Public Agricultural Payments to Farmers in Relation to Nature Benefits

Case Study Germany

February 2010 by:

Institut für Agrarökologie und Biodiversität (IFAB)
Böcklinstr. 27, D-68163 Mannheim

Authors: Dr. Rainer Oppermann, Jenja Kronenbitter and Tobias Lepp

E-mail: mail@ifab-mannheim.de

www.ifab-mannheim.de

Founded by:

BirdLife INTERNATIONAL

G|M|F The German Marshall Fund of the United States

STRENGTHENING TRANSATLANTIC COOPERATION

1. Introduction

In the course of the publication of agricultural payments (CAP-payments) for farms a debate started whether and to what extend these payments are justified. At the same time a discussion about the settings of the European agricultural policy agenda for the next agricultural reform started.
In the context of this debate the presented study asks to what extent farmers provide nature benefits and by comparison what CAP-payments they get.

2. Material and Methods

The study is divided in two parts. Both sub studies analyse nature benefits provided by farms and received CAP-payments, - 1) at farm level and 2) at area level.

2.1 Nature benefits and agricultural payments at farm level

The objective of this study is a comparison of farm's biotic and landscape structural benefits and CAP-payments. Therefore we compared anonymized natural inventory data of farms with actual CAP-payments.

2.1.1 Farms

In the present study data from 27 farms in five federal states were used (Fig. 1).

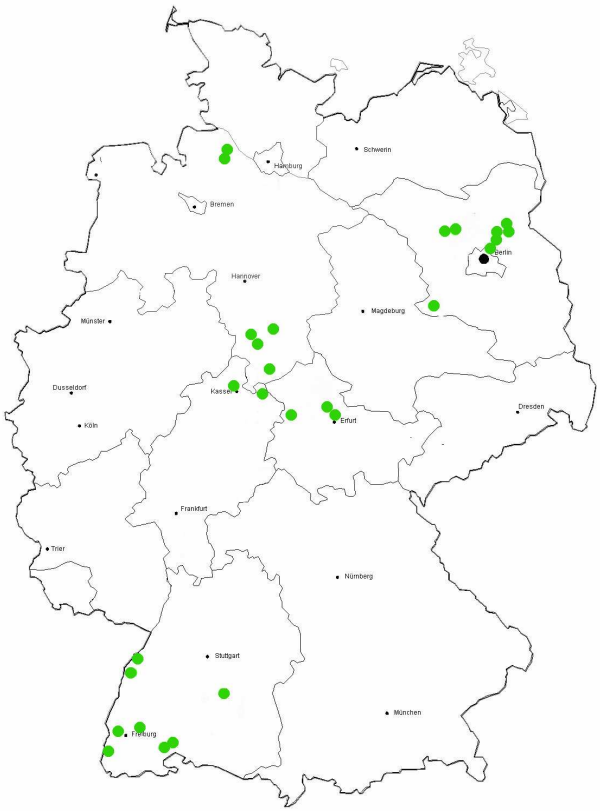


Figure 1: *Location of the farms in Germany*

The data used in this study derive from the project 'Naturindikatoren für die landwirtschaftliche Praxis' (N*ature indicators for agricultural practice*) in which nature benefits of several farms were examined in 2002/2003. The objective of the former study was to create and test indicators enabling a stronger integration of biotic and landscape structural benefits in agricultural practices (OPPERMANN ET AL. 2005).
The data of CAP-payments are from 2008. Therefore, only data from farms without basic restructurings, expansions etc. between 2002 and 2008 have been used. However, it should be noted that operational changes, not being noticeable in our preceding probing analysis, cannot be ruled out. A new natural inventory on farms in 2008 was not carried out.
The farms cover a wide range of small and big farms, conventional and ecological managed farms, cash crop, forage growing and mixed farms (Tab. 1).

Tab. 1: *Summary of the analysed farms and their characteristics*

No.	***farm type***	***size (ha)***	***arable land (%)***	***grass -land (%)***	***livestock units / ha (LU/ha)***	***cultiva-tion type***	***soil capability class***	***direct payment (€)***	***direct payment (€/ha)***	***2.pillar payment (€)***
1	mixed	248	83	17	0,3	ecol.	70	93.700	380	54.700
2	mixed	21	30	70	0,5	ecol.	unknown	2.700	130	4.000
3	forage	77	17	83	0,5	ecol.	40	14.400	190	6.900
4	cash crop	60	99	1	0	conv.	50	17.200	290	0
5	cash crop	433	100	0	0	conv.	62	150.600	350	0
6	mixed	114	46	54	0,7	ecol.	45	30.800	270	29.600
7	cash crop	310	100	0	0	conv.	70	99.400	320	3.000
8	cash crop	98	97	3	0	ecol.	59	22.300	230	15.800
9	forage	70	40	60	1,4	ecol.	50	22.000	310	12.100
10	forage	98	0	100	1,7	conv.	60	31.300	320	0
11	mixed	471	75	25	0,6	ecol.	49	160.000	340	0
12	cash crop	66	99	1	0,5	conv.	32	17.100	260	0
13	cash crop	315	100	0	0	conv.	28	98.700	310	0
14	mixed	188	66	34	0,7	ecol.	unknown	37.800	200	20.500
15	mixed	1.267	87	10	0,5	ecol.	33	277.700	220	144.100
16	forage	310	53	47	0,5	conv.	33	93.400	300	6.300
17	mixed	114	87	13	2,7	ecol.	24	27.200	240	14.500
18	forage	532	0	100	0,9	ecol.	32	125.100	240	0
19	mixed	1.232	96	4	0,4	ecol.	33	349.900	280	227.400
20	forage	32	0	100	1,3	ecol.	22	6.100	190	9.800
21	mixed	116	44	56	1,6	conv.	72	40.500	350	6.900
22	mixed	38	42	58	0,8	conv.	45	8.000	210	2.500
23	mixed	68	34	62	0,7	conv.	63	18.000	260	15.100
24	mixed	57	100	0	0,1	ecol.	60	16.000	280	11.800
25	mixed	26	58	42	0,5	ecol.	35	4.600	180	5.300
26	grafting	150	98	2	0,9	conv.	60	43.900	290	1.000
27	cash crop	217	100	0	0	conv.	38	66.300	310	43.000

Informations relating to areas are rounded to ha and %, informations relating to payments are rounded to 100 € and in the case of payments per ha to 10 €/ha.

2.1.2 Agricultural payments

CAP-payments are essentially distinguished between 1. pillar payments and 2. pillar payments.

1. pillar payments are referred to direct payments. The amount of payments depends on the availability of so called payment entitlements, the area of worked land of each farm and on the land use (e.g. basic rate for grasslands is lower than for arable land). For an easier comparison of payments direct payments of each farm have been converted to € per ha.
2. pillar payments are part of the so called "European Agricultural Fund for Rural Development" (EAFRD). These payments are used for country-specific support programmes for competitiveness, environment, diversification and further issues. Because the 2. pillar payments are country-specific and include investment subsidies a well as area payments, a comparison of this payments is impossible. For the sake of completeness they are listed in Table 1.
The CAP-payments to each farm are publicly accessible in the internet since 2008.

2.1.3 Analysis

The following three nature indicators were determined as proportion of the total area of each farm (examples see Fig. 2):

- species rich farmland
- extensively used farmland
- landscape features

Fig. 2: *Farmland, which is rich in species like this arable land (left) or the extensively used flower rich hay meadow (middle), forms the basis of a lively and diverse cultural landscape. Farmers, who cultivate these areas and thus conserve biodiversity, provide real and valuable nature benefits. Also the conservation of hedges (right) and spinneys, as well as the cultivation of traditional orchards, which are managed by farms, are benefits for nature.*

Species rich areas provide an essential contribution to biodiversity preservation in agriculturally utilized landscapes. The biodiversity of agricultural landscapes mainly depends on the agricultural management of the farms in a landscape. It can be positively influenced e.g. by a reduction of herbicides, reduced use of fertilizers, reduced stand densities and an extensive use of grasslands. In order to detect the biodiversity of farmland, a transect method and a list of indicator species for species rich grassland as well as for arable land were used within the framework of the nature indicator project. Following this practice a method for the valuation of farmland was developed (OPPERMANN ET AL. 2005).
The intensity of use is a critical factor for the quality of living space of agriculturally used areas. Therefore, extensively used farmlands, such as extensively used grasslands, traditional orchards and field margins, do have a strong significance. Due to their natural biodiversity they become valuable refuges within an intensively used

agricultural landscape. However, it often takes several years until a visible increase of biodiversity can be noted on newly created extensively used farmlands. Additionally, an extensive use of lands preserves soils and groundwater. Ultimately, each extensification of land management causes losses in revenues and therefore a remuneration of these measures is urgently needed.
A further indicator is the extent of landscape features such as groves, hedges, boundary ridges, scrubland etc.. Landscape features are cultural asset worth of preservation with important functions as habitats for retreat, reproduction and over-wintering of animals. The extent of landscape features in a certain region on one hand depends on the condition of the nature region and on the other hand it depends on the history of cultivation.

2.2 Nature benefits and agricultural payments at area level

Actual photographs were taken in several regions of Germany. They show examples of typical land management and its influence on nature elements. Examples are selected from large scale structured and small scale structured landscapes as well as from a region with good soils and a region with bad soils.

The photographs were taken in august 2009 in the following regions:

- Mecklenburg (Mecklenburg Lake District)
- Sachsen-Anhalt (Northern Harz region)
- Baden-Württemberg (Kraichgau)

3. Results

3.1 Results: Nature benefits and agricultural payments at farm level

Table 2 shows a compilation of provided nature benefits and received direct payments of each farm. As main criteria for a valuation of a farm's nature-friendliness the nature indicator species rich farmland was selected. This indicator best mirrors directly provided nature benefits.

The studied farms get on average 280 €/ha direct payments. A comparison of the percentage of species rich farmland and received payments showed that farms with best nature benefits receive significantly less direct payments than farms with low nature benefits (Fig. 3). It is striking that direct payments of ‚nature friendly' farms are around the value of 280 € and by contrast, farms with low nature benefits often get above-average direct payments. The shown negative correlation between the amount of direct payments and the area of specie rich farmlands is statistically significant (Spearman-rank-correlation: $N=27$, $S=5526$, $p<0.000$, $\varphi=-0.69$).

The data sets for the different farm types are very small (grafting: 1 farm, forage growing: 6 farms, cash crops: 7 farms, mixed: 13 farms). Thus, a separate analysis can only show some tendencies. For forage growing farms as well as for mixed farms again the 'nature friendly' farms get below-average direct payments per ha whereas farms with low nature benefits partially get significantly above-average payments (Fig. 4a and 4b). None of the studied cash crop farms has a high proportion of

species rich farmland, therefore a comparison of the amount of direct payments to 'nature friendly' farms and 'less nature friendly' farms is not possible.

Tab. 2: *Summary of the analysed farms and their nature characteristics*

No.	***farm type***	***species rich farmland (%)***	***extensively used farmland (%)***	***landscape features (%)***	***direct payment (€/ha)***
1	mixed	0	24	3	380
2	mixed	5	1	5	130
3	forage	24	56	8	190
4	cash crop	0	50	7	290
5	cash crop	0	70	10	350
6	mixed	14	18	19	270
7	cash crop	0	0	16	320
8	cash crop	1	36	2	230
9	forage	0	0	2	310
10	forage	0	1	5	320
11	mixed	11	0	2	340
12	cash crop	10	15	6	260
13	cash crop	0	10	4	310
14	mixed	18	45	8	200
15	mixed	9	22	5	220
16	forage	6	47	10	300
17	mixed	78	36	18	240
18	forage	0	97	6	240
19	mixed	21	57	5	280
20	forage	51	70	13	190
21	mixed	0	43	8	350
22	mixed	43	64	4	210
23	mixed	14	57	11	260
24	mixed	1	3	6	280
25	mixed	17	46	8	180
26	grafting	1	2	8	290
27	cash crop	1	4	5	310
Average (n=27)-		-	-	-	280

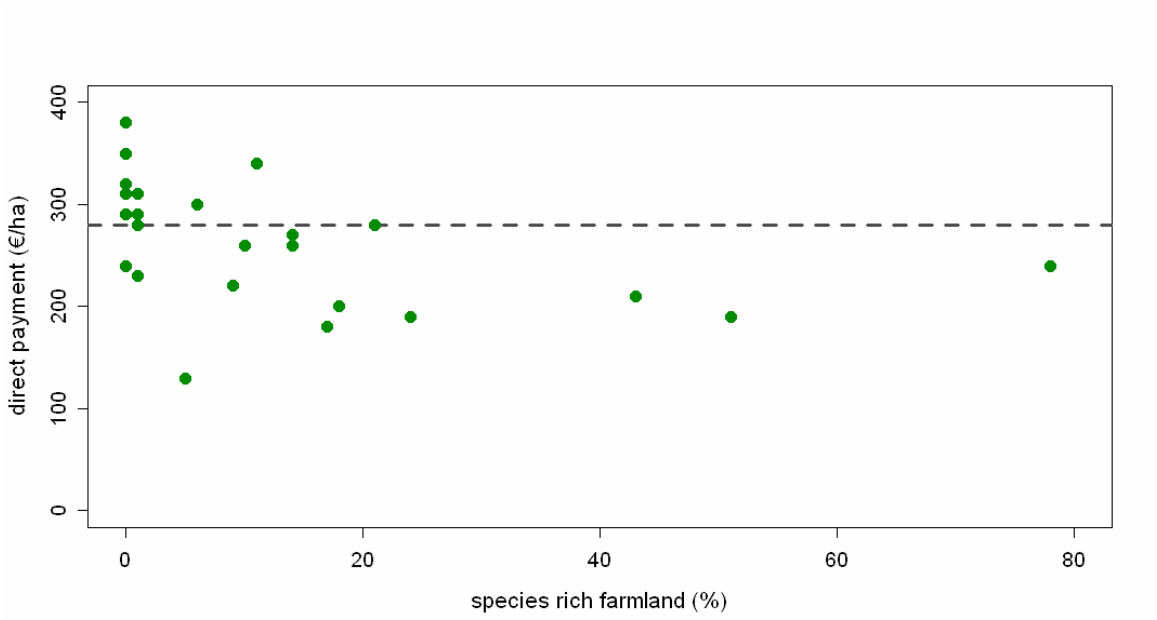


Abb. 3: *Farms with high nature benefits (large extent of species rich farmland), mostly get significantly fewer direct payments than farms with no at all or low nature benefits. Therewith direct payments to 'nature friendly' farms are below the mean value of 280 € (grey line) while 'less nature friendly' farms often get above-average direct payments.*

a) b)

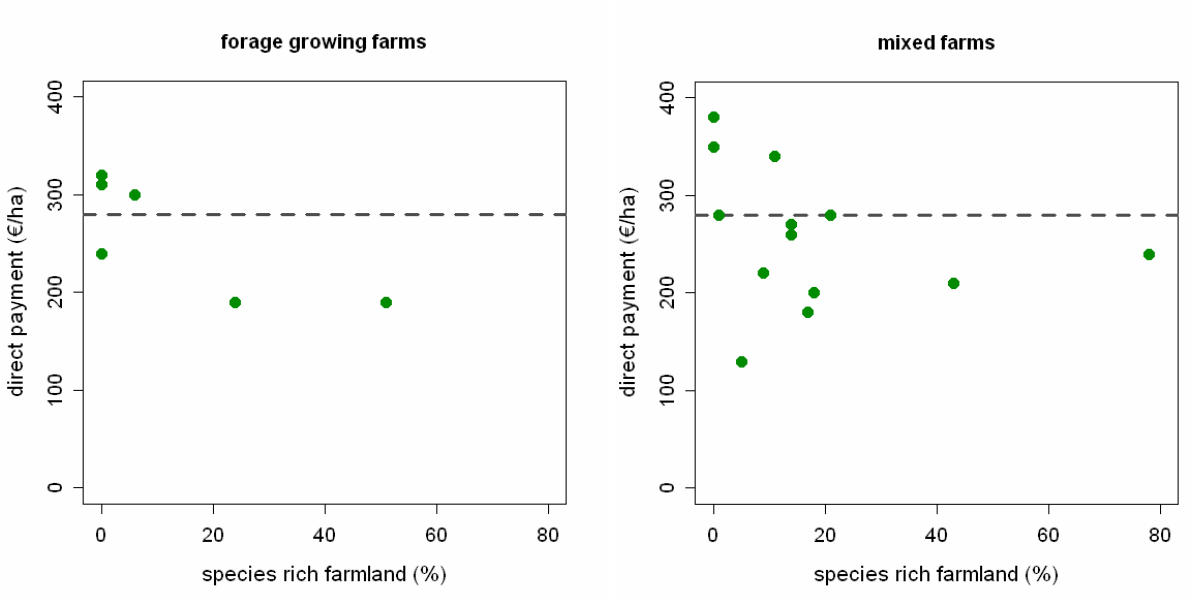


Fig. 4: *For forage growing farms (a) and mixed farms (b), farms with high nature benefits (high percentage of species rich farmland) mostly get significantly fewer direct payments than farms without or with only low nature benefits. Therewith direct payments to 'nature friendly' farms are below the mean value of 280 € (grey line) while 'less nature friendly' farms often get above-average direct payments.*

Under a sustainable management, extensively used farmlands can also be an important indicator for farms' nature friendliness. In contrast to the indicator species rich farmland, no negative correlation between the proportion of extensively used farmland and the direct payments per ha could be proved (Fig. 5). However, payments to farms with a very low proportion of extensively used farmland are higher than the average of 280 € per ha in almost all cases while direct payments per ha to 'nature friendly' farms are lower than 280 € per ha in more than half of the cases.

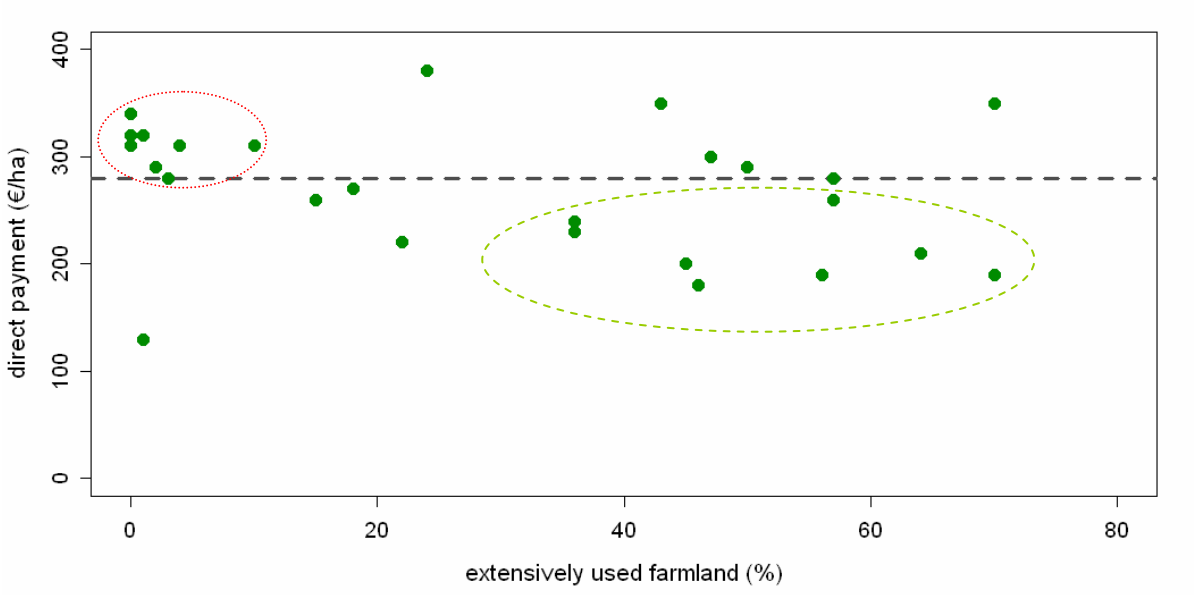


Abb. 5: *In contrast to the indicator species rich farmland no significant correlation between the proportion of extensively used farmland and the direct payments could be proved. However, payments*

to farms with a very low proportion of extensively used farmland (up to about 15%) are higher than the average of 280 €/ha in almost all cases (red dashed circle) while direct payments to 'nature friendly' farms are lower than 280 €/ha in more than half of the cases (green dashed circle).

Besides species rich farmland and extensively used farmland, a possible indicator for the nature friendliness of a farm is the extent of landscape features. No significant correlation between the proportion of landscape features and direct payments could be proved.

A comparison of direct payments to ecologically and conventionally managed farms proved a significant higher average payment to conventionally managed farms (Fig. 6). The difference in die amount of payments is statistically significant (Wilcoxon rank test: $N_{ecological}$=15, $N_{conventional}$=12, W = 42, p = 0.02).

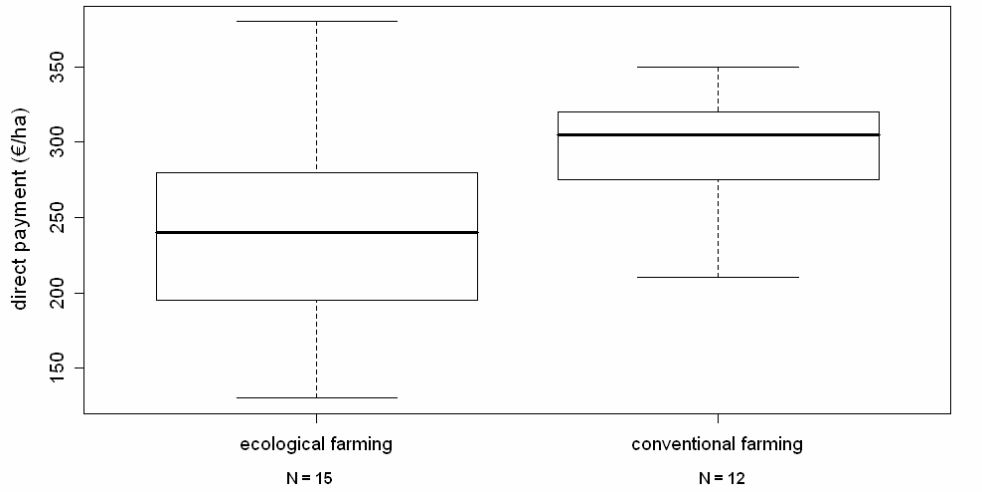


Fig. 6: D*irect payments to ecologically and conventionally managed farms. Conventionally managed farms get a significant higher average direct payment.*

The results point up that ‚less nature friendly' farms profit more by the actual payment system and get significant higher direct payments than ‚nature friendly' farms.

3.2 Results: Nature benefits and agricultural payments at area level

The analysis of the photographs shows that in many cases farmers get high payments without providing any nature benefits and even by causing nature damages, for example:

- remaining natural habitats are directly negatively affected by actual land management
- buffer zones and transition areas are missing in the majority of landscapes and farms
- isolation of remaining natural habitats

The situation shown in the pictures are talking for themselves and are explained in the adjoining legend of the photos.

hillside cultivation of maize extended to the reed bank

This photograph from Mecklenburg shows a maize field on a slope, which borders directly the reed of a nature reserve. The consequences are soil erosion and nitrate leaching, which end up in the reed and the water of the nature reserve.

missing edge strip/ ‚islandization' of habitats

This photograph, taken in Mecklenburg shows a field which borders directly a wetland habitat (kettle / sedge fen). With the loss of the margin, nitrate and pesticides can enter the wetland habitat easily. In the background there are several other wetland habitats, which could be easily linked and thus the ecological value of these habitats could be increased.

missing edge strip

This picture from Mecklenburg shows a field which directly borders a hedge. The margin of hedges is of particular high ecological value, because it is an important habitat, a hide and breeding zone of several plants and animals in intensively used agricultural landscapes. The value could be much higher and a change of the ecological value could be achieved by leaving an edge strip of 5-10m.

cultivation to the very base of stems of a cherry tree avenue

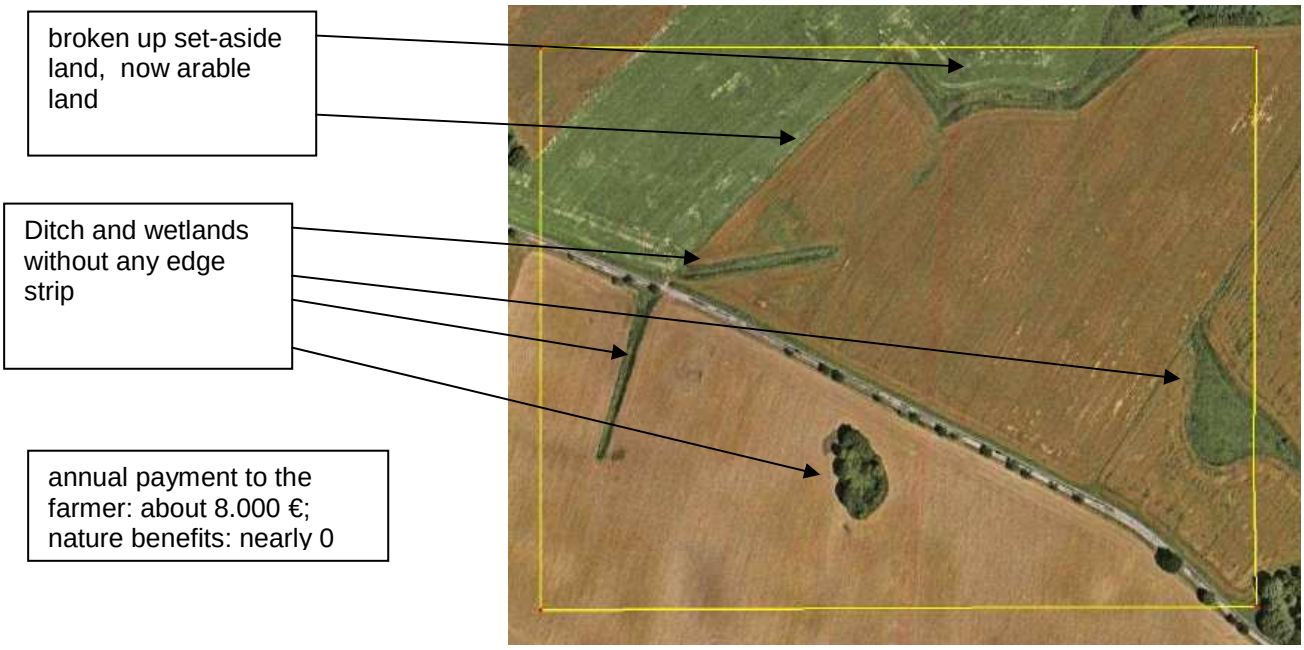
cherry tree avenue

area of arable land 43 ha;
direct payments about 13.000 €;
nature benefits = 0

This photograph shows a cherry tree avenue near the Northern Harz, which is worth preserving. The trees suffer visibly from the road traffic and the agricultural cultivation, which reaches directly on the base of the stem. With an adequate sized border of the field between the avenue and the cropland, the situation for the trees could definitely be improved.
The aerophoto shows the field in total. The farmer gets annually about 13.000 € direct payments for the cultivation of this arable land. Adequate sized margins or extensive used meadows along the cherry tree avenue and some flower strips across the plot, to link the biotopes, are not in practice up to now. But in fact for such high payments those arrangements could be expected.

Land cultivation to the border of a mulched drainage ditch

This photograph from Mecklenburg shows the cultivation bordering directly the top edge of a mulched drain water ditch. The consequences are water pollution loads due to nitrate and pesticide leaching. The habitat was also destroyed with mulching the vegetation.



This satellite picture shows the arable land of the picture above. The farmer does hardly provide any nature benefits on these 30 ha arable land (in the yellow rectangle) but he gets about 8.000 € annual direct payment for this area.

4. Summary

The presented study comprises two approaches in respect to nature benefits of farms and the Common Agricultural Policy (CAP): on the one hand a case study, which compared the CAP-payments to farms with their nature benefits and on the other hand a photo documentation of agricultural used land in various German regions. The following conclusions were achieved by the present comparisons and photo examples:

1. The actual system of CAP payments supports more
   - farms with low nature benefits instead of farms with high nature benefits
   - conventional farms instead of organic farms

2. As a consequence for farmers it is in a medium and long term view better to work more intensively, specialized and conventionally on their farms. This is not only due to a better income situation deriving from the products, but also due to the income deriving from CAP payments.

3. Farms with high nature benefits are disadvantaged.

4. There is a lot of, or even most of the utilised agricultural land which achieves high payments without any nature benefits and even with nature damage.

5. To support farmers, the public pays the money twice: firstly to support an intensive land use (with direct payments of Pillar I) and secondly – only in relatively small extent - with additional payments to some nature benefits (with Pillar II, agri-environment schemes or nature conservation by contracts). Both terms of payments are in conflict with each other.

6. There are several nature benefits which are not part of the Cross Compliance obligations or special law. Therefore, they are not sufficiently delivered by farmers for free or as normal by-products:

   - The conservation of agricultural land which has a high ecological value (High Nature Value farmland = HNV-farmland) e.g. species-rich grassland and species rich arable land, unploughed field margins, extensive production on poor grassland and preservation of wetland habitats etc..

   - An extensive use of grassland strips along water bodies.

   - The conservation of grassland on sensitive and species-rich habitats like boggy soils, wet meadows, slopes with high risk of erosion, HNV-farmland and species rich grassland

   - The conservation of margins and low intensity strips along hedges, forest edges and if necessary through parts of the field

   - The introduction of erosion control strips.

7. In order to solve the shown conflict between CAP payments and the nature benefits of farms, the Common Agricultural Policy has to be significantly reformed.

The presented study clearly shows that in the actual CAP system there are key elements missing for supporting a high nature value agriculture. Therefore, it is essential to link payments to the delivery of environmental priority areas and only to support those farmers who maintain and create ecologically valuable farmland.

5. Literature

Bundesanstalt für Landwirtschaft und Ernährung (BLE) (2009): Datenbank zum Abruf von Informationen zu den Empfängern der EU-Agrarfonds. Internetabruf unter http://www.agrar-fischerei-zahlungen.de/Suche im August 2009.

IFAB (2009): Fotos aus verschiedenen Regionen Deutschlands.

OPPERMANN, R., BRABAND, D. & HAACK, S. (2005): Naturindikatoren für die landwirtschaftliche Praxis.- Berichte über Landwirtschaft Band 83, S. 76-102.