Analyzing Farms' Participation Decisions in Agro-tourism Activities in Norway: Some Welfare Implications

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Selected Paper Presented at the
American Agricultural Economics Association Annual Meetings
Denver, Colorado
August 1-4, 2004

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The aim of this paper is to assess the role played by socio-demographic factors, the financial situation of the farm household, as well as the productive orientation and physical location of the farm on the adoption of agro-tourism activities in Norway. Agro-tourism activities in Norway can be classified mainly into two groups: a) renting of fishing and hunting rights, and b) renting of rooms on the farm, huts, cabin, and provision or direct sell of food to travelers. Results indicate that factors such as the size and the location (rural or semi-rural) of the farm play a statistically significant and more important role on the decision of renting fishing and hunting rights than on the development of other agro-tourism activities on the farm. On the contrary, socio-demographic factors such as the presence of a female partner in the household and the age of the main farm operator play a statistically significant role on the adoption of agro-tourism activities on the farm.

Keywords: agro-tourism, diversification, farming, Norway

Introduction

In the recent years, many policies were implemented aiming to diversify farmers' labor supply outside the regular production activities, while keeping farmers on the farm. These new diversification activities could be proven very valuable if they succeed to increase both, farming survival and farmers' income. In this paper, we focus on agro-tourism activities undertaken by Norwegian farmers. Norwegian farm units are small and subsidy dependent, with one of the highest PSE[1] (Producer Support Estimate, OECD 2001) levels in Europe. The average size of productive land on farm holdings in Norway was calculated as 12.3 hectares, which was the smallest of many Northern European countries, and well below the average of 17.5 hectares of the European Union (Nersten 2001). The WTO negotiations and the possibilities of EU membership have resulted over the last 10-15 years in uncertainty for farmers regarding the future levels of support. To reduce farm subsidy dependence and to meet changes in consumer demand, farmers are stimulated by policy makers to take up new value-added and agro-tourism activities as additional income sources.

Background about Agro-tourism Activities in Norway

While only 3 percent of Norway's land-area is agricultural land, most farm holdings also own large areas of more or less productive forest and mountain areas. These areas provide possibilities for recreation activities, traditional farming and summer pastures, wildlife and fishing. Rural tourism, like salmon fishing and mountain hiking, has a long history in Norway, and has experienced renewed interest during the past 10-15 years. Farm tourism, including renting of fishing and hunting rights, and the further development of

[1] "Producer Support Estimate, PSE is an indicator of the annual monetary value of gross transfers from consumers and taxpayers to support agricultural producers, measured at farm gate level, arising from policy measures, regardless of their nature, objectives or impacts on farm production or income. The percentage PSE is the ratio of the PSE to the value of total gross farm receipts, measured by the value of total production (at farm gate prices), plus budgetary support. " OECD, 2001. *Agricultural Policies in the OECD Countries. Monitoring and Evaluation.* The percentage PSE for Norway (all commodities) has been 66% in the 1986-2000 period.

related tourism services and activities is therefore seen as one possible route for rural development. Since agro-tourism is seen as a possible growth sector in Norwegian rural areas the Ministry of Agriculture has developed a number of initiatives. Investments in developing an agrotourism facility have received grants and subsidized loans since the early 1990s (Jervell and Vangsgraven, 1998). Thus, the expectancy is that servicing tourists could become an important industry in rural areas.

The main objective of this paper is to analyze the role play by different factors that contribute to the diversification towards agro-tourism (including renting of: fishing and hunting rights, rooms to tourists, cabins in the forest to hunters, or manufacturing of traditional food products, and handcrafts, among others). Specially, we will analyze the role played by socio-demographic characteristics such as farmers' gender, education, age, the presence of a female and children in the household. Additionally, other factors such as farm's characteristics, such as financial situation, productive orientation, and location will be also considered.

State of the Art and Contribution

A sizable literature exists on labor supply allocation off the farm, and the role played by the income obtained from these diversification activities outside the farm (see Fall and Magnac, 2004). However, the role played by new activities on the farm (such as agro-tourism related activities) is a new feature that deserves more study and further analysis.

Recently, there is a proliferation of different international case studies that look at the role played by these new lines of agricultural diversification on farming. For example, Getz and Carlsen (2000) analyze the characteristics and goals of family and owner-operated businesses in the rural tourism and hospitality sectors in Western Australia. They conclude that the most important motivation to start a new owner-operated business is to "live in the

right environment," followed by the motivation of "enjoying a good lifestyle." In contrast, reasons such as "making lots of money" or "gaining prestige by operating a business" rank as the least important reasons to start an owner-operated business.

In the European context, Dominos and Skuras (1996) examine various forces affecting the choice of diversification strategies among farmers in a disadvantaged region in Greece. They show that total arable land positively affects the adoption of conventional farm business strategies, and negatively affects the decision of adopting alternative development strategies. In their study, the age of the farmer is not a statistically significant factor on developing alternative farm enterprises. However, these results may not be fully generalizable to other agricultural regions, particularly those in the Northern countries. Bowler et al. (1996) adds to this literature looking at the development of alternative farm enterprises in the Northern Pennines of England. They conclude that farm indebtedness is the dominant variable discriminating between farms adopting different pathways. More recently, Bailey et al. (2000) look at the provision of equine services in the British agriculture, concluding that demand for equine services is more elastic than for agricultural commodities. Consequently, the authors state that diversification in horse operations is likely to have more long term benefits than traditional agricultural production.

The study with the closest objectives to the current one was done by McNally (2001). She studies participation decisions in farm diversification in England and Wales, concluding that large farms are more likely to diversify their production than small farms. Additionally, when diversification activities are present, she concludes that they make a relative small contribution to the farm's business income. The present study extends and complements McNally's research first by analyzing exclusively agro-tourism diversification in Norway, which is a different spatial and socio-cultural case study than England and Wales. Secondly,

since the data set analyzed here represents well the current active farmers in Norway, we will study the role played by socio-demographic characteristics (such as farmers' age, education, and gender, the presence of a female partner, and children) on the adoption of agro-tourism activities. In this research we expect first to confirm some of the conclusions obtained by McNally, including that more labor intense specialized farms are less likely to diversity their activities into agro-tourism. We also expect to confirm that larger farms are more likely to diversify their production into new agro-tourism activities. This finding was also reported by Gasson (1998), stating that farms in the top size category in England and Wales are four times as likely to diversify as the smallest farms**.**

We contribute to the literature on farm labor diversification and agro-tourism by testing the role played by different socio-demographic variables. In particular, we hypothesize that the presence of a female in the farm household is a crucial factor in developing these new lines of agro-tourism activities. We expect that the presence of a female in the household is particularly relevant for farms devoted to more labor intense agro-tourism activities. Gasson (1998) stated that the contribution of farmer's wives was crucial for farms operating in the UK and Ireland. However, she also indicates that the role played by farmer's wives is usually overlooked and undervalued. Bouquet (1998) highlights that offering accommodation on the farm in Britain and has been operated as a female enterprise in parallel with farming, and as an extension of the home-maker role. Halliday (1989) also reports in a study of attitudes towards farm diversification in Devon that the provision of tourist accommodation was most frequently seen as an entirely separate venture and run by female members of the household. However, to our knowledge, no study has quantified the role played by female farmers (or spouses of male farm operators) on these new agro-tourism diversification activities. Further, we also shed light on the role of the presence of children in the farm household. Analyses of labor participation in general, and of off-farm labor

participation especially, show significant negative effects of young children on female labor market participation and labor supply (Hearn, McNamara, Gunter,1996; Phimister, Vera-Toscano, and Weerisink, 1996). The effects of the presence of children on diversifying into on-farm tourism activities may be affected in the same way. Or on the contrary, on-farm diversification may be more compatible with childcare and household work, without negatively affecting the decision of diversifying into new agro-tourism activities. Additionally, we look at the effect of the main operator's education and age. We expect that more educated farmers are more likely to undertake these new agro-tourism activities. Age, as a measure of experience, is expected to have a positive effect on the adoption of agro-tourism activities, although we also expect that after a certain age level, the probability of engaging in agro-tourism activities will decrease.

We also analyze how the physical location of the farm affects the development of agro-tourism activities, and the implications that the physical location may have in the context in which these new agro-tourism activities are being fostered by government authorities. Walford (2001) analyze the geographical patterns of development in tourist accommodations in England and Wales. He concludes that the physical location of the farms with respect to selected *Scenic Areas* plays an important role on the development of tourist accommodations in England and Wales. He further deduces that location within such scenic areas may discourage farms to provide accommodations because local authorities may exercise a more strict control on the regulations; however, this may benefit other farms located within the penumbra of the scenic areas. In the current study, we analyze the role played by geographical location in rural and semi-rural communities in relation to farms that are in the vicinity of larger towns. Other variables that contain information regarding the financial situation of the farm, as well as whether the main operator works outside the farm are also examined. In particular, we employ the total debt ratio of the farm, expressed as total farm

debt over the sum of total debt plus total worth. Given that we are employing the accumulated debt ratio of the farm, it is quite likely that the relationship between this variable and the likelihood of engaging in agro-tourism activities is negative, particularly for the activities that require additional investments. With regard to the pluriactivity of main farm operators, we expect that those that work outside the farm are less likely to develop the kind of agro-tourism activities that request more labor input. Finally, other variables that look at the productive orientation of the farm in terms of number of heads of livestock (mainly dairy cows), pigs, as well as also the total area of arable land are included in the analysis. We expect that farms which a larger number of livestock (mainly oriented to milk production, which is the main productive activity in Norwegian farming, Nielsen 2001) are less likely to engage in agro-tourism activities due to the intense labor input required in the production process.

Thus, the inclusion of both, internal characteristics (such as the productive orientation of the farm, the financial situation of the farming household, the size, the gender, and age of the main farmer operator, etc) as well as external factors (such as the location of the farm with respect to urban areas) will help us to identify the relative importance of each of these elements on the decision of diversification towards agro-tourism activities.

In the Norwegian context, very few references are available. Off-farm wage labor is a common and important diversification of farm households, and female off-farm labor participation has increased significantly the last 20 years (Jervell, 1999). Eikeland and Lie (1999) look in general at the role of pluriactivity in rural areas. They conclude that the classification of actitvities affects in a significant way the total estimate of the rate of pluriactivity in rural areas. In their analysis they quantify the number of running businesses in two or more industries (pluriactive) between 17 and 28 percent, depending on the number of industries that are considered. Rønning (2002) studies the contribution of farm enterprises to

the rural economies, concluding that agro-tourism related activities do contribute to the farming income in a positive and statistically significant way. However, Rønning's dataset is biased towards larger enterprises, under-presenting small family farms in which different activities are being developed. Alsos, Ljunggren and Pettersen (2003) use three different theoretical perspectives on farm household as an arena for the entrepreneurial decision to start new business activities in an in-depth study of 16 Norwegian farm entrepreneurs. They found different motivations and conclude that farm households will respond differently to policies aimed at stimulating on-farm diversification.

Modeling Framework

Our underlying theoretical framework is based on random utility models, in which each farming household maximizes its expected utility through the decision of whether or not to participate in agro-tourism activities, given a set of farmers' socio-demographic characteristics, location and characteristics of the farm, as well as other conditions. From an economic standpoint, a farming household participates in agro-tourism when the expected benefits obtained from those are above the total costs (including the opportunity cost of labor, and the investment costs required to undertake these new activities). In order to estimate the probability that a particular farm engages on agro-tourism activities, we use logit models, based on the following logistic probability function:

(1) $$Log\left(\frac{P_i}{1-P_i}\right) = \mathbf{X_i'\beta},$$

where $Log\left(\frac{P_i}{1-P_i}\right)$ is the logarithm of odds-ratio of the probability of participating in agro-tourism activates over the probability of non-participating. Note that the parameter vector $\boldsymbol{\beta}$ cannot be interpreted as the direct effects on the probability of participating. Rather, they

measure the change in the odds ratio for a change in a unit of an explanatory variable. In order to estimate the effects on the probabilities directly, the marginal effects must be estimated (Maddala).

As stated above, the underlying statistical model is based on a latent and continuous unobservable variable, which corresponds with the utility that each farming household maximizes by participating or not participating in agro-tourism activities (represented by the variable $Agrotour_i^*$). This unobserved variable is function of observed characteristics of the farm (represented by a vector of variables $\mathbf{X}_i$). Thus, the latent model is represented by

(2) $$Agrotour_i^* = \mathbf{X_i'\beta} + \varepsilon_i.$$

However, since utility is non-observable, the researcher models the observable variable, or decision to participate, $Agrotour_i$, which depends on whether or not the gained utility by it is grater or smaller than zero. The decision to participate is observed if and only if the latent variable is greater than zero. Conversely, a non-participation decision is observed when the latent variable is less than or equal to zero.

Thus,

(3) $$Agrotour_i = \begin{Bmatrix} 1 \\ 0 \end{Bmatrix} \quad \text{iff} \quad Agrotour_i^* = \mathbf{X_i'\beta} + \varepsilon_i \begin{Bmatrix} > \\ \leq \end{Bmatrix} 0.$$

In the equation above, the ε_i are *iid* unobservable random variables, following a logistic distribution with mean 0 and variance of $\pi^2/3$.

In the sample of analysis, the main agro-tourism activities include two main categories: a) the renting of fishing and hunting rights, as well as b) the direct rents of rooms on the farm, cottages and cabins in the mountains and the provision of food and other services to guests. In the analysis that follows bellow, we first analyze the probability of a farm

undertaking any agro-tourism activity; then later we focus our analysis on looking at the two main categories of agro-tourism activities.

Given that some farms combine more than one agro-tourism activity, an extension of the previous logit models is also considered. We use an ordered logit model to analyze the intensity of participation in agro-tourism activities. In the ordered logit model, the farming household selects the number of activities that maximizes its utility.

In the latent regression model represented in (2) the utility obtained by the different degrees of dedication remains unobservable (*Agrotourism**), although the number of agro-tourism activities that each farm household undertakes is observable[2]. In this way, the observed dependent variable is of the form:

$$(4) \qquad Agrotour_i = \begin{Bmatrix} 0 \\ 1 \\ 2 \end{Bmatrix} \quad if \quad \begin{matrix} Agrotourism^* = \mathbf{X_i'\beta} + \varepsilon_i \le 0, \\ 0 < Agrotourism^* = \mathbf{X_i'\beta} + \varepsilon_i \le \mu_1 \\ \mu_1 < Agrotourism^* = \mathbf{X_i'\beta} + \varepsilon_i \le \mu_2 \end{matrix}$$

where the $\mu's$ are unknown parameters to be estimated with $\boldsymbol{\beta}$.

Data

The data employed in this study are rather innovative. This study uses individual survey data combined with both, individual income statistical records and Agricultural Census Statistics. Questions related to farmers' adoption of agro-tourism activities, as well as the main socio-demographic characteristics were extracted from the Living Standard Survey (2002) developed by *Statistics Norway*. The most relevant farm characteristics, including size and productive orientation of the farm were extracted from the Norwegian Agricultural Census. This data set was efficiently merged with confidential records obtained from the *Tax*

[2] Note that the renting of fishing and hunting rights is for many the first step into more value-added agro-tourism activities.

and Revenue Service of Norway (2001) reflecting each individual household member's income, wealth, and debt.

A representative sample of 2010 farms was approached to participate in the Living Standard Survey (2002) conducted by S*tatistics Norway*. In order to minimize the sample selection bias, the sampling methodology used a stratification procedure with weights. Most surveys were completed via personal interviews. However, phone interviews were implemented in the case of long distances to farms located in remote areas. Both, the main farm operator and spouse were interviewed independently. Summary statistics corresponding to all farmers' socio-demographic characteristics and main farming production orientation (livestock, crops, and fruits) match the Norwegian Agricultural Census (1999). The response rate is about 85% of the initial number of farms considered.

In general, agro-tourism activities in Norway can be classified into two main types: a) direct renting of fishing and hunting rights, which do not require any special investment by farm in terms of equipment or labor; and b) agro-tourism activities carried out in the farm, including renting of wooden huts, cabins, and rooms on the farm. Additionally, other activities undertaken on the farm include the provision of food to travelers and guests, and the direct sell of local and specialty products (both food and handcrafts). In total, about 59% of the sample of farms are involved in one or more of the indicated agro-tourism activities, being the most common activity the renting of fishing and hunting rights. In particular, about 51% of the farms in the sample are renting their rights for fishing salmon or small and big game hunting, while only 7% of the farms are engaged in agro-tourism activities that include accommodation on the farm.

In this sample, the average age of farmers is about 47 years, with about 16 years of experience running the farm, and 82% have an education level above the primary education. Most of the main farm operators are male and married (69.20%), and about half live in rural

or semi-rural communities (51%). Thirty four percent of the sample have children below 12 years of age living in the household. The mean level of income in each household (including all sources of income in addition to agriculture) is about 202,941 NOK in 2002[3]. In terms of pluriactivity (or work outside the farm), about 57% of the farmers in the sample work off the farm. The sample is also representative of the farm population with respect to the Agricultural census variables experience in farming, off-farm work and marital status (Statistics Norway, www.ssb.no).

Empirical Estimation

In order to make our results comparable across the different agro-tourism activities, a common specification has been employed to model the participation in any of the agro-tourims activities that are carried out by this sample of farmers. Further, we compare the effects of different socio-demographic characteristics on the engagement of different agro-tourism activities (renting of fishing and hunting rights, or renting of rooms and food manufacturing). Finally, we employ the same set of explanatory variables to model the intensity of participation in agro-tourism decisions via an ordered probit model.

The estimated specification for all models has the following form:

$$Agrotourism_i^* = \beta_0 + \beta_1 Wife_i + \beta_2 Age_i + \beta_3 Age_i^2 + \beta_4 Education_i + \beta_5 Livestock_i + \beta_6 Pigs_i + \beta_7 Arableland_i + \beta_8 Rural_i + \beta_9 Debtratio_i + \beta_{10} Coop_i + \beta_{11} Workoutside_i + \beta_{12} Kids_i + \varepsilon_i. \quad (5)$$

Complete definition of the explanatory variables is presented in Table 1, as well as their main summary statistics. In the above specification, the variable *Wife*, and *Kids* are indicator variables that reflect, respectively, the presence of a female partner and children

[3] Using an exchange rate of 1 €=8.5 NOK, this is equivalent to 23,875 € in 2002.

under 12 years of age in the household[4]. Since most of the main farm operators are male, the inclusion of the variable *Wife* in the regression does not only account for the presence of a female in the household, but also for the marital status of the main farm operator. The variables *Age*, Age^2 and *Education* represent the age, age squared and education of the main farm operator, respectively. The variable *Workoutside* equals to one if the main farm operator works also outside the farm. Variables denoting the size and productive orientation of the farm are *Livestock, Pigs, and Arableland*. They denote, respectively, the number of heads of livestock (mainly dairy livestock), and pigs on the farm, as well as the size of the farm in terms of decares of arable land[5]. Other included variables represent whether the farm is located in a rural or semi rural area (variable *Rural*), the financial situation of the farm represented by the debt ratio (*Debtratio*) and whether the farm is a cooperative farm (variable *Coop*).

Results

When analyzing participation decisions in any of the agro-tourism activities via a logit model (as presented in Table 2), we find that variables representing the education of the main farm operator, as well as the size of arable land and the location in a rural area are all positive and statistically significant. Further, the variable representing the number of heads of livestock is negative and statistically significant. Socio-demographic variables describing the household characteristics, other variables denoting the financial situation of the farm, and whether the farm is a cooperative farm are not statistically significant. These results are expected, and similar to the ones presented in previous studies. Since in Norway the most common agro-tourism activity is renting the fishing and hunting rights, it seems intuitive that

[4] The threshold of 12 years of age was chosen since children older than 12 may help on a more or less regular basis on the farm.
[5] The main crop orientation in Norway (production of cereals) has not been included in the regressions, since it is highly correlated with the total size of the arable land.

variables reflecting the household socio-demographics play a small role on the decision of whether to rent such rights. The same logic may apply to justify the lack of statistical significance of the financial situation of the farm and whether the farm is a cooperative. In general, renting fishing and hunting rights does not require additional investments on the farm, or allocation of working hours.

Similar results are obtained when modeling the decision of renting fishing and hunting property rights (Table 3) by itself. As above, the education of the farm operator is the only socio-demographic variable statistically significant, with a positive sign. Also, as in the previous model, the variable denoting the rural or semi-rural location of the farm is statistically significant. This is also as expected since the availability of farms with fishing and hunting rights to rent is larger in rural areas. Other variable that becomes statistically significant in this model represents the size of arable land, while the variables denoting the importance of animal production in the farm are not statistically significant. These set of empirical results make also intuitive sense, since the productive orientation of the farm as well as other socio-demographic characteristics are less likely to affect the decision of whether or not to rent the fishing and hunting rights.

However, when modeling farm participation in agro-tourism activities developed on the farm (see Table 4) (such as renting rooms, cabins, and alpine huts) as well other activities (which include the direct sell of local agricultural food products and handicrafts, and serving meals) variables that represent the household socio-demographics play a more important and statistically significant role. For instance, the presence of a female spouse in the household is now a positive and statistically significant factor. In addition, the age of the farm operator (in its squared form) is negative and statistically significant. Negative and statistically significant are also the variables denoting the animal productive orientation of the farm (variables livestock and pigs). The variable representing the total area of arable land is not

statistically significant, while the variable representing the rural and semi-rural location of the farm is positive and statistically significant. In addition, the variable denoting that the farm is a cooperative farm is also negative and statistically significant. Finally, the variable representing that the main farm operator works also outside the farm is negative, although not statistically significant. The same occurs with the variable indicating that children below 12 years of age are present in the farm household. Thus, it may occur that taking care of children below 12 is not a statistically significant drawback for the provision of agro-tourism activities on the farm.

When modeling the intensity of participation in agro-tourism activities via an ordered logit, it is interesting to note that education of the main farm operator is the only socio-demographic characteristic statistically significant. Again, the variable denoting the size of arable land, and the rural or semi-rural location of the farm are statistically significant variables contributing to the intensity in which agro-tourism activities are undertaken by farming households. The rest of the included variables are not statistically significant. Coefficients and marginal effects of the ordered logit are presented in Table 5.

Conclusions

In this paper, we analyze farm participation decisions in agro-tourism activities in Norway. The data employed are rather innovative and come from a variety of sources that allow us to shed light on the role played by a variety of factors, including the main socio-demographic characteristics of the farming households, the financial situation of the farm household, the productive orientation and physical location of the farm. The most extended agro-tourism activity in Norway consists of renting of hunting and fishing rights, while other activities developed on the farm such as renting rooms, mountain cabins and alpine huts are

less common. Our results show that the size and the rural or semi-rural location of the farm play a more positive and statistically significant role on the decision of renting fishing and hunting rights than on the development of other agro-tourism activities on the farm. On the other hand, socio-demographic factors such as the presence of a female partner (with a positive sign) the age of the head of the farm (with a negative sign) play a statistically significant role on the adoption of agro-tourism activities on the farm. However, and contrary to our initial expectations, the presence of children below 12 years of age does not impact in a negative and statistically significant way the participation in agro-tourism activities. In addition, more labor intense productive orientations (such as milk production) play a negative and statistically significant role on engaging in agro-tourism activities that require more labor input.

Thus, the current analysis reveals how different productive orientations and different farmer's socio-demographics affect the decision of whether or not to participate in agro-tourism activities. Further analysis is required in order to assess the welfare effects of these new agro-tourism activities undertaken by Norwegian farmers. Future research may focus on analyzing whether agro-tourism activities increase farming survival rate, or if on the opposite, are a step towards quitting agricultural production.

Table 1- Description and Summary Statistics of Explanatory Variables

Variable	Description	Mean	Std. Dev.	Min	Max
Agrotour	=1 if farm participates in agro-tourism activities on the farm	.0734536	.2609637	0	1
Agros	=1 if farm participates in any agro-tourism activity	.5940722	.6042326	0	3
Rentals	=1 if farm rents hunting or fishing rights	.5115979	.5000266	0	1
Age	=Age of main farm operator (continuous variable)	47.32152	11.0299	20	82
Age2	=Square of main farm operator's age	2360.907	1057.386	400	6724
Education	=1 if main farm operator's education is above primary school	.8289219	.3766988	0	1
Livestock	=number of heads of livestock	18.52771	26.59221	0	195
Pigs	=number of pigs	8.981314	40.77749	0	804
Arableland	=size of arable land (in decras)	92.95232	80.44356	0	494
Rural	=1 if farm located in rural or semi-rural community	.5012887	.5001595	0	1
DebtRatio	=ratio of total farm debt/ (total debt + total worth)	10.55175	128.572	0	2848.355
Coop	=1 if farm is a farm cooperative	.073501	.2610412	0	1
Workoutside	=1 if main farm operator works outside	.5780645	.4940277	0	1
Kids	=1 if children below 12 years live in the household	.3485825	.4766751	0	1

Table 2- Participation Decision in Any of the Agro-tourism Activities

	Coef.	Std. Err.	z	Marginal Effects	Std. Err.	z
Wife	.0498496	.1358886	0.37	.0123968	.03381	0.37
Age	.0570802	.0407124	1.40	.0141848	.01012	1.40
Age2	-.0004975	.0004286	-1.16	-.0001236	.00011	-1.16
Education	.7694518	.1644282	4.68	.1912134	.04087	4.68
Livestock	-.004987	.0028955	-1.72	-.0012393	.00072	-1.72
Pigs	-.0012557	.0013882	-0.90	-.000312	.00034	-0.90
Arableland	.0025756	.0010019	2.57	.00064	.00025	2.57
Rural	.3670527	.1205403	3.05	.0909415	.0297	3.06
Debtratio	-.0003769	.0004693	-0.80	-.0000937	.00012	-0.80
Coop	.1732753	.2286694	0.76	.04306	.05682	0.76
Workoutside	-.0569328	.1332461	-0.43	-.0141481	.03311	-0.43
Kids	-.139707	.1476516	-0.95	-.0347401	.03672	-0.95
Constant	-2.29221	.963779	-2.38			
Likelihood Ratio Test	48.79 (0.000)					
Psedo-R2	0.0282					
Log-Likelihood	-841.28314					

(*) dy/dx is for discrete change of dummy variable from 0 to 1

Table 3- Participation Decisions in Renting Property Rights for Fishing and Hunting

	Coef.	Std. Err.	z	Marginal Effects	Std. Err.	z
Wife	.0515934	.1352337	0.38	.0128931	.03379	0.38
Age	.0436251	.0405337	1.08	.0108999	.01013	1.08
Age2	-.0003434	.0004264	-0.81	-.0000858	.00011	-0.81
Education	.6956067	.1643803	4.23	.1738008	.04107	4.23
Livestock	-.0028291	.0028657	-0.99	-.0007069	.00072	-0.99
Pigs	-.0006825	.0013614	-0.50	-.0001705	.00034	-0.50
Arableland	.0020051	.0009856	2.03	.000501	.00025	2.03
Rural	.3330786	.1198704	2.78	.0830239	.02975	2.79
DebtRatio	-.0006246	.0005543	-1.13	-.0001561	.00014	-1.13
Coop	.3210504	.227294	1.41	.080216	.05679	1.41
Workoutside	.0084534	.1323843	0.06	.0021121	.03308	0.06
Kids	-.1089215	.1468527	-0.74	-.0272142	.03669	-0.74
Constant	-2.098599	.9601709	-2.19			
LR test (P-value)	40.94 (0.0001)					
Pseudo-R2	0.0236					
Log-likelihood	-848.377					

(*) dy/dx is for discrete change of dummy variable from 0 to 1

Table 4- Logit Model: Dep. Var. Agrotour=1 if participation in activities on the farm

Agrotour	Coef.	Std. Err.	z	Marginal Effect	Std. Err.	z
Wife	.4805026	.2757282	1.74	.0236218	.01265	1.87
Age	.1388181	.0947586	1.46	.0074007	.00505	1.47
Age2	-.0016723	.0010049	-1.66	-.0000892	.00005	-1.66
Education	.4640141	.3432722	1.35	.0247377	.01838	1.35
Livestock	-.014847	.0062877	-2.36	-.0007915	.00034	-2.32
Pigs	-.0276901	.0156115	-1.77	-.0014762	.00068	-2.16
Arableland	.0018717	.0017832	1.05	.0000998	.0001	1.04
Rural	.3717762	.2307968	1.61	.0199554	.0126	1.58
DebtRatio	.0000795	.0006588	0.12	4.24e-06	.00004	0.12
Coop	-.9253782	.5439592	-1.70	-.049334	.02896	-1.70
Workoutside	-.3889582	.2519555	-1.54	-.0207363	.01347	-1.54
Kids	-.2751232	.279368	-0.98	-.0143426	.01434	-1.00
Constant	-5.599602	2.224449	-2.52			
LR Test (P-value)	29.54 (0.003)					
Psedo-R2	0.0449					
Log-Likelihood	314.10086					

(*) dy/dx is for discrete change of dummy variable from 0 to 1

Table 5- Modeling Intensity of Participation in Agro-tourism activities:0=no activity, 1=only one activity (mainly renting), 2=combination of renting fishing and hunting rights with the development of agro-tourism activities on the farm

	Coef.	Std. Err.	Dy/dx from y= 0 to 1	Std. Err.	dy/dx from y=1 to 2	Std. Err.	dy/dx from y=2 to 3	Std. Err.
Wife	.1031557	.1316621	-.0256732	.0328	.0213426	.02738	.0043306	.00544
Age	.0589512	.0395453	-.014653	.00983	.0121308	.00815	.0025221	.00171
Age2	-.0005484	.0004168	.0001363	.0001	-.0001129	.00009	-.0000235	.00002
Education	.7285481	.161901	-.1797718	.03867	.1544593	.03444	.0253124	.00533
Livestock	-.0051395	.0027844	.0012775	.00069	-.0010576	.00057	-.0002199	.00012
Pigs	-.001547	.0013769	.0003845	.00034	-.0003183	.00028	-.0000662	.00006
Arableland	.0022355	.0009501	-.0005557	.00024	.00046	.0002	.0000956	.00004
Rural	.3630544	.1168595	-.0899767	.0288	.0743354	.02389	.0156413	.00534
DebtRatio	-.0004214	.0004671	.0001047	.00012	-.0000867	.0001	-.000018	.00002
Coop	.1150231	.2171363	-.0284599	.05343	.0233133	.04329	.0051466	.01017
Workoutside	-.0684395	.1290958	.0170019	.03204	-.0140573	.02647	-.0029445	.00559
Kids	-.1512123	.1427031	.037609	.03549	-.0312241	.02957	-.006385	.00599
μ_1	2.21181	.9345121						
μ_2	5.423794	.9478245						

(*) dy/dx is for discrete change of dummy variable from 0 to 1

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