PRELIMINARY RESULTS OF A SURVEY OF FARM ANIMAL BIODIVERSITY CONSERVATION ACTIONS IN EUROPE UNDER THE FRAMEWORK OF AGENDA 2000

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Abstract

In this paper we report on preliminary results of a research aimed to examine the content of farm animal biodiversity conservation actions currently under implementation in the European Union in the framework of EU Agenda 2000. In particular, we surveyed sixty-three Rural Development Plans (RDPs) set up in twelve countries in application of EEC regulations 1257/99 and 1750/99. Our analysis focused on endangered breeds of six major livestock species included in the RDPs. This analysis, which is based on the comparison with the indicator's status of the DAD-IS FAO database, allowed to identify priorities in conservation efforts in each country, and estimate the level of expected public expenditure needed to ensure the moving of breeds from at-risk (of extinction) status to not-at-risk status over the period 2000-2006.

Key Words: farm animal biodiversity, Agenda 2000, Rural Development Plans.

JEL Classification: Q18, Q20

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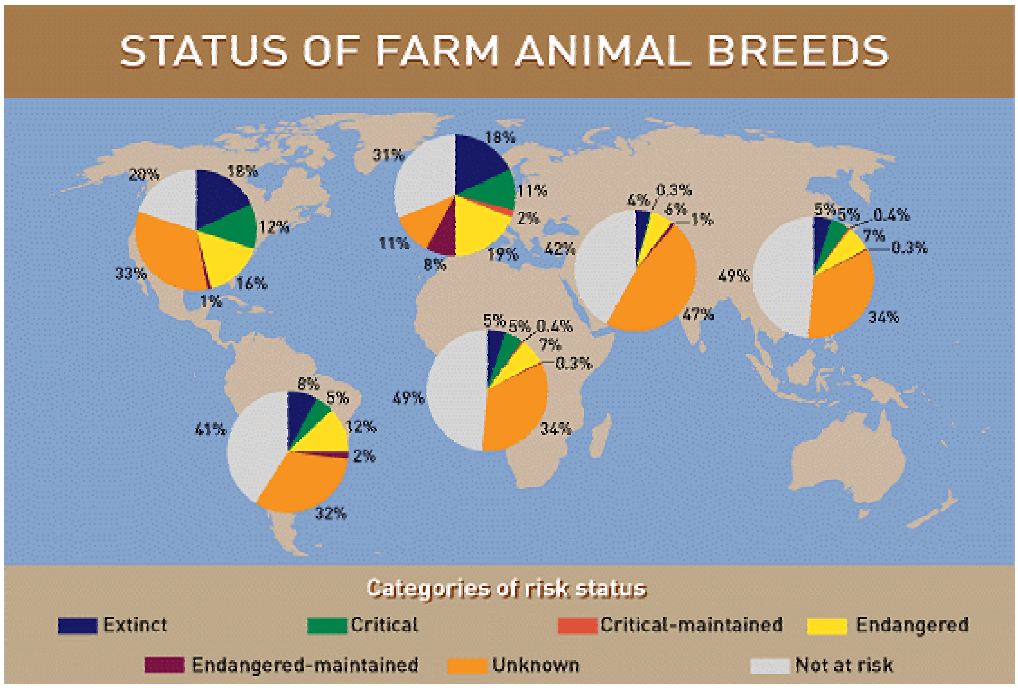
1. Introduction

Policy-makers and public opinion are expressing serious concerns about the continuing reduction in the overall pool of genetic resource of agricultural importance, especially domestic breeds of livestock. According to the most recent estimates of FAO (2000), 10% of domesticated breeds have been lost in the last century, and a further 20% are at risk of extinction. The threat to farm animal biodiversity is dramatically displayed in Figure 1 which shows a summary of the status of farm animal breeds in the world. In Europe the condition of farm animal biodiversity is particularly critical: 18% of breeds existing in the early 1900's have already been lost, and 40% of recorded breeds risk to become extinct over the next 20 years, unless significant changes take place in the driving forces behind biodiversity depletion. The causes of biodiversity depletion are widely known, as are the ecological and socio-economic consequences of farm animal biodiversity loss (OECD, 1996; Pearce and Moran, 1994)[2]. The challenge to biodiversity conservation is the development of strategies, actions, and institutions that can slow the rate of genetic erosion by encouraging, especially at farm level, effective conservation and sustainable use of farm animal genetic resources.

The Convention on Biological Diversity (CBD), signed at the United Nations "Earth Summit" held at Rio de Janeiro in 1992, suggests to implement economic incentives to achieve biodiversity conservation goals (UNEP, 1995). The European Union (EU), which ratified the CBD in 1993, pursues the CBD recommendations. Under the auspices the "Agenda 2000" and Regulations 1257/99 and 1750/99 on support to Rural Development Plans (RDPs), EU rules make provisions and set general guidelines and goals under which member countries can compose voluntary management agreements for the provision of livestock biodiversity services. The specific measure provides for payments to farmers, in the form of cost shares or incentive payments, in return for maintaining local breeds at extinction risk. Member countries, and sub-country level administrative units are free to compose their own plans under these rules. Payments are calculated according to the following guidelines: i) revenue loss due to adoption of the environmental plan; ii) increase in production costs due to adoption of the environmental plan; iii) an incentive payment to encourage adoption; iv) cost of investments that do not generate income. In any event, premiums cannot exceed the ceilings given in EEC 1257/99. Breeds to protect are extracted from lists compiled by authoritative international institutions (such as FAO) or from specific surveys conducted by each country (i.e. "Action plan for the preservation and sustainable use of biodiversity in the livestock sector"). To be eligible for voluntary agreement, the breeders must be members of a recognized breeders association. Further, the size of livestock at risk of extinction must not be reduced during the overall period of the contract.

[2] The most important force behind the loss of farm breeds is the homogenisation of livestock productions. Farmers replace local breeds in favour of a few high-yielding breeds. This specialisation is endorsed by perverse economic incentives, which suggest that economically rational farmers' decisions are based only on private profitability. Drucker at al. (2001) report that In European Union, over 60% of cattle are derived form the Holstein Friesian breed.

Figure 1. Status of farm animal breeds in the World



Source: FAO web site (2000)

In this paper we report on preliminary results of a research project aimed to examine the content of farm animal biodiversity conservation actions currently under implementation in Europe, as a result of the application of EEC regulations 1257/99 and 1750/99. We surveyed sixty-three Rural Development Plans (RDPs) set up in twelve different EU countries[3]. Our analysis focused on six livestock mammalian species: asses, cattle, goats, horses, pigs, and sheep The starting point for our investigation was the Domestic Animals Diversity-Information System (DAD-IS) FAO database which frequently monitors status of breeds in the world. We compared breeds included in the DAD-IS FAO database with breeds entered in the various RDPs. This comparison allowed us to identify priorities in conservation efforts in each country. Moreover, by using FAO indicators on the current population size of each breed, we estimated the level of expected public expenditure necessary to ensure the upgrading of breeds from the at-risk status to at the not-at-risk status during the period 2000-2006.

2. The status of local breeds in the European Union

The FAO is actively engaged in promoting agricultural biodiversity programs. One of the most useful initiatives is the Domestic Animals Diversity- Information

[3] In particular, we examine the RDPs of the following countries: Austria, Belgium, Denmark, Finland, France, Germany, Ireland, Italy, Netherlands, Portugal, Spain, and Sweden.

System (DAD-IS). DAD-IS monitors worldwide breeds and classifies them in seven risk categories: extinct, critical, endangered, critical-maintained, endangered-maintained, not at risk, and unknown.

The category "extinct breed" indicates that it is no longer possible to recreate the breed population. Extinction is absolute when there are no breeding males (semen), breeding females (oocytes), nor embryos remaining. The category "critical breeds" indicates that the total number of breeding females is less than 100, or the total number of breeding males is less than or equal to five, or the overall population size is close to, but slightly above 100 and decreasing, and the percentage of pure-bred females is below 80 percent. The category "endangered breed" indicates that: the total number of breeding females is between 100 and 1000; or the total number of breeding males is less than or equal to 20 and greater than five; or the overall population size is close to, but slightly above, 100 and increasing and the percentage of pure-bred females is above 80 percent; or the overall population size is close to, but slightly above 1000 and decreasing and the percentage of pure-bred females is below 80 percent. The categories "critical-maintained breed" and "endangered-maintained breed" indicate that breeds are being maintained by active public conservation programme or within a commercial or research facility. The category "not a risk breed" indicates breeds for which the total number of breeding females and males is greater than 1000 and 20 respectively; or the population size approaches 1000 and the percentage of pure-bred females is close to 100 percent, and the overall population size is increasing. Finally, the category "unknown breed" covers breeds for which no data are available[4].

In the analysis we take in account only breeds included in the Critical, Endangered, Critical-Maintained and Endangered-Maintained categories, and breeds included in the not-at-risk category but with a population showing a decreasing trend. Table 1 reports a summary of the breeds at risk of extinction in the European countries under investigation. The total number of breeds at risk is 652; 162 breeds fall in the "Critical" category, 256 breeds are included in the "Endangered" category, 35 breeds are in the "Critical-maintained" category, and 80 breeds are classified as "Endangered-maintained". It is worthwhile to note that in the investigated countries there are currently at least 120 breeds not at risk of extinction but with a decreasing trend in population size. In terms of species, the number of breeds at risk is the following: horses (175), sheep (173), cattle (161), pigs (67), goats (64), and asses (12).The country with the highest number of local breeds at risk is Germany (164), followed by France (123) and Italy (115).

3. Farm biodiversity actions in the European Union

Table 2 displays the RDPs (prepared in application of the EEC Regulations 1257/1999 and 1750/99) we examined. As already mentioned, the data set has been limited to twelve countries, but will be increased in future

[4] The main domestic animal included in this program are six mammalian species (asses, cattle, goats, horse, pigs and sheep) and four avian species (chickens, ducks, geese and turkeys).

studies. Table 3 displays the comparison between data on breeds at risk of extinction according the DAD-IS FAO database and data on local breeds included in the conservation goals of RDPs. A summary of this comparison is illustrated in Figure 2. Figure 3 portrays the relative levels of protection for each mammalian species. The comparison shows that in every country, the number of local breeds included in the RDPs is constantly lower than number of analogue breeds indicated by FAO. According to the FAO, local breeds at risk of extinction in the examined European countries are 652, but only 286 breeds (43.9%) appear in the RDPs. The biggest level of livestock biodiversity protection is pursued in Austria (87.9%) and in Spain (80.4%). Belgium (68.4%), Italy (64.4%), France (43.9%) occupy intermediate positions. The lower levels of protection are found in Finland (35.3%), Sweden (30.0%), Germany (28.1%), Portugal (25.0%) and Ireland (13.0%). Denmark and Netherlands are not considered because they have not included any farm animal protection measures into their RDPs. As could be expected, with regards to the mammalian species, the highest number of protected breeds is observed for cattle (91 local breeds, equal to 56.5% of the total), followed by sheep (88 local breeds, equivalent to 51.0% of the total). The analysis of data for horse breeds reveals a critical status. Although the number of breeds at risk is the highest (175) among the mammalian species, the percentage of protection is equal to 30.2% of total breeds. This fact is probably due to serious difficulties in promoting the horse raising.

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Figure 2 - Breeds at risk and level of conservation in RDPs

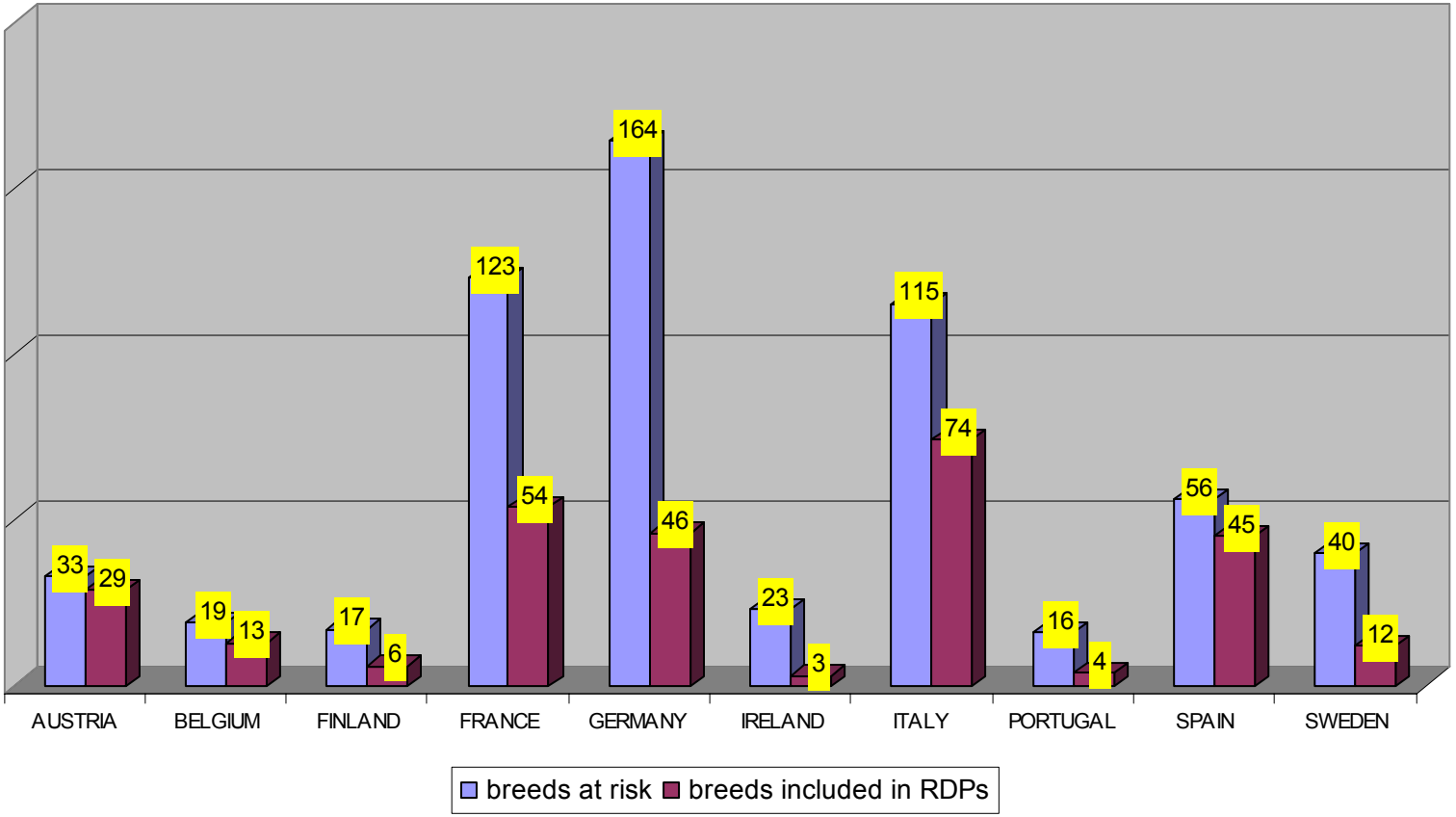
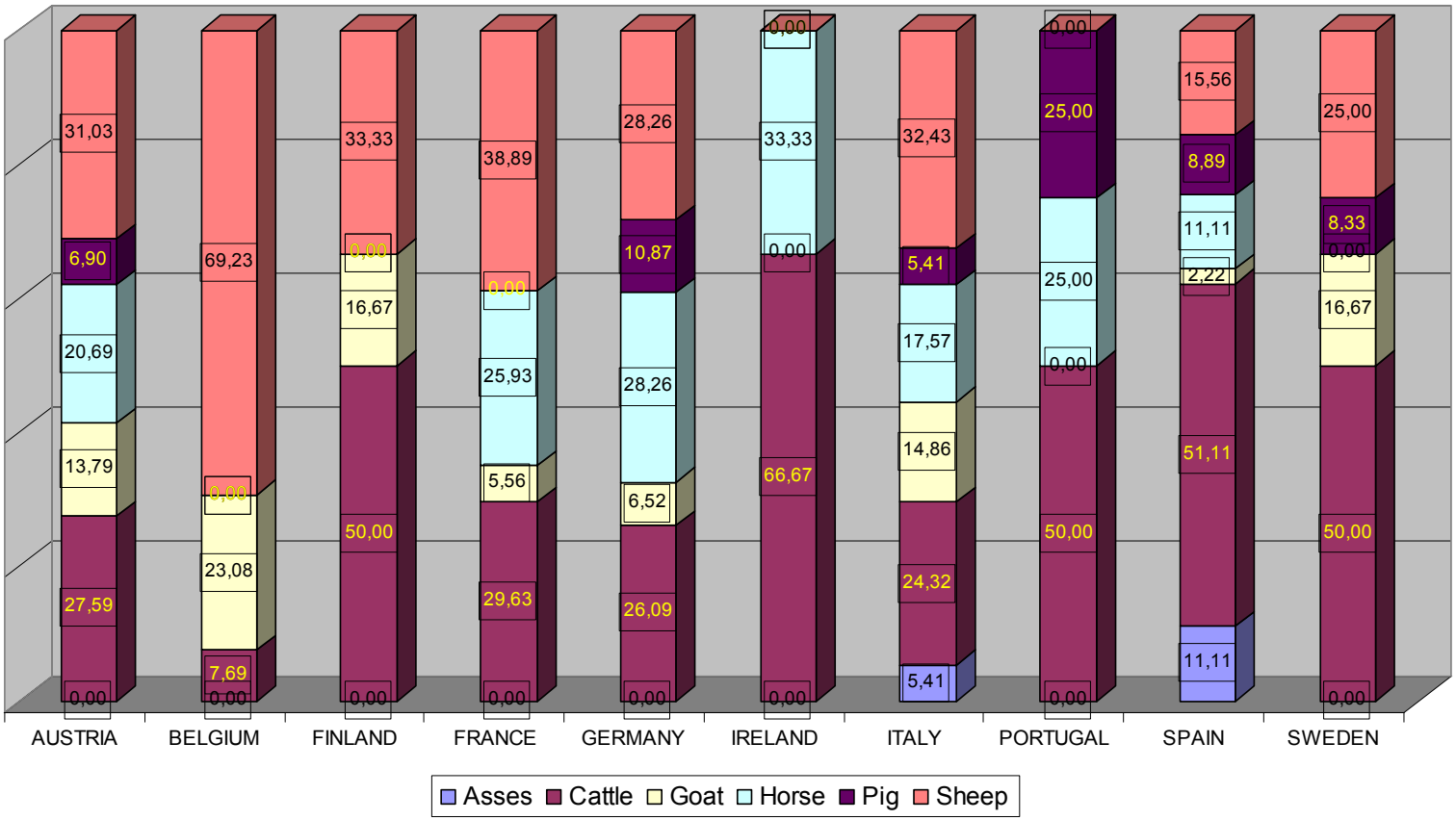


Figure 3 - Percentage levels of conservation in RDPs for mammalian species



4. An estimate of public expenditure for farm animal biodiversity conservation

In this section we offer an estimate of the public expenditure for farm animal biodiversity protection. This estimate may be useful to policy makers in order to assess the cost and the effectiveness of livestock biodiversity conservation goals. In particular we estimate two levels of public expenditure:

1) the level of annual public expenditure necessary to ensure the maintenance of current population size of the farm breeds at risk included in RDPs;
2) the level of annual public expenditure necessary to ensure the upgrade of breeds included in RDPs, from the at-risk status to the not-at-risk status.

Both estimates are based on current population data and threshold levels indicated by FAO for each breed. The first level of expenditure has been estimated by multiplying the current size of each breed by the relative average annual payment contemplated by the RDP. The second level of public expenditure has been estimated by multiplying the average payment by 1022 (which corresponds to the threshold level required to consider a breed not at risk). Detailed analysis of each RDP reveals that the payment varies from a minimum of 20 euro to a maximum of 511 euro for adult head[5]. Table 4 reports public expenditure estimates.

Table 4 – Level of public annual expenditure for biodiversity conservation (values in Euro)

Country	Expenditure necessary to assure the actual level of breeds at risk	Expenditure necessary to assure the moving of breeds to not risk level
Austria	1,912.283.71	7,084,760.01
Belgium	110,501.88	125,195.00
Denmark	0	0
Finland	2,994,622.95	3,314,251.23
France	6,699,495.80	8,639,387.30
Germany	1,424,031.00	4,210,919.85
Ireland	940,400.00	2,402,722.00
Italy	6,595,916.75	7,733,780.60
Netherland	0	0
Portugal	296,070.00	427,286.00
Spain	2,787,630.32	5,168,455.76
Sweden	315,865.00	814,000.00
TOTAL	**24,076,817.41**	**39,920,757.75**

[5] A detailed list of the payments for each endangered breed is available upon request from the authors. It is interesting to note that in many cases the actual level of payment is lower than the income reduction associated with raising local breeds. This fact contrasts with the general rules established in the ECC 1257/99 Regulation (art. 24). For instance, typical is the example of the comparison between the “Bruna Italiana” and “Modicana” cattle breeds. The former is a cattle breed highly specialised in milk production. The second is a Sicilian cattle breed at risk of extinction. The final income loss associated with raising the “Modicana” is calculated at 158,00 euro per head. This loss is calculated by including the EEC payment in the total revenue of raising the “Modicana”. Therefore, only farmers who already raise local breeds will have an incentive to participate in the biodiversity voluntary agreements.

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According to our estimates, RDPs should assign approximately 24,1 million euro per year in order to stabilise the trend of the domestic animal populations at risk of extinction, and 39,9 million euro to ensure that the breeds are no longer at risk of extinction. France and Italy are the countries where it is necessary to allocate the largest amount of financial resources to reach both biodiversity conservation goals.

5. Conclusion

In the last few decades, the intensive features of livestock activity in Europe have provoked a dangerous erosion of farm animal genetic resources. Farm animal biodiversity performs key ecological and economical services. If correctly assembled in time and space, it can play an important role as cash reserves in low-income areas and in conservation of soil fertility, crop protection and productivity in less favoured regions.

In this paper we investigate the farm animal biodiversity status in Europe and the livestock biodiversity measures of numerous Rural Development Plan (RDPs) set up to implement ECC Regulation 1257/99. The analysis has highlighted that many breeds at risk of extinction according the FAO are not included in the RDPs. The analysis also indicates that the main efforts of RDPs has been devoted to preserve cattle and sheep local breeds. Further, we estimate the levels of public expenditure needed to maintain the current population size of local breeds at risk of extinction, and the levels of public expenditure needed to reach the not-at-risk status. This information could be useful to policy makers to reallocated future financial resources to reach effective biodiversity goals. Finally, we note some discrepancies between the level of payment to maintain or raise local breeds and the payment principle declared in the ECC Regulation. In many cases, there is no economic profitability for farmers to switch from higher productive breeds to local breeds. That implies that in many cases it is also urgent to revise the level of economic incentives.

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