

# LIVELIHOOD STRATEGIES ON DANISH ORGANIC FARMS AND THEIR CONTRIBUTION TO FARM BASED RURAL DEVELOPMENT

Pia Frederiksen (1) Vibeke Langer (2)

(1) Department of Policy Analysis, National Environmental Research Institute, P.O. Box 358, DK- 4000 Roskilde, Denmark. [pfr@dmu.dk](mailto:pfr@dmu.dk)

(2) Department of Agricultural Science, the Royal Veterinary and Agricultural University, Agrovej 10, DK-2630 Taastrup, Denmark. [vl@kvl.dk](mailto:vl@kvl.dk)

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## Abstract

Household livelihood strategies among Danish organic farmers are identified using combinations of off-farm income levels, time used for farming, and farm size. This is based on interviews carried out in 2002 with 10 % of the Danish organic farmers representing the national distribution of organic farm types as well as major landscape systems. The relationship between these strategies and farm-based rural development is investigated in terms of engagement in other farm-based activities and landscape management, and it is discussed how different strategies may be interpreted and the questions it raises to the further development of the organic farming.

## Introduction

Agricultural restructuring takes place all over Europe. Economies of scale still force a change towards larger farms, but the Common Agricultural Policy of the European Union is in a process of changing the subsidy structures from production support to area support. The share of the budget allocated to Rural Development support schemes in favour of environmentally friendly land use and on-farm diversification among other, is increasing as a consequence of this shift. These developments broaden the possible development pathways that an agricultural enterprise may take and enhance the options for seeking alternatives to the agricultural industrialisation (Ilbery and Bowler, 1998; Kelly and Ilbery, 1995).

The choice of conversion to organic production may be viewed as one development pathway – a recombination of farm resources for value added agricultural products (Van der Ploeg, et al. 2004). Organic farming is, however, not a single strategy but may be combined with other development strains. This paper describes the diversity among organic farming households in terms of human resource use for farm production, off-farm work and other farm-based activities (OFA). The aim is to show that organic farming in Denmark is in itself composed of a variety of resource allocation strategies, and to assess if these strategies have any implications for issues related to organic farming development and to societal objectives for rural development, such as nature management, on-farm diversification and depopulation of the countryside.

## Background

The development pathways that farm households may take within the changing political economic context have been discussed by Ilbery and Bowler (1998). Based on earlier studies they identified 6 different pathways: Continuation of the traditional industrial model of farm business development, agricultural or structural diversification, redeployment of human resources into off-farm occupation, extensification with reduced capital input, or semi-retirement as hobby or part time farmers. Within the perspective of rural development, which has attracted increased attention in recent years, Van der Ploeg *et al.*(2004) describe farm based rural development by in terms of three processes, which are in several ways related to the developments pathways described by Ilbery and Bowler, by focussing on: *deepening* of activities (more value added pr unit of product) encompassing on-farm processing and high

quality production; *broadening* of activities (structural diversification) including non-agricultural farm-based activities such as agri-tourism, nature- and landscape management. The third is *re-grounding* – mobilising resources through e.g. farming economically or off-farm incomes. A large number of studies have provided evidence of the diversity of farms and livelihood- and production strategies in Europe (e.g de Vries 1993, Jervell 1999, Eikeland 1999, McNally 2001, Djurfeldt *et al.* 2002, Walford 2003, Meert 2005), demonstrating that understanding diversification of farm household activities is important when describing and analysing agricultural change.

In the context of organic farming, high farm diversity has traditionally referred to a mixed production where different land use branches complemented each other on the farm, aiming at an internal ecological balance (see review: Raupp, 2000). Reality is, that a majority of organic farms in Denmark are highly specialised (Langer, 2002; Frederiksen and Langer 2004), but exhibit various other types of diversity, including a range of non-agricultural income activities – both on and off the farm. It is, however, not known if this diversity supports other dimensions of sustainable agriculture – such as economical and environmental sustainability - and thereby which role organic farms play in relation to societal goals of rural development, and internal goals of developing the organic farming itself.

The concepts and approaches to study these aspects are not always totally clear, which may confuse discussions of resource use. The diversification of core farming business has long been conceptualised as pluriactivity – meaning the combination of agricultural with other economic activity (Fuller, 1990). The concept of pluriactivity is however sometimes reserved for off-farm income (Kinsella *et al.*, 2000), while non-agricultural farm based activities may be termed structural diversification or alternative farm enterprises (Ilbery and Bowler, 1998; Evans and Ilbery, 1993). Part-time farming is another conceptual entrance to this issue, but as Evans notes (*ibid.*) it is not always clear, whether part-time farming implies the existence of off-farm incomes or only characterises the extent of agricultural human resource use. Moreover, it may be unclear if all persons contributing working hours have been taken into account or only the farmer's activities have been considered. Another aspect is if the focus is on the farming household or on the farmer. Some studies do not differentiate the role of the spouse in the development of pluriactive farms, and pluriactivity may be defined as the participation of either spouse or farmer in off-farm activities. Thus a farmer may work full-time on the farm but still be living on a pluriactive farm. On the other hand it has been argued that the off-farm work of the spouse should be seen as the agricultural version of the general development of the dual-income households (Jervell, 1999), helped by the mechanisation of farm work, and that this may have implications for the household decision making on farm issues. Thus it may be important to make a distinction between the role of farmer and spouse in pluriactive strategies, as well as a distinction between part-time farms as a characterisation of the input of human resources (time) on the farm, or as the farmer's engagement in off-farm work.

The approach taken here is based on a wish to focus on the strategies employed by the household level and the differentiation of resource use to different kinds of activities. One way to do this is to use livelihood strategies as an analytical approach. The concept of livelihood strategies has mostly been applied in a development context, focussing on sustainable rural livelihoods (Bryceson, 1999). In a developed world context, Kinsella *et al.* (2000) have demonstrated its use as an analytical framework for identification of pluriactive strategies and their rationality in Ireland. Livelihood strategies are here used in the sense of “patterns of behaviour that has already taken place” (Fuller, 2004), and not as strategically planned pathways. Using this framework allows a focus on the household more than on the farm operator as well as on the patterns of resource allocation to farming, other farm based and off-farm activities.

## Data and Methods

Data on farming households, background and history on farm, and resource use for farming, off-farm activities and other farm-based activities were collected through quantitative interviews. Moreover farmers were asked to draw all landscape elements (hedgerows, wildlife habitats and ponds, etc) on a farm map, and recent changes in these were recorded. Respondents estimated time used for agricultural and non-agricultural farm-based activities for farmer, spouse, relatives and assistants in classes of less than 10 hours/week, 10-20 hours/week, 20-36 hours/week and 37 hours and above/week on average. The interviews were carried out in 2002 in 11 case-areas, within which all organic farmers were approached (response rate: 75%). A total of 347 farmers were interviewed and 341 subsequently included in the analyses. These farms covered approximately 10% of all organic farmers in Denmark and represented the national distribution of farm types. The case areas represented major landscape types of Denmark and areas with a relatively high density of organic farms.

Farms were grouped according to time used for farming pr person. This categorisation was based on the definition that farms on which no person used more than 10 hours pr week were hobby farms. Likewise that farms on which no person worked full time were part time farms. Full time farms were subdivided according to number of persons working full time on the farm. The workload of all contributors was estimated in 4 classes based on this principle, as shown in table 1.

Table 1: Groups of farms based on pattern of time-use for agricultural activities

<b>Agricultural type:</b>		<b>Workload:</b>
Hobby farms		Less than 10 hours pr week and person
Part time farms		Between 10 and 37 hours pr week and person
Full time farms	Single full time farms	37 hours or more pr week – one person
	Double full time farms	37 hours or more pr week - 2 or more persons

Farms were subsequently grouped into 6 levels of off-farm work based on combinations of the farmer's and the spouse's off-farm activity. The off-farm income level of the farmer was defined at three levels: main income, minor income or no income. These three groups were again subdivided according to the spouse's off-farm workload divided into high (full or part time off-farm job), and low (minor or no off-farm work). See table 2:

Table 2: Off-farm categories

<b>Off farm level:</b>	<b>Farmer's income from off-farm work</b>	<b>Spouse level of off-farm work</b>
Farmer major/spouse major: <b>FmajSmaj</b>	main part of income	full or part time
Farmer major/spouse minor: <b>FmajSmin</b>	main part of income	minor or none
Farmer minor/spouse major: <b>FminSmaj</b>	minor share of income	full or part time
Farmer minor/spouse minor: <b>FminSmin</b>	minor share of income	minor or none
Farmer no/spouse major: <b>FnoSmaj</b>	no off-farm income	full or part time
Farmer no/spouse minor: <b>FnoSmin</b>	no off-farm income	minor or none

A classification combining human resource use for agricultural activities (agricultural type) and off-farm activities was used as an approach to identify groups of similar use of human resources.

It was subsequently explored if these groups had any implications for the up-take of other farm-based activities and landscape management on the farm.

For this purpose other farm-based activities (OFAs) were grouped into four groups:

- farming related: farm shops, processing of farm produce, direct sale or running a machine pool
- land related: farm tourism, leasing of hunting rights, riding schools and horse pensions
- profession related: crafts, business on farm, paid childcare,
- Other: sale of energy (windmills), let out of buildings

The respondent also estimated the time used and the economic importance of these activities. Economic importance was divided into none, little, some and major, while time use was estimated in the same categories as for agricultural activity.

The density of landscape elements were estimated and the management was investigated by estimating the density of young elements (less than 5 years old) and old elements (more than 30 years old) – arguing that the non-removal of old elements may also be viewed as a result of management decisions.

Development in farm size from 2001 to 2004 was followed using registry data from 2004 which was available for 269 of the 340 farms. The size of the farms was compared to the 2001 size, and change classes established for comparison.

## Results

The first part of the analysis concerns the identification of groups of farms with similar strategies of resource use, based on human resource allocation to off-farm and agricultural activities. The second part of the analysis explores if the strategies identified have any implications for the landscape management and the up-take of other farm-based activities. Moreover if the development of farm sizes in the period from 2001 to 2004 was different in these groups.

### Resource use on farms

On 44% of the farms both the farmer and the wife drew the main income from off-farm work. On additional 10% of the farms, off-farm income was the farmers' main income source, while the spouses had no or little off-farm activity. This means that a total of 54% of the organic farms in 2001 was managed by a farmer who drew the main income outside the farm business. 45% of the farms were managed by the remaining four groups of farms on which farmers had no or minor off-farm incomes and spouses varied. (See fig. 1)

39% of the farms were full-time farms, while part-time farms and hobby farms made up 31% each. The full time farms were sub-divided in two groups: the double full time farms, where 2 or more persons worked full time on the farm (15%), and the single full time farms, where one person worked full time (24%). The time allocation to farm work by spouses was surprisingly low – typically less than 10 hours pr week, except for the traditional family farms on which farmer and spouse both worked full time on the farm. One third of the double full time farms (5% of total) were family farms. Figure 2 shows the percentage of farms with different allocation of time to agricultural activity, and the contribution of spouses to this.

While the size of farms were significantly different between the 4 groups of farms with increasing agricultural resource use ( $p<0.0001$ ), a significant difference in size among groups with different off-farm levels ( $p<0.01$ ) was only found between the two groups, where the farmer drew the main income from outside the farm, and the four groups in which the farmer had no or minor off-farm incomes. Thus it seems that the off-farm engagement of the spouse is not closely connected to farm size. This is reasonable, as spouses do not in general use much time on farming activities.

Fig 1: 340 farms categorised according to levels of off-farm work in 2001 (legend, see table 1)

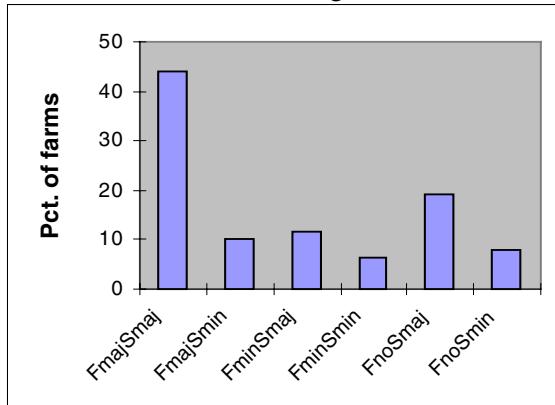
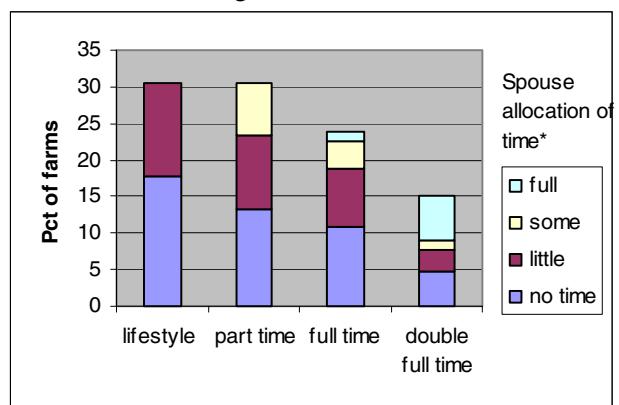


Fig 2: 340 farms categorised according to the resources used for agricultural activities in 2001



\* Little time is less than 10 hours/week, while some time is more than 10 hours but less than 37 hours/week

Based on these analyses, the 6 off-farm levels were reduced to two: the farmer having main income from off-farm work and the farmer having no or minor income from off-farm work. The subgroup of family farms was however kept in mind.

A division in livelihood strategies based on agricultural type, off-farm level and farm size was produced and is presented in table 3. Those of the resulting groups that represented less than 2% of the total sample were not identified as separate strategies, as they covered special situations such as pensioners, a few farms run by a manager, etc. The fifth group had a subdivision for further study, which separated family enterprises from the others.

Table 3: Combination of off-farm income levels and time used for farming on 341 farms in 2001. Groups which are not further described are in Italics, the other in gray.

farmer's off-farm work	time for agricultural activities				
		lifestyle	part time	full time	double full time (enterp. /family ent.)
<i>Main</i>	Pct of farms	28	24	2	0,3
	Mean farm size, ha	17	30	68	88
<i>no/minor</i>	Pct of farms	2	6	22	15 (10/5)
	Mean farm size, ha	13	47	71	129 (114/137)

The farm dwellers were identified as the households running hobby farms on which the farmer drew the main income from off-farm work. They used little time on farm work, and the farms were smaller, primarily arable farms. They made up 28% of the sample. Two groups of part time farmers were present: the first one consisted of the 24% busy part timers, who managed smaller farms and still drew their main income from off-farm work. The other group – the part timers – consisted of the 6% part time farmers, with no or little off-farm income. Their farms were on average larger than the busy part timers and the farmers used more time on the farm, while the opposite was true for the spouses. Farm dwellers and the two groups of part timers held mainly arable and mixed farms and 30% of the farmers had an urban background. In the other end the full timers, who manage full time farms with no major off-farm income were found. The enterprisers, being the double full time farms with no major off-farm income, managed on average considerably larger farms than the full timers, only 12% had an urban background (20% for the full timers) and the farms were predominantly dairy farms. The full timers managed all farm types with no one dominant. One third of the enterprisers were so-called family enterprisers, where farmer and spouse ran the farm together, both using full time. They made up

5% of the total sample. There were no large differences in average age between the groups, the lowest mean of 43 years found with the enterprisers and the highest of 50 years with the part timers.

### **Engagement in Other Farm-based Activities**

A total of 231 Other Farm-based Activities were undertaken on 168 (49%) of the farms, while the remaining 51% did not engage in OFAs. 9% of the farms had more than one activity. Table 4 shows the distribution of the single types of activities.

Table 4: Other farm based activities, N=231

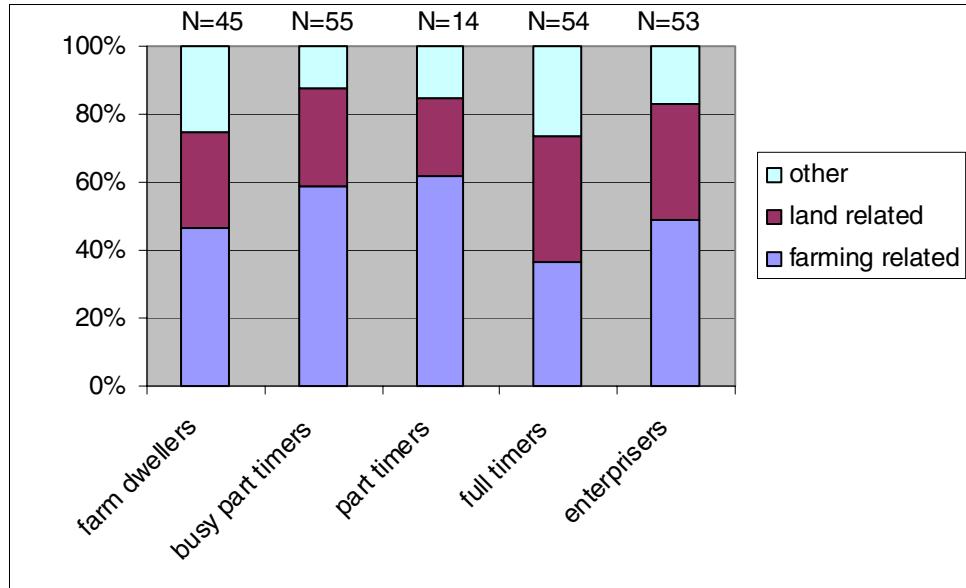
Type of activity	Percentage of activities	group share
Farm based shop	8	
Processing of agricultural produce	8	
Machine station	6	
direct sale	15	
<b>Total farming related</b>		<b>37</b>
Rural tourism,	6	
Out lease of hunting rights	14	
Riding school/horse pension	1	
<b>Total land related</b>		<b>21</b>
Crafts	5	
professional child day-care	6	
business/practise	3	
<b>Total professional</b>		<b>14</b>
Sale of renewable energy	5	
Hire out buildings	14	
Other	10	
<b>Total other</b>		<b>29</b>

The farming related activities made up the largest share of OFAs (37%) but lease out of hunting rights and buildings were also frequent. The economic importance of the activities was none or little for many activities, but farm shops and direct sale were often of some or major importance, and so was the renting out of buildings. Professional business/practise and child day-care on farm were almost always of some or major economic importance, but these groups were to some extent confused with off-farm work and might have been classified as such. Excluding those profession related activities, where the farmer had stated major income from off-farm activity (4% of all), 10% of the farm households used some or full time on OFAs, while the remaining 35% only used little time on the activity.

The share of farms that had taken up OFAs differed somewhat between the strategy groups, the lowest share being among farm dwellers (43%) and the highest among busy part timers (57%) and enterprisers (58%). There were also small differences in the types of OFAs that the different groups took up, as figure 3 shows. Farming related activities were more frequent on part time farms, while land related activities were more frequent among enterprisers.

In total 17% of all farms had OFAs of some or major economic importance, again excluding the questionable 4% professionally related activities on the farm. This was distributed with 20% of the enterprisers, 19% of full timers, 25% of part timers, 22% of busy part timers and 8% of farm dwellers. Structural diversification was thus thriving among half of the organic farmers in 2001, and the contribution of OAFs to the economy was significant for around 20% except the group of farm dwellers, who engaged relatively less in OFAs and with little economic importance.

Fig 3: Other Farm-based Activities taken up by different groups. Number of activities are 179 in total\*), excluding the profession related from the analysis

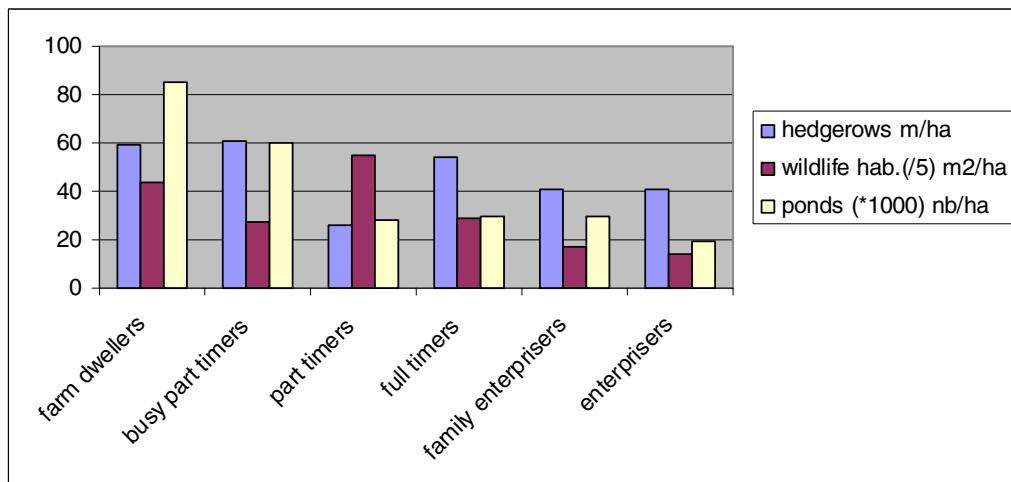


\*) Profession related are excluded in this analysis due to the confusion with off-farm activities.

### Management of landscape elements

This part of the analysis concerns the existence and management of landscape elements. Figure 4 shows the average density of landscape elements in each group of farmers, and here the family enterprisers are included in order to see if there is any difference in terms of landscape management on the two types of enterprisers.

Fig. 4: Average density of landscape elements on farms by strategy group.



There is no simple pattern in terms of hedgerow density. Former analyses have shown that higher hedgerow density is found on the smaller farms and is connected to smaller field sizes (Frederiksen and Langer, 2005), and here we also find that the farm dwellers and busy part timers (managing the smallest farms) have higher densities than the other groups. Hedgerows are to a large extent related to farm management, in terms of shelter and prevention of wind erosion, but are also increasingly planted for amenity value. On the contrary the establishment of ponds are not at all related to farm management, while removal may be related to rationalisation of the farm area. The comparably higher density of ponds related to farm dwellers and partly busy part timers may thus be due to a higher priority to for amenity values without any immediate management function. These relationships would have to be more firmly established by studies

using other research methods. The wildlife habitats are not significantly related to any groups, but are related to topography and areas not easily cultivated (Frederiksen and Langer, 2005).

The elements most frequently changed during the period from 1996 to 2001 were hedgerows, as 124 farms planted new hedgerows and only 28 of these were renewals, while 10 removed hedgerows without planting new ones. 43 farms established new ponds or re-established old ones, while only two were removed. Wildlife habitats were not very dynamic, as only 10 farms established new areas and 5 farms took smaller uncultivated areas into rotation.

In table 4 it is shown how enterprisers were the most active in terms of removal and establishment of hedgerows – this is common in a process of reshaping the farm area to make it more rational. The hedgerows established were however considerably longer in total than the ones removed. The establishment of ponds was not so frequent in this group. The full timers and the busy part timers showed almost the same pattern, although with a minor share of farms engaged, and a larger share of the full timers were engaged in the establishment of ponds. The part timers and farm dwellers were even less engaged in hedgerow planting as a group, but were as active as the rest of the group in terms of establishment of ponds.

Table 4: Percentage of group making recent changes in landscape elements

	hedgerow removal	hedgerow planting	establishment of ponds
farm dwellers	3	24	14
busy part timers	11	40	5
part timers	5	24	19
full timers	13	39	20
enterprisers	26	52	12

### Changes in farm size 2001-2004

64% of the remaining farms were considered unchanged, that is, they had not changed their farm area more than plus or minus 10%. The change pattern is tabulated in table 5. It is evident that the enterprisers pursued the general structural development and scale-enlargement most, but also a large share of full timers increased their farm sizes. Family enterprisers were somewhat more stable than the other enterprisers. The farm types that reduced most (50-100%) were almost exclusively meat farms, while dairy farms were the most dynamic (48% unchanged), and mainly increasing the area. The arable, meat and mixed farms had larger unchanged groups of 60-70%. In terms of size groups the share of the farms that were unchanged, fell from 80% in the group of 0-10 ha, to 45% in the group of >100 ha.

Table 5: Changes in farm size between 2001 and 2005. Percentage share of farmer groups distributed in change groups

	50-100% neg	10-50% neg	unchanged	10-50% pos	50-100% pos	>100% pos
farm dwellers	4	9	77	7	1	1
busy part timers	8	7	69	11	0	5
part timers	0	21	64	7	7	0
full timers	0	12	58	19	7	5
family enterprisers	5	9	50	27	9	0
Enterprisers	5	14	36	32	9	5

### Discussion

The organic farmers in Denmark covered a broad range of livelihood strategies in 2001: 54% of farmers had major incomes from off-farm activity, 49% engaged in some kind of OFA, and on

around 15% of the farms these activities had some or major economic importance. Establishment of new landscape elements were much more frequent than removal, and hedgerow planting was the most frequent, followed by establishment of ponds.

5 different livelihood strategies were identified based on combinations of farm household resource use for agricultural activities and off-farm levels. Three of these, the farm dwellers, the busy part timers and the part timers followed strategies of re-grounding – engaging in off-farm work, and around half of them additionally undertook other farm-based activities.

The farm dwellers constituted more than half of the total number of organic farms in Denmark, they ran primarily arable farms, and they were the group least engaged in OFAs. They had relatively large densities of landscape elements on their farms, but showed relatively little engagement in new establishments compared to the other groups of households. It is quite possible that the large densities are primarily due to their small size, and lack of need for rationalisation of the farm area. Farm dwellers did only change little in farm size from 2001 to 2004. In terms of rural development it could be argued that this large group has its main contribution in terms of preventing depopulation of the countryside, but also that they may be refugees for biodiversity as the density of landscape elements is high and stable.

The two groups of part timers were mainly arable and mixed farms and part timers cultivated larger farms than busy part timers on average. The share of the groups which remained with stable farm sizes was relatively large, they engaged in similar types of OFAs – dominantly farming related and then land related - but the engagement was higher among busy part timers. They were engaged in hedgerow planting and removal, while part timers were more engaged in establishment of ponds

The enterprisers had the largest share of households following strategies is of “broadening”, while full timers engaged in OFAs at the same level as the part timers. The tendency for both groups was that land related and other activities were more frequent than farm related activities. The enterprisers and especially the non-family enterprisers were very dynamic in terms of farm size changes. 46% increased their size during the three years and some of them considerably. The family enterprisers were more stable, indicating that the two groups may follow different strategies, even if they were both primarily dairy farms. The full timers were even more stable, but less than part timers. The enterprisers were very active in establishment of hedgerows, but also removing them – this being characteristic for farms on which area is being rationalised. Establishment of ponds was much less frequent – indicating that it is not amenity values driving the landscape management. The enterprisers moreover contribute to local development by offering employment to one or more persons. Around 25% of the full timers also offer employment, but less than full time.

It thus seems as if all the organic farmers contribute to farm-based rural development in one way or the other, but that different aspects may be favoured on different farms. This division in livelihood strategies is not a “final say” pointing to clear-cut groups of farmers with similar patterns of resource use. On the contrary large variations seem to exist. It point, however to a huge diversity with variation in many dimensions, but where agricultural workload and off-farm work are important aspects. A descriptive analysis like this is however not the proper way of making hard conclusions as to the vulnerability of these development pathways or the need for support of one or the other kind. On the contrary it poses more questions than answers, but form a background on which further studies may be conducted.

Interesting issues for further study would be which preconditions that lie behind the appearance of different livelihood strategies. Here a sustainable livelihood approach focussing on assets, capabilities and entitlements seem be useful. This may throw light on the possible strengths and weaknesses inherent in different resource allocation patterns, and how they may develop.

Future analysis could moreover focus on the economic and social role of these various farm types for the local community, both in terms of economy, use of human and material resources and in terms of social relations – and thereby their contributions to societal goals

Some more concrete follow-up questions could be:

Broadening of farm activities is frequent but only economically rewarding for a minority of the farms. What are the circumstances under which these activities may be developed?

Landscape densities are larger on smaller farms. Are small farms functioning as refugees for biodiversity in the Danish agricultural landscape, deserving more attention than is presently the case?

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