

GEO 511 Master's Thesis:

Shaping cultural landscapes: Agricultural decision-making in the Entlebuch (Switzerland) and Southern Illinois (USA) with particular focus on cultural ecosystem services

by

Patrick Schoch

06-705-115

patrick-schoch@bluewin.ch

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Supervision:

Prof. Dr. Norman Backhaus

Human Geography Unit, Department of Geography, University of Zürich - Irchel
Winterthurerstr. 190, 8057 Zürich, Switzerland
norman.backhaus@geo.uzh.ch

Prof. Dr. Adrienne Grêt-Regamey

ETH Zürich, Institute for Planning of Landscape and Urban Systems
Wolfgang-Pauli-Str. 15, 8093 Zürich, Switzerland
gret@nsl.ethz.ch

Dipl. geogr. Enrico Celio

ETH Zürich, Institute for Planning of Landscape and Urban Systems
Wolfgang-Pauli-Str. 15, 8093 Zürich, Switzerland
ecelio@ethz.ch



**Universität
Zürich**^{UZH}

Preface

As I was seeking an interesting field to conduct research in connection with a master's thesis, I got really excited about when Prof. Dr. Adrienne Grêt-Regamey proposed a comparative study between Switzerland and the USA (with focus on cultural ecosystem services) to me. It has been a good piece of work since then, but here now the final product is available. It is my first bigger work written completely in English.

Primarily, I have always seen this to be for training and education purposes – and indeed I was given a chance to learn a lot. It was the first time that I attended a research project from scratch. Every stage until this final text, with all its results, discussion points and remaining questions, were very instructive. Quite a number of people have, directly or indirectly, been involved in the project and of course it has not always been easy to combine all the different interests and opinions. Neither has it always been easy to stay focused on the original research questions and to choose the methods appropriately where possible. Certainly, some decisions would be taken differently in retrospect. Still, I enjoyed myself assembling this master's thesis and greatly benefited from it.

I would like to encourage you as the reader to keep an open eye while reading the chapters as you might discover coherences in the data that I did not see or you might find an argument onesided (neglecting relevant aspects). I would definitely be interested in hearing about it.

I must also emphasize that I am educated in geography, atmospheric sciences and spatial planning and not really in agricultural science or the like. In other words, I have no prior affiliation to farming and therefore conceive it to be disputable whether I am the right person to conduct such research. As said, it served for further education purposes, but nonetheless I regard it as important to ask such questions in business as in science.

This thesis also wants to promote sustainable development and the concept of ecosystem services. However, I must ask myself whether a return flight from Europe to America and a stay in Illinois is justifiable in this context. If there is an easy answer to this question, I sense it not to be in favor of my actions. The goal of sustainable development is an immense and pressing challenge and even though mainly farmers are in the focus of this thesis, it of course involves everybody from every background to make a contribution. I would like to dwell upon that spirit.

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I am in these people's debt and I can only hope to have mentioned everything they helped me with. Naturally, I am also grateful to the respondents of the surveys and the farmers who participated in the interviews (and pretests).

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Content

Preface	ii
Acknowledgment	iii
Figures	vi
Tables	viii
Abbreviations	x
Summary	xi
1. Introduction	1
2. Literature review	4
2.1 The concept of ecosystem services.....	4
2.2 Cultural ecosystem services.....	7
2.3 Scientific approach to agricultural decision-making	9
2.4 Intensive and extensive agriculture.....	11
3. Study areas.....	14
3.1 Selection of study areas.....	14
3.2 The Entlebuch	17
3.2.1 <i>Historical review</i>	18
3.2.2 <i>UNESCO Biosphere Entlebuch</i>	20
3.2.3 <i>Present agricultural context</i>	21
3.2.4 <i>Direct payments</i>	24
3.3 Southern Illinois.....	27
3.3.1 <i>Historical review</i>	28
3.3.2 <i>The study region today</i>	31
3.3.3 <i>Present structural context in agriculture and subsidies</i>	32
3.3.4 <i>Government conservation programs</i>	34
4. Methods	37
4.1 Survey principles	37
4.2 Survey sampling	38
4.2.1 <i>Sampling of survey recipients in the Entlebuch</i>	38
4.2.2 <i>Sampling of survey recipients in Southern Illinois</i>	38
4.3. Questionnaire design.....	40
4.3.1 <i>Agricultural decision-making factors</i>	40
4.3.2 <i>Operationalization of cultural ecosystem services</i>	41
4.3.3 <i>Intensity index</i>	44

4.4 Survey preparation.....	46
4.5 Data analysis	48
5. Results	51
5.1 The Entlebuch.....	51
5.1.1 <i>Demographics</i>	52
5.1.2 <i>Farms</i>	55
5.1.3 <i>Cultural ecosystem services</i>	61
5.1.4 <i>Decision-making factors</i>	63
5.1.5 <i>Regression analysis</i>	67
5.1.6 <i>Summary of findings from the Entlebuch case study</i>	72
5.2 Southern Illinois.....	73
5.2.1 <i>Demographics</i>	74
5.2.2 <i>Farms</i>	77
5.2.3 <i>Cultural ecosystem services</i>	84
5.2.4 <i>Decision-making factors</i>	87
5.2.5 <i>Regression analysis</i>	92
5.2.6 <i>Summary of findings from the Southern Illinois case study</i>	96
6. Discussion.....	97
6.1 Conditions in the study areas.....	97
6.2 Agricultural decision-making in the study areas	99
6.3 Cultural ecosystem services in agricultural decision-making	104
7. Conclusions	107
7.1 Implications for future research	107
7.2 Criticism of methods applied.....	108
8. Literature	112
Appendix	121
Appendix A: Pictures from the study regions	121
Appendix B: Label certification	122
Appendix C: U.S. Conservation Programs	125
Appendix D: Additional data analyses outputs	127
Appendix E: Questionnaires	138

Attached CD contains Portable Document Format (PDF), Rich Text Format (RTF), survey data and correlation tables.

Figures

Fig. 1: Linkages between ecosystem services and human well-being.....	4
Fig. 2: Landscape-based cultural ecosystem services and their circulatory interactions	8
Fig. 3: A framework for the integration of ecosystem services into decision-making	9
Fig. 4: Map of land cover in the Swiss study area	16
Fig. 5: Map of land cover in the Southern Illinois study area.....	16
Fig. 6: General map of the Swiss study area.....	17
Fig. 7: Zoning of the UNESCO Biosphere Entlebuch.....	20
Fig. 8: General map of the U.S. study area.....	27
Fig. 9: Flow chart of data analysis.....	48
Fig. 10: Age of responding farmers in the Entlebuch	52
Fig. 11: Farm was operated by a family member before (Entlebuch).....	53
Fig. 12: Likelihood of a family member continuing the farm (Entlebuch).....	53
Fig. 13: Completed vocational education (Entlebuch)	53
Fig. 14: Off-farm working hours per week (Entlebuch)	54
Fig. 15: Proportion of personal income from farming activities (Entlebuch)	53
Fig. 16: Controllable annual income of respondents (Entlebuch).....	54
Fig. 17: Farm sizes in the Entlebuch	55
Fig. 18: Farming enterprises in the Entlebuch.....	56
Fig. 19: Label certification (Entlebuch).....	57
Fig. 20: Operation of agricultural enterprises (Entlebuch)	57
Fig. 21: Farms' percentage of set-aside land (Entlebuch)	58
Fig. 22: Agreement with the pursuit of environmental goals (Entlebuch).....	60
Fig. 23: Agreement to policy and economical statements (Entlebuch)	65
Fig. 24: Screeplot (Entlebuch)	67
Fig. 25: Age of responding farmers in Southern Illinois.....	74
Fig. 26: Current farm was operated by a family member before (Southern Illinois).....	75
Fig. 27: Likelihood of a family member continuing the farm (Southern Illinois).....	74
Fig. 28: Highest degree achieved in professional education (Southern Illinois).....	75
Fig. 29: Off-farm working hours per week (Southern Illinois)	75
Fig. 30: Proportion of personal income from farming activities (Southern Illinois).....	75
Fig. 31: Yearly gross farm income (Southern Illinois)	76
Fig. 32: Farm sizes in Southern Illinois.....	77
Fig. 33: Representativity of U.S. case study (concerning farm size).....	78
Fig. 34: Farming enterprises in Southern Illinois	79
Fig. 35: Land in farms, Johnson County.....	79

Fig. 36: Label certification (Southern Illinois).....	80
Fig. 37: Operation of agricultural enterprises (Southern Illinois)	80
Fig. 38: Farms' percentage of set-aside land (Southern Illinois)	81
Fig. 39: Respondents own perception of their farming intensity (Southern Illinois)	82
Fig. 40: Importance of environmental goals in farming practices (Southern Illinois).....	83
Fig. 41: Agreement to policy and economical statements (Southern Illinois)	89
Fig. 42: Prominent correlations within "big farm" in Southern Illinois.....	90
Fig. 43: Screeplot (Southern Illinois)	92
Fig. 44: Recap of results to agricultural decision-making from the two case studies	100
Fig. 45: View of the southwest of the Swiss study area in the Entlebuch in June 2011 ..	121
Fig. 46: View of the Southern Illinois study area in March 2011.....	121
Fig. 47: Frequency of label certification in the Entlebuch.....	122
Fig. 48: Respondents' working time in agriculture (Entlebuch).....	130
Fig. 49: Respondents' working time in agriculture (Southern Illinois).....	127
Fig. 50: Current farm workload for respondents (Entlebuch)	129
Fig. 51: Current farm workload for respondents (Southern Illinois)	127
Fig. 52: Respondents' intention regarding farming orientation (Entlebuch)	127
Fig. 53: Results to question no. 13 (Entlebuch).....	127
Fig. 54: Respondents' intention regarding farming orientation (Southern Illinois).....	127
Fig. 55: On the farm working hours of different groups of persons (Entlebuch).....	128
Fig. 56: On the farm working hours of different groups of persons (Southern Illinois).128	
Fig. 57: Influence of different people on the farm decision-maker (Entlebuch)	129
Fig. 58: Farming orientation supported by different people (Entlebuch)	129
Fig. 59: Influence of different people on the farm decision-maker (Southern Illinois) ...	129
Fig. 60: Farming orientation supported by different people (Southern Illinois)	129
Fig. 61: Perception of landscape characteristics in the Entlebuch (question no. 9)	130
Fig. 62: Activity towards CES by respondents in the Entlebuch (question no. 10)	130
Fig. 63: Perception of landscape characteristics in Southern Illinois (question no. 1)	130
Fig. 64: Activity towards CES by respondents in Southern Illinois (question no. 2)	130
Fig. 65: Rating of decision-making factors in the Entlebuch (question no. 6)	131
Fig. 66: Rating of decision-making factors in Southern Illinois (question no. 8).....	131
Fig. 67: Box plots of decision-making factors to farm intensity (Entlebuch).....	133
Fig. 68: Box plots of decision-making factors to farm intensity (Southern Illinois).....	134

Tables

Table 1: Comparison of study areas	15
Table 2: Most important farming goals in Southern Illinois	31
Table 3: Indicators of landscape aesthetics	42
Table 4: Indicators of cultural heritage	42
Table 5: Indicators of recreation and tourism	43
Table 6: Indicators of spiritual significance.....	43
Table 7: Off-farm professions (Entlebuch).....	54
Table 8: Further characteristics of farms in the Entlebuch	58
Table 9: Calculated intensity of farms in the Entlebuch	59
Table 10: Perception of landscape characteristics in the Entlebuch.....	61
Table 11: Activity towards CES by respondents in the Entlebuch.....	62
Table 12: Ranking of decision-making factors in the Entlebuch.....	63
Table 13: KMO and Bartlett's Test (Entlebuch)	67
Table 14: Total variance explained (Entlebuch)	67
Table 15: Components gained from principal component analysis (Entlebuch).....	68
Table 16: Relevant output of logistic regression (Entlebuch)	69
Table 17: Findings of logistic regression (Entlebuch)	69
Table 18: Casewise list (logistic regression, Entlebuch)	70
Table 19: Relevant output of multiple regression (Entlebuch)	71
Table 20: Findings of multiple regression (Entlebuch)	71
Table 21: Official U.S. income data.....	76
Table 22: Further characteristics of farms in Southern Illinois.....	81
Table 23: Calculated intensity of farms in Southern Illinois.....	82
Table 24: Perception of landscape characteristics in Southern Illinois.....	84
Table 25: People's description of Southern Illinois during interviews.....	84
Table 26: Activity towards CES by respondents in Southern Illinois.....	85
Table 27: Ranking of decision-making factors (Southern Illinois)	87
Table 28: Economically dependent questionnaire items in the Southern IL case study....	91
Table 29: KMO and Bartlett's Test (Southern Illinois)	92
Table 30: Total variance explained (Southern Illinois)	92
Table 31: Components gained from principal component analysis (Southern Illinois).....	93
Table 32: Relevant output of logistic regression (Southern Illinois)	94
Table 33: Findings of logistic regression (Southern Illinois)	94
Table 34: Casewise list (logistic regression, Southern Illinois)	95
Table 35: Indication of the Southern Illinois case study's reliability	110

Table 36: Label certification in Southern Illinois	124
Table 37: Southern Illinois farmers' participation in conservation programs.....	125
Table 38: Wilcoxon signed-rank test for pairwise comparison of decision-making factors (Entlebuch)	132
Table 39: Wilcoxon signed-rank test for pairwise comparison of decision-making factors (Southern Illinois)	132

Abbreviations

CES	Cultural Ecosystem Services
CRP	Conservation Reserve Program
EBI	Environmental Benefit Index
ECS	Ecological Compensation Strips
EDPs	Ecological Direct Payments
ES	Ecosystem Services
ETH	Swiss Federal Institute of Technology
GATT	General Agreement on Tariffs and Trade
GDP	Gross Domestic Product
GVE	Animal Unit (Ger.: Grossvieheinheit)
LAWA	Department of Agriculture and Forest of the Canton of Lucerne (Ger.: Dienststelle Landwirtschaft und Wald)
MA	Millennium Ecosystem Assessment
NRES	Department of Natural Resources and Environmental Sciences, University of Illinois at Urbana-Champaign
PCA	Principal Component Analysis
PEP	Proof of Ecological Performance
PLUS	Planning of Landscape and Urban Systems, Institute for Spatial and Landscape Planning (IRL), ETH Zürich
SIRAP	Southern Illinois Regional Assessment Project
UBE	UNESCO Biosphere Entlebuch
UIUC	University of Illinois at Urbana-Champaign
UNESCO	United Nations Educational, Scientific and Cultural Organization
USDA	United States Department of Agriculture
UZH	University of Zürich

Summary

Land use change, driven by demands on the land from economic development and growing populations, is putting pressure on natural resources and disrupting biological cycles which are ultimately essential to our well-being. The concept of ecosystem services is trying to sensitize for the problem and helps to pave the way for sustainable development. It is applied in this research.

Agriculture is a field that has manifold direct impacts on the environment. Therefore it is important to establish understanding of agricultural decision-making, to elaborate sensible and effective policies. To contribute to this goal, the objective of this study is to compare key factors in farmers' decision-making process in two contextually different regions, and thus understand land use decision-making in different systems with similar influences on the landscape. For this purpose, two case studies using mail questionnaire surveys in the Entlebuch (Switzerland) and Southern Illinois (USA) are conducted. It is initially assumed that policy contexts in the two regions are different, but the land use is similar – with mainly small-scale livestock operations. Farmers or individuals that actively shape larger parcels of agricultural land are the surveys' targeting group.

A first research question investigates the structures (context) and the actual land use practices in the study areas. A second research question asks why land use decision-makers manage the land as they do. And in the issue, a final research question scrutinizes whether cultural ecosystem services – the nonmaterial benefits people obtain from ecosystems – are important in agricultural decision-making.

The methods applied involve structured questionnaires with closed questions. Data analysis relies mainly on descriptive statistics, but also regression analysis to explain farming intensities – determined primarily by a farm's percentage of ecological compensation strips and assuming that less intensive use is more beneficial to the environment.

As to the results, surveys reach response rates of 24.2% in the Entlebuch and 18.4% in Southern Illinois. Both samples are deemed to be representative. However, while the systems – primarily in terms of agricultural policies – prove to be different, the land use emerges to be unlike as well. Small-scale cow-calf operations dominate in the Entlebuch, but only about a third of the respondents keep livestock in Southern Illinois. There, more than half of the land is in row crops – apparently an increasing development (since prices are currently high). This pertains even more so for full-time farmers which only amount to a fifth of respondents. The rest in Southern Illinois are almost exclusively retired hobby farmers who operate relatively small farms and often have all their acreage idling in a government conservation program. The bigger a farm, the easier it is to be economical and vice versa. On the contrary and most likely due to the country's agricultural policies, a

much larger number of small-scale farmers remain economically productive in the Entlebuch, even part-time farmers who account for about a fifth of respondents there.

In Switzerland, farmers receive ample direct payments for operating their farms less intensively, eventuating in extensive land use among the majority of farms. Government influence is weaker in Southern Illinois and conservation programs are voluntary. Comparatively, a higher percentage runs intensive farms and, not least, this applies to full-time farms.

The main messages from the study are that financial and economic considerations as well as the natural premises, which actually allow certain land uses, are most important in agricultural decision-making in either study area – above all for productive farms. Also farm succession is important, especially in Southern Illinois where most respondents are of advanced age. Less intensive land use is essentially contingent upon government financial incentives – even though other research also found different explanations. Farmers themselves prefer intensive farming which is again tied to profit-maximizing. Particularly in the Entlebuch, farmers perceive a conflict between conservation endeavors and financial well-being what is likely due to strong government involvement and regulations. A similar conflict can indirectly be detected in Southern Illinois.

Another main message is that cultural ecosystem services – mainly spiritual and aesthetic values – are of considerable importance in agricultural decision-making. This is applicable to almost all the farms in both study areas. The Entlebuch survey evaluation even indicates them to be supportive of extensive farming. Therefore trying to incorporate related aspects into agricultural policies is concluded to be worthwhile.