

# Impact of the ‘Family-firm life cycle’ on the Management Processes Involved in Sustainable Glasshouse Horticulture

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**Abstract**— In Flanders glasshouse vegetables and ornamental plants are typically produced at family businesses. At this type of businesses the objectives and long-term firm developments are influenced by the so called ‘family-firm life cycle’. In many cases the firm shows a life cycle that corresponds with the life cycle of the entrepreneur. The objective of the paper is to test the hypothesis that the ‘family-firm life cycle’ will have an impact on the personal and business characteristics, objectives and the quality of the management processes involved in sustainable glasshouse horticulture. As sustainable horticulture integrates the three P’s (People, Planet, Profit) special attention is paid to human resource, environmental and financial management. Data for the research are based on interviews and accounting data at 138 glasshouse holdings situated in Flanders (northern part of Belgium). The results reveal that the glasshouse managers in the different phases of the ‘family-firm life cycle’ show significant differences in age, education level and numbers of seminars attended. The economic dimension, modernity of durable goods, solvency and investment pattern of the firms in the different stages of the ‘family-firm life cycle’ also show significant differences. At the older businesses the availability of a successor has an important influence. The results confirm the hypothesis that the objectives and the quality of the management processes involved in environmental, human resource and financial management are dependent on the phase in the ‘family-firm life cycle’. In the early stages firm managers are more ambitious and attach a higher importance to the management processes involved in sustainable development. In the later stages the availability of a successor has an important influence. Unexpectedly no significant influence of the phase in the ‘family-firm life cycle’ on the income obtained per familial labour unit is found. The insights derived from this research have important implications both for research and practice. They can enable glasshouse growers and advisers to take and/or support correct decisions and may help policy makers to differentiate on the base of the ‘family-firm life cycle’.

**Keywords**— farm management, horticulture, sustainability

## I. INTRODUCTION

During last years integrated responsibilities for people (employment, health, education, human rights), profit (economic and financial continuity) and planet (clean environment and preservation of resource stocks) are becoming a necessity for sustainable entrepreneurship in horticulture. Sustainable entrepreneurship is derived from the concept sustainable development, which can be defined as the development that meets the needs of the present generation, without compromising the ability of future generations to meet their own needs [1]. In order to get insight into sustainable development of glasshouse horticulture in Flanders one has to take into account the specific characteristics of glasshouse production. In Flanders glasshouse vegetables and ornamental plants are typically produced at ‘micro-firms’. The ‘owner-manager’, together with his family, has a central position in the management process, and his decisions are greatly influenced by his personal values, attitudes and objectives or goals. According to agricultural economics literature the objectives and long-term firm developments are influenced by the so-called ‘family-firm life cycle’. The firm frequently shows a life cycle that corresponds with the life cycle of the farmer-entrepreneur [2]. The concept of the ‘family-firm life cycle’ has been used to explain farm size distributions within the agricultural sector, or within regions, or to explain changes in the size of family firms over time [3]-[4], and can contribute to a sound understanding of sustainable development.

The objective of the paper is to test the hypothesis that the ‘family-firm life cycle’ will have an impact on the personal and business characteristics, objectives and the quality of the management processes involved

in sustainable development of the glasshouse holdings. As sustainable horticulture integrates the three P's (People, Planet, Profit) [5] attention is paid to social, environmental as well as economic aspects.

## II. MATERIALS AND METHODS

The empirical research was performed at 138 glasshouse holdings selected from the Flemish Farm Accountancy Data Network (FADN), permitting to couple accounting data collected during the period 1996 - 2003 to the results of a questionnaire measuring the importance of several personal and business objectives and indicators for the quality of the management process by means of five-point Likert-type scales. The respondents were also asked to indicate the three most important objectives by means of the 'pick-any' method.

The data on personal and business objectives, collected by means of the five-point-Likert-type scales, are reduced to a limited number of dimensions by means of Principal Component Analysis (PCA), reflecting the main objectives of the managers.

The management processes considered in the paper are : environmental management, human resource management and financial management. As indicators for environmental management the extent of registration and external comparison of the use of energy, fertilizers and pesticides with other firms or norms are used. In order to evaluate human resource management (HRM) at the glasshouse holdings employing personnel several indicators are used, such as involvement of personnel in decision making, rewarding policy, opportunities for training, etc. For financial management the period of financial planning and the availability of a financial plan (written or not) for the coming 5 years are used as indicators.

In order to investigate the influence of the phase in the 'family-firm life cycle', the glasshouse holdings in the sample are divided into five groups, according to the age of the business and the availability of a successor. The first group is composed of 18 holdings in the start phase with a business age lower than 10 years. In the second group there are 35 holdings in the growth phase with a business age between 10 and 20 years. The third group is composed of 49 holdings in the consolidation phase with a business age between

20 and 30 years and the non-availability of a successor. In the fourth group there are 20 holdings in the exit phase with a business age of 30 years or more and the non-availability of a successor. The last group consists of 16 holdings with a business age of 20 years or more and the availability of a successor.

Analysis of variance (ANOVA), post hoc Duncan tests and  $\chi^2$ -tests are used to test the statistical significance of the differences observed between the groups.

## III. RESULTS AND DISCUSSION

### A. *Personal and business characteristics according to firm phase*

The glasshouse managers in the different phases of the 'family-firm life cycle' show significant differences in age, education level and number of seminars attended. The economic dimension, modernity of the durable goods, solvency and investment pattern of the firms in the different stages of the 'family-firm life cycle' also show significant differences. At the older businesses the availability of a successor has an important influence. The hypothesis that the life cycle of the firm manager parallels the life cycle of the family firm can be confirmed by the results. More information on these results can be found in [6].

### B. *Personal objectives according to firm phase*

Five groups of personal objectives are distinguished on the basis of Principal Component Analysis (PCA) [6]:

1. 'Instrumental objectives' (status) : 'attractive lifestyle', 'high social status', 'high level of income', 'meeting people'
2. 'Expressive objectives' (entrepreneurship) : 'job satisfaction', 'self-fulfilment', 'doing better than my colleagues', 'personal independence'
3. 'Familial/social objectives' : 'building up a business for my family', 'maintaining family traditions', 'playing a role in society'
4. 'Intrinsic objectives' : 'working with plants', 'a pleasant job which is also a hobby', 'working with family members'

5. 'General objectives' : 'satisfactory income to continue the business', 'making good products'

The results indicate that the emphasis on various objectives is changing during the firm manager's life time. From the 'Instrumental objectives' a 'high level of income' is the most important, independent of the phase in the 'family-firm life cycle'. The mean scores for the group of 'Expressive objectives' are quite high in each phase of the 'family-firm life cycle', although the objectives 'job satisfaction' and 'personal independence' are significantly more important at the businesses in the start phase and at the older ones with a successor, compared to the businesses in the exit phase. The group of 'Familial/social objectives' has a rather low importance, except at the older businesses with a successor. In general, the group of 'Intrinsic objectives', covering the aspects of craftsmanship, receives a high average score. Although no significant differences could be detected among the groups, 'a pleasant job which is also a hobby' belongs to the top 3 at 50 % of the older businesses with a successor. The 'General objectives' 'satisfactory income to continue the business' and 'making good products' are important independent of the phase in the 'family-firm life cycle'. More information on these results can be found in [6] and [7].

### *C. Business objectives according to firm phase*

Following five groups of business objectives were distinguished on the basis of Principal Component Analysis (PCA) [6]:

1. 'Financial independence of the firm' : 'financial independence of the firm', 'productivity', 'cost reduction'
2. 'Creativity and innovation' : 'creativity and innovation', 'flexibility', 'sound liquidity position', 'product quality', 'image of the business'
3. 'Growth' : 'creating jobs for family members', 'growth'
4. 'Stabilisation' : 'stabilisation', 'survival', 'size reduction'
5. 'Profitability' : 'profitability', 'saving jobs'

Within the first group of objectives 'financial independence of the firm' scores significantly higher in the start phase than in the exit phase, which can be explained by the lower solvency of the firms in the start phase. Although the mean scores do not differ

significantly, 'productivity' is mentioned in the top 3 of many firms in the start phase. From the objectives belonging to the dimension 'Creativity and innovation', the average score on the objective 'product quality' is higher in the start phase and at the older businesses with a successor than in the growth phase. As expected, the highest average scores for the objective 'growth' are obtained at businesses in the start phase, growth phase and at the older businesses with a successor, and are significantly higher than in the exit phase. The objective 'survival' is significantly more important in the start phase and at the older businesses with a successor than in the exit phase. In general the objective 'size reduction' has a low importance and is significantly more important at firms in the exit phase than at firms in the start phase and at the older businesses with a successor. The objective 'profitability' receives high average scores independent of the phase in the 'family-firm life cycle'. More information on these results can be found in [6] and [7].

### *D. Indicators for sustainable development according to firm phase : a management approach*

In Table 1 the impact of the 'family-firm life cycle' on the management processes involved in sustainable horticultural production is presented. As sustainable horticulture integrates the three P's, special attention is paid to environmental, human resource and financial management. As indicator for environmental management the extent of registration and external comparison of the use of energy, fertilizers and pesticides with other firms or norms is used. The results indicate no significant differences for registration, however external comparison of energy and pesticides is significantly more important at businesses in the start phase, the growth phase and at older businesses with a successor than at businesses in the exit phase. At businesses in the start phase the average scores for comparison of the use of energy are also significantly higher than at businesses in the growth phase and at the older businesses with a successor.

Several indicators are used to evaluate human resource management (HRM) at the glasshouse holdings employing personnel. The percentage of

businesses employing personnel is ranging from 55 % of the businesses in the exit phase to 81 % of the older businesses with a successor. The average number of paid labour units (expressed in full-time labour units) and the importance attached to HRM do not show any significant differences according to the phase in the 'family-firm life cycle'. In general there is a low involvement of the personnel in decision making, which can be explained by the fact that they are mainly involved in executive activities. Task division of the personnel seems to be significantly more important at businesses in the start and growth phase and at the older businesses with a successor than at these in the exit phase. Businesses in the start phase attach more importance to discussions about the functioning of the personnel compared to businesses in the growth phase and the exit phase. Low scores are obtained for solving problems of the personnel and opportunities for training, regardless of the phase in the 'family-firm life cycle'. Most of the firm managers declare to have a rigid rewarding policy with fixed wages (opposed to incentive reward system), but the average score is significantly higher at businesses in the start phase than at those in the consolidation phase and at older businesses with a successor. No significant differences among the groups are observed for improvement of the labour conditions. Safety of the personnel is important in each phase of the 'family-firm life cycle'.

Despite the fact that the scores received for financial planning are generally low, a significantly higher score is obtained for the businesses in the start and growth phase and at the older businesses with a successor. Written financial plans are scarce independent on the phase in the 'family-firm life cycle'. Unexpectedly, despite the observed differences in objectives and indicators for sustainable management no significant differences among the groups were detected for the income per familial labour unit.

#### IV. CONCLUSIONS

The results show that the 'family-firm life cycle' is a useful concept in explaining the objectives and management processes involved in sustainable production in horticulture. The hypothesis that the life-

cycle of the firm manager parallels the life cycle of the family firm can be confirmed. In the early stages firm managers are more ambitious and attach a higher importance to the management processes involved in sustainable development. In the later stages the availability of a successor has an important influence. The insights derived from this research have important implications both for research and practice. They can enable glasshouse growers and advisers to take and/or support correct decisions and may help policy makers to differentiate on the base of the 'family-firm life cycle'.

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Table 1 Environmental, human resource and financial management according to firm phase

FIRM PHASE	0-10 y.	10 - 20 y.	20 - 30 y. without successor	>= 30 y. without successor	>= 20 y. with successor	Statistical Significance
	START PHASE	GROWTH PHASE	CONSOLI- DATION PHASE	EXIT PHASE		ANOVA 1-5 scale
<b>ENVIRONMENTAL MANAGEMENT (1-5 scale)</b>	N = 18	N = 35	N = 49	N = 20	N = 16	
* ENERGY MANAGEMENT						
- Registration	3,33	2,97	2,84	3,05	2,94	0,890
- External comparison with other firms or norms	3,22 <sup>C</sup>	2,23 <sup>B</sup>	2,00 <sup>AB</sup>	1,30 <sup>A</sup>	2,25 <sup>B</sup>	0,002
* FERTILIZER MANAGEMENT						
- Registration	3,17	2,74	2,86	3,15	3,13	0,840
- External comparison with other firms or norms	2,59	2,29	2,35	1,50	2,73	0,138
* PESTICIDE MANAGEMENT						
- Registration	3,33	3,09	3,12	3,25	3,19	0,987
- External comparison with other firms or norms	2,67 <sup>B</sup>	2,69 <sup>B</sup>	2,22 <sup>AB</sup>	1,45 <sup>A</sup>	2,56 <sup>B</sup>	0,046
<b>HUMAN RESOURCE MANAGEMENT(1-5 scale)</b> (% of firms with personnel)	N = 12 (67%)	N = 27 (77%)	N = 33 (67%)	N = 11 (55%)	(N = 13 (81%))	
- Paid labour units (converted to full-time labour forces)	3,35	2,07	2,17	1,62	2,81	0,287
- Importance of human resource management	4,50	3,41	3,70	3,18	3,62	0,181
- Involvement personnel in decision making	1,75 <sup>AB</sup>	1,52 <sup>AB</sup>	1,27 <sup>A</sup>	2,18 <sup>B</sup>	1,31 <sup>A</sup>	0,071
- Task division personnel	4,08 <sup>B</sup>	4,26 <sup>B</sup>	3,39 <sup>AB</sup>	3,09 <sup>A</sup>	3,31 <sup>B</sup>	0,033
- Discussions about functioning personnel	4,33 <sup>B</sup>	2,41 <sup>A</sup>	3,27 <sup>AB</sup>	2,27 <sup>A</sup>	3,15 <sup>AB</sup>	0,006
- Solving problems of personnel	2,58	2,63	2,64	2,36	2,46	0,984
- Rewarding policy	2,60 <sup>B</sup>	2,12 <sup>AB</sup>	1,57 <sup>A</sup>	2,00 <sup>AB</sup>	1,38 <sup>A</sup>	0,044
- Training opportunities for personnel	1,75	2,04	1,64	1,82	2,38	0,472
- Improving labour conditions	3,67	2,52	2,55	2,45	2,77	0,170
- Safety personnel	4,33	3,63	3,85	4,09	3,92	0,548
<b>FINANCIAL MANAGEMENT (1-5 scale)</b>	N = 18	N = 35	N = 49	N = 20	N = 16	
- Period of financial planning (years)	3,00	2,46	2,29	2,35	2,13	0,554
- Financial plan for coming 5 years	3,22 <sup>B</sup>	2,83 <sup>B</sup>	1,88 <sup>A</sup>	1,75 <sup>A</sup>	3,19 <sup>B</sup>	0,000
- Written financial plan for coming 5 years	1,89	1,71	1,35	1,30	2,06	0,102
<b>INCOME (euro/year)</b>	N = 18	N = 35	N = 49	N = 20	N = 16	
- Income per familial labour unit (euro/year) 1996-1999	36.711	39.047	38.242	30.809	47.888	0,500
- Income per familial labour unit (euro/year) 2000-2003	30.260	47.750	44.470	38.530	64.120	0,410

<sup>A,B,C</sup> Different characters indicate significant differences at 5 % significance level