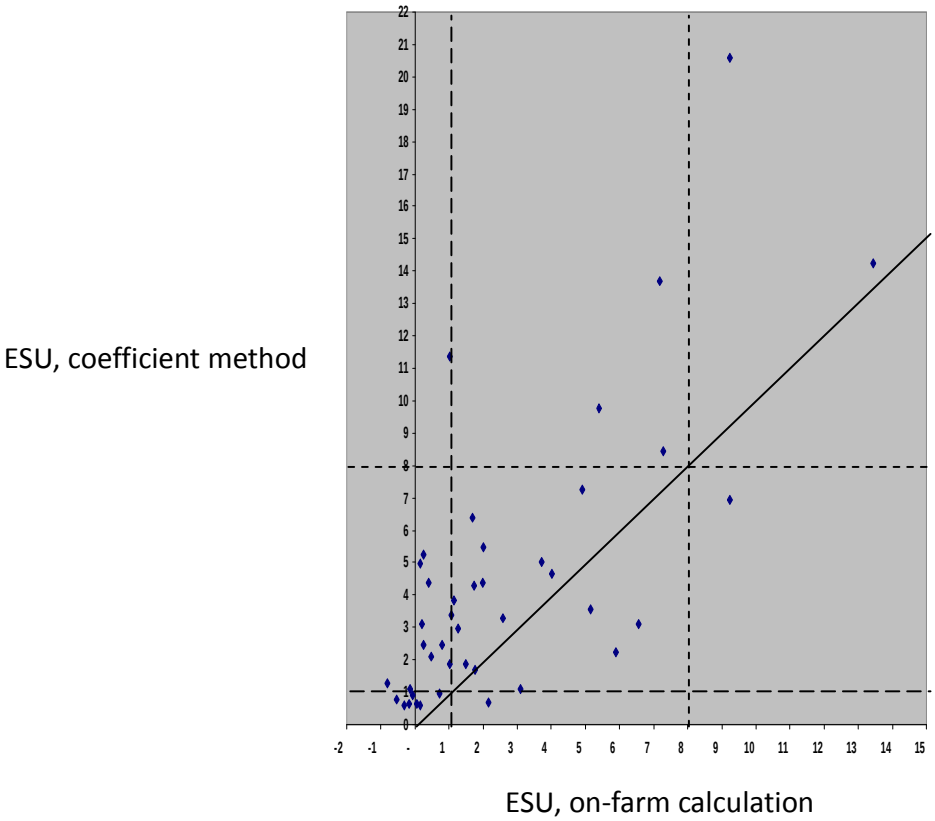

Fig. 3.3: The ESU size of households in Borşa commune.
(Dotted lines show the 1 and 8 ESU thresholds)

3.4 Discussion

The most important income source of the land-owning households is pensions (43%), of 140 Euros/month on average, reflecting the fact that the population is ageing. 30% of household members are employed, with an average salary of €250/month; 6% are on benefit or have no income. Taken together, these figures indicate a relatively low standard of living in the communes. On the one hand, this is also likely to maintain a dependency on home-produced food from small-scale agriculture, preventing a complete abandonment of farming.

But it may also impede the modernization and development of agriculture; such improvements would not clearly need external financial assistance, e.g., from grants. Some support from the Rural Development Programme (RDP) is restricted to farms of certain size. The uptake of such measures seems to be low – few households access non-refundable funds (0% in Borşa and 7% in Dăbâca).

The farm size classification of the household suggests, that there is a substantial number of households which according to their size could apply for several RDP grant programmes; however, there exist also other impediments than the size (see e.g. Redman 2010), such as the level of information available. The figures also imply that the capacity to provide even match-funding for such grants from the household budget is very limited – most of the spending is on life's essentials and basic household improvements.

The difference between the two ESU calculation methods, suggesting that the method officially used for the RDP funds could overestimate the farm size, should be studied further, as should its potential impact on scheme eligibility.

The low levels of ownership of agricultural machinery (70% of the households don't own a tractor), together with the significance of contracting costs, suggests that this is a field where progress could be made, whether through individual investments or the setting up of machinery rings.

60% of the household heads don't believe that their heir apparent will take over the household. The most important factors which they think would encourage them to take over are: creating jobs for young people in non-agricultural sectors, measures intended to improve the living standards and agriculture development, with preference differences between the communes. The biggest development potential, however, is seen in livestock breeding (cattle more than sheep), although the number of cattle has decreased dramatically during the last 20 years.

This divergence between the actual situation and the statements farmers make about the potential could be in fact a statement about how farming was in the past and a reflection of their positive mindset towards farming and their justification of their own persistence (they are still to some extent active of course). The extent to which this reflects the aspirations of the heir apparent is another question.

4. Land use and landscape structure

This aspect of the project addresses two questions:

- What is the current land use/land cover pattern?
- How have these changed over time?

Due to its influence on both biodiversity and the management choices and viability of farm households, it is important to look beyond total area data at the commune level to investigate the landscape pattern - the size, shape, arrangement and distribution of individual landscape elements. In order better to describe the composition and spatial arrangement, landscape metrics can be used (Walz 2011). Landscape indices were used to compare data for 1968 and 2011 – years whose data are adjudged to be of comparable accuracy.

Present day land use was mapped as part of a wider grassland survey (see chapter 5) in 2010 and 2011 and combined with information from local residents. As sources for the former land use, we used cadastre maps which were last edited between the late 1960s and early 1970s (scale 1:25,000) and are available at the Agency of Cadastre and Land Registration in Cluj. Information on the situation at the end of the communist period was limited - we were restricted to interviews with local experts (town hall engineers, a former brigade leader and a former mayor). For the analysis of landscape structure, ArcGIS 9.3 (ESRI 2009), QGIS 1.7.3 (QGIS Development Team 2011) and V-LATE 1.1. (Lang &Tiede 2003) were used.

4.1 Land use classes

Figure 4.1.1 shows a comparison between the area under the main land use types at the end of the 1960s, the end of the 1980s and today. In the 1960s around 60% of the agricultural area was cropland, while the grassland area was ca. 40%. The proportion of arable increased until at the end of the communist period it was ca. 70%, while the grassland area decreased to ca. 30%.

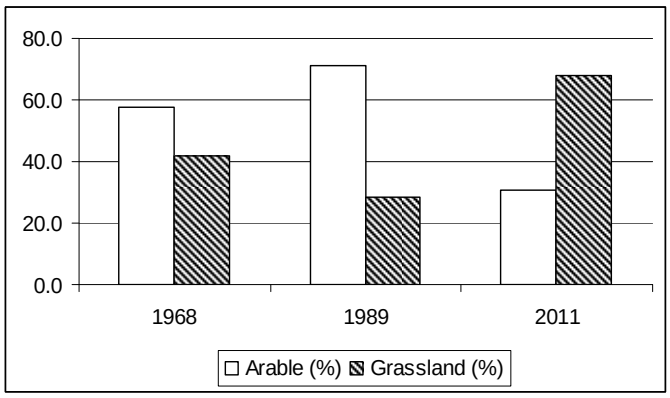

Figure 4.1.1: Main land use types in Borşa and Dăbâca, 1968 and 2011,
% of the agricultural area (excluding abandoned land).
Sources: 1968: Cadastre map, Agency of Cadastre and Land Registration Cluj;
1989: interviews with experts; 2011: land use mapping

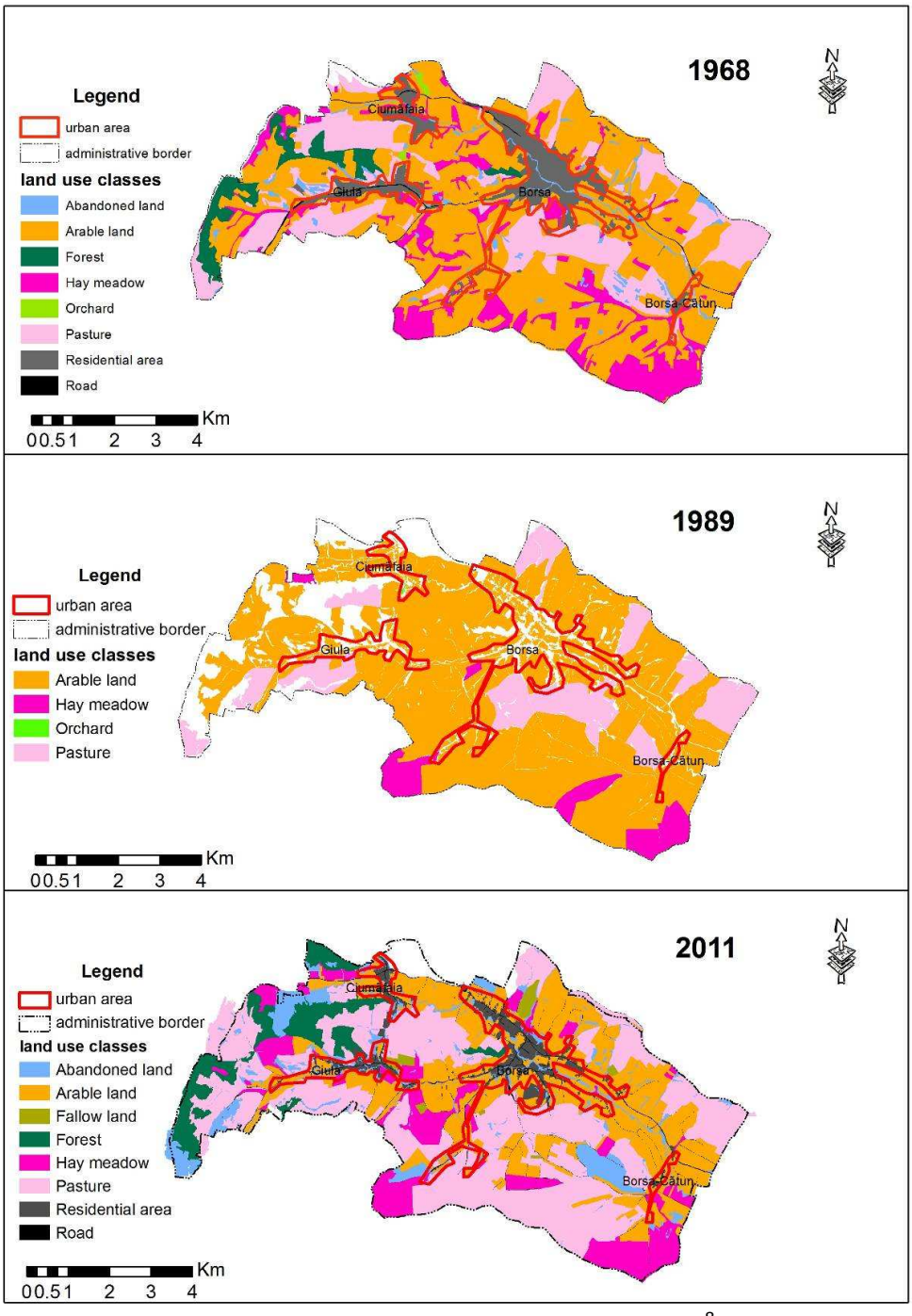

Figure 4.1.2: Land use map for Borşa commune for 3 periods[8]. Sources see Fig. 4.1.1.

[8] Definitions: arable land: land used for crops or/and forage cultivation including sown grasslands which are alternated with cropland after less than 5 years; fallow land – arable land intentionally not ploughed for 1-2 years (classified as agricultural); abandoned land: land with no evidence of deliberate human activity covered by shrubs, river edge vegetation, aquatic vegetation etc. (not classified as agricultural); hay meadow – land covered by grasslands used for forage by mowing and not included in cropland rotation for at least 5 years; pasture – land used for grazing and not included in cropland rotation for at

Two decades later, in 2011, the situation is almost the opposite: the arable area has fallen to ca. 30%, whereas the pasture and meadow now accounts for around 70% of the total. Figure 4.1.2 illustrates the considerable changes in land use in Borşa commune over the last 40 years or so. Note that the map for 1989 was based solely on expert statements, not on cartographic material or a field survey and is therefore less accurate.

It can be clearly seen that the arable retreated from the hill slopes between 1989 and 2011 and is mainly restricted to the valleys today. Another interesting observation is that there are some patches of grassland, both pastures and meadows, which have been under the same land use for over 40 years.

The increase in the area of grassland between 1989 and 2011 is largely a consequence of vegetation succession on cropland which was abandoned from the 1990s onwards, for reasons outlined in the earlier sections. The "new" grasslands are now used as hay meadows or pastures; however, the type of management and its intensity as well as the conservation value of the various grasslands all vary considerably.

Figure 4.1.3: Borşa valley, looking NW, 2009.

4.2 Landscape structure

Landscape metrics describe the composition of a landscape, for example, the number of patches and the mean patch size. If we look at the development of these indices for different land use classes between 1968 and 2011 (Table 4.2) we observe that the number of patches increased for arable and abandoned land, whereas it decreased for grassland (pastures and hay meadows).

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least 5 years; residential area – land used mainly for buildings, houses and surrounding small agricultural area.

In contrast, the mean patch size of grassland areas has increased, while the mean cropland patch size has decreased. These findings are visible in the maps for Borşa commune for the two years (Fig. 4.1.2).

Table 4.2: Patch number, mean patch size and proportion of total area, agricultural land uses, Borşa and Dăbâca communes

Class	1968			2011		
	PN	*MPS (ha)*	*A (%)*	*PN*	*MPS (ha)*	*A (%)*
Arable land	105	48.8	46.0	237	10.9	23.3
Hay meadow	137	9.1	11.2	66	28.5	16.9
Pasture	70	35.2	22.1	44	86.8	34.3
Abandoned land	107	2.9	2.8	356	2.5	7.9
Forest	9	107.3	8.7	21	61.9	11.7

An increased mean grassland patch size could have positive effects from an ecological point of view: a bigger patch size could provide more chances to preserve rare species and a characteristic structure of grassland habitats, greater stability, and a lower risk of habitat deterioration through invasive species, due to the edge effect which could be greater in small patches than in large ones (Collinge 2009). But in the case of hayfield, the reduction in total area suggests that the increase in patch size is at least in a part a reflection of small meadow patches dropping out of hay making.

Figure 4.2: Land use/management heterogeneity in Borşa commune. 2009.

5. Grasslands

Semi-natural grasslands are among the most species-rich ecosystems in temperate Europe (Pärtel et al. 2005, Dengler et al. 2009). They are defined as unsown vegetation that is maintained by livestock grazing and/or mowing, and that has not been substantially modified by intensive management[9]. Their origins and history are related to an extensive human activity that created and maintained open and semi-open habitats (Dierschke & Briemle 2002, Rozbrojová et al. 2010). Grasslands have undergone a serious decline in most parts of the world (Gibson 2009).

The main threats to the existence of semi-natural grasslands are on the one hand intensification of agriculture, and on the other hand abandonment of (traditional) farming practices (Plantureux et al. 2005). Both of these threats lead to replacement of the habitats with more intensively-used grasslands, arable or the natural forest habitats, all resulting in a loss of the existing biodiversity.

Grasslands, whether they are used as meadows or pastures, provide important ecosystem services such as (Cristea et al. 2004):

- fodder for domestic grazing animals;
- biodiversity conservation (plants and animals);
- soil protection;
- microclimate control;
- aesthetic values;
- opportunities for recreation and nature education;
- enhancement of social relations amongst farmers.

Some time ago, the nature value of grassland was only an important topic for conservationists and scientists, but the issue has gradually become significant for agricultural policymakers, administration and farmers too, leading to and resulting from the introduction of agricultural subsidies rewarding nature conservation through suitable farming practices.

Important in this context was the introduction of the concept of High Nature Value grassland or farming in policy and nature conservation. HNV grasslands/farmlands are areas where low intensity agriculture maintains a high level of biodiversity. According to EFNCP[10], HNV farmland is characterised by low intensity land use and a large proportion of semi-natural vegetation and/or the mosaic structure of the landscape.

As we showed in the previous chapter, around 70% of the research area is covered by grasslands today, partly the result of a considerable increase of grassland area during the last two decades. In our study we wanted to find out more about these grasslands and asked the following questions:

- What grassland types occur in the research area?

[9] http://www.high-nature-value-farming.eu/facts/semi-natural-pastures-meadows/
[10] http://www.high-nature-value-farming.eu/facts/identifying-high-nature-value-farming/

- Can we identify High Nature Value grassland or farmland? If so, of which type?
- Is there a difference between pastures and hay meadows in terms of nature value?
- What role does grassland fragmentation play?
- Is there a difference between "old" and "new" grasslands in terms of nature value?

The field data was collected in two growing seasons, 2010 and 2011. With the help of a physical blocks map, every polygon where mapping units had been drawn was checked in the field, the mapping unit being phytosociological alliances with a minimum area of 0.3 ha. For every polygon with semi-natural grassland vegetation, a species list of vascular plants was recorded along a transect chosen along the most obvious ecological gradient or parallel to the longest dimension of the polygon. The species were noted with an abundance-dominance value using the 3-step abundance-dominance Tansley scale (class 1 - 1%, class 2 - 1-25%, class 3 – over 25%).

To determine the vegetation types (alliance) into which the polygons fall, we used the latest monograph on Romanian vegetation (Sanda et al. 2008). The separation of grassland into alliances was based on species lists recorded for each polygon, using as discriminant criteria the relative abundance of species and their coenotic groups. In order to assess the conservation status of species recorded in the field we used the Red List of Romanian vascular plants (Oltean et al. 1994) and Annex II of Habitats Directive (1992).

5.1 Grassland types

The inventoried grasslands belong to 7 alliances:

Molinion caeruleae Koch 1926

Grasslands belonging to this alliance are characterised by vegetation growing on oligotrophic soils. Another feature of site conditions is the high level of groundwater, reflected in the occurrence of many hygrophilous species. Usually, these grasslands are found in sites with small depressions. Characteristic species are for example *Molinia caerulea, Sanguisorba officinalis, Ranunculus polyanthemos, Carex tomentosa, Juncus conglomeratus, Gentiana pneumonanthe* and *Serratula tinctoria*.

Fig. 5.1: *Molinion* in Dăbâca commune. 2010.

Agrostion stoloniferae Soo (1933) 1971

This alliance groups together grasslands usually found on alluvial plains or near human settlements on land with moderate moisture. The alliance consists of mesophilous to hydrophilous conenoses, growing on soils well supplied with nutrients. These grasslands, with their high productivity, usually show significant human impacts. The dominant, characteristic and frequent species are: *Festuca pratensis, Agrostis stolonifera, Alopecurus pratensis, Crepis biennis, Glechoma hederacea, Gratiola officinalis, Cirsium canum, Dactylis glomerata* and others.

Arrhenatherion elatioris Koch 1926

Grasslands belonging to this alliance develop on level terrain or light slopes near human settlements being conditioned by a moderate input of fertilisers, usually organic. Having a high productivity and providing high quality forage, these grasslands are usually used as hay meadows. The dominant, characteristic and frequent species are: *Arrhenatherum elatius, Poa pratensis, Trisetum flavescens, Dactylis glomerata, Festuca pratensis, Prunella vulgaris, Salvia pratensis, Campanula patula, Pastinaca sativa, Pimpinella major, Lotus corniculatus, Knautia arvensis, Taraxacum officinale, Phleum pratense* and others.

Cynosurion cristati R. Tuxen 1947

Grasslands assigned to this alliance have large ecological amplitude in terms of species' requirements to soil humidity, acidity and nutrients. The dominant and characteristic species are: *Cynosurus cristatus, Agrostis capillaris, Festuca rubra, Bellis perennis, Trifolium repens, Gentiana cruciata, Leontodon autumnalis, Hypochoeris radicata* and others. They are used both as hay meadows and pastures, their structure and dynamics being conditioned by the intensity of anthropic influences.

Lolio-Potentillion anserinae R. Tuxen 1947

This alliance includes grasslands growing on trampled soil with moderate humidity and nitrogen near running waters. The dominant, characteristic and frequent species are: *Potentilla anserina, Festuca arundinacea, Carex hirta, Elymus repens, Potentilla repens, Dactylis glomerata, Agrostis stolonifera, Plantago major, Prunella vulgaris, Trifolium repens, Rumex crispus, Poan annua, Verbena officinalis, Ranunculus repens, R. sardous, Inula britanica* and others.

Festucion valesiacae Klika 1931

This is an alliance of xerophilous grasslands, which can be found on thermophilous slopes at low altitude. Dominant and characteristic species are: *Festuca rupicola, F. valesiaca, Dichanthium ischaemum, Stipa capillata, Linum austriacum, L. hirsutum, Muscari comosum, Medicago falcata, Oxytropis pillosa, Polygala major, Adonis vernalis, Ajuga laxmannii, Salvia austriaca, S. nemorosa, Thymus pannonicus, Veronica orchidea, Scabiosa ochroleuca, Eryngium campestre, Fragaria viridis, Dorycnium herbaceum* and others.

Cirsio-Brachypodion Hadac & Klika in Klika & Hadac, 1944

These semi-dry grasslands occur on calcareous soils being used as hay meadow or extensively grazed by sheep. The dominant, characteristic and frequent species are: *Brachypodium pinnatum, Bromus erectus, Asperula cynanchica, Carex humilis, Polygala*

major, Cirsium pannonicum, Centaurea scabiosa, Ranunculus polyanthemos, Prunella grandiflora, Gentiana cruciata, Veronica teucrium, Trifolium pannonicum, T. ochroleucon and others.

As is shown in Table 5.1, which summarises the main distinctive features for each alliance, *Cynosurion* has the greatest extent while *Potentillion anserinae* and *Molinion* have the lowest. Four alliances belong to Natura 2000 habitat types, one of them being a priority habitat type (6240* - *Festucion valesiacae*). The highest number of rare species can be found in the *Cirsio-Brachypodion* alliance.

Only three alliances are used either as hay meadow or pasture (*Agrostion stoloniferae*, *Cynosurion* and *Cirsio-Brachypodion*) while the other four are exclusively used as hay meadow (*Molinion* and *Arrhenatherion*) or pasture (*Potentillion anserinae* and *Festucion valesiacae*). All the inventoried grasslands can be considered as being semi-natural, due to their structure, their age (older than 5 years) and the extensive anthropic influence. None of them have been sown or surface seeded in at least the last five years.

Table 5.1: Distinctive features of inventoried grassland
(average species richness per polygon)

Alliance	Average species richness	Rare species richness	Natura 2000 habitat	Area (ha)	Land use
Molinion	42	3	6410	5	hay meadow
Agrostion stoloniferae	69	1	6440	650	hay meadow/pasture
Arrhenatherion	65	0		99	hay meadow
Cynosurion	83	0		3261	hay meadow/pasture
Potentillion anserinae	45	0		5	pasture
Festucion valesiacae	92	0	6240*	1145	pasture
Cirsio-Brachypodion	94	6	6210	705	hay meadow/pasture

5.2 HNV farmland type of the research area

The three types of High Nature Value farmland as defined by EFNCP[11] are:

- Type 1: Large cover of semi-natural vegetation under low-intensity use for livestock
- Type 2: Lower proportion of semi-natural vegetation, existing in a mosaic with arable and/or permanent crops.
- Type 3: Characteristics of land cover and farming intensity of this farmland type do not suggest HNV farming, but nevertheless it continues to support species of conservation concern (often bird species).

According to our present data, both communes could be assigned to the type 1 of High Nature Value farmland due to their large area covered by semi-natural grasslands. Looking at the land use maps 1968 – 1989 – 2011 (Figure 4.1.2) one could be tempted to say that every time period there was a different HNV-farmland type: in the 1960s, for

[11] http://www.high-nature-value-farming.eu/facts/identifying-high-nature-value-farming/

example, there was a large area of semi-natural grassland intercalated with cropland up to the hill tops – possibly a Type 2 mosaic.

In the 1980s the permanent grassland area was reduced to isolated patches and cropland dominated – most likely, intensively-used cropland at that. However, it is probable that some of the rare plant and animal species, e.g. the *Maculinea* butterflies or the plant species of the genus *Serratula* (*S. wolffii*, *S. radiata*), already had populations in the area at that time, in those grassland patches characterised by a continuity in space and land use. At the landscape level at least, this could possibly be described as HNV Type 3 - more intensive farmland supporting rare species.

Because the present grasslands and landscape still show traces of the past (e.g., in structure, species composition, shrub cover), the area shows characteristics of all three HNV farmland types at the same time as well as being classified as type 1 through the high semi-natural vegetation cover. In any case, the current HNV Type 1 farmland seems to have a different character from e.g. a landscape dominated by mountain pastures and hay meadows that had not been transformed into an arable-dominated landscape to this extent in the recent past.

While this discussion is more scientific and the fact remains that semi-natural grassland has to be protected in any case, the landscape and land use history has implications for the implementation of current policy measures (see section 7 below). Mosaicicity, whether or not it is dominated by semi-natural vegetation, is not protected through suitable CAP measures in Romania. Landscape metrics could be incorporated into schemes; this would have the advantage setting objective criteria for the targeting and monitoring of HNV areas, but this implies an ability to set appropriate threshold values.

5.3 Comparison of pastures and hay meadows

In the area, grasslands are normally managed either as pastures or as hay meadows. The pastures are used mainly for livestock grazing from early in the spring (April) until late autumn (October-November). Hay meadows are mowed once or several times per year depending on grassland structure and productivity. Whether grasslands are used as pasture or hay meadows, both practices promote environmental heterogeneity, which is mirrored in the structure, functioning and biodiversity of grassland vegetation (Pykälä 2000).

While the impacts of hay cutting on grassland structure result mainly from defoliation and biomass removal, pasturing has additional effects through trampling, nitrogen input and selective grazing (Marion et al. 2010). Proulx & Mazunder (1998) suggest that species richness declines with increasing grazing in nutrient-poor ecosystems, because the limiting available resources prevent regrowth of species after grazing.

Mowing and extensive grazing are important activities that have shaped the local landscape structure. Because the grassland habitats were created and maintained by human activity their features reflect not only environmental conditions but also historical and present day anthropic influences (Rozbrojová et al. 2010).

The hay meadows in the research area shelter around four times more rare species (Romanian National Red List, Annex II of Habitat Directive) than pastures (9 and 2 species respectively) and so have a greater biodiversity conservation value (see table 5.3). *Sanguisorba officinalis* and *Echium russicum*[12] occur in both hay meadow and pastures, while *Orchis laxiflora, O. incarnata, Serratula wolffii*[13]*, S. radiata, Dictamnus albus, Iris aphylla* ssp *hungarica* and *Allium albidum* were found only in hay meadows. While mowing and hay removal is generally beneficial to species richness and the occurrence of rare and endangered species (Schaffers 2002), more intensive management often leads to the loss of rare taxa and dominance by a few more competitive species (Dornelas et al. 2009).

Table 5.3: Characteristic features of hay meadows and pastures in the research area

Feature	**Hay meadow**	**Pasture**
Total area (ha)	1879	3818
Patch number	66	44
Mean patch size (ha)	28.5	86.8
Number of rare plant species	9	2

As is shown in table 5.3, hay meadows are more fragmented than pastures (66 compared with 44 patches), while the total area covered by hay meadows is only half that of pastures and their mean patch size only one third that of pastures (28.5 ha compared with 86.78 ha). From a conservation point of view, the smaller mean patch size of the hay meadows could make these habitats more susceptible to rapid biodiversity loss due to the edge effect, that might disrupt habitats not yet greatly affected by human activities, especially if they are surrounded by abandoned or intensified areas (Holway 2005).

[12] Picture at page 31. Borşa commune, 2011.
[13] Picture at page 30. Borşa commune, 2009.

5.4 Comparison of old and new grasslands

Based on our observations during land use and vegetation mapping (see chapter 4), we hypothesise that the described changes have in many cases led to a shift of farming from the "old" pastures and meadows to the "new" grasslands, because they are easier to reach from the villages or their relief makes them more convenient for farming (see also Jones et al. 1998). This in turn often leads to overly low stocking rates on many old pastures or the abandonment of mowing on old hay meadows. Figure 5.4.1 (Gwyn Jones, pers. comm.) shows this development for a site in the nearby commune of Apahida: areas used as hay meadows (red) during the 1960s, remote from the village, are now used as pastures (blue), whereas some of the former arable land (yellow) has been converted to grass fodder production.

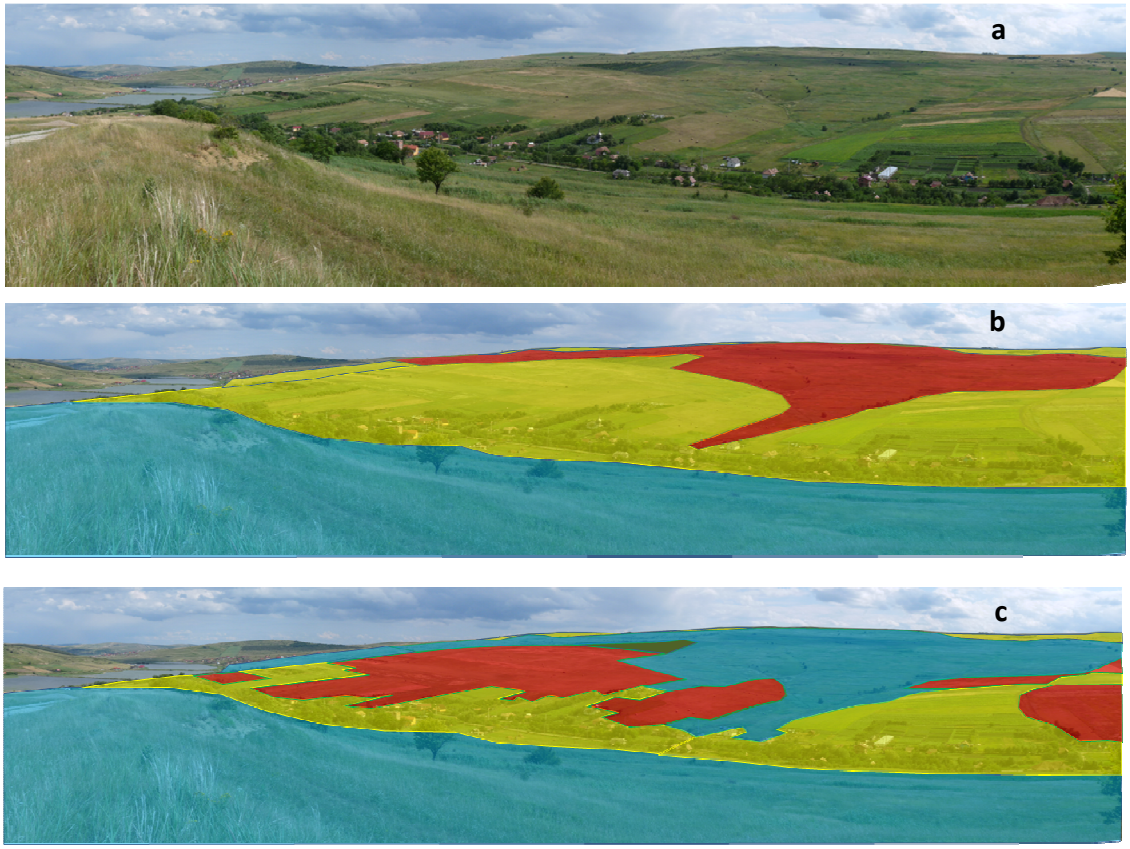

Fig. 5.4.1: Grassland use change in Apahida commune.
a) 2011 landscape, b) land use 1968 (after cadastre), c) land use 2011.
Red: hay meadow, blue: pasture, yellow: cropland; green: afforested.

On the basis of the collected data we will be able to assess if there is a difference between old and new grasslands from a nature conservation point of view. In general, higher species richness is encountered in grasslands that have been continuously managed (grazed or mown) for long periods (Cousins & Eriksson 2002).

We hypothesise that the quality of the "new" grasslands depends on both the former and current land use. If they are mown regularly or grazed with a favourable stocking rate they will gradually become valuable semi-natural grasslands. In the case of abandonment or undergrazing, they are invaded by shrubs and invasive species like wood small-reed (*Calamagrostis epigejos*), which also reflects a deterioration in their agronomic value. The abandonment of the "old" grasslands could lead, after a short period of biodiversity increase, to a shift of vegetation types, shrub invasion and finally to the loss of open habitats.

Fig. 5.4.2: A site formerly used as hay meadow, nowadays almost completely abandoned and occasionally used as sheep pasture, Dăbâca commune, 2011.

6. Farmers' organisations and common grazings

Common property rights belong to communities, community-based organisations and other social groups and may be regarded as a form of shared wealth or assets (Reid 2003). This report deals with common grazings, that is, pastures characterised by multiple grazing rights and/or multiple graziers (Jones 2011).

The once-widespread historic tradition of common grazing has survived to a significant extent only in some parts of Europe, for example in Scotland (Reid 2003, Jones 2011), Spain (Lana Berasain 2008) and eastern Europe (e.g. Bulgaria[14]). Common grazings are often semi-natural grasslands of significant nature value and are often linked to small-scale farming. Recent changes in agricultural structure and the way in which the CAP is implementation on them are key issues which need to be addressed if this centuries-old system is to be adapted to the changing needs of graziers and of wider society.

In the study area, common pastures can still be found, both in the ownership of the municipalities (communal pastures) and of compossessorates. A compossessorate is a historic property regime type designating a group of land owners as well as their land; the land is owned jointly and cannot normally be alienated outwith the compossessorate. They are found in Transylvania and northern Romania (Mantescu 2009). The hay meadows in our area have not been held in common, at least not for the last 100 years.

The questions we asked in our study are:

- How did the common grazings develop over time and what is their current situation?
- What are their management practices and governance mechanisms?

We also looked at the interaction of CAP subsidies and common land; this work is reported in section 7 below.

The information presented below was gathered through semi-structured interviews with the local authorities of the four communes Borşa, Dăbâca, Vultureni and Aşchileu Mare (the town hall engineer, mayors, farmers' association president and a member of the compossessorate directorial board), carried out towards the end of 2011.

6.1 Compossessorates

Almost every commune in the region had one or several forest and/or pasture compossessorates before collectivisation. In at least two cases they were founded in the 1920s, after the 1921 agrarian reform and reallocation of land from the large land owners to the peasants.

[14] http://www.efncp.org/projects/common-land/plovdiv-conference/bulgaria/

During the collectivisation process the compossessorates were dissolved, in 1961 in Borşa, for example, with the land passing into the ownership of the local agricultural production co-operatives. Between the fall of the communist regime and the re-establishment of the compossessorates, those pastures remained the property of the communes.

In three out of four communes, the pasture compossessorates were re-established between 2001 and 2011 on the basis of laws 1⁄2000 and 247⁄2005 with the fourth soon to follow suit. In addition, there are several forest compossessorates. With only one cattle breeders' association in the four communes, compossessorates are in fact the commonest type of farmer organisation in the study area. In the 75 communes of Cluj County around 50-60 forest and pasture compossessorates had been re-established by 2011[15].

The compossessorates in the study communes have around 150 - 200 members, each of them owning a multiple of a land share called a "iuş" (right of legacy). In comparison to the traditional land unit "jugăr" for non-compossessorate-land compassing 0.58 ha, one iuş measures 0.42 ha. The compossessorate is governed by a committee of elected members, chaired by a president.

6.2 Associations

After the fall of the communist regime, several associations were formed in the area, for example in Borşa, Dăbâca and in Iclod, with farmers from neighbouring Dăbâca commune also joining. The establishment of the associations may reflect what one of the mayors described as everybody being "very much up for agriculture" in the years after 1990. However, by 2005 all these associations had shut down for a variety of reasons, from financial collapse to loss of mutual trust and poor management.

The current attitudes of local residents towards associations are mixed: many of the farmers state that associations are very much needed in the area, especially because individual farmers lack sufficient agricultural machinery. However, the impediments to founding new associations include not only the lack of financial resources, but often a lack of faith that it would work, maybe reflecting negative experiences in the past.

Nevertheless, there is one success story in the area, the cattle breeders' association in Aşchileu Mare commune, founded in 2003 with 220 members. Our first impressions are that the commitment and expertise of the association's president regarding the CAP instruments are important drivers for its success. The association had rented around 450 ha of pasture from the local council (the remaining 600 ha of communal land being mostly abandoned); in 2011 however, they had to transfer around 200 ha to the newly founded compossessorate.

[15] according to a member of the compossessorate directorial board in Borsa

6.3 Governance and management of commons

Details of the grazing management (e.g. grazing period) and the necessary maintenance works for the coming year are discussed in an annual meeting in spring in both types of common grazing. The shepherds and cowherds for the year are also selected. In practice, some management practices may be put in place for periods of more than a year. This is a significant social event in the community.

Until about 10 years ago, a second very important event was the tradition ritual of establishing the milk quota for sheep in spring, which still survived, at least in Dăbâca commune. This happened at the first milking after the lambs were weaned. The milk volume determined the amount of milk and/or cheese the ewe's owner would receive during the year (at that time the farmers still made cheese at home; today it is produced in the dairy).

Another customary practice on common grazings is duty of pasture maintenance work "every man in power" has to carry out in association with the right to graze one cow on the communal pasture, for example 3 days of shrub clearance, anthill levelling and repairing of watering sites. Until some years ago farmers using the communal pastures also paid grazing taxes to the local council; this has been relaxed in most cases, especially after the introduction of direct payments.

Figure 6.3: The sheep flock grazing Dăbâca's former communal cattle pasture (now rented out) on the boundary ridge with Borşa, some of whose communal grazing land is immediately behind

6.4 Development and current situation of common grazings

At least for Borşa and Dăbâca, what is communal and compossessorate pasture today was also in common ownership before collectivisation. And while in communist times it was owned by the "consiliu popular", i.e. the state, the pastures were still being used in practice in common by the people. Even on the former compossessorate land, it seems that the local agricultural co-operatives did not in general change land use practices.

The communal and compossessorate pastures are therefore characterised by a certain continuity of location, land use type and continuous shared land use, in spite of changes of ownership. However, it appears that this continuity is disappearing due to a combination of land abandonment and the introduction of CAP measures (see sect. 7).

For Borşa and Dăbâca it is possible to determine what proportion of the grassland was common grazing land at the time of the maximum contraction of the grassland area at the end of the 1980s: in Dăbâca commune, about 50% of the pasture area at that time was former communal land; in Borşa commune, the former communal land and the former compossessorate pastures each formed one third of the total pasture area. Today, in Dăbâca and Borşa only about 25% of the current pasture area is common pasture, due to the increase in the total grassland area.

The proportion of pastures not used as commons varies between the communes; in neighbouring Vultureni for example the whole pasture area belongs to the commune or compossessorate, in marked contrast to the case study communes, where there have always been at least some areas of individually-owned pasture.

In many cases, and on both the compossessorate and communal pastures, the drastic reduction in livestock numbers led to an overly low grazing pressure and too little maintenance work being carried out, resulting in increased scrub encroachment. Some communal pastures have been abandoned: the association in Aşchileu Mare, for example, ceased to rent a large area of the communal land because they couldn't maintain it. In neighbouring communes with a higher forest cover (Aşchileu, Vultureni), some of the pastures have already metamorphosed into shrub vegetation or even forest.

Whether the situation is generally better for the compossessorate pastures remains to be studied. The compossessorate of Borşa has not so far been able to claim direct payments for the whole of its pasture area due to the encroachment of shrubs; they plan to use the subsidy money to address the issue, allowing them to claim more in future.

An important development is the new grassland law 214/2011[16], which requires, amongst other things, the drawing up of management plans for communal and compossessorate grasslands – potentially an opportunity for both ecological and agricultural benefits, particularly if they are tied to funding possibilities. Another important provision is that the period of leases to associations or organisations of communal land has to be at least 10 years. However, it is difficult to predict the impact of the new law, as the implementing regulations for which are yet to be published.

[16] http://www.dreptonline.ro/legislatie/legea_214_2011_organizarea_exploatarea_pajistilor.php

7. CAP instruments – implementation and impact

Romania's accession to the European Union (EU) in 2007 led amongst other things to the introduction of Common Agriculture Policy (CAP) instruments. This necessitated the establishment of an Integrated Administration and Control System (IACS) in order to ensure the correct implementation of the CAP measures, underlying which is a Land Parcel Identification System (LPIS) to identify and quantify the land eligible for payments.

The short time available for implementation was a challenge for both the state agencies and the potential beneficiaries. Wegener et al. (2011) state that the main CAP accountability problems for Romania and Bulgaria are related to the complex administrative structures required, the high number of subsistence and semi-subsistence farms and the inadequate representation of the farmers and their organisations in the development of schemes and their implementation.

In the study area, the main CAP subsidies available are the Single Area Payment Scheme (SAPS; for the year 2011, up to €100.65/ha); the Complementary National Direct Payments (i.e. State Aids) for crops on arable land (CNDP I, decoupled from production); CNPD II coupled area payment for selected crops and the coupled CNDP for livestock. Furthermore, farmers can access the different measures of the National Programme of Rural Development for which they are eligible; the area is not within the LFA.

SAPS and some area-based rural development measures are implemented, controlled and managed by the Payment and Intervention Agency for Agriculture (APIA,) (Wegener et al. 2011). Farmers submit the subsidy claims, which identify their parcels within the LPIS, at the local payment agency offices.

A common requirement for all types of area-based subsidies is that eligible single parcels have to have an area of at least 0.3 ha and that the total claimed area has to be at least 1 ha (Ministry of Agriculture and Rural Development of Romania 2010).

Agri-environment payments are a potentially-important instrument for nature conservation, one whose implementation is particularly diverse across the EU (European Commission 2005). In Romania, the agri-environment programme (measure 214 of the NRDP) contains several packages, with the first one being aimed at the protection of HNV grasslands and the second being an add-on for non-mechanised operations.

Not all the grassland parcels In Romania are eligible for agri-environment payments, only ones located in specific communes (see figure 5). The main criterion on the basis of which the eligible communes were selected for the period 2007-2013 was that they had more than 50% semi-natural grasslands in or around 2006 (Ministry of Agriculture and Rural Development of Romania 2010).

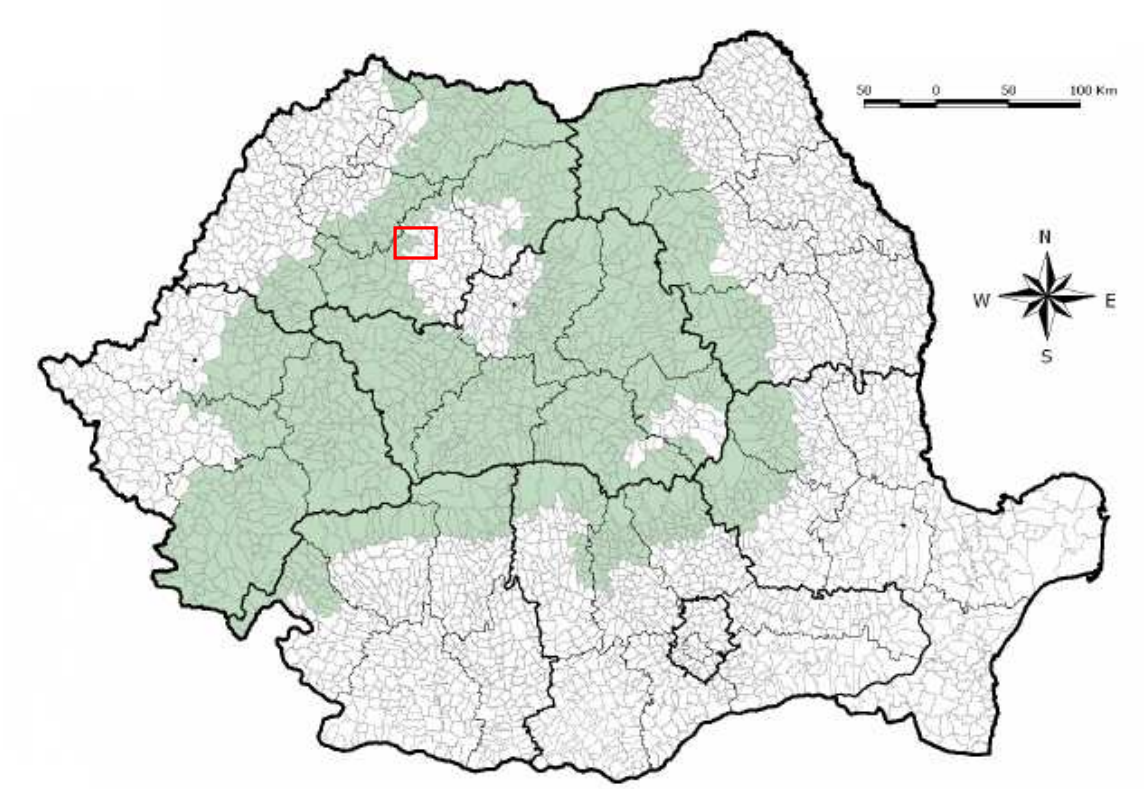

Figure 7: Map of the communes which are eligible for HNV-agri-environment payments 2007-2013 in Romania (green). The red rectangle shows the location of the studies communes. *Source: NRDP, Ministry of Agriculture and Rural Development of Romania 2010.*

The wider study area contains eligible communes (Vultureni and Aşchileu Mare) as well as ineligible ones (Borşa and Dăbâca - the main focus of our work thus far), as the map of the selected communes shows (Fig. 7, in detail at Fig. 1.1). Surprisingly, more than half of the agricultural area of both Borşa and Dăbâca is covered by semi-natural grasslands (see chapter 5).

We addressed the following issues:

- To what degree have the area-based subsidies (direct and agri-environment payments) been implemented in the four communes?
- What role do the area-based payments play on the common grazings?
- What impact do the limitations on parcel and total claimed area size have?
- How does the application process for direct payments work?
- What role does land use change (see chapter 4) play in the subsidies?
- How was exclusion from the HNV grassland agri-environment payments possible in communes apparently dominated by HNV grasslands?

- Have the aims of the examined CAP instruments been realised so far? What are the benefits for agriculture and nature and where are the problems?

The information presented in the following section was collected through interviews with town hall engineers, mayors, other stakeholders and farmers in 2011 and the leading APIA official who was responsible for Dăbâca and Borşa communes in 2010. The process of helping claimants fill in the online application form was observed in 2011 in the town halls of Borşa and Dăbâca.

7.1 Implementation of area-based subsidies

Concerning the direct payments, we received the following answers:

- Borşa commune: direct payments were applied for on around 70% of the agricultural area in 2010 (APIA, pers. comm.), with around 350 to 400 households applying (mayor of Borşa, pers. comm.)
- Dăbâca commune: around 70% of the agricultural area was claimed in 2010 (APIA, pers. comm.)
- Vultureni: around 60-70% of the owners or users of land applied for direct payments during 2011 (mayor of Vultureni, pers. comm.).

Precise data have not as yet been officially published or released by APIA or the Ministry. While there may be issues of confidentiality at the parcel level, it is to be hoped that at least at commune level statistical data will officially be made available in the near future so that civil society can be involved in evaluating the schemes and formulating improvements.

Many farmers don't have the minimum number of animals necessary to claim the Complementary National Direct Payments (CNDP) for livestock (min. 3 cows at the beginning of 2008; min. 50 ewes or 25 female goats in the current year). In Dăbâca commune, only about 10-15 people received the CNDP for livestock in 2010 (statement from agricultural agent).

In the context of the agro-economic survey in Borşa and Dăbâca (see chapter 3), the farmers were asked which area-based payments and Complementary National Direct Payments (CNDP) they could name. While 98% of farmers know of the direct payments and 95% of the CNDP for crops, which are all claimed on the one form, only 21% and 34% (Borşa/Dăbâca respectively) had heard of the CNDP for cattle production, and 7% and 15% of the CNDP for sheep production. Nobody had heard of the agri-environment payments, which are not available there, but are available in the commune next door, illustrating the dependence on awareness-raising at the very local scale.

Questions on how the agri-environment scheme is implemented in the two eligible communes have revealed some interesting details. In Vultureni, with around 1000 ha of pasture and 450 ha of hay meadows, nobody has applied for agri-environment payments so far - neither the farmers, nor the compossessorate nor the local council (statement by

the mayor of Vultureni). In Aşchileu Mare, some agri-environment payments have been claimed, but neither the absolute number nor proportion of claimants is known as yet.

As we show in 7.4 below, the application procedure for the area-based subsidies depends in practice on a few key persons in the communes. It is likely that the difference in uptake rates and the low overall uptake of agri-environment payments in the eligible communes is connected to a lack of accurate information about the scheme among farmers. Whether this reflects a similar lack of awareness on the part of the key animateurs or that they feel they don't have the duty or the time to inform the farmers is not clear. The general recollection of how information on agri-environment was disseminated was that APIA had held only one information seminar in the communes since the start of the agri-environment programme.

Many of the people who did claim agri-environment payments are caught in a dilemma – their five year commitment is for a certain parcel, but the parcel location they sketched in the first year of application in 2008 may not be accurate: something which may only have come to light later (see, geo-locating the parcels, 7.4 below).

7.2 CAP subsidies and common land

Until 2009 the town halls / local councils claimed direct payments on those communal pastures which had not been rented to associations. Order 541/210/2009 of the MAPDR/MAI led to the rules being tightened up, ruling out such claims from 2010 onwards.

Subsequently, in the villages without associations, some of the communal pastures have been rented to individual farmers, who apply for the subsidies and become responsible for the maintenance works; this has happened in three out of the four villages. In some cases the pastures are grazed by the lessee's own animals; in some cases the village herds continue to graze the communal pasture. The latter can be crucial, if the lessee doesn't have enough of his own animals to guarantee the minimum stocking rate of 0.3 LU/ha. While in principle it is welcome that in this system the subsidies for the pastures can be claimed and used for the maintenance works, its successful implementation depends heavily on the integrity of the renters and the municipal authorities. If the farming activities of individual smallholders are not economically viable, then this arrangement is unlikely to be sustainable in the long run.

In one of the communes most of the communal land has been run without subsidies since 2010. This situation, in contrast to the case described above, has the advantage that there is no 'artificial' competition for land by non-users, but has the disadvantage that money which could be used for scrub clearance and other works is not claimed.

The handling and administration of the subsidies within a compossessorate is similar to that within associations, both being conducted by a board of directors. The compossessorates may prove to be a more stable form of organisation and long-term

planning for the subsidy management may be easier, since they don't depend on grazing leases.

7.3 Size restrictions for area-based payments

In order to understand why the size restriction for claimed parcels could be a problem, it must be explained that the traditional land unit in Transylvania is the "jugăr"[17] which is about 0.58 ha (Rus 2007). Other frequently found parcel sizes are half a jugăr (0.28 / 0.29 ha), often used for hay meadow parcels and a quarter jugăr (0.14) for house and garden. These original sizes may also have been split by inheritance. This means that traditionally the parcels are either clearly bigger than the 0.3 ha necessary for CAP payments or they measure 0.01 or 0.02 ha less than the required size.

APIA locally estimates that in general about 10% of the parcels are smaller than 0.3 ha. In total numbers, this means around 450 parcels in Borşa commune and 280 parcels in Dăbâca commune. However, we encountered one hay meadow physical block (around 40 ha) made up almost entirely of parcels smaller than 0.3 ha, due to the particular property and land use history. Almost nobody could claim direct or agri-environment payments for these parcels; interestingly enough, this meadow is one of the nature hot spots in the area because of the occurrence of rare butterfly species.

A "solution" for the 0.28 ha parcel problem which is often applied is to declare 0.3 ha in the subsidy claim and risk being penalised. Other claimants didn't declare some or all of the plots smaller than 0.3 ha to avoid being forced to maintain them in GAEC. The guidelines say that the farmer has to declare *all* the agricultural parcels which he uses, whether it is eligible for payment or not and that he has to respect GAEC rules on all the declared parcels (APIA 2010). Thus, not declaring the smaller parcels is technically a violation of the rules, especially if the farmer uses the parcel.

We suggest that the minimum parcel size for the area-based subsidies should be lowered to 0.2. This would allow for maintaining small parcels as a driver for diversity and would consider the historically-based frequency of 0.28 ha parcels.

7.4 Application procedure and land use change

It is important to realise that the Land Parcel Identification System (LPIS) in Romania started at a time when land restitution was still ongoing, while there had been no comprehensive update of the cadastral maps after 1990.

The eligible land (within the communes) in Romania is at present divided on LPIS into physical blocks, defined as a land area delimited by permanent natural or artificial boundaries that can include one or more agricultural parcels. On LIPS, the physical blocks are allocated into agricultural categories: arable land, permanent pastures, vineyards and others. It is not clear why this is necessary. The allocation of the physical

[17] Also 'iugăr' http://webdex.ro/15847/iugar

blocks to the categories is mainly based on the expert visual interpretation of orthophotos (Jílek & Meixner 2006). The first LPIS map of physical blocks was used between 2006 and 2010, when it was superseded by a new map generated using new orthophotos.

During the application period for area-based subsides, farmers have to submit an application form for area-based payments (including other subsidies like agri-environment). Since 2011 the first part of the application procedure, including parcel localisation, has been carried out online through the IACS online system[18] (Figure 7.4.1); the finalised application form still has to be submitted to the APIA office. In practice, claimants need to locate their parcels within the physical blocks at the local APIA office.

In the study area, the result is that the first stage of the application process for over 90% of applicants is carried out centrally in the commune, in three communes by the town hall staff (usually by one of 2-3 specialists, such as the agricultural agent or engineer) and in one by the president of the farmers' association. This has arisen from the need to help the farmers who, in most cases, don't have a computer with a fast internet connection at home or could not work the online IACS system without problems.

This has one big advantage: in most cases the people who help the farmers know the local toponyms and land use much better than the APIA officers who helped locate the parcels in the first years using the information the farmers gave them in a crowded office far from the commune. Parcels should be located more accurately from 2011 onwards – and in many cases in different place from where they had been claimed previously!

One weakness is that such a system can only be as good as the advisor - every piece misinformation from the farmers' helpers has consequences for many farmers. Nevertheless, those involved show a high level of commitment and seem to go beyond what their duties might imply. However, we also observed that with such help, the farmers often had a passive role in the application process, in many cases not even glancing at the screen.

It would on balance seem to be a positive development that the applications are filled out in the communes, where there is a high level of knowledge of the local land use. However, the people able and committed to carry out the IACS applications should be trained and officially accredited and be paid for their work, so that liabilities are clear. Operating at the interface between farmers and the payment agency, they are also potentially an important contact person for recommendations on how the IACS and LPIS system could be improved.

We often heard the suggestion that the entire application process should be carried out in the villages, i.e. that APIA could set up a temporary office in the town hall for some days so that the farmers, often in their 70s and 80s, would not be forced to travel to the nearest payment agency office and wait for long hours in the crowded corridors. Another advantage would be having the local engineers or other specialists present as a

[18] http://www.apia.org.ro/materiale%20promovare/pliant_IACS_2011_color_EN.pdf; see also Power point presentations about IACS on http://www.apia.org.ro/ipa-online.htm

mediator between farmers and APIA officers while making the responsibilities (and liabilities) clear.

There are two characteristics of the IACS system which would seem to need improvement: the farmers and their advisors can only see the location of their *own* parcels within the physical block; they receive a warning if there is an overlap with other parcels which exceeds a certain threshold, but no information as to where the overlap occurs. This often leads to a trial and error approach until no overlap warning is triggered, but this is no guarantee that the parcel is where it really should be - the error can be entirely on the part of the other claimant, who got his parcel incorrectly located first. As about 30% of the farmers don't apply for direct payments (see chapter 7.1), a warning-free mislocation can easily happen without anyone noticing. Most of the persons involved believe that the resulting map of the parcels describes a situation somewhat divorced from reality – a potential time-bomb awaiting the introduction of GPS-based field checks.

Figure 7.4.1: Example of the IACS system from a guidance manual (APIA 2012)

An obvious solution would be to allow the (authorised) advisors in the communes to access boundary information for *all* the parcels within the physical blocks so that they can locate the parcels in a more accurate way.

A second criticism of the current system is that the applicants are in practice only allowed to declare the 'official' land use of the physical block containing their particular parcel. That means, if a physical block has been classified as arable through the orthophoto interpretation, the farmer has to assign the parcels within this block to one of the arable crop codes (e.g. cereals, fallow, temporary grassland…), since a change to a permanent grassland or other non-arable crop code is only possible through additional paperwork.

Figure 7.4.2. shows a comparison between our mapping of actual in Borşa and Dăbâca and the LPIS base map of the physical blocks generated in 2006. The balance between arable and grassland is the wrong way around, a result reminiscent of the 1989 land use map (see Fig. 4.1.1) - the LPIS map for some reason seems to describe the situation of 20 years ago rather than the present day. The declaration the farmers are 'forced' to make are therefore likely to be wrong in many cases. In addition the farmers and town hall staff may not be mentally willing to recognise former arable land as permanent pasture (although it should change its official land use in its sixth year after going into grass).

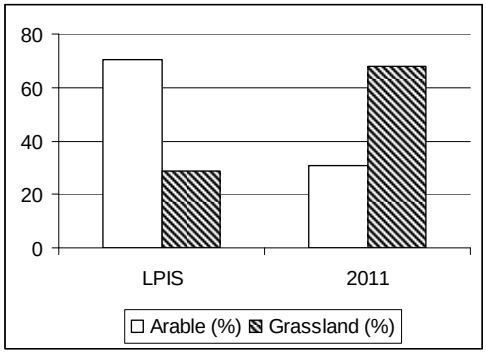

Figure 7.4.2: The main land use classes according to the LPIS map of the physical blocks (APIA 2006) and our land use survey, Borşa and Dăbâca commune.
% of the agricultural area (excluding abandoned land).

We cannot state with confidence that permanent grassland is under-declared until APIA releases commune-level statistics. However if, as we surmise, it is a real effect, it could influence the availability of subsidies in future e.g. the eligibility of possibly future payments for long-established grasslands. Furthermore, the baseline for the permanent grassland surface is based on the declarations of the farmers in 2007[19] when the same weaknesses were present. These errors further complicate the interpretation of rules to maintain the area of permanent grassland and to ensure its basic protection.

7.5 Assessment of HNV-agri-environment payments

To answer the question of why the communes Borşa and Dăbâca have been classified as ineligible for agri-environment payments for HNV grasslands - the main package of the agri-environment scheme - we have to look in more detail at the basis on which the selection of the eligible communes and municipalities was made according to the National Rural Development Programme (Ministry of Agriculture and Rural Development of Romania 2010): the Corine Land Cover (CLC) map 2000, with additional information from 'other studies' (which are mentioned but not specified).

[19] Article no. 3(1) in the ordinance about the approving of GAEC; http://www.apia.org.ro/dir_iacs/ORDIN_147.pdf

Figure 7.5.1 shows a comparison between our land use map based on field data and the Corine land cover map 2000, which was used for the designation of the eligible area for the HNV grassland package. The distribution pattern of the main grassland patches are the same in both maps, but the area classed as grassland is clearly smaller in the CLC map.

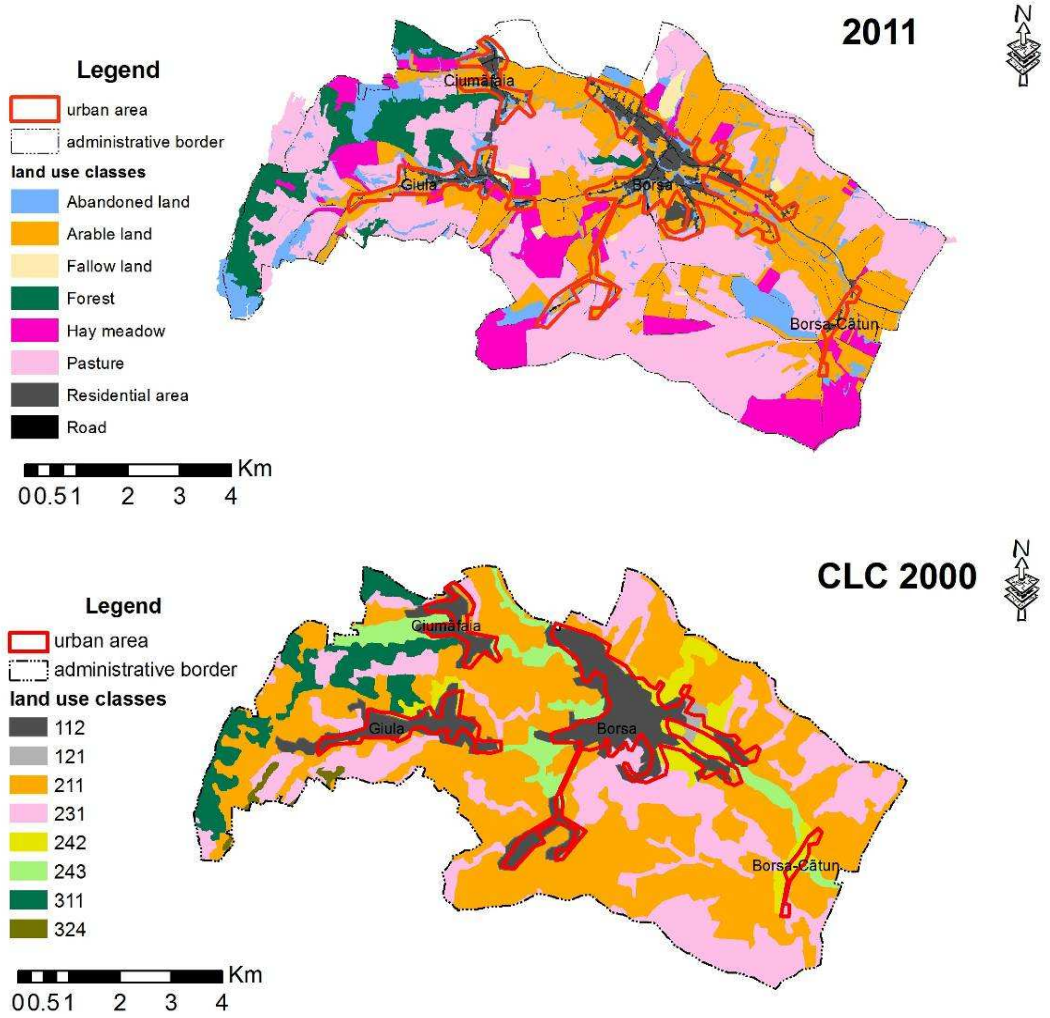

Figure 7.5.1: Land use map for Borşa commune according to our land use data (top) and the Corine Land Cover Map 2000[20] (bottom)

Classes of the CLC 2000 map:
112: Discontinuous urban fabric; 121: Industrial or commercial units;
211: Non-irrigated arable land; 231: Pastures; 242: Complex cultivation patterns; 243: Land principally occupied by agriculture, with significant areas of natural vegetation;
311: Broad-leaved forest; 324: Transitional woodland-shrub

[20] http://www.eea.europa.eu/data-and-maps/data/corine-land-cover-2000-raster-1

Figure 7.5.2 shows the proportion of the different land use classes for Borşa commune according to CLC 2000 and our data. An exact comparison is not possible because there are two land cover classes in the CLC map, which can contain either cropland or grassland: 242 - complex cultivation patterns (5% in Borşa) and 243: land principally occupied by agriculture, with significant areas of natural vegetation (6% in Borşa). It is not known which CLC units were classified as being HNV grassland.

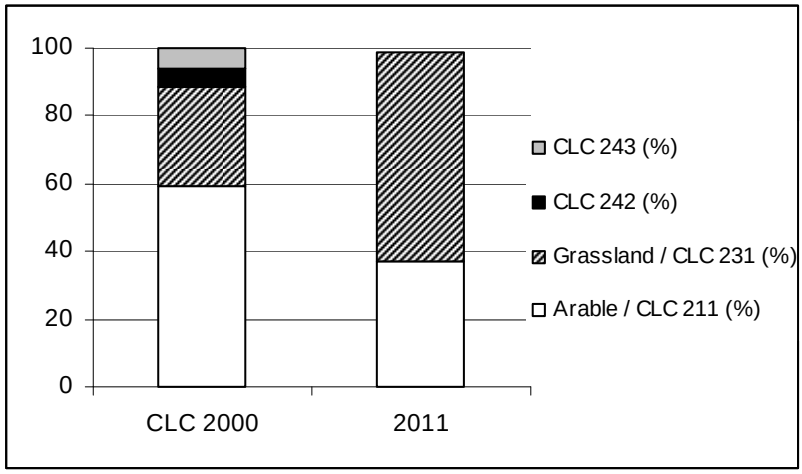

Figure 7.5.2: Comparison land use classes for Borşa commune according to the Corine Land Cover (CLC) map 2000 and our land use data

Classes of the CLC 2000 map: 211: Non-irrigated arable land; 231: Pastures; 242: Complex cultivation patterns; 243: Land principally occupied by agriculture, with significant areas of natural vegetation.

However, even if CLC classes 231, 242 and 243 are *all* included (c.40%), the "HNV grassland area" in Borşa still does not exceed the crucial 50%, whereas in reality the proportion of grassland is much higher (see chapter 5.2). The CLC is already 11 years old, but it is also known that the Corine maps have limited precision, especially at local level (see e.g. Paracchini et al. 2008).

To sum up: the exercise by which communes were made eligible for HNV grassland payments was based on flawed data (data for Dăbâca not shown, but they are similar to Borşa), and has had the consequence that no HNV agri-environment payments can be applied for on grasslands which are of sufficient quality to be designated an SCI.

It is questionable whether this black and white, over/under 50%, approach really makes sense in light of the general aim of the agri-environment measure to protect High Nature Value farmland, especially in such dynamic landscapes as are found in those many regions of Romania which are affected by land use abandonment. It is not clear why the measures should only be available in communes with a high cover of HNV farmland – there is no assessment of relative value. The eligible zone for the HNV grassland package should be extended to the whole country in the 2014-2020 RDP.

At the same time, to be able to target the payments better in the future and protect the existing High Nature Value grasslands, it is necessary to carry out a comprehensive mapping of Romania's grasslands. The only existing study so far (Sarbu et al. 2004) is based on extrapolated data and is therefore not accurate enough for this purpose.

If it is not possible to extend the HNV agri-environment package to the whole country by 2014, we suggest also using other data sources for the designation of the eligible area as described by Paracchini et al. (2008). For example, one basic option could be to include all Natura 2000 sites in the eligible area.

In the rationale for the agri-environment scheme (Ministry of Agriculture and Rural Development of Romania 2010) there is neither a clear definition of what exactly HNV grassland means, nor any classification and characterisation made for these types of grasslands. At the moment, the agro-environment payments make only very minimal demands on the applicant, and they are technocratic in character, with no reference to the qualitative and functional aspects of the habitat.

Furthermore (see 5.2 above), the HNV agri-environment package that exists addresses only HNV-farmland types 1 and 3, and even these not very thoroughly. Those for the first type include only grasslands, and the ones for the latter only bird species. Other types of semi-natural habitats of conservation value have not received attention. For instance, sub-continental peri-Pannonic scrub (Natura 2000 habitat code 40A0*) could be endangered in the regions that are eligible for the first HNV grasslands package, precisely by the very implementation of this package! There is no overall vision for HNV landscapes.

When the management prescriptions for the HNV grassland scheme were established, there was no consideration given to the fact that different bio-geographical regions not only have particular structural and functional features, but also different ecological demands and potential threats and that therefore the measures necessary for their actual conservation might be in conflict with the contractual obligations. For instance, establishing the first of July as a starting date for the mowing activity in the whole country can lead to a degradation of some meadows if is facilitates the establishment of invasive species that have a short term biological cycle and that disperse their seeds prior to this date.

It is essential that the agri-environment measure considers bio-geographical regions and in particular moves away from a general starting date for mowing for the whole country. Based on our experience gained through the implementation of a pilot agri-environment measure for hay meadows in Borşa and Dăbâca communes[21], we are also convinced that there have to be two separate measures for pastures and hay meadows. The data on the relative maintenance costs of meadows and pastures (see section 3.2 above), while needing further investigation, are also suggestive of this.

[21] http://www.mozaic-romania.org/mozaic-project/the-hay-meadow-programme.aspx

8. Conclusions

After a period of population growth due to a boom of agriculture in the first half of the 20th century, the populations of Borşa and Dăbâca communes have declined and currently show clear signs of ageing. Farming is mainly carried out on a semi-subsistence and subsistence level and with few people being employed in agriculture.

Due to this fact and the lack of machinery – 70% of the households don't own a tractor – the hiring of contractors is the biggest cost in cropping. As most of the people are restricted through low pensions and wages from making investments in agriculture, arable farming is carried out on only part of the area formerly utilised and cattle numbers have declined.

This development in agriculture has led to the abandonment of cropping on many of the arable fields which had, before the fall of the communist regime, covered around 70% of the communes' agricultural area. During the last two decades they have evolved to semi-natural grasslands and are in most cases used as sheep pastures. Through our field mapping we have been able to show that the proportion of cropland and grassland has been reversed between 1989 and 2011, with 70% being grassland today.

The area can be classified as High Nature Value type 1 farmland; however there are also characteristics of type 3 – relict grassland hotspots of biodiversity and rare species that once were isolated in a more intensively farmed area – and a mosaic landscape structure, with fallows and new and old grassland at different stages in the succession.

The vegetation types used as hay meadows stand out due to their higher number of rare and endangered species compared to those vegetation types used as pasture. They are also more fragmented and thus more vulnerable to deterioration processes – the spread of invasive species, for example.

These findings lead us to the conclusion that the protection of the hay meadows through unbroken low-intensity use is a priority for nature conservation in the area and that meadow management should be more favourably rewarded than pasture management, which is in any case more ubiquitous, through a separate agri-environment package, for example. However, the pastures are also threatened by shrub encroachment, especially the older ones, as grazing shifts to new, closer, potentially more productive pastures on former arable land.

The designation of the two communes as ineligible for agri-environment payments is incorrect, whether judged by the RDP criteria or by actual land use data - the Corine Land Cover map is an insufficient basis for such designation.

While more work needs to be carried out on some of the issues identified, and in particular in understanding the processes at work in the rest of the area, and the implication of these processes for the region's nature values, a number of improvements in policy already emerge, several of which will be key issues as the new Rural Development Programme for 2014-2020 is developed:

- Establishing eligibility criteria for accessing agro-environment payments which include quality as well as quantitative aspects, taking into consideration the conservation value of the species, habitats and landscapes.
- Elaborating a new system of support payments that take into account the real costs of implementation of the management measures needed to ensure the favourable conservation status of different habitats, which also might differ in terms of traditional usage practices (e.g. pastures versus hay meadows)
- Developing and implementing national programmes for inventorising and mapping all the natural and semi-natural habitats.
- Elaborating a national system of HNV habitats classification that would also include their characterisation and description
- Elaborating a methodology for evaluating and monitoring HNV farmlands that would enable an efficient and clear quantification of the conservation value of both habitats and landscapes and of changes in these values.

The observation of the application procedure of area-based subsidies has revealed that although improvements are being made constantly, both the structure of the Land Parcel Identification System and the application process still disregards the reality of ageing rural communities of small scale-farmers, leaving them and the town halls without enough assistance.

More information is definitely needed, especially about subsidies other than direct payments, such as agri-environment packages. It would also be helpful to all involved and could lead to an improved database, if the farmers, town hall staff and APIA officers could co-operate more. In order to allow an independent assessment of the LPIS system and the success of the agricultural subsidies, it will be necessary to release statistical data to research institutes and universities.

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