



Table of Contents

1. INTRODUCTION	13
1.1. COUNTRY BACKGROUND AND PROBLEM STATEMENT	13
1.2. MOTIVATION OF THE STUDY	16
1.3. OBJECTIVES AND RESEARCH QUESTIONS	17
1.4. HYPOTHESIS	18
1.5. (ONCEPTUAL FRAMEWORK OF THE STUDY	18
2. SECTORIAL ANALYSIS AND BACKGROUND OF THE STUDY AREA	20
2.1. ECONOMIC REFORMS IN UZBEKISTAN	20
2.2. ÄGRICULTURAL SECTOR OF UZBEKISTAN	23
2.2.1. Agricultural development	23
2.2.2. Farm restructuring process	29
2.2.3. Landproperty rights	36
2.2.4. Agricultural market, price setting and agricultural products' chain	38
2.2.5. Impact ojagricultural policy on agricultural productivity.....	45
2.2.5.1. Agricultural labour productivity	46
2.2.5.2. Agricultural land productivity.....	46
2.2.5.3. Total factor productivity	47
2.3. REGIONAL BACKGROUND: KHOREZM REGION	49
2.3.1. General inforimation about Khorezm: history, location and climate	49
2.3.2. Economy ojKhorezm	51
2.3.3. Agriculture ojKhorezm	52
2.4. WATER RESOURCES AND WATER MANAGEMENT SYSTEM	55
2.4.1. Overview ojwater use	55
2.4.2. Water management.....	56
2.4.3. Irrigation and drainage system	58
2.5. SOIL RESOURCES OF KHOREZM	61
2.5.1. Soil type and soil quality	61
2.5.2. Soil salinity	64
2.6. LAND DEGRADATION IN THE STUDY AREA.....	65
2.7. (ONSEQUENCES OF UNSUSTAINABLE RESOURCE USE IN AGRICULTURE OF (ENTRALASIA	68
3. THEORETICAL FRAMEWORK AND METHODOLOGY FOR LAND DEGRADATION ASSESSMENT	71
3.1. LAND DEGRADATION: DEFINITIONS, CAUSES AND IMPACTS	71
3.1.1. Definition ojland degradation	71
3.1.2. Causes ojland degradation	72
3.1.3. Land degradation impact	74
3.2. ECOSYSTEM SERVICES AND ITS IDENTIFICATION	76

3.3.	THEORETICAL FRAMEWORK FOR ECONOMIC ASSESSMENT OF THE LAND DEGRADATION COSTS	78
3.3.1.	<i>Total economic value of land and land-based services</i>	78
3.3.2.	<i>Economic assessment of land degradation - selecting of valuation methodology.....</i>	82
3.3.3.	<i>Production loss approaches</i>	86
3.3.4.	<i>Mitigation cost approach</i>	87
3.4.	IMPLEMENTATION COSTS OF ALTERNATIVE TECHNOLOGIES	88
3.4.1.	<i>Water supply costs</i>	88
3.4.2.	<i>Irrigation efficiency and water productivity</i>	90
3.4.3.	<i>Assessment of budgetary and trade effects</i>	91
3.4.4.	<i>Partial budgeting</i>	92
3.5.	COST-BENEFIT ANALYSIS OF LAND USE CHANGES	92
3.5.1.	<i>Cost-benefit analysis for decision-making</i>	92
3.5.2.	<i>Discounting and compounding</i>	93
3.5.3.	<i>Present value</i>	94
3.5.4.	<i>Net present value</i>	94
3.5.5.	<i>Benefit - cost ratio</i>	95
3.5.6.	<i>Internal Rate of Return</i>	95
3.5.7.	<i>Action against inaction</i>	96
4.	DATA SOURCES AND ANALYSES	97
4.1.	<i>Land classification</i>	97
4.2.	<i>Crop pattern, yields, product prices and water consumption</i>	98
4.3.	<i>Water use efficiency</i>	99
4.4.	<i>Water price calculation</i>	101
4.5.	<i>Cotton value chain and wheat value chain</i>	102
5.	ASSESSMENT RESULTS	104
5.1.	LAND DEGRADATION (OSTS IN KHOREZM	104
5.1.1.	<i>Production losses as an impact of land degradation</i>	104
5.1.2.	<i>Mitigation costs of land degradation</i>	105
5.2.	ASSESSMENT OF WATER CONSERVATION IMPACTS	106
5.2.1.	<i>Changes in irrigation efficiency</i>	106
5.2.2.	<i>Inflows to the state budget</i>	108
5.2.3.	<i>Results of the Partial budget analysis</i>	109
5.3.	(OST)-BENEFIT ANALYSIS OF THE LAND-USE CHANGES	111
5.3.1.	<i>Action versus inaction: production changes</i>	111
5.3.2.	<i>Action against inaction: economic benefits</i>	114
5.3.3.	<i>Action against inaction: costs</i>	117
6.	DISCUSSION OF THE RESULTS	119

6.1.	POTENTIALS FOR WATER PRICING	119
6.2.	IMPROVING OF WATER SECTOR	121
6.3.	PERSPECTIVES OF LAND-USE CHANGES	123
7.	SUMMARY, CONCLUSIONS AND RECOMMENDATIONS	126
7.1.	GENERAL SUMMARY AND CONCLUSIONS	126
7.2.	RECOMMENDATIONS FOR FURTHER RESEARCH	127
REFERENCES		129
APPENDICES		146
ÄPPENDIX 1.	IAND AREA OF DIFFERENT FARMS	146
ÄPPENDIX 2.	ÄGRICULTURAL CROP PRODUCTION BY CATEGORY	147
ÄPPENDIX 3 A.	(LASSIFICATION OF SOILS ACCORDING TO WATER PERMEABILITY, 1000 HA.....	148
ÄPPENDIX 3 B.	ÄDAPTABILITY OF VARIOUS SPRINKLING TYPES FOR THE SOILS OF DIFFERENT PERMEABILITY,,	149
ÄPPENDIX 4 A.	(ROP ALLOCATION FOR SELECTED SCENARIOS	150
ÄPPENDIX 4 B.	ÄLTERNATIVE CROP ROTATION FOR IMPROVING SOIL ORGANIC MATIER	151
ÄPPENDIX 5.	SELECTING OF OPTIMAL CONSERVATION TECHNOLOGY	152
ÄPPENDIX 6.	LAND CLASSIFICATION IN UZBEKISTAN BY REGIONS, HA	153
ÄPPENDIX 7.	ECONOMIC BENEFITS OF INACTION AND ACTION, 1000 USD	154
ÄPPENDIX 8.	COST OF INACTION- DECREASING OF INFLOWS TO THE STATE BUDGET, 1000 USD	155
ÄPPENDIX 9.	IRRIGATION WATER PRODUCTIVITY	156
ÄPPENDIX 10.	FOOD PRICE INDEX IN KHOREZM	157
ÄPPENDIX 11.	SOIL SALINIZATION OF THE KHOREZM REG ION	158
ÄPPENDIX 12.	MAP OF THE SOIL BONITET CLASSIFICATION OF THE KHOREZM REG ION	159

