

# THE FARMER AS A MAIN FACTOR OF STRUCTURAL CHANGE IN RURAL AREA'S: EXAMINATION OF SLOVENIAN FARMERS' CHARACTERISTICS, PERCEIVED OPPORTUNITIES AND THREATS AND STRATEGIES AS PART OF RURAL DEVELOPMENT IN SLOVENIA

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## Abstract

Agriculture in Slovenia is characterized by less-favourable natural and structural conditions. The degree of competitiveness of the whole agro-food sector will eventually decide whether farmers and industry will be able to compete on the EU market. Slovenian agriculture at the moment still lacks competitiveness. Farmers that want to stay into business will have to further develop their farm. For farm development, besides craftsmanship and management skills increasingly entrepreneurial competencies are needed.

To get insight into the entrepreneurial characteristics of Slovenian dairy farmers by investigating the opportunities and threats as perceived by farmers (external factors) to establish a future in rural Slovenia in the relation to internal factors (farmers' and farm characteristics) and future strategy of the farmer.

To get this insight the following research questions are defined:

- What are the main characteristics of the Slovenian dairy farms and farmers?
- How are external factors that might impact the development of the dairy sector perceived by the Slovenian dairy farmers?
- What is the relation between the identified internal and external factors and the *present farm structure and future strategies and plans*: of Slovenian dairy farm.

The dairy sector was taken as case. Farm size, strategies like consolidation or expansion and operating in flat, hilly or mountainous regions have been considered as important factors to study.

Results showed that farmers with plans to expand in the future have already larger milk quota than farmers that want to consolidate. 36% of the dairy farmers sample had non agricultural income besides their farming business. In this sample, farmers in flat areas had more milk quota than farmers in hilly and mountainous areas, but the total amount of agricultural land is about the same. Besides this, farmers in hilly and mountain areas have more forest land.

There is a strong relation between the farmers goals, preferred farm type, the farmers personal characteristic and his/her perception of opportunities and threats and the present size of milk quota. There is less relation to the expressed future plans of farmers

In relation to perceived opportunities and threats farmers consider land and labour availability, the world market, legislation and town planning as a threat, while ICT, food safety and animal welfare and environmental issues, rural development, European borders, and EU subsidies are pictured as opportunities.

In general the outlook to the world at large seems to be rather positive, except acting on the world market, while restrictions in the local environment, like land and labour availability deteriorate the picture. Results are comparable with a similar study in earlier years in The Netherlands by Bergevoet (2005). These results suggest that local (policy) circumstances have a large impact on how comparable strategies amongst farmers can result in large country differences in the structure of the agricultural enterprises and rural landscape.

- There is large variation of dairy farms in Slovenia in farm size, milk quota and natural circumstances in the sample of farms studied. Farms in flat areas have larger milk quota than farms in hilly and mountain areas and less forestry.
- There is not a strong relation between farmers goals, farm type, farmers' characteristics, and opportunities and threats and the future expansion plans as formulated by the farmers.
- However there is a strong relation between the farmers goals, farm type, farmers' characteristics, and opportunities and threats and the present farm size.
- If the Slovenian dairy farmers want to expand their farm size from a large fraction of the farmers their entrepreneurial characteristics have to improve to meet the future challenges.

**Keywords:** rural development, structural changes, farmers, strategies, Slovenia

**JEL classification:** Q18

## Introduction

Agriculture in Slovenia is characterized by less-favourable natural and structural conditions, which explains its status of a net importer of food and its relatively protectionist agricultural policy. Agriculture is of limited importance for the Slovenian economy and its relative weight is decreasing. It contributes less than 3 % to the gross domestic product and around 6 % of the employed persons work in agriculture. Despite there is considerable financial support for the Slovenian farmer. Not only do farmers benefit from the CAP reform but also the Slovenian farmers receive additional support from their government (Erjavec, 2005).

The great debates about supports, which in the end all have a very simple goal, i.e. to improve the income position of farmers, should not neglect the fact that agriculture is in the first place an economic activity. The degree of competitiveness of the whole agro-food sector will eventually decide whether farmers and industry will be able to compete on the EU market. Slovenian agriculture however at the moment still lacks competitiveness (Erjavec, 2005).

Slovenia is one of a number of countries with milk production and cattle in alpine or mountain regions. These countries have in common that dairy herds are small and mainly consist of dual purpose breeds such as Simmental and Brown Swiss breeds. At the moment the average herd size is still rather small but comparable to countries in the region. The number of farms in Slovenia decreased substantially during the last 10 years. In the remaining farms the average herd size has grown considerably as did the milk production per animal (Klopčič & Lovendahl, 2008). It is expected that these trends will continue in the near future. The farmers that want to stay into farming will have to further develop their dairy farm. Social and family ties and lack of availability of farms in other locations limit the flexibility to change the business location; therefore most farmers want to develop their farm from its present location. This offers serious challenges for farmers as well as policy makers. To successfully do this they need entrepreneurial skills.

## Strategic management en entrepreneurship

For farm development besides craftsmanship and management skills increasingly entrepreneurial competencies are needed (Bergevoet & Woerkum 2006). A vital part of these entrepreneurial competencies is making and executing strategic business plans. David (2009) describes this as a cyclical process that usually involves the following steps:

- a) formulating long-term goals,
- b) an internal assessment,
- c) an external assessment,
- d) the choice of a strategy and
- e) the execution of this strategy (Figure 1).

It is a process with continuous feed-back and fine tuning.

Porter (1985) identifies three basic strategies a firm can pursue. These are cost leadership, differentiation, and market segmentation (or focus). Both cost leadership and differentiation are relatively broad in market scope while market segmentation is narrow in scope. *Cost leadership* involves specialization, whereas *differentiation* involves the incorporation of specific products (for example home made cheese and local products) in the dairy farmers activity portfolio.

Agriculture is a risky business since is characterized by highly volatile prices of farm inputs and outputs and entails the management of inherently variable living plants and animals and is mostly carried out in the open air (Hardaker et al., 1997). Diversification is a strategy to manage this risk. In the decision to specialize or diversify the farmer has to evaluate the pro's and con's of these strategies. For example specialization can lead to higher production as total and per unit of input and higher incomes, whereas diversification may lead to a less efficient production but realize a more constant income. Agricultural policy of the Slovenian government gives much emphasis on diversification of activities in rural areas (Erjavec, 2005).

*Market segmentation* is a strategy that involves the development of niche markets with specific products; this is a strategy that is difficult to pursue for a dairy farming business.

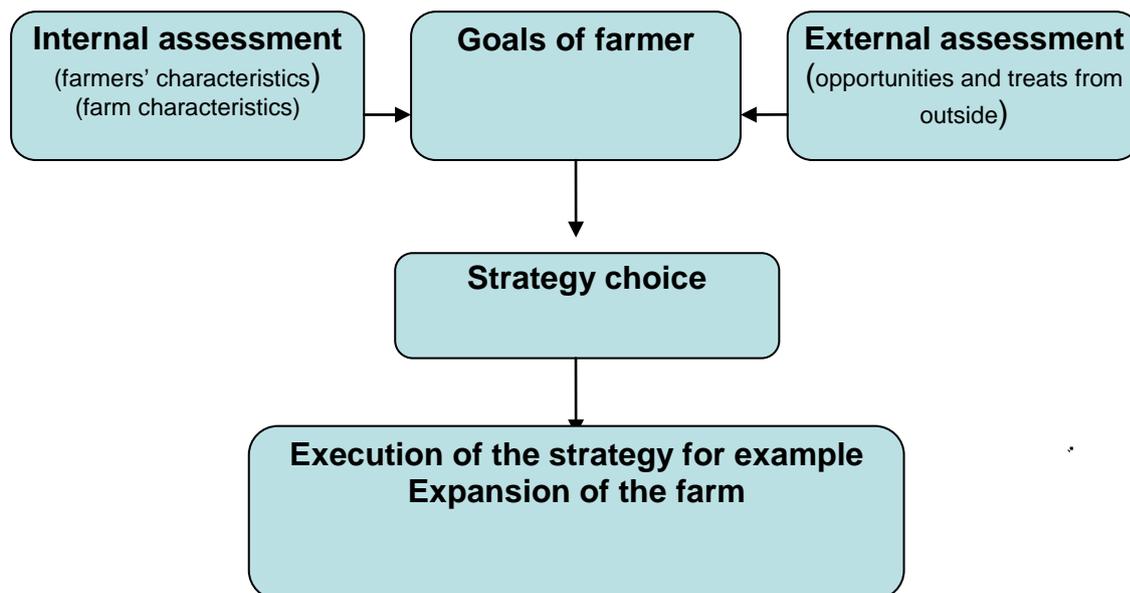


Figure 1. The analytical model based on the strategic management process for the agriculture sector (modified after David , 2009).

Management and entrepreneurship is increasingly being recognized as a crucial factor underlying farm operations and something that can vary greatly from farmer to farmer. Olsson (1988), for instance, reviewed several Swedish studies that determined that these are the key elements in the variable economic success of individual farms and other businesses, surpassing even quality and quantity of land, labour, and capital in importance. More recently, researchers have integrated farmers' goals and values in both economic spheres as well as social and lifestyle spheres into a comprehensive concept of individual management style (Bennett, 1980; Olsson, 1988; Fairweather & Keating, 1994). These researchers have shown that entrepreneurial and management style is an amalgam not only of different goal orientations, but also of different strategies farmers used to achieve their goals. These strategies depend partly on their available physical and human resources and partly on attitudes towards factors such as risk, family life, the future, and so on.

To meet these challenges farmers dairy farmers increasingly need entrepreneurial skill (Bergevoet, 2005). Research on entrepreneurial characteristics of dairy farmers in Slovenia is lacking. Insight in these characteristics can be of benefit for amongst others farmers' organizations, agricultural policymakers and educators and extension workers since the future of the country side and rural communities are partly depending on the developments in the dairy sector.

### *Objective of this paper*

To get insight into the entrepreneurial characteristics of Slovenian dairy farmers by investigating the opportunities and threats as perceived by farmers (external factors) to establish a future in rural Slovenia in the relation to internal factors (farmers' and farm characteristics) and future strategy of the farmer (specialization, diversification).

To get this insight the following research questions are defined:

- What are the main characteristics of the Slovenian dairy farms and farmers?
- How are external factors that might impact the development of the dairy sector perceived by the Slovenian dairy farmers?
- What is the relation between the identified internal and external factors and the *present farm structure and future strategies and plans*: of Slovenian dairy farmers?

In the remaining part of this paper the questionnaire and the statistical procedures are described in the next section of the paper, results and discussion are in section 3, and the conclusions and recommendations are in the final section.

## **Material and methods**

### *Description of Questionnaire*

A questionnaire based on (Bergevoet, 2005) was further elaborated and translated into Slovenian. The questionnaire was made up out of 5 parts. First, background data on size of the enterprise, age, gender, and level of education of the farmers were asked. Second, data on farmer's goals were collected through a list of statements (for example: "As an entrepreneur my goals are: To realise an income as high as possible."). The third section contained statements on attitudes, perceived behavioural control and subjective norms. And the last section contained questions on the external assessment by the farmers. In which their opinion of social, technical, environmental and political developments were asked. The last section contained questions on the future strategies the respondent wants to pursue (e.g. consolidation, expansion or diversification). The questionnaire is available on request by the first author.

All the questions from the second and third section were so-called closed questions, using Likert-type scales. The questionnaire was pre-tested both internally and with farmers and farmer related experts. The questionnaire was accompanied with a letter of recommendation from a local farm leader. The questionnaires (Q) were distributed amongst participants of farmers meetings in the winter of 2007. These meetings were part of a larger project (Twinning SI04-AG-06) that focused on information transfer on Farm quota and premiums. Number of questionnaire send was 1500. Number of Q returned 576 of which 525 were used for analysis. Fifty-one questionnaires were excluded because the respondents did not have any quota or dairy cattle. Thus a response rate of 35% was achieved.

### *Data analysis*

Data were entered in Excel and later transferred PASW statistics version 17.0. Analysis was done with this statistical software. The analysis involved the following steps:

#### *Step 1: Data description*

A comprehensive overview of the farm characteristics.

#### *Step2: Data reduction by means of factor analysis*

The aim of this step of the analysis was to get insight into common factors underlying the specific statements of the farmer. Therefore data reduction was performed by means of factor analysis. Data reduction was performed for farmers goals, preferred farm type, the farmers personal characteristic and his/her perception of opportunities and threats (external factors).

#### *Step 3: Investigate the relation between the in step 1 determined factors and present farm structure and future strategies and plans:*

To investigate this relation a linear regression analysis was used with the identified factors on farmers goals, preferred farm type, the farmers personal characteristics acting as the independent variables and the milk quota or future strategies/plans as the dependent variable. The goal factors were analysed in a stepwise procedure and only those factors that contributed significantly were entered into the model.

## Results

The characteristics of the participating farmers and their farms are given in Table 1 and Figure 2.

Table 1. Farm structure of participating dairy farmers comparison of respondents farm size originating from flat areas compared to hilly and mountain areas.

			Farm location		
	Total Slov. (n=505)	SD	Flat area (n=340)	Hills and mountains area (n=165)	Difference
A+D milk quota (*000 kg) <sup>1</sup>	127	117	139	108	**
No. of cows	21	15	23	19	NS
ha grass	13	13	12	17	*
ha maize	5	3.5	6	2,	**

<sup>1</sup> A quota is milk to be delivered to processing plant; D quota is milk for direct sales

NS = not significant, \*  $p < 0.05$ , \*\*  $p < 0.01$

As can be seen from table 1 large differences in farm size exist amongst the respondents. The average milk quota was 127.000 litres with a minimum of 2.000 litres and a maximum of 781.000 litres per farm (see also figure 2 for an insight into the distribution). To reduce the potential impact of the skewed distribution on further analysis a Log 10 transformation for the variable total milk quota was performed <sup>ii</sup>. Besides agricultural activities, 36% of the dairy farmers that responded had non-agricultural income. The age of respondents was around 50 years, but comparable to the situation in the field.

Dairy farming in Slovenia is done in different geographical circumstances: farms can be either located in flat areas or in hilly or mountain areas. Differences in location were investigated to see whether these differences have impact on farm structure and size (table 2). As can be seen from these table farms in hilly and mountain areas have smaller milk quota than farms in flat areas. Total farm size does not differ. However farmers in hilly and mountain areas have more grassland and less maize than their colleagues in flat areas.

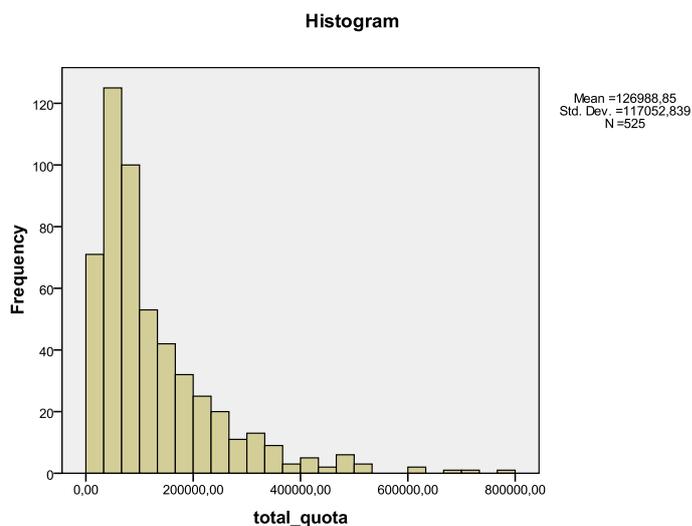


Figure 2. Quota size of the participants' farms.

### *Farmers' characteristics*

In the questionnaire questions were asked on three groups of farmers' characteristics:

- 1) farmers goals,
- 2) farmers' desired farm type and the management process.

In the appendix the details on the factor analysis can be found in table A1 to A3.

### *Farmers goals*

Thirteen questions were asked related to the goals farmers wanted to pursue. Applying factor analysis to the data reduced the number of variables, related to the goals of the dairy farmer from 13 to 4. The identified factors can be described as follows:

Factor 1 (Dairy-farming as a profession): High scores were found on questions regarding: "Enjoy my work", "Work with animals", "To work with machines", "To be able to work together with family members", "To work outside in the field".

Factor 2 (take society into consideration): the variables, which have a relatively high loading on this factor are: "To create and maintain nature and landscape", "To contribute to a positive image of the dairy sector", "to be respected by the community?", "To produce a good and safe product", and "To create and improve animal welfare",

Factor 3 (farming as business): all the variables which are related to running a farm as a business are in this factor. Variable with a high loading on this factor are: "To realize an income as high as possible", "To have sufficient leisure (vacation) time", "To be my own boss, thus to be independent", "To contribute to a positive image of the dairy sector / to be respected by the community".

Factor 4 (satisfaction and continuity): variables that have high loading on this factor are "To have pleasure in my work", "To build on the continuity of the farm so a family member can take over in the future".

The identified factors gave insight into a whole array of goals of dairy farmers that are both economic and non-economic. These findings are consistent with the findings in the literature (Gasson, 1973; Coughenour & Swanson 1988; Gasson & Errington 1993; Fairweather & Keating 1994; Willock et al., 1999). Besides economic goals (or instrumental goals, as they were termed by Gasson, 1973) - Factor 3 - several non-economic goals related to dairy farming can be distinguished. These are intrinsic (Factors 1, farming is valued as an activity in its own right), social (Factor 2, farming for taking care for society), and expressive (Factor 4, farming is a means of self-expression or personal fulfilment).

### *Desired farm type*

Fourteen questions were asked related to the desired farm type that farmers wanted to create in future. Applying factor analysis to the data reduced the number of variables related to the desired farm type from 14 to 3. Similarity exists with the factors determined by Bergevoet et al. (2004).

Analysis of these resulting three factors showed that the desired future farm types could be characterized as:

Factor 1 (modern family farm): variables like related to large, intensive, innovative and modern, high tech farming on a family farm had high positive loadings on this factor. Whereas an ecological farm had a negative loading on this factor.

Factor 2 (diversification); on this factor high loadings were found on agricultural activities (fattening bulls, suckler cows, pigs, small ruminant, wine garden, horticulture), are a second source of income, agro-tourism or/and special regional products, cottage industry and forestry as a second source of income and ecological farming.

Factor 3 (low input farm); on this factor high loadings were found on A low cost and a farm in which other agricultural activities (fattening bulls, suckler cows, pigs, small ruminant, wine garden, horticulture,...) are a second source of income farm

### *The management process*

The third group of variable on which factor analysis was performed related to the farmers management process. In the questionnaire 24 questions were asked related to the planning and decision making process, farmers' personal characteristics and the farmers opinion towards legislation.

Factor analysis reduced the number of 24 variables related to personal characteristics to 7 factors. Analysis of the seven factors showed the following factors as identified:

Factor 1 (Entrepreneurship): Variables with high loadings on this factor are: I monitor my production targets by analyzing my farm results, I am a good organizer, I regularly negotiate with suppliers or customers about prices and conditions to do business, I try to be among the highest (top) producers, I use the internet to find information for my farm, I look more often for challenges than other farmers, I'm good informed on the for my business relevant legislation

Factor 2 (Information seeking): Variables with high loadings on this factor are: I prefer to receive advice on an individual basis, I like to participate to professional lectures and training, like to participate in a study group, Farming is still great fun / satisfying, Before I take important decisions I take a lot of advise

Factor 3 (Risk averseness): Variables with high loadings on this factor are: I like to avoid debts as much as possible, When I come to business I like to play on safe / I like to avoid risk, Before I take important decisions I take a lot of advise.

Factor 4 (Planning): Variables with high loadings on this factor are: My goals are written down in clear plans, It is clear to me where my farm will be within 5 years, Farming is still great fun / satisfying

Factor 5 (Diversification): Variables with high loadings on this factor are: Having income from outside the farm (off farm work) is important for the continuity of the farm business, Contact with the general public is important to me, that is the reason why I invite visitors to my farm, I or my family enjoys/would enjoy to sell products directly to the consumer. These are all variable associated with rural business other than traditional dairy farming.

Factor 6 (external locus of control): Variables with high loadings on this factor are: I can make plans but reality is always different. That's the reason that I have stopped planning things, The moment there are more solutions to a problem I find it difficult to make a choice. Locus of control is a term in psychology which refers to a person's belief about what causes the good or bad results in his or her life, either in general or in a specific area such as health or academics. Locus of control refers to the extent to which individuals believe that they can control events that affect them. Individuals with a high internal locus of control believe that events result primarily from their own behaviour and actions. Those with a high external locus of control believe that powerful others, fate, or chance primarily determine events. Those with a high internal locus of control have better control of their behaviour, tend to exhibit more political behaviours, and are more likely to attempt to influence other people than those with a high external locus of control; they are more likely to assume that their efforts will be successful. They are more active in seeking information and knowledge concerning their situation (Wikipedia 18/11/2009).

Factor 7 (Pessimism): The variable "I discourage young people to become a farmer" has high loadings on this variable. The items in this domain relate to an individual's general satisfaction with farming as a career and to the future prospects for themselves and others within the industry (Willock et al., 1999).

### *External factors: Opportunities and threats*

Figure 4 gives the average scores of the farmers towards a number of opportunities and threats. In relation to perceived opportunities and threats farmers consider land and labour availability, the world market, legislation and town planning as a threat, while ICT, food safety and animal welfare and environmental issues, rural development, European borders, and EU subsidies are pictured as opportunities. Factor analyses reduced the number of opportunities and threats from 18 to 5 indicated as "consumers concern", "legislation", "limited resources", "policies" and "technology". In the appendix the details on the factor analysis can be found in Table A4.

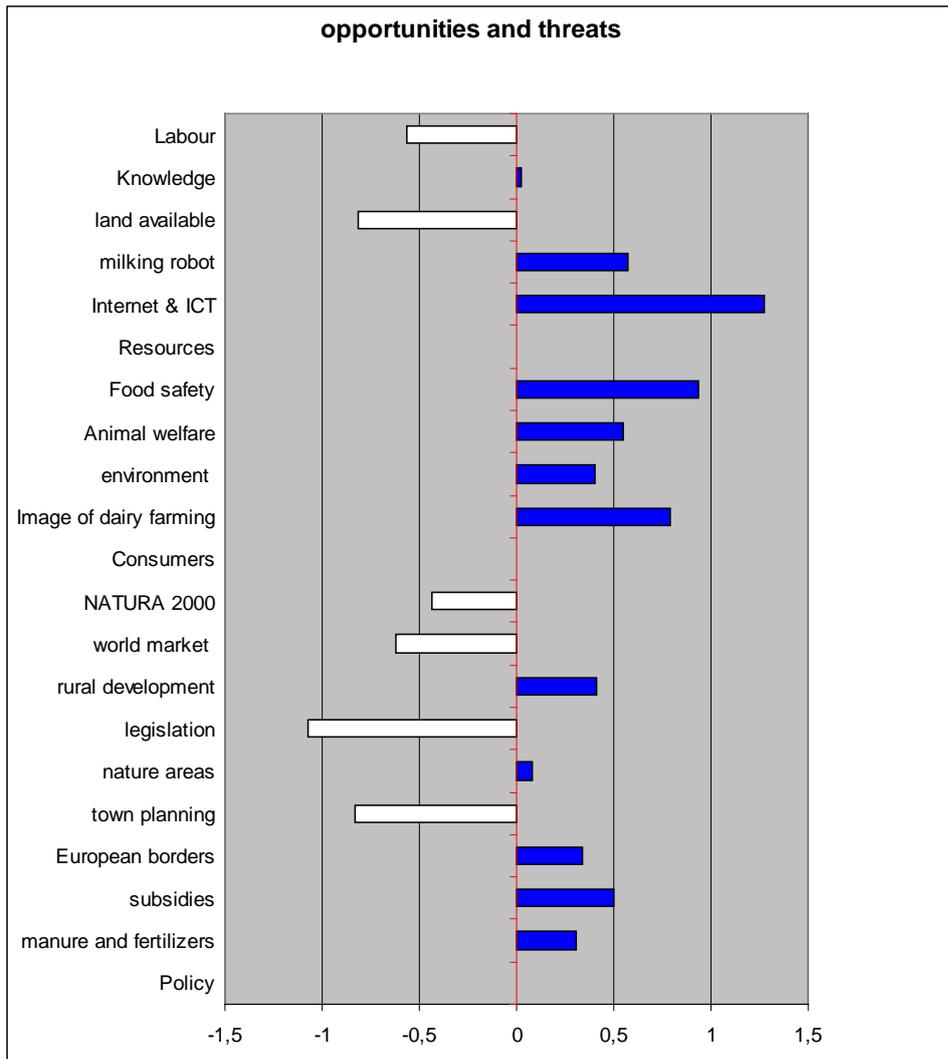


Figure 4. Opportunities (+) and threats (-) as experienced by the farmers.

*Items scored on a Likert scale ranging from -3 (big threat) to +3 (big opportunity)*

In general the outlook to the world at large seems to be rather positive (as can be seen from the positive scores), except acting on the world market, while restrictions in the local environment, like land and labour availability deteriorate the picture.

#### *Future plans and farm size*

Two groups of farmers were distinguished:

(1) almost half of the respondents indicated that their future plans were mainly focusing on consolidation (233 respondents) and

(2) the other group that indicated that they wanted to expand their farms (263 respondents).

This fraction is the same for both in farms located in the flat areas as well as in hilly and mountain areas. There was no significant difference between present farm size of farms that wanted to expand and farms that wanted to consolidate.

To investigate the relation between the future strategies and plans and the identified factors on farmers goals, preferred farm type, the farmers personal characteristics and his/her perception of opportunities and threats, a linear regression was performed. The results of the final model are given in Table 2.

Table 2. Final model of the linear regression analysis between the expansion plans of farmers and farmers goals, preferred farm type, the farmers personal characteristic and his/her perception of opportunities and threats<sup>1</sup>.

	Standardized Coefficients
Modern family farm	0,17
Information searching	0,14
Pessimism	-0,20
Risk averseness	-0,15

Dependent Variable: expansion yes / no

<sup>1</sup>  $R^2$  is 11%. Only significant relations are displayed.

The explained variance in this model is rather small (11%). The variables “modern family farm”, “information searching”, “pessimism” and “risk averseness” in Table 3 contribute significantly to this.

To investigate the relation between the present farm structure (as expressed by the milk quota) and the identified factors on farmers goals, preferred farm type, the farmers personal characteristic and his/her perception of opportunities and threats, a linear regression was performed. The results of the final model are given in Table 3.

Table 3. Final model of the linear regression analysis between the present farm size (Log milk quota) and farmers goals, preferred farm type, the farmers personal characteristic and his/her perception of opportunities and threats<sup>1</sup>.

	Standardized Coefficients
Entrepreneurship	0,20
Information searching	0,14
Being a farmer	-0,10
Low input farming	-0,19
Diversification	-0,20
Risk averseness	-0,25
External locus of control	-0,15
Limited resources	-0,15
Aversion towards legislation	-0,11

<sup>1</sup> Dependent =log milk quota;  $R^2$  of this final model= 43%; only significant relations are displayed.

The model was able to explain 43% of the observed variation in Milk Quota (Log transformation) which can be regarded sufficient. A positive relation with the milk quota (meaning the higher the score of the respondents the larger the milk quota were found) were found for the factor entrepreneurship and Information searching. These two factors are generally considered beneficial for executing plans. The factors that had a negative relation were those factors that are generally considered not very beneficial for executing plans: for example the observed external locus of control and risk averseness. And finally a set of factors with a negative relation that by nature are not unfavourable for entrepreneurs but probably result in other (successful) farm enterprises not being large specialized farms. Examples of this are the factors (farm types) diversification and low input farming.

Farmers differ in entrepreneurial characteristics and these results in differences in present farm size. The higher scores on entrepreneurial characteristics the larger the present milk quota. However there is no strong relation between either present farm size and future plans or entrepreneurial characteristics. If as assumed entrepreneurial characteristics are needed for the execution of future plans than these characteristics have to be developed by large groups of Slovenian dairy farmers. Being an entrepreneur and gaining strategic competencies are complex issues requiring a high level of skills. Therefore, as (Coutts, 1994) suggests, improving a farmer’s strategic characteristics calls for, using participatory approaches. Study groups offered possibilities for such approaches.

Results are comparable with a similar study in earlier years in The Netherlands by Bergevoet (2005). Although dairy farmers characteristics are similar in Slovenia and The Netherlands the farmers have a larger milk quota per farm in the Netherlands. These results suggest that local (policy) circumstances have a large impact on how comparable strategies amongst farmers can result in large country differences in the structure of the agricultural enterprises and rural landscape.

## Conclusions

- There is large variation of dairy farms in Slovenia in farm size, milk quota and natural circumstances in the sample of farms studied. Farms in flat areas have larger milk quota than farms in hilly and mountain areas and less forestry.
- There is not a strong relation between farmers goals, farm type, farmers' characteristics, and opportunities and threats and the future expansion plans as formulated by the farmers.
- However there is a strong relation between the farmer goals, farm type, farmers' characteristics, and opportunities and threats and the present farm size.
- If the Slovenian dairy farmers want to expand their farm size from a large fraction of the farmers their entrepreneurial characteristics have to improve to meet the future challenges.

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<sup>i</sup> Factor analysis was performed with varimax orthogonal rotation. Factors with an Eigenvalue larger than 1 were identified and described. For further analysis, the original set of variables, related to the goals, was replaced with a set of variables created from the factor scores. These new variables were computed, based on the factor loadings of all variables on the factor. Details on the results of the factor analysis are available on request (contact first author)

<sup>ii</sup> To investigate whether the new distribution was significantly different from a normal distribution the Kolmogorov-Smirnov Z test was performed ( $p=0.07$ ). From this test it could not be concluded that the new distribution was significantly different from a normal distribution. For the remaining analysis for this LOG10 transformation was used.

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## Appendix results of data reduction

Factor extracted with Factor analysis, Factors with loadings > 0.40 or <-.040 are bold.

Table A1. Factor analysis farmer's goals.

	<u>Dairy- farming as a profession</u>	<u>take society into consideration):</u>	<u>farming as business</u>	<u>satisfaction and continuity</u>
1)To realize an income as high as possible	.143	.022	<b>.545</b>	.207
2) To have pleasure in my work	.188	.200	.056	<b>.682</b>
3)To build on the continuity of the farm so a family member can take over in the future	.103	.046	.177	<b>.739</b>
4) To have sufficient leisure (vacation) time	-.009	.094	<b>.719</b>	-.352
5) To be my own boss, thus to be independent	.086	.027	<b>.647</b>	.345
6) To create and maintain nature and landscape	.101	<b>.736</b>	.124	-.018
7) To contribute to a positive image of the dairy sector / to be respected by the community?	.092	<b>.421</b>	<b>.505</b>	.138
8) To produce a good and safe product	.112	<b>.752</b>	.102	.190
9) To create and improve animal welfare	.327	<b>.704</b>	-.021	.099
10) To work with animals	<b>.679</b>	.392	.032	.125
11) To work with machines	<b>.820</b>	.162	.127	-.052
12) To be able to work together with family members	<b>.611</b>	.254	.050	.343
13) To work outside in the field	<b>.756</b>	-.001	.120	.184
<b>Results of factor analysis</b>				
Initial Eigenvalues	3.87	1.35	1.22	1.03
Rotation Sums of Squared loadings	2.29	2.08	1.58	1.53
% of variance explained	17.62	15.99	12.17	11.79
Cumulative % of variance explained	17.62	33.61	45.78	57.57

Factor extracted with Factor analysis, Factors with loadings > 0.40 or <-.040 are bold

Table A2. Factor analysis desired farm type.

	Modern family farm	Diversification	Low input farming
1) A large farm	<b>.688</b>	.077	-.009
2) An intensive farm	<b>.778</b>	-.080	-.090
3) An innovative - creative farm, using experiments to develop farm further	<b>.547</b>	.244	-.027
4) A modern farm, implementing new technologies which have proved to be safe	<b>.693</b>	.149	.149
5) A real family farm aimed at maintenance of employment for family members	<b>.533</b>	.162	.039
6) A breeding farm with high genetic potential	<b>.702</b>	-.129	.040
7) A high tech farm	<b>.596</b>	-.046	.320
8) A low cost farm	.122	<b>-.063</b>	<b>.808</b>
9) A farm in which other agricultural activities (fattening bulls, suckler cows, pigs, small ruminant, wine garden, horticulture,...) are a second source of income	-.062	<b>.407</b>	<b>.568</b>
10) A farm in which agro-tourism or/and special regional products are a second source of income	.069	<b>.816</b>	-.013
11) A farm in which cottage industry is a second source of income	.114	<b>.830</b>	-.004
12) A farm in which forestry is a second source of income	.097	<b>.592</b>	.050
13) An ecological farm	<b>-.045</b>	<b>.721</b>	.157
14) A farm, which is included in the SKOP programme (Slovenian Agri-Environmental Programme (SAEP))	.090	.384	.345
<b>Results of factor analysis</b>			
Initial Eigenvalues	3.41	2.47	1.10
Rotation Sums of Squared loadings	3.04	2.68	1.26
% of variance explained	21.76	19.16	8.9
Cumulative % of variance explained	21.76	40.92	49.92

Table A 3. Factor analysis The management process.

	Entrepreneurship	Information seeking	Risk averseness	Planning	Diversification	external Locus of control	Pessimism
It is clear to me where my farm will be within 5 years	.110	.082	.158	<b>.771</b>	-.037	-.137	-.041
My goals are written down in clear plans	.290	.156	-.055	<b>.721</b>	.075	-.121	-.087
I can make plans but reality is always different. That's the reason that I have stopped planning things	-.086	-.017	.161	-.073	-.030	<b>.653</b>	.141
I monitor my production targets by analyzing my farm results	<b>.645</b>	.247	.128	.133	-.225	.046	-.166
Having income from outside the farm (off farm work) is important for the continuity of the farm business	.005	-.132	.148	.032	<b>.546</b>	.241	-.161
The moment there are more solutions to a problem I find it difficult to make a choice	-.275	.299	.072	.082	.113	<b>.487</b>	.287
When I come to business I like to play on safe / I like to avoid risk	-.061	.098	<b>.731</b>	.135	.068	.128	.174
I like to avoid debts as much as possible	.028	-.028	<b>.794</b>	.001	.021	.089	.074
Before I take important decisions I take a lot of advise	.113	<b>.410</b>	<b>.428</b>	.071	.130	.095	-.288
I am a good organizer	<b>.554</b>	.027	.133	.153	.190	.060	-. <b>459</b>
I or my family enjoys/would enjoy to sell products directly to the consumer	.188	.186	.105	.020	<b>.643</b>	.049	.142
I prefer working in barn or on land above talking a lot of time with people	.128	.095	.109	.176	-. <b>613</b>	.378	.156
I regularly negotiate with suppliers or customers about prices and conditions to do business	<b>.646</b>	-.039	-.006	.060	.149	.052	.094
Contact with the general public is important to me, that is the reason why I invite visitors to my farm	.372	.303	-.094	.082	<b>.565</b>	-.170	.148
I try to be among the highest (top) producers	<b>.543</b>	.120	-.362	.236	.145	.057	.187
Farming is still great fun / satisfying	.168	<b>.456</b>	.026	<b>.409</b>	-.161	.002	-.143
I discourage young people to become a farmer	.109	-.117	.229	-.112	.020	.121	<b>.696</b>
I use the internet to find information for my farm	.435	.310	-.142	-.281	-.001	-.275	-.236
I like to participate in a study group	.378	.622	-.037	-.064	.126	-.254	.128
like to participate to professional lectures and training	.165	.771	.095	.091	-.057	-.005	-.039
I prefer to receive advice on an individual basis	.049	<b>.582</b>	-.015	.248	.203	.264	-.099
I look more often for challenges than other farmers	<b>.596</b>	.307	-.222	.141	.199	-.137	.136
I'm good informed on the for my business relevant legislation	<b>.602</b>	.241	.144	.169	-.007	-.148	-.044
Legislation spoils the pleasure in my work	.095	-.045	.028	-.244	-.008	<b>.653</b>	-.144
<b>Results of factor analysis</b>							
Initial Eigenvalues	4.62	2.36	1.70	1.31	1.21	1.16	1.04
Rotation Sums of Squared loadings	2.95	2.32	1.78	1.73	1.71	1.67	1.23
% of variance explained	12.88	9.68	7.42	7.21	7.11	6.94	5.14
Cumulative % of variance explained	12.88	21.96	29.39	36.60	43.71	50.65	55.79

Table A4. Factor analysis of Opportunities and threats.

	consumers concern	Aversion towards .	Limited resources	policies	technology
1) Policy on manure and fertilizers	.178	.042	.128	<b>.704</b>	-.144
2) Policy on subsidies	.090	.081	.034	<b>.724</b>	.090
3) Disappearing of the European borders	.010	.094	-.058	.347	.196
4) Policy on town planning	.089	.089	.163	-.078	-.015
5) Policy on nature areas	.243	<b>.624</b>	.046	.080	.064
6) Increasing amount of legislation	.106	<b>.596</b>	.101	.215	-.035
7) Policy on rural development	.139	<b>.451</b>	.018	<b>.529</b>	.244
8) Producing for world market prices	.002	<b>.576</b>	.029	.042	.038
9) Living close to a nature reserve or in the area NATURA 2000	.152	<b>.763</b>	.100	-.017	-.062
10) Image of dairy farming	.272	.217	-.133	.244	<b>0.40</b>
11) Consumers concern for the environment	<b>.847</b>	.203	.043	.089	.070
12) Consumers concern for animal welfare	<b>.850</b>	.147	.034	.165	-.022
13) Consumers concern on food safety	<b>.846</b>	.128	.102	.111	.133
14) Development of the internet and other possibilities of ICT	.072	.024	.135	.063	<b>.784</b>
15) Development of the milking robot	.001	-.066	-.028	-.088	<b>.752</b>
16) (No) availability of agricultural land	.109	.179	<b>.785</b>	.005	-.014
17) (No) availability of useful knowledge	-.051	.003	<b>.821</b>	.072	.059
18) (No) availability of labour	.093	.048	<b>.786</b>	.075	.012
<b>Results of factor analysis</b>					
Initial Eigenvalues	3.98	1.89	1.49	1.378	1.10
Rotation Sums of Squared loadings	2.42	2.05	2.03	1.61	1.50
% of variance explained	13.43	11.40	11.27	8.95	8.36
Cumulative % of variance explained	13.43	24.84	36.10	45.05	53.40