

## **Environmental Behavior Related to the Socio-Economic Situation of Farmers: A Case Study in South East England, North Holland and South West Germany**

*Bareld van der Ploeg, Patrick Baudoux and Gottfried Häring*

### **Abstract**

This paper seeks to analyse socio-economic factors influencing farmers' environmental behaviour. The analysis is based on an international farm survey, especially on data from British, Dutch and German study areas. The principal analytical techniques used were scale-construction (scores for environmentally friendly and unfriendly behaviour) and inspection of tables in which these scores were related to socio-economic variables at farm level.

It appears that both unambiguous patterns of environmental behaviour (friendly or unfriendly) do not have an equal socio-economic background in every study area. However, the two other patterns (indifferent or compensatory) are each marked by a particular socio-economic background in all study areas. Farmers with indifferent behaviour, who will bring about neither environmental harm nor benefits, are mostly in a marginal position. On the other hand, farmers with a compensatory pattern (environmental harm and benefits) often are dynamic farm developers.

In general, one of the main conclusions from this survey is that the social and economic conditions under which farmers work have a major influence on attitudes towards environmentally integrated farming and patterns of farming. Attention is drawn also to the potential differences within rural areas and their effect upon farmers goals and farming styles.

### **Introduction**

Agricultural practices have an important influence on landscape and natural resources. This influence often reaches a level which threatens the sustainability of agricultural production at the farm level. This paper seeks to analyse socio-economic factors influencing farmers' environmental behaviour. The analysis is based on an international farm survey, especially on data from British, Dutch and German study areas. The principal analytical techniques used were scale-construction (scores for environmentally friendly and unfriendly behaviour) and inspection of tables in which these scores were related to socio-economic variables at the farm level. The two scores underlying four patterns of environmental behaviour are described in section 4. A conceptual inventory of socio-economic variables is presented in section 2.3.

The study areas are not representative for the different countries. The selected areas have outstanding environmental qualities which are threatened by conventional farming practices of development but which need continuation of (adjusted) farming as well. Sub-areas often

can be placed on a continuum running from optimal to marginal conditions for farming. The environmental and agricultural situation of the three study areas is described in section 3. The socio-economic background of the patterns of environmental behaviour is analysed in the sections 5 and 6. A full description of the agri-environmental situation can be found in the report of an international research project about sustainable landuse in which both authors are involved (KAULE ET AL., 1997).

## **Material and Methods**

### **Material**

This study is based on a farm survey carried out in different regions of the European Union during 1995/1996. In this paper, the focus will be put on the results for the study regions in Germany, Great Britain and the Netherlands. In Germany, the study regions are the Kraichgau and the Swabian Jura in Baden-Württemberg, in Great-Britain the North and South Downs in South East England, and in the Netherlands, Beemster and Waterland in North Holland. The principal focus of the survey was farm structure and development, farmer's background, land use and labour input, the farm business, conservation investment and behaviour, future plans and expectations. The sample in Baden-Württemberg involved 150 farms in the two study regions, in South East England 144 farms and in the Netherlands 168 farms.

### **Methods**

The analysis is guided by a conceptual model. The theoretical background of this model is sketched in 2.3. In qualitative field explorations in this study, the model can serve as a set of sensitizing concepts. In the quantitative analysis of survey data, the model can be interpreted in terms of variables of several orders (dependent, independent, intervening and mediating).

This paper analyses variations in farmers' environmental behaviour (dependant variable) in relation to farmers' socio-economic situation (in the model mentioned as intervening or mediating variables). In a previous analysis, we related farmers' goals (independent variable) and their socio-economic situation to participation in agri-environmental schemes (KAZENWADEL ET AL, 1996). Variations on environmental behaviour were found in four patterns of environmental behaviour: (1) unfriendly, (2) indifferent, (3) compensatory and (4) friendly. This was based on two scores. In the first score all indicators obtained through the survey about environmentally unfriendly farming practices or farm development were discounted. The second score was the friendly counterpart of this first score. In each country and for both scores a (almost) split half division was made between farmers with a high value and others with a low value-score. A combination of the two divisions resulted in four patterns of environmental behaviour. Farmers belonging to the indifferent pattern have low values on both scores. The compensatory pattern is marked by high values on both score (negative and positive). Both other patterns (friendly and unfriendly) are the logical complements of this.

To evaluate if farmers with different behaviours differ in their economic situation the results of the survey have been analysed statistically. For each study area the farms are divided into four groups following the conceptual model described above. Statistical tests are used to evaluate whether each group is significantly different from the other three groups concerning the tested parameters. For the survey data, a normal distribution cannot be assumed.

Therefore, for quantitative data the non-parametric *Mann-Whitney U test* is used. Qualitative parameters are evaluated by the *Pearson Chi-square test*.

### Conceptual model

The analysis of data was guided by the following conceptual model. In this model the variable to be explained (dependent variable) is called “farmers’ engagement in environmental integrated farming”.

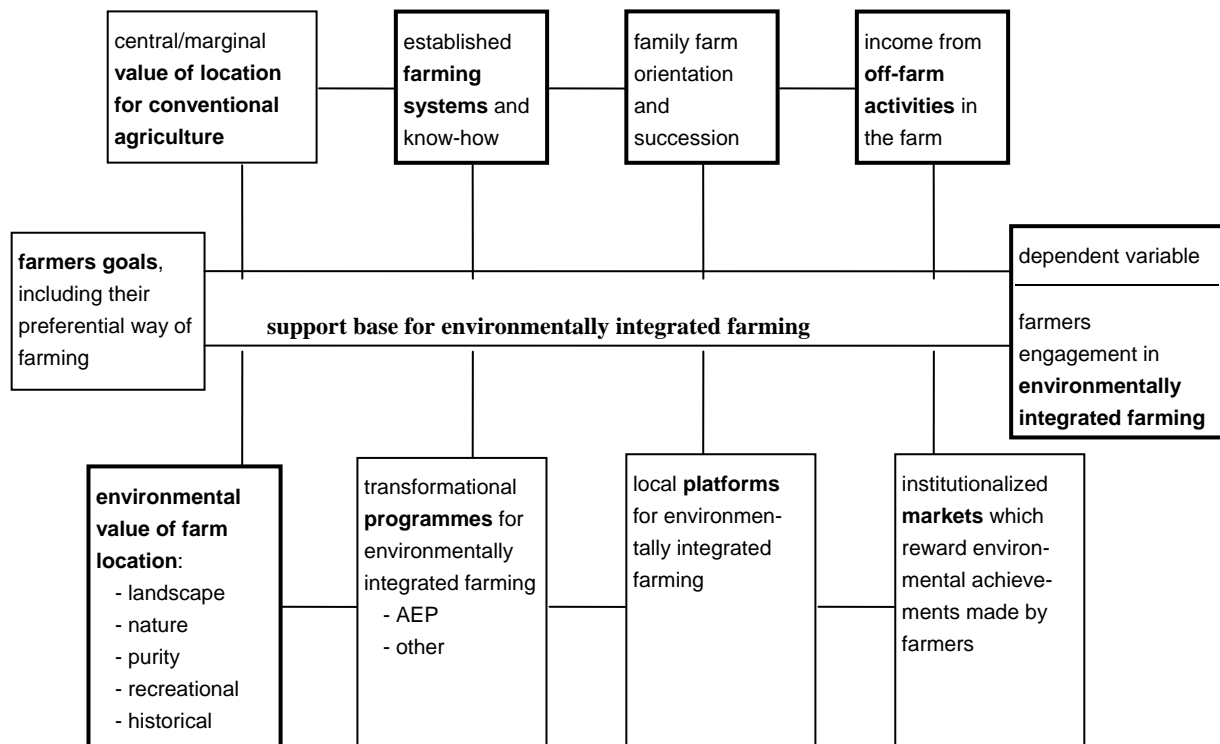


Figure 1. conceptual model of conditions which are relevant for farmers’ engagement in environmentally integrated farming

The central explaining variable (independent variable) is sought in farmers’ goals, including their preferential way of farming. This “independent variable” and its impact on environmental behaviour has been analysed by VAN DER PLOEG (1997)<sup>15</sup>. The bottom part of the model represents mediating or stimulating factors towards environmentally integrated farming. For this analysis the independent variables in bold print are the most relevant.

This paper will concentrate on factors for or against environmentally integrated farming which are mentioned on the top-part of the model. These categories can be read as an inventory of socio-economic “contingent conditions” to practices of environmentally integrated farming. The phrase “contingents conditions” is borrowed from DRUMMOND AND

<sup>15</sup> PLOEG, B. VAN DER (1997): Mentality groups in agriculture: Results of a survey in Germany (Baden-Württemberg, Great Britain (Kent/Sussex) and the Netherlands (North-Holland). Paper for the XVII congress of The European Society for Rural Sociology, August 1997

SYMES (1996). A whole of contingent conditions for specific forms of environmentally friendly behaviour might also be called a “niche” (see GRAY, 1996).

### The Study Regions – Environmental and Agricultural Situation

The first Baden-Württemberg study region is the Swabian Jura which is located at an altitude from 400 to 1000 m above sea-level. It has varied environmental conditions. In the most favourable areas, high yields in cereals and silage maize can be obtained. But there are also large areas where low-intensity grassland dominate. Preventing contamination of water is important here, because this region contributes greatly to the drinking water supply of central Baden-Württemberg. The Kraichgau is a region where natural conditions for arable farming are favourable. Cereals, sugar beet, maize, and oilseeds are grown. Most of the farms are arable. Often the intensity of production is high. Due to the hilly landscapes characteristic of the area, soil erosion is a major problem in the Kraichgau. In both areas traditional low intensity land use practices tend to be given up and therefore, the protection of species adapted to these practices plays an important role.

The Dutch sub-area Beemster is very homogeneous and offers very good conditions for arable and grassland farming. Goals in this region are the preservation of the cultural landscape and the protection of the surface water. Waterland is more heterogeneous. Its peat soils are mostly used for grassland farming (dairy, cattle and sheep). Bird protection and the degradation of the peat soils play an important role in this area.

Table 1. Characterisation of the study regions

	Baden-Württemberg		North Holland		South-East England
Study area	Kraichgau	Swabian Jura	Beemster	Waterland	North and South Downs
Conditions for arable farming	very good	bad to good	very good	bad	good
Conditions for grassland farming	bad to good	bad to good	very good	average	good
Main farm types	arable	dairy arable	dairy cattle/sheep arable	dairy cattle/sheep	arable
main environmental values/ problems	- erosion - species adapted to low intensity land use forms	- water protection - species adapted to low intensity land use forms	- cultural landscape - surface water	- bird protection - degradation of peat soils - economic marginalization - stimulation of multifunctional landuse	- cultural landscape - access - protection of chalk grassland

The North and the South Downs are situated in the South of London. Characterised by a steep scarp face and long sweeping slopes, the chalk downlands of the Downs are one of the richest wildlife habitats in England. Conditions for arable farming are quite good, but also low intensity sheep and beef farms do find considerable conditions.

### Different Behaviours of Farmers

Farming practices and farm development are the variables to be explained. A central sensitizing concept was: Environmentally Integrated Farming (EIF), for which the questionnaire contained a large number of indicators (e.g. planting or removing trees, reducing or increasing inputs, organic farming). In order to measure EIF two scores were calculated. The first score was based at positive indicators. The second score was based on negative indicators. The positive and negative scores were combined to derive four EIF-patterns:

EIF-Pattern	EIF-positive scores	EIF-negative scores
Environmentally unfriendly	low	high
Indifferent	low	low
Compensatory	high	high
Environmentally friendly	high	low

The distribution of farmers in the four EIF-patterns does not differ too much in the three study areas (Table). This is partly caused by the method of classification in which for each EIF-score and study area the discrimination level between “low and high” was set separately as near to the split half level as possible. However, the relative large number of farmers who demonstrate in each country the compensatory pattern does have a substantial meaning. There is a bias, possibly caused by general dynamism in farm development, to combine changes which are environmentally unfriendly with compensatory friendly changes or practices.

Table 2. Distribution of farmers of the three study areas in different EIF-patterns in %

		D	GB	NL
	group	N=150	N=126	N=167
Environmental unfriendly	1	24,7	24,6	21,0
Indifferent	2	24,0	20,6	22,8
Compensatory	3	30,0	38,9	33,5
Environmental friendly	4	21,3	15,9	22,8
Total		100,0	100,0	100,0

In the following chapter, economic differences of different behaviours of farmers are described separately for each country. Relevant in the point of view of economic differences are parameters such as the age, the farm size, ownership of the farmland, husbandry, income, debts and investments, but also the judgement of the current or the future economic situation of the farm.

### **Evaluation of Economic Differences of Different Groups of Farmers**

To get an overview of significant research results Table summarizes the differences between the four EIF-patterns in each country. Significant differences between groups are marked as positive or negative symbols. Whereas plus means “older”, “higher income”, “higher share” than the other group, etc., minus means the opposite. Empty cases, and same symbols show that there are no significant differences between the groups. Upper case numbers indicate that significance is only found for the group with the given number. At the end an appendix with the total of the research results is shown.

#### **Baden-Württemberg**

Environmentally unfriendly farmers: Unfriendly farmers keep more animals and have higher livestock density than indifferent or friendly farmers. In addition, these farmers seem to have a successor more often than the others. In any case, looking at the other researched parameters these farmers cannot be characterized as the opposite of friendly farmers.

Indifferent farmers: As to parameters affecting the income situation, the share of farmers with a high rate of non-agricultural income sources (off-farm work by respondent or other family members, pensions, tourism, investments, and others) is much higher in the group of indifferent farmers than in the other groups. On the other hand, fewer of them made considerable investments. Taking into account that indifferent farmers also have problems finding a successor and a significantly lower input of working hours per year, they could be seen as farmers with a low economic orientation in managing their farm. Compared to the very small differences in the average age of the farmers it cannot be argued that indifferent farmers are old farmers which will give up their farms in a couple of years.

Compensatory farmers: They have the largest farm size and keep more animals than the others. In addition, they have got the highest share of farmers with borrowed capital and considerable investments. The assumption that compensatory farmers have higher incomes or consider their economic situation to be better than the others cannot be confirmed: They have the same income classes, the same change in income and debts and they estimate the current and the future economic situation of the farm similarly to the other groups.

Environmentally friendly farmers: They keep fewer animals than unfriendly and compensatory farmers and they return a higher share of their income to eliminating their debts. Also they are older and they often do not have a successor. The consequence might be a future decrease of this behaviour pattern in the study region.

Table3 Significant differences between the four groups within the three study regions.

		Baden-Württemberg				North Holland				South East			
		1	2	3	4	1	2	3	4	1	2	3	4
Group													
N=		37	36	45	32	35	38	56	38	31	26	49	20
age of the farmer	years			-	+		+	-	+				
farm land	ha	+ <sup>2</sup>	- <sup>3</sup>	+	-	+	-	+	+	-	- <sup>3</sup>	+	+ <sup>1</sup>
own area	ha		-	+		+	-	+ <sup>2</sup>	- <sup>1</sup>	-	-	+	-
own area	%		+	-		+	+		-			+	-
rented land	ha	+	-	+	+	- <sup>4</sup>	-	+ <sup>2</sup>	+	-	-		+
Livestock units per farm	LU	+ <sup>2</sup>	-	+	- <sup>3</sup>	+ <sup>2</sup>	-	++ <sup>24</sup>	+	-	-		+
Livestock density	LU/ha	+	-	+ <sup>2</sup>	- <sup>1</sup>	+		+	-				
non-agricultural income sources	%	-	+	-		-	+	-	-				
Family labour	units		-	+	+	+	-	+					
farms with considerable debts	%	-	-	+		+	-	+	-				
farms with investments > 10.000 ECU	%	+	-	+		+	--	+	-	-	-	+	-
household income	%									-	+		
income changes	%												
share of income to decrease debts	%	-	-	+	+	+	-	+					
changes in the debt rate	%									-	+		
current econ. situation of the farm	%					+	-	-	-				
future econ. situation of the farm	%					+	-		-				
successor	%		-	+	-	+	-	+	-		-	+	+
farm type**	%					D>A	BS>	D>B	BS>				
						>BS	D>H	S <sup>12</sup>	D <sup>1</sup>				
							O <sup>13</sup>						

\* Group 1: environmental unfriendly farmer

Group 2: indifferent farmer

Group 3: compensatory farmer

Group 4: environmental friendly farmer

\*\*D: Dairy farms; A: Arable farms; BS: Beef and Sheep farms; Ho: Horticulture farms

## North Holland

The general impression of the Dutch case is that the four groups of farmers differ much more than those in Baden-Württemberg or in South East England when considering economic parameters.

Environmentally unfriendly farmers estimate their economic situation to be better than the others, in general it is seen as fair (unfriendly: as good). Furthermore, the future of the economic situation is always considered to be slightly worse than the current situation. But however, unfriendly farmers consider the future situation to be better than their colleagues. The hypothesis that their income also is higher cannot be confirmed. The given differences are not significant. Unfriendly farmers are found mostly in the intensive farming types: arable farming and dairy farming.

Indifferent farmers have the same socio-economic background as those in Baden-Württemberg. They farm small farms, keep fewer animals than the others, and additional income sources are rather important. Furthermore, they work less on their farm and more than 50% of them do not have a successor. The share of farms with considerable debts or investments is lower than in the other groups. In addition, indifferent farmers often have low intensity livestock farms. Analysing the total of the given differences in the examined parameters it seems that - comparable to Baden-Württemberg - indifferent farmers differ much more from the other groups than do the others.

It seems that compensatory farmers do not differ from unfriendly farmers. In most of the parameters no differences can be detected although the judgement of the current economic situation is considered worse than in the case of unfriendly farmers. On the other hand, successors do not seem to be a problem.

Environmentally friendly farmers have dairies and low intensity livestock farms. They have a smaller proportion of rented land and they have a high rate of non-successors. This may be interpreted as a sign for a possible future development in North Holland.

### **South East England**

In the Downs, only farmers of relatively large farms were interviewed. The regional average is much lower. But within the sample it seems that economic differences between the different attitudes are much smaller than in Baden-Württemberg or North Holland. Especially the parameters age, livestock units per ha farmland, non-agricultural income sources, labour and the general economic situation do not differ much between the groups.

Environmentally unfriendly farmers have smaller farms than compensatory and friendly farmers. Considerable investments are rather low and therefore, the share of farms with borrowed capital has decreased in the last five years. Although the income situation is worse than for indifferent farmers, they do not have their severe successor problems.

Compensatory farmers run rather large farms (average: 404 ha), have the highest share of farmers with investments, often consider their current economic situation as very good or good and farmers think that in the future they will have a successor for the farm. The share of compensatory farmers that have made considerable investments (> 10,000 ECU) is higher than the share of the others. In general, the share of investing farms corresponds well with the average farm size of the groups. The larger the farms, the higher the share of farms with considerable investments.



Indifferent farmers are the opposite: They have smaller farms with few animals. As in North-Holland and Baden-Württemberg they often have no successor.

Environmentally friendly farmers have large farms with more animals per farm than unfriendly or indifferent farmers. Furthermore, parameters as to investments and debts are average and these farms often have a successor, which is different to the other research regions.

### **Comparison of the results of the different groups and regions**

This analysis demonstrates that economic conditions vary widely between regions and between different behaviours of farmers. Main differences that have been found between the study regions can be explained by the different natural and social conditions. They led to the given farm structure, farm sizes and often also to the given livestock density and to the proportion of rented land. But there are also regional differences that cannot be explained so easily: The household income is higher and grew more in the Downs than in Baden-Württemberg. In North Holland it is the smallest. The same gradient from GB to BW to NL can be found for payment rates of debts, changes in the debt rate and the estimation of the current and future economic situation of the farms. Farmers in the Downs always seem to have the best economic background. The worse conditions are found in North Holland (certainly Beemster and Waterland have to be distinguished here). The situation of a successor for the farm seems to be best in GB, then in NL and at worst in BW. Perhaps this is due to the fact that the interviewed farmers in the Downs are older than the others.

Referring to Table 3 some “general tendencies” with regard to the socio-economic background of environmental behaviour appear for two patterns. These patterns are environmental ambiguous patterns (indifferent, compensatory). Both other patterns (unfriendly, friendly) do not have comparable socio-economic backgrounds in different countries. This applies mostly to the friendly pattern of environmental behaviour.

The indifferent pattern (neither environmental harm nor benefits) has a socio-economic background of farming on small holdings without successors and with few investments. This applies to each of the three study areas. In the German and Dutch study areas, the indifferent pattern appears to be contingent with farm families gaining a large share of income from sources outside agricultural production as well. Generally, these external incomes -including subsidies from environmental schemes- are introduced in a context of winding down or await farm strategies rather than in those of development strategies (with investments) or survival strategies (with farm succession).

On the other hand the compensatory pattern (environmental harm and benefits as well) has a background of farming on larger holdings often with a successor and many investments made during the past ten years. This applies to each of the three study areas. In the German and Dutch study areas, this compensatory pattern shows a negative correlation with non agricultural income for the farm family. This may mean that the desire for additional income is not the farmers’ primary motivation to engage in environmentally friendly actions. More important encouragement might be cost reduction (esp. less fertilizer or chemicals), schemes payment, intrinsic or expressive motivations (including feelings of responsibility), social motivations (including reputation management) or the need to confirm to legal and contractual obligations (e.g. investments in manure disposal).

In the German and Dutch study areas, the unfriendly pattern (environmental harm without compensatory benefits) has equal socio-economic backgrounds compared to the compensatory pattern (larger farms, full-time farmers with successors, investments, (pm: also livestock density). The farm families with this unfriendly pattern in general have a high degree of specialization in agricultural production: external sources of income are relatively unimportant. The socio-economic background in the unfriendly pattern in the British study area is quite different from the background in the German and the Dutch study area. In the British study area the socio-economic background in the unfriendly pattern is much more alike as compared to the background in the indifferent pattern (small farm, no successors, few investments).

The background in the friendly pattern (environmental benefits without harm) is quite different in study areas in different countries. In the German study area, the background is the same compared to the background in the indifferent pattern (small farms, few successors, few investments). In the Dutch study area, many of the farmers with the friendly pattern are relatively young and they often farm on more land compared to most other farmers but in general, they are rather pessimistic about the future of their farm. In general, these Dutch farmers have a large share of rented land, often from owners (government or conservation organisations) who offer only renting contracts with strong environmental constraints to farming. The British study shows a socio-economic background in the friendly pattern which is quite different from the background in the German study area but which resembles the findings in the Dutch study area. British farmers with this pattern are often large farmers who in many cases have a successor but who in general made few investments.

## Conclusions

The most significant results suggest, that the socio-economic situation of farmers with different behaviours vary widely in different study regions. This means that it is not possible to detect clear structures for different behaviours within regions. Inspecting the agriculture of different regions it cannot be said that the behaviour of the farmer defines the farm or the economic background or v.v. On the contrary, attention is needed for the possible heterogeneity of rural areas with regard to farmers' farming styles.

As a general impression, it might be concluded that farmers meet extreme difficulties to combine a dynamic course of farm development with a friendly pattern of environmental behaviour. In the best case, these dynamic farmers belong to the compensatory pattern. However, also winding down farm strategies may have negative environmental consequences. In general, a winding down strategy can easily be combined with the friendly pattern of environmental behaviour, especially in cases in which such strategies involve a reduction of stock density. Stand still strategies can most easily be combined with the indifferent pattern. If these stand still strategies occur on a low level of intensity concerning land use, they can coincide with high environmental qualities (esp. biodiversity). In the long run, the critical point can be the weak economic sustainability of such static low intensity farming systems, especially in marginal agricultural areas.

In the German and Dutch study areas, the sub areas were placed on a ordinal scale running from marginal to optimal circumstances for (conventional) agricultural production. In both countries the most marginal sub areas have relatively large numbers of farmers who adhere to the friendly pattern. The most optimal sub areas have relatively large numbers of farmers who

adhere to the unfriendly pattern (Dutch study area) or to the compensatory pattern (German study area). The sub area in Holland which is neither optimal nor marginal has a relatively large number of farmers who adhere to the compensatory pattern.

Patterns of environmental behaviour differ largely for both British study areas. In North Downs, many farmers adhere to the compensatory pattern. In South Downs, many more farmers belong to the friendly and indifferent pattern as compared to the North Downs.

It seems that in the future environmental friendly behaviour will decrease and will only last in non-economic orientated types of farms. Indifferent farmers will also decrease as they usually have no successor. On the other hand, for profit orientated farmers (especially in the compensatory pattern) it gets harder and harder to show environmentally friendly behaviour.

A main conclusion for agri-environmental policy makers will be that they should take into account the different living-conditions of farmers. They should create conditions for all farmers to adapt environmentally friendly farming practices. To support farm stability in the long run compensation payments to endure environmental friendly farming and to extend the positive behaviour of compensatory farmers might be a better way than imposing prohibitions. Environmentally unfriendly farmers and partly indifferent farmers are a problem. Unique compensation will not lead to the expected behaviour. Changing their habits has to be attained by imposing prohibitions.

### References

- Drummond, I. and D. Symes (1996): Rethinking Sustainable Fisheries : The Realistic Paradigm. In: *Sociologica Rurales, Volume 36-2*.
- Giddens, A. (1984): The Constitution of Society : Outline of the Theory of Structuration, Cambridge.
- Gray, J. (1996): Cultivating Farm Life at the Borders : Scottish Hill Sheep Farms and the European Community, *Sociologia Rurales, Volume 36-1: 27-50*.
- Kazenwadel, G.; van der Ploeg, B.; Baudoux, P.; Häring, G. (1996): Sociological and economic factors influencing farmers' participation in agri-environmental schemes. In: Workshop on "Landscape and Nature Conservation", vom 26.-29. September 1996 in Stuttgart Hohenheim; EU concerted action AIR 3-CT93-1164, 238 S.
- Kaule, G. et al. (1997): Regional Guidelines to Support Sustainable Landuse by E.U. Agri-Environmental Programmes (AEP), Stuttgart, draft.
- Also: [http://www.ilpoe.uni-stuttgart.de/ilpoe/EU\\_HOME1.html](http://www.ilpoe.uni-stuttgart.de/ilpoe/EU_HOME1.html)
- Romer, P. (1994): The Origins of Endogenous Growth, *Journal of Economic perspectives, 8, 1: 3-22*.
- Ruttan, V.W. (1996): What Happened to Technology Adoption-Diffusion Research, *Sociologica Rurales 36: 51-73*.
- Sachs, L. (1988) Statistische Methoden : Planung und Auswertung, Berlin.
- Ploeg, B. van der (1997): Mentality groups in agriculture: Results of a survey in Germany (Baden-Württemberg, Great Britain (Kent/Sussex) and the Netherlands (North-Holland). Paper for the XVII congress of The European Society for Rural Sociology, August 1997.
- Ploeg, J.D. Van der and A. Long (1994): Born from Within : Practice and Perspectives of Endogenous rural Development, Assen.
- Zey, M (ed.) (1992): Decision Making : Alternatives to Rational Choice Model, London.

Table 4. Complete results of Baden-Württemberg, North Holland and South East England

		BADEN-WÜRTTEMBERG								NORTH HOLLAND								SOUTH EAST ENGLAND							
		Unfriendly (N = 37)		Indifferent (N = 36)		Compensatory (N = 45)		Friendly (N = 32)		Unfriendly (N = 35)		Indifferent (N = 38)		Compensatory (N = 56)		Friendly (N = 38)		Unfriendly (N = 31)		Indifferent (N = 26)		Compensatory (N = 49)		Friendly (N = 20)	
		Av.	sign.	Av.	sign.	Av.	sign.	Av.	sign.	Av.	sign.	Av.	sign.	Av.	sign.	Av.	sign.	Av.	sign.	Av.	sign.	Av.	sign.	Av.	sign.
age of the farmer	Years	46,9		48,4		44,3	*4	49,2	*3	48,1		53,7	*3	46,5	*2,4	53,7	*3	53,0		54,1		49,5		49,2	
farm land	ha	34,7	*2	19,3	*1,3	39,0	*2,4	26,8	*3	34,4	*2	14,1	*1,3,4	36,0	*2	30,7	*2	200,3	*3,4	258,7	*3	403,6	*1,2	314,6	*1
own area	ha	18,4		13,7	*3	21,0	*2	16,1		24,2	*2,4	9,5	*1,3	20,1	*2	13,2	*1	94,2	*3	99,1	*3	222,6	*1,2,4	96,5	*3
own area	%	70,5		78,5	*3	63,1	*2	67,6		65,8	*4	64,2	*4	62,4		49,8	*1,2	49,8		45,1		55,4	*4	28,0	*3
rented land (long time)	ha	31,8	*2	4,2	*1,3,4	15,9	*2	8,6	*2	6,7	*4	3,0	*3,4	11,3	*2	13,8	*1,2	87,5	*4	90,4	*4	118,8		174,6	*1,2
Livestock units per farm	LU	31,1	*2	13,5	*1,3	38,3	*2,4	21,6	*3	55,8	*2	26,4	*1,3,4	65,8	*2,4	45,3	*2,3	123,1	*4	107,5	*4	160,8		186,3	*1,2
Livestock density	LU/ha	0,93	*2,4	0,65	*1,3	0,89	*2	0,66	*1	1,89	*4	2,09		1,90	*4	1,37	*1,3	0,52		0,55		0,47		0,63	
non-agricultural income	%	44,5	*2	69,4	*1,3	44,6	*2	56,8		25,1	*2	54,7	*1,3,4	30,1	*2	30,7	*2	31,0		24,9		23,3		20,6	
Family labour	units	1,4		1,1	*3,4	1,7	*2	1,7	*2	1,3	*2	0,7	*1,3	1,2	*2	1,0		1,3		1,2		1,7		1,8	
farms with consid. debts	%	48,5	*3	48,5	*3	73,3	*1,2	53,1		77,1	*2,4	51,4	*1,3	75,0	*2,4	55,3	*1,3	48,4		46,2		61,7		55,0	
farms with investments	%	76,5	*2	48,6	*1,3	82,2	*2	71,9		94,3	*2,4	44,7	*1,3,4	91,1	*2,4	73,7	*1,2,3	67,7	*3	65,4	*3	98,0	*1,2,4	85,0	*3
Household income	N =	31		31		43		31		34		30		53		35		28	*2	23	*1	43		19	
<= 16.000 ECU	%	29,0		29,0		18,6		29,0		41,2		40,0		39,6		40,0		21,4		17,4		20,9		10,5	
16 - 32.000 ECU	%	48,4		41,9		48,8		38,7		35,3		60,0		35,8		51,4		57,1		26,1		32,6		57,9	
32 - 48.000 ECU	%	22,6		19,4		20,9		25,8		20,6		0,0		18,9		8,6		10,7		26,1		25,6		31,6	
48 - 64.000 ECU	%	0,0		6,5		7,0		3,2		2,9		0,0		3,8		0,0		7,1		4,3		7,0		0,0	
> 64.000 ECU	%	0,0		3,2		4,7		3,2		0,0		0,0		1,9		0,0		3,6		26,1		14,0		0,0	
		BADEN-WÜRTTEMBERG								NORTH HOLLAND								SOUTH EAST ENGLAND							

		Unfriendly (N = 37)				Indifferent (N = 36)				Compensatory (N = 45)				Friendly (N = 32)				Unfriendly (N = 35)		Indifferent (N = 38)		Compensatory (N = 56)		Friendly (N = 38)		Unfriendly (N = 31)		Indifferent (N = 26)		Compensatory (N = 49)		Friendly (N = 20)		
		Av.	sign.	Av.	sign.	Av.	sign.	Av.	sign.	Av.	sign.	Av.	sign.	Av.	sign.	Av.	sign.	Av.	sign.	Av.	sign.	Av.	sign.	Av.	sign.	Av.	sign.	Av.	sign.	Av.	sign.	Av.	sign.	
income changes	N =	33		33		44		32		33		37		56		37		31		25		48		19										
increased a lot	%	9,1		6,1		2,3		3,1		9,1		0,0		5,4		2,7		32,3		28,0		27,1		31,6										
increased slightly	%	21,2		33,3		25,0		25,0		15,2		16,2		14,3		5,4		25,8		20,0		33,3		15,8										
stayed the same	%	33,3		36,4		25,0		46,9		39,4		37,8		33,9		40,5		32,3		28,0		35,4		47,4										
decreased slightly	%	30,3		15,2		34,1		18,8		27,3		32,4		32,1		32,4		6,5		8,0		4,2		5,3										
decreased a lot	%	6,1		9,1		13,6		6,3		9,1		13,5		14,3		18,9		3,2		16,0		0,0		0,0										
share of income to decrease debts	N =	23	*3,4	19	*3,4	32	*1,2	19	*1,2	25	*2	17	*1,3	41	*2	18		31		26		45		19										
nothing	%	39,1		42,1		9,4		10,5		4,0		0,0		0,0		0,0		71,0		57,7		68,9		68,4										
< 25%	%	47,8		42,1		53,1		42,1		28,0		58,8		29,3		50,0		25,8		38,5		28,9		31,6										
25% to 50%	%	13,0		15,8		28,1		31,6		36,0		41,2		36,6		27,8		0,0		3,8		2,2		0,0										
50% to 75%	%	0,0		0,0		9,4		15,8		20,0		0,0		19,5		22,2		3,2		0,0		0,0		0,0										
> 75%	%	0,0		0,0		0,0		0,0		12,0		0,0		14,6		0,0		0,0		0,0		0,0		0,0										
changes in debt rate	N =	33		31		45		32		33		36		56		38		31	*2	25	*1	48		19										
increased a lot	%	3,0		6,5		17,8		12,5		36,4		11,1		28,6		7,9		3,2		0,0		10,4		10,5										
increased slightly	%	12,1		16,1		17,8		15,6		15,2		8,3		12,5		18,4		3,2		8,0		8,3		0,0										
stayed the same	%	60,6		58,1		37,8		53,1		18,2		61,1		37,5		50,0		29,0		60,0		39,6		31,6										
decreased slightly	%	18,2		12,9		24,4		15,6		30,3		16,7		17,9		15,8		19,4		8,0		10,4		31,6										
decreased a lot	%	6,1		6,5		2,2		3,1		0,0		2,8		3,6		7,9		45,2		24,0		31,3		26,3										

BADEN-WÜRTTEMBERG				NORTH HOLLAND				SOUTH EAST ENGLAND			
Unfriendly (N = 37)	Indifferent (N = 36)	Compensatory (N = 45)	Friendly (N = 32)	Unfriendly (N = 35)	Indifferent (N = 38)	Compensatory (N = 56)	Friendly (N = 38)	Unfriendly (N = 31)	Indifferent (N = 26)	Compensatory (N = 49)	Friendly (N = 20)

		Av.	sign.	Av.	sign.	Av.	sign.	Av.	sign.	Av.	sign.	Av.	sign.	Av.	sign.	Av.	sign.	Av.	sign.	Av.	sign.				
current ec. sit. of the farm	N =	34		34		45		32		35	*2,3,4	32	*1	55	*1	36	*1	30		26		49		20	
very good	%	0,0		2,9		0,0		0,0		2,9		0,0		3,6		2,8		13,3		7,7		24,5		15,0	
good	%	17,6		11,8		20,0		18,8		68,6		25,0		38,2		25,0		46,7		53,8		49,0		65,0	
fair	%	52,9		50,0		35,6		37,5		25,7		59,4		43,6		58,3		36,7		34,6		24,5		15,0	
bad	%	26,5		32,4		31,1		37,5		2,9		15,6		10,9		11,1		0,0		3,8		0,0		5,0	
very bad	%	2,9		2,9		13,3		6,3		0,0		0,0		3,6		2,8		3,3		0,0		2,0		0,0	
future ec. sit. of the farm	N =	33		31		43		31		35	*2,4	32	*1	55		36	*1	25		26		44		20	
very good	%	0,0		3,2		0,0		0,0		0,0		0,0		0,0		0,0		8,0		0,0		2,3		0,0	
good	%	15,2		9,7		18,6		0,0		48,6		25,0		34,5		16,7		32,0		30,8		34,1		25,0	
fair	%	30,3		32,3		27,9		41,9		48,6		50,0		49,1		61,1		56,0		61,5		59,1		75,0	
bad	%	48,5		41,9		37,2		41,9		2,9		21,9		14,5		19,4		4,0		7,7		4,5		0,0	
very bad	%	6,1		12,9		16,3		16,1		0,0		3,1		1,8		2,8		0,0		0,0		0,0		0,0	
successor situation	N =	34		34	*3	44	*2,4	29	*3	35	*2,4	38	*1,3	56	*2,4	38	*1,3	30		26	*3,4	47	*2	19	*2
sure	%	17,6		11,8		18,2		10,3		37,1		13,2		28,6		18,4		33,3		23,1		31,9		31,6	
no successor	%	11,8		35,3		6,8		6,9		14,3		52,6		26,8		57,9		13,3		26,9		12,8		10,5	
too early to know	%	52,9		32,4		63,6		41,4		37,1		28,9		42,9		15,8		43,3		19,2		46,8		52,6	
uncertain	%	17,6		20,6		11,4		41,4		11,4		5,3		1,8		7,9		10,0		30,8		8,5		5,3	
farm type (significance)	N =	37		36		45		32		35	*2,3,4	38	*1,3	56	*1,2	37	*1	31		26		49		20	

significant for  $\alpha = 0,05$