



Manh Coung Pham (Autor)

Land-use Change in the Northwestern Uplands of Vietnam

Pham Manh Cuong

LAND-USE CHANGE IN THE NORTHWESTERN UPLANDS OF VIETNAM



Cuvillier Verlag Göttingen

<https://cuvillier.de/de/shop/publications/2444>

Copyright:

Cuvillier Verlag, Inhaberin Annette Jentzsch-Cuvillier, Nonnenstieg 8, 37075 Göttingen,
Germany

Telefon: +49 (0)551 54724-0, E-Mail: info@cuvillier.de, Website: <https://cuvillier.de>

TABLE OF CONTENTS

ABSTRACT	I
ZUSAMMENFASSUNG	IV
ACKNOWLEDGEMENTS	VII
TABLE OF CONTENTS	XI
LIST OF TABLES	XV
LIST OF FIGURES	XVII
ABBREVIATIONS	XXI
1. INTRODUCTION	1
1.1 Importance of Land-Use Change Research in Tropical Uplands	1
1.2 Background	3
1.3 Objectives of the Study.....	7
1.4 Outline.....	7
2. THEORETICAL BACKGROUND	11
2.1 Definitions of Land-Use and Land-Cover	12
2.2 Definitions of Some Forest-Related Terms.....	13
2.3 Land-Use and Land-Cover Mapping: an application of remote sensing technology	17
2.4 Land-Use and Land-Cover Change Detection	25
2.5 Accuracy Assessment of Land-Use Mapping and Change Detection	31
2.6 Major Driving Forces and Agents of Land-Use Changes	37
2.7 Different Approaches for Explaining Land-Use Change.....	45
2.8 Scale and Related Issues in Land-Use Change Studies	52

2.9 The Critical Triangle of Rural Development.....	63
2.10 Induced Innovation Theory	64
2.11 Conceptual Framework	65
2.12 The von Thünian and Ricardian Land-Rent Theory	69
2.13 Spatially Explicit Land-Use Model	72
2.14 Spatial Integration of Socioeconomic and Bio-Geophysical Data.....	74
2.15 Spatial Effects in Spatial Econometrics.....	82
2.16 Summary	86
3. MACROECONOMIC SITUATION AND THE METHODOLOGY FOR DATA COLLECTION AND LAND-USE CHANGE ANALYSES.....	89
3.1 Macroeconomic and Institutional Environment.....	90
<i>3.1.1 Decollectivization and individualized property rights</i>	<i>90</i>
<i>3.1.2 Market liberalization</i>	<i>94</i>
<i>3.1.3 Poverty alleviation and rural development programs.....</i>	<i>94</i>
<i>3.1.4 Environmental protection and management policies</i>	<i>97</i>
<i>3.1.5 Migration and resettlement programs</i>	<i>102</i>
3.2 General Information on Son La Province	104
<i>3.2.1 Geophysical characteristics</i>	<i>104</i>
<i>3.2.2 The socioeconomic situation</i>	<i>105</i>
<i>3.2.3 Special programs for socioeconomic development and environmental protection.....</i>	<i>109</i>
3.3 Selection of Research Site and Method of Data Collection.....	111
<i>3.3.1 Selection of working communes.....</i>	<i>111</i>
<i>3.3.2 The selection of the unit of primary data collection.....</i>	<i>111</i>
<i>3.3.3 Village survey methods.....</i>	<i>113</i>
<i>3.3.2 Selection of the time research span.....</i>	<i>115</i>
<i>3.3.3 Land-use data</i>	<i>117</i>
<i>3.3.4 Geophysical data.....</i>	<i>125</i>
<i>3.3.5 Collection of primary socioeconomic data at the village level.....</i>	<i>127</i>
3.4 Methods of Analyzing Land-Use Changes	132
<i>3.4.1 Geo-referenced analyses at an aggregated scale</i>	<i>132</i>
<i>3.4.2 Spatially disaggregated econometric models</i>	<i>133</i>
3.5 Data Quality and Possible Errors	152
<i>3.5.1 Accuracy assessment of land-use data</i>	<i>152</i>

3.5.2 Possible errors in field survey data	164
3.6 Summary	166
4. GEO-REFERENCED ANALYSES OF THE HYPOTHEZIZED CAUSES OF LAND-USE CHANGE 169	
4.1 A Brief Description of the Selected Villages	169
<i>4.1.1 Bio-geophysical diversity.....</i>	169
<i>4.1.2 Population growth and migration.....</i>	173
<i>4.1.3 Ethic diversity.....</i>	175
<i>4.1.4 A general description of the agricultural production.....</i>	176
4.2 Land-Use Change during the Period from 1989 – 2002	179
<i>4.2.1 Land-use patterns and land-use changes</i>	179
<i>4.2.2 Land-use conversion and land-use change detection matrices</i>	184
4.3 Geophysical Conditions and Land-Use Change.....	192
<i>4.3.1 Influence of elevation on land-use change.....</i>	192
<i>4.3.2 Influence of slope on land-use change</i>	195
4.4 Demography and Land-use Change.....	198
<i>4.4.1 Population and land-use change.....</i>	198
<i>4.4.2 Impact of migration and the creation of the Hoa Binh dam on land-use change</i>	203
<i>4.4.3 Ethnic minorities and deforestation</i>	207
4.5 Timber Logging and Forest Depletion	210
4.6 Impact of Accessibility to Roads and Agricultural Markets on Land-Use Changes	216
<i>4.6.1 Impact of transportation network.....</i>	216
<i>4.6.2 Development of agricultural markets</i>	221
4.7 Improvement in Land Tenure Security	224
<i>4.7.1 Decollectivization and “package contract” during the period from 1988 - 1993</i>	224
<i>4.7.2 The Land law of 1993 and the improvement in individualized land-use rights</i>	226
4.8 Summary	239
5. SPATIALLY DISAGGREGATED ECONOMETRIC LAND-USE MODELS 241	
5.1 Multinomial Logit Models.....	242
5.2 Empirical Results.....	243

5.3 Discussion	247
<i>5.3.1 The estimated effects of geophysical factors.....</i>	<i>247</i>
<i>5.3.2 Impact of accessibility to roads and agricultural markets</i>	<i>249</i>
<i>5.3.3 Role of agricultural technology in land-use change</i>	<i>251</i>
<i>5.3.4 Impact of socioeconomic conditions and policies.....</i>	<i>256</i>
5.4 Summary	261
6. THE NEXUS BETWEEN ENVIRONMENTAL SUSTAINABILITY, AGRICULTURAL GROWTH AND POVERTY ALLEVIATION	265
6.1 Exploring the Relationships between Agricultural Growth and the Environment.....	265
<i>6.1.1 Agricultural development in the research region during the period from 1989 - 2002</i>	<i>266</i>
<i>6.1.2 Agricultural growth-environment interaction</i>	<i>279</i>
<i>6.1.3 Environment degradation-agriculture interaction.....</i>	<i>290</i>
6.2 Exploring the Relationship between Agricultural Growth and Poverty....	292
<i>6.2.1 Agricultural growth and poverty reduction.....</i>	<i>292</i>
<i>6.2.2 Poverty and agricultural growth interaction.....</i>	<i>298</i>
6.3 Relationships between Poverty and Environment.....	306
<i>6.3.1. Poverty and environment interaction: a broad evidence</i>	<i>307</i>
<i>6.3.2. Poverty reduction and environment interaction</i>	<i>311</i>
<i>6.3.3 Environment degradation – poverty interaction</i>	<i>314</i>
6.4 Summary	318
7. CONCLUSIONS AND POLICY IMPLICATIONS.....	321
7.1 Major Results	322
7.2. Policy Implications	330
REFERENCES	339
APPENDIX	379