LAND USE MANAGEMENT AND THEIR IMPACTS ON EFFICIENCY OF AGRICULTURAL LAND USE IN SON TAY TOWN, HA NOI CITY

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Received date: 18.09.2016 **Accepted date: 27.03.2017**

ABSTRACT

This study aims to find out the nature of land use management practices and their impacts on the efficiency of agricultural land use in Son Tay town. Proportional random sampling was used to select 160 households from 4 communes, which represented two areas. Data were gathered through individual face-to-face and in-depth interviews, and from secondary sources. Data were analyzed using the 5-points Likert scale to assess the level of land use management. Using analysis of variance (ANOVA) and LSD's post-hoc multiple comparison to test the differences between some indicators among land users and between the 2 regions. The efficiency of agricultural land use was measured in terms of economic and social aspects. They were value added (VA) per hectare, laborers per hectare, and VA per laborer. The impact of land use management on the efficiency of agricultural land use was analyzed by using the Spearman rank correlation coefficient in SPSS17.0 with a significance level of 0.05.

The results of the research showed that the local people realize that there have been remarkable changes in the land use management recently. There were moderately positive impacts of land use management in terms of organizing the implementation of legal establishment documents; land use planning, management of land use planning and plans for land use; allocation and management of the implementation of land use rights; and land valuation on the efficiency of agricultural land use. Otherwise, there was a moderately negative impact of land use management in terms of the real estate market information on the efficiency of agricultural land use.

Keywords: Agricultural land use, efficiency of land use, land use management, SonTay town.

Quản lý sử dụng đất và tác động của chúng đến hiệu quả sử dụng đất nông nghiệp tại xã Sơn Tây, Hà Nội

TÓM TẮT

Nghiên cứu nhằm đánh giá tình hình quản lý sử dụng đất và tác động của chúng đến hiệu quả sử dụng đất nông nghiệp tại thị xã Sơn Tây. Sử dụng phương pháp lấy mẫu ngẫu nhiên phân tầng để chọn 160 hộ từ 4 xã đại diện cho hai vùng. Số liệu sơ cấp được thu thập từ phỏng vấn trực tiếp và từ các nguồn thứ cấp. Số liệu được xử lý bằng thang đo Likert 5 mức để đánh giá tình hình quản lý sử dụng đất. Sử dụng Phân tích phương sai ANOVA và Post-hoc để so sánh sự khác biệt về giá trị trung bình trong một số chỉ tiêu giữa các đối tượng sử dụng đất, giữa 2 vùng. Hiệu quả sử dụng đất nông nghiệp được đánh giá theo các chỉ tiêu kinh tế và xã hội. Đó là giá trị gia tăng (VA) trên mỗi ha, công lao động trên mỗi ha và giá trị gia tăng trên mỗi lao động. Tác động của quản lý sử dụng đất đến hiệu quả sử dụng đất nông nghiệp được đánh giá bằng cách sử dụng hệ số tương quan Spearman Rank trong SPSS 17.0 với mức ý nghĩa 0,05.

Kết quả nghiên cứu cho thấy người dân đã nhận ra một sự thay đổi đáng kể trong quản lý sử dụng đất thời gian qua. Quản lý sử dụng đất có tác động thuận ở mức trung bình đến hiệu quả sử dụng đất nông nghiệp trong các nội dung tổ chức thực hiện các văn bản về quản lý sử dụng đất; quy hoạch sử dụng đất, quản lý quy hoạch và kế hoạch sử dụng đất; giao và quản lý việc thực hiện quyền sử dụng đất. Mặt khác, quản lý sử dụng đất có tác động nghịch ở mức trung bình đến hiệu quả sử dụng đất nông nghiệp trong nội dung thông tin bất động sản.

Từ khóa: Hiệu quả sử dụng đất, quản lý đất sử dụng, sử dụng đất nông nghiệp, thị xã Sơn Tây.

1. INTRODUCTION

Land is a natural resource, a valuable national property, and a prerequisite for all manufacturing processes. Land use is the way in which humans exploit the land and the natural resources which are associated with the land to serve their benefits (Meyer, 1996). Land uses and their changes should be determined by land-use management practices that are carefully considered in order to develop an integrated land use policy framework (Gautam and Raghavswamy, 2004). Sustainable land use management relates to the economics, society, culture and environment, present and future, and limits soil and water degradation and reduces production costs.

Son Tay Town is a third grade urban area situated north-west of Ha Noi city with a total area of 113.5 km^2 (923.62 m^2 per capita), and an average population density of 1083 people/km^2. Since the time of Modernization-Industrialization, Son Tay Town has faced challenges related to the expanding Ha Noi Capital with increasing pressure of land demands for industry and urban development; organizing resettlement and employment change for a large number of farmers who have no cultivated land. This research aims to find out the impacts of land use management practices on the efficiency of agricultural land use in Son Tay Town.

2. RESEARCH HYPOTHESIS

Changes in land use management are very crucial to adapt to the trends of agriculture development in the industrialization and modernization period. It is assumed these changes could influence the efficiency of agricultural land use.

3. METHODOLOGIES

3.1. Data collection

The secondary data were collected from administrative organizations, land operation units in the research area, and previous related studies. The primary data were collected from 160 households which were randomly selected from 4 representative communes surveyed of the 2 areas investigated. Duong Lam commune and Vien Son commune represent the plains area; Co Dong commune and Kim Son commune represent the semi-mountain and semi-plains area.

3.2. Method of data processing

Both qualitative and quantitative analyses were used in the study. Descriptive analysis, such as means, frequency counts, percentages, and standard deviation, were used to describe the characteristics of each area. Likert scales with a five-point bipolar response (Likert, 1932) were also used to measure people's attitude to agricultural land use management. These scales range from the lowest to highest level of the local people's attitude as follows:

Level	Point	Rating Scale
Highly interested / highly detailed / very high	5	> 4.2
Interested / detailed / high	4	3.4 - 4.19
Moderately interested / moderately detailed / moderate	3	2.6 - 3.39
Slightly interested / slightly detailed / low	2	1.8 - 2.59
Very slightly interested / very slightly detailed / very low	1	< 1.8

Using analysis of variance (ANOVA) and LSD's post-hoc multiple comparison to test the difference in some indicators among land users and between the 2 investigation regions. According to the theory, X_1 and X_2 are independent random variables picked from two overall subjects which are expected to be μ_1 and μ_2, respectively. To test the equality of the average rates of the two overall subjects, hypothesis H_0: $\mu_1 = \mu_2$ and null-hypothesis H_1: μ_1 μ_2 are built. To come to the conclusion that hypothesis H_0 is accepted or rejected, we will use the appropriate inspection based on the value of P (p-value) (SPSS abbreviates p-value to sig). If the p-value (sig.) is $\leq \alpha$ (significant level), hypothesis H_0 is rejected. This means that there is a significant relationship among the variables that need inspecting. If the p-value (sig.) > α (significant level), hypothesis H_0 is accepted. It means that there is no difference among means of the two overall subjects.

The efficiency of agricultural land use was measured in terms of economic and social aspects. They were value added (VA) per hectare, laborers per hectare and VA per laborer in VND.

Observation values of the areas were ordinal data, so the Spearman rank correlation coefficient test was used to measure the degree of relationship between the independent variables (the land use management) and efficiency of agricultural land use. The null hypothesis is: "There is no relationship between the two variables," while the alternative hypothesis is: "There is a relationship between the two variables". The following formula was used to calculate the co- efficiency:

$$r_s = 1 - \frac{6\sum d^2}{n(n^2-1)}$$

Where: d^2 = is the sum of the squared differences between the pairs of ranks, and n = is the number of pairs.

Significance analysis of $r_s$was done by t statistics: $t = \frac{r_s\sqrt{n-2}}{\sqrt{1-r_s^2}}$

Null hypothesis was rejected when $t > t_{table\ (\alpha/2(n-2))}$

The general interpretations of the strength of a relationship (effect sizes) was as follows:

Category of interpretations of the strength of a relationship (effect sizes)

General interpretation of the strength of a relationship	r (coefficient correlation)
Perfectly negative correlation	-1.00
Extremely negative correlation	-0.75 to -0.99
Highly negative correlation	-0.50 to -0.74
Moderately negative correlation	-0.25 to -0.49
Slightly negative correlation	-0.01 to -0.24
No correlation	0
Slightly positive correlation	0.01 to 0.24
Moderately positive correlation	0.25 to 0.49
Highly positive correlation	0.50 to 0.74
Extremely positive correlation	0.75 to 0.99
Perfectly positive correlations	1.00

Source: Zulueta and Costales, 2005

The data were entered in a coding sheet. The impact of land use management on the efficiency of agricultural land use was analyzed by using the Spearman rank correlation coefficient test in SPSS17.0 with the significance level 0.05 and confidence level of 95 percent.

4. RESULTS AND DISCUSSIONS

This part is divided into three sections. The first section describes agricultural land use status in Son Tay Town. The second section refers to land use management in Son Tay which focuses on organizing the implementation of legal documents on land use management; land use planning, management of land use planning, and plans for land use; the allocation and management of the implementation of land use rights; land valuation; and real estate information market. The third section analyzes the impacts of land use management on the efficiency of agricultural land use.

4.1. Agricultural land use status

4.1.1. Agricultural land use

The total natural area of Son Tay town is 11,353.22 ha; in which, agricultural land occupies 43.47%, non-agricultural land accounts for 54.66%, and the rest (1.86%) is unused land. The area of agricultural land of the town in 2010 was 4,935.36 hectares, a decrease of 233.75 hectares compared with the area in 2005. The area of land used for agricultural production was 4,050.10 hectares, accounting for 82.06% of the area of agricultural land and a reduction of 139.62 hectares in comparison with the area in 2005. The area of aquaculture land was 164.91 hectares. The town had 6 Land Utilization Types (LUTs) with 31 land sub-utilization types (Table 1). In the past few years, the value of agricultural production accounted for 11% of the total value of gross production of the town Son Tay. Therefore, enhancing the efficiency of agricultural land use is extremely important.

4.1.2. Efficiency of agricultural land use

The results showed that there were big gaps of economic efficiency among different LUTs in

one area. In the plains area flower and landscape plants LUT had the highest economic efficiency with a VA of 172.40 million VND, which was 5.2 times higher compared to paddy rice LUT. Cash crop LUT had a VA of 130.28 million VND, which was 2.72 times higher compared to paddy rice LUT. In the semi-mountain and semi-plains areas, aquaculture LUT had the highest economic efficiency with a VA/ha of 287.62 million VND, which was 3.55 times compared to cash crop LUT and 8.83 times compared to paddy rice LUT. There was a small gap of economic efficiency of each LUT in two areas. Vegetable LUT had economic efficiency in the plains area, which was 1.43 times higher compared to the values of the semi-mountain and semi-plains areas. In each area there was a big gap of economic efficiency among land sub-utilization types in one LUT. The land sub-utilization type of vegetable had economic efficiency in the plains area, which was 2.89 times higher compared to the land sub-utilization type of spring peanut - summer peanut - winter corn. Therefore, it is important for choosing plants for each land sub-utilization types appropriate with each area.

The results showed that land sub-utilization type of one LUT in each area required different laborers with different VA/labor. In the plains area, the land sub-utilization type spring rice - summer rice - tomato used 1042 labors/ha, which was 1.92 times higher compared to the land sub-utilization type of spring rice - summer rice. In the semi-mountain and semi-plains areas, land sub-utilization type of vegetable required 1375 laborers/ha, which was 2.41 times higher compared to the land sub-utilization type of spring rice - summer rice. Different LUTs in different areas used different total number of laborers with different VA/labor.

Regarding using fertilizer: corn received fertilizer with a high ratio of N:P2O5:K2O (125.1-83.4-69.5 kg.ha-1), which was 1.2 times higher compared to the standard rate. Organic fertilizer was used at a lower level compared to the standard rate such as in cabbage with 7.0 tons.ha-1, which was from 2.2 - 2.5 times lower compared to the standard rate, and tomato also received a lower level of fertilizer using 6.0 tons/ha, which was from 3 - 4 times lower compared to the standard rate. Almost all the farmers used pesticides according to the guidance of agricultural corporations. Pesticides were used correctly according to the list of the chemicals used by the Ministry of Agriculture and Rural Development regulations. Pesticide Sokupi 0.36AS doses were only used for cabbage and kohlrabi with 0.84 liters/ha, which was higher than permissible standards.

4.2. Agricultural land use management in Son Tay Town

4.2.1. Organizing the implementation of legal documents on land use management

Research results showed that most of the local people were interested in land policies with a mean of 3.32. Promulgating and guiding the implementation of legal documents for land use management, only 40% rated a score of good to the enactment and implementation of legal documents of local land, and about 30% of households surveyed rated a score of poor. The promulgation and implementation, and guidance of documents for land law agricultural land were assessed at a moderate level (mean was 3.21). They thought that land policies had great effects on changing their decision making about their agriculture land use (mean was 3.53) and there was no difference between the plains area, and semi-mountain and semi-plains area.

4.2.2. Land use planning, management of land use planning and plans for land use

Son Tay town has made plans for planning and implementing supervision of land use planning of the town and all the wards within. However, land use planning had various aspects which were not suitable in reality and it did not reflect the local people's real demands properly and sufficiently. The status of land allocation was slower than the schedule. The majority of respondents knew about land use planning with the level of awareness being 3.64 and there was no difference between the two areas (mean was 3.66 in the plains area; the semi-mountain area was 3.61). This shows that the publishing of land use planning was done very well.

Table 1. Efficiency of agricultural land use in Son Tay town in 2010

Land sub-utilization types	Plains area			Semi-mountain and semi-plain area		
	VA/ha (mil. VND)	Labor/ha (Laborers)	VA/Labor (Thous. VND)	VA/ha (mil. VND)	Labor/ha (Laborers)	VA/Labor (Thous. VND)
I. Rice paddy	33.05	410	81.39	32.57	431	76.36
1. Spring rice	23.23	278	83.62	22.92	292	78.59
2. Spring rice - summer rice	42.88	542	79.15	42.21	569	74.13
II. Rice paddy - cash crop	85.41	975	85.98	80.97	936	87.40
3. Spring rice - summer rice - winter corn	57.22	778	73.56	60.45	806	75.04
4. Spring rice - summer rice - cabbage	93.06	1014	91.78	86.01	1028	83.68
5. Spring rice - summer rice - kohlrabi	77.88	986	78.97	80.74	1000	80.74
6. Spring rice - summer rice - winter soybean	56.25	750	75.00			
7. Spring rice - summer rice - vegetables	92.41	995	92.66	88.14	1028	85.67
8. Spring rice - summer rice - winter peanut	60.50	764	79.20			
9. Spring corn - summer rice - winter soybean	47.21	736	64.13			
10. Onion - summer rice - cabbage	107.19	1139	94.12			
11. Spring rice - early cabbage - late cabbage	116.98	1222	95.71			
12. Onion - summer rice - kohlrabi	92.01	1111	82.81			
13. Cucumber - summer rice - early cabbage	124.80	1194	104.48			
14. Spring peanut - summer rice - soybean				54.51	500	109.02
15. Spring rice - vegetables - vegetables				114.78	1208	94.99
16. Soybean - summer rice - vegetables				79.68	944	84.36
17. Vegetables - summer rice - winter corn				83.46	972	85.84
III. Cash crop	100.47	1016	96.97	69.89	778	83.53
18. Spring peanut - summer peanut - winter corn	53.66	681	78.84	59.04	681	86.75
19. Spring peanut - soybean - early cabbage	84.79	903	93.92			
20. Cucumber - summer peanut - late cabbage	117.08	1153	101.57			
21. Soybean - summer peanut - tomato	88.81	931	95.43			
22. Spring corn - vegetables- vegetables	116.75	1153	101.28			
23. Spring peanut - vegetables - winter corn	86.88	917	94.78			
14. Spring peanut - summer peanut - cabbage				84.60	903	93.71
25. Soybean - summer peanut - winter corn				52.73	667	79.09
26. Vegetables	155.29	1375	112.94	137.79	1375	100.21
27. Cassava				15.28	264	57.88
IV. Flower and landscape plant	172.40	1493	115.47			
28. Flower and landscape plant	172.40	1493	115.47			
V. Fruit				42.23	361	116.66
29. Longan, litchi				37.61	333	112.83
30. Grapefruit				46.86	389	120.49
VI. Aquaculture						
31. Fish				287.62	2083	138.06

Table 2. Assessment of organizing the implementation of legal documents on agricultural land use management in Son Tay Town

Criteria	Plains area	Semi-mountain and semi-plains area	N = 160	%
Interested on land policy	80	80	160	100.00
- Very highly interested	10	8	18	11.25
- Highly interested	29	26	55	34.38
- Moderately interested	26	28	54	33.75
- Slightly interested	12	14	26	16.25
- Very slightly interested	3	4	7	4.37
Means	3.39	3.25		3.32
p-value			0.395	
Promulgating and guiding the implementation land legal documents	80	80	160	100.00
- Very good	7	5	12	7.50
- Good	35	28	63	39.38
- Moderate	18	27	45	28.12
- Bad	12	14	26	16.25
- Very bad	8	6	14	8.75
Means	3.26	3.15		3.21
p-value			0.513	
Impacts of land policy on respondents' agricultural land use	80	80	160	100.00
- Very high (≥ 80%)	3	4	7	4.38
- High (60% - 79%)	48	43	91	56.88
- Moderate (40% - 59%)	21	22	43	26.87
- Low (20% - 39%)	8	10	18	11.25
- Very low (< 20%)	0	1	1	0.62
Means	3.58	3.49		3.53
p-value			0.478	
General assessment	80	80	160	100.00
High (> 11)	31	23	54	33.75
- Moderate (7 - 11)	44	51	95	59.38
- Low (< 7)	5	6	11	6.87

The details of the land use planning was rated at a moderate level (mean is 3.02) and there was no difference between the plains and semi-mountain areas (mean was 3.00 and 3.04, respectively). The impact level of land use planning on respondents' land use was high (mean was 3.61) and there was no difference between the two areas (mean was 3.71 in the plains area and the mean in semi-mountain area was 3.51).

4.2.3. The allocation and management of the implementation of land use rights

Land allocation, land leasing, and land acquisition performed well. The order and procedures have been in place and there is now no more inapproroate land allocation. Planning and infrastructure design of residential areas before land allocation were seriously considered. The land allocation was carried out strictly and appropriately. Up to now, the town has allocated agricultural land to households for stable use with a rate of 100%. Inspection and checking the state of land use is regularly done to ensure legal land use and highly economic efficiency. The study results showed that the respondents were interested in obtaining agricultural land use rights with a moderately interested level (mean was 3.69) and there was no difference between the two areas. However,

they rated this task performance moderately with mean of 3.09 and there was no difference between the two areas. But they were clearly aware of the impact of allocation of land use rights on their agricultural land use (mean was 3.35) and there was a difference between the two areas (mean was 3.64 in the plains area and 3.06 in the semi-mountain area).

4.2.4. Land valuation

The People's Commitee of the town has issued land prices according to the regulations and adjusts them every year. The research results indicated that the majority of the respondents (91.26%) showed their interest in land price according to the regulations as well as agricultural land price on the market (means were 3.72 and 3.74, respectively). The main cause of land valuation result is normally applied in the case to make restitution, supported by land clearance. Review the promulgation, the level of interest rates and the level of impact of land valuation to the use of agricultural land of farmers were moderate, the average value was 2.89. There was no difference between the two areas in these criteria. However, they did not highly appreciate the promulgation and implementation of land price according to the regulations (mean was 2.43). According to the respondents, the land valuation did not have a big impact on their agicultural land use (mean was 2.89). This reflects the idea that the land valuation in Son Tay is not close to reality.

Table 3. Assessment of land use planning, management of land use planning and plans for land use in Son Tay town

Criteria	Plains area	Semi-mountain and semi-plains area	N = 160	%
Knowing about land use planning	80	80	160	100.00
- Very high clear	15	15	30	18.75
- Highly clear	33	27	60	37.50
- Moderately clear	25	32	57	35.63
- Slightly clear	4	4	8	5.00
- Very slightly clear	3	2	5	3.12
Means	3.66	3.61		3.64
p-value			0.740	
Detail level of land use planning and land use plans	80	80	160	100.00
- Very detailed	2	4	6	3.75
- Detailed	28	38	66	41.25
- Moderately detailed	23	6	29	18.13
- Slightly detailed	22	21	43	26.87
- Very slightly detailed	5	11	16	10.000
Means	3.00	3.04		3.02
p-value			0.832	
Impacts of management of land use planning and land use plans on respondents' land use	80	80	160	100.00
- Very high (≥80%)	15	12	27	16.88
- High (60%-79%)	38	31	69	43.12
- Moderate (40%-59%)	18	26	44	27.50
- Low (20%-39%)	7	8	15	9.38
- Very low (< 20%)	2	3	5	3.12
Means	3.71	3.51		3.61
p-value			0.197	
General assessment	80	80	160	100.00
High (>11)	30	40	70	43.75
- Moderate (7-11)	44	33	77	48.13
- Low (<7)	6	7	13	8.12

Table 4. Assessment of the allocation and management of the implementaion of land use rights in Son Tay town

Criteria	Plains area n =80	Semi-mountain and semi-plains area n = 80	N = 160	%
Interested in land use rights	80	80	160	100.00
- Very highly interested	15	12	27	16.88
- Highly interested	42	40	82	51.25
- Moderately interested	14	17	31	19.37
- Slightly interested	6	9	15	9.38
- Very interested	3	2	5	3.12
- Means	3.75	3.64		3.69
p-value			0.463	
Allocation and management of the implementation of land use rights	80	80	160	100.00
- Very good	3	2	5	3.12
- Good	16	17	33	20.63
- Moderate	48	50	98	61.25
- Bad	11	8	19	11.88
- Very bad	2	3	5	3.12
Means	3.09	3.09		3.09
p-value			1.00	
Impacts of allocation of land use rights on respondents' agricultural land use	80	80	160	100.00
- Very high (≥80%)	2	3	5	3.13
- High (60%-79%)	58	14	72	45.00
- Moderate (40%-59%)	12	52	64	40.00
- Low (20%-39%)	5	7	12	7.50
- Very low (< 20%)	3	4	7	4.37
Means	3.64	3.06		3.35
p-value			0.00	
General assessment	80	80	160	100.00
High (>11)	19	6	25	15.63
- Moderate (7-11)	56	67	123	76.87
- Low (<7)	5	7	12	7.50

4.2.5. Real estate information market

Management and development of real estate market is a new task. So far, land transactions are mainly spontaneous between buyers and sellers. The town has not an agency to manage this field. The research results showed that up to 91.88% of respondents were interested in information on the real estate market (mean was 4.62) and there was no diference between the two areas. However, they did not appreciate the performance of this task in the local area (mean was 2.12). Up to 75.63% considered the provision of the real estate market as poor and very poor, and there was no diference between the two areas. According to them, the real estate market has had a major influence on their agricultural land use (mean was 3.81) and there was no diference between the two areas.

Table 5. Assessment of land valuation in Son Tay town

Criteria	Plain area n = 80	Semi-mountain and semi-plain area n = 80	n = 160	%
Interested in government land prices	80	80	80	100.00
- Very highly interested	14	15	29	18.13
- Highly interested	39	37	76	47.50
- Moderately interested	21	20	41	25.63
- Slightly interested	4	5	9	5.62
- Very slightly interested	2	3	5	3.12
Means	3.74	3.70		3.72
p-value			0.800	
Issuing and performing government land prices	80	80	80	100,00
- Very good	3	4	7	4.38
- Good	6	6	12	7.50
- Moderate	22	24	46	28.75
- Bad	37	38	75	46.87
- Very bad	12	8	20	12.50
Means	2.29	2.58		2.43
p-value			0.055	
Interested in market land prices	80	80	80	100.00
- Very highly interested	15	14	29	18.13
- Highly interested	44	41	85	53.13
- Moderately interested	13	15	28	17.50
- Slightly interested	5	6	11	6.87
- Very slightly interested	3	4	7	4.37
Means	3.79	3.69		3.74
p-value			0.521	
Impacts of land valuation on respondents' agricultural land use	80	80	80	100.00
- Very high (≥80%)	3	2	5	3.13
- High (60%-79%)	10	11	21	13.13
- Moderate (40%-59%)	52	47	99	61.87
- Low (20%-39%)	9	12	21	13.12
- Very low (< 20%)	6	8	14	8.75
Means	2.94	2.84		2.89
p-value			0.461	
General assessment	80	80	160	100.00
High (>11)	25	35	60	37.50
- Moderate (7-11)	49	38	87	54.38
- Low (<7)	6	7	13	8.12

Impact of land use management on efficiency of agricultural land use in Son Tay town.

The impact of land use management on the efficiency of agricultural land use was measured by analyzing the relationship between 2 variables. The results in table 7 show that land use management had a moderate influence on improving the efficiency of agricultural land use. However, it is necessary to research each aspect of land use management in order to adjust and make them suitable for the aims of enhancing efficiency of agricultural land use.

Table 6. Assessment of real estate information market in Son Tay town

Criteria	Plains area	Semi-mountain and semi-plains area	N = 160	%
Interested in real estate information market land prices	80	80	160	100.00
- Very highly interested	62	55	117	73.13
- Highly interested	14	16	30	18.75
- Moderately interested	3	7	10	6.25
- Slightly interested	1	2	3	1.87
- Very slightly interested	0	0	0	0.00
Mean	4.69	4.55		4.62
p-value			0.221	
The provision of real estate information market	80	80	160	100.00
- Very good	0	0	0	0.00
- Good	2	1	3	1.88
- Moderate	19	17	36	22.50
- Bad	48	52	100	62.50
- Very bad	11	10	21	13.12
Means	2.10	2.14		2.12
p-value			0.707	
Impacts of real estate information market on respondents' agricultural land use	80	80	160	100.00
- Very high (≥80%)	18	16	34	21.25
- High (60%-79%)	38	40	78	48.75
- Moderate (40%-59%)	17	18	35	21.88
- Low (20%-39%)	5	4	9	5.62
- Very low (< 20%)	2	2	4	2.50
Means	3.81	3.80		3..81
p-value			0.932	
General assessment	80	80	160	100.00
- High (>15)	31	20	51	31.88
- Moderate (10-15)	47	56	103	64.37
- Low (<10)	2	4	6	3.75

Table 7. Relationship between land use management and efficiency of agricultural land use in Son Tay town

Agricultural land use management	Level of relationship between land use management and efficiency of agricultural land use	
	Economics efficiency	Social efficiency
Organizing the implementation of legal documents on land use management	0.264**	0.370**
Land use planning, management of land use planning, and plans for land use	0.334**	0.423**
Allocation and management of the implementation of land use rights	0.398**	0.384**
Land valuation	0.164*	0.249**
Real estate information market	- 0.459*	- 0.456*

*Note: ** Significant level 0.01 (2-tailed), * Significant level 0.05 (2-tailed). N = 160*

Organizing the implementation of legal documents had a positive relationship at a moderate level with efficiency of agricultural land use ($0.264 < r_s < 0.370$; P = 0.01). There was a positive relationship at a moderate level ($0.334 < r_s < 0.423$, P = 0.01) between the land use planning, management of land use planning, and plans for land use, and efficiency of agricultural land use. There was a positive relationship at a moderate level ($0.384 < r_s < 0.398$; P = 0.01) between the allocation and management of the implementation of land use rights and the efficiency of agricultural land use. This means, in Son Tay town, organizing the implementation of legal documents; land use planning, management of land use planning, and plans for land use; and allocation and management of the implementation of land use rights have positively impacted at a moderate level the efficiency of agricultural land use.

The land valuation and efficiency of agricultural land use have a positive relationship at a slight level (r_s = 0.164; P = 0.05) and a moderate level (r_s = 0.249; P = 0.01). This means, in Son Tay town, land valuation has had a slightly positive impact on the efficiency of agricultural land use.

There was a negative relationship at a moderate level ($-0.459 < r_s < -0.456$; P = 0.01) between the real estate market information and the efficiency of agricultural land use. This means, in Son Tay town, the real estate market information has had a moderately negative impact on the efficiency of agricultural land use. The reality in Son Tay town in recent years shows that, due to the planned expansion of Ha Noi City to the northwest, real estate information often comes from many sources and forms (formal or informal ones), so users are bewildered. They do not know whether and when their land has been revoked and withdrawn. Thus, it is difficult for them to make decisions on investments, especially with long-term investment strategies.

5. CONCLUSION

Son Tay town has a total natural area of 11,353.22 hectares, in which agricultural land occupies 43.47%, non-agricultural land accounts for 54.66%, and the rest is unused land at 1.86%. The results show that the local people realize that there have been great changes in land use management in the past years at a moderate level. There are moderately positive impacts of land use management in terms of organizing the implementation of legal establishment documents; land use planning, management of land use planning, and plans for land use; allocation and management of the implementation of land use rights; and land valuation on the efficiency of agricultural land use. Otherwise, there is a moderately negative impact of land use management in terms of real estate market information on the efficiency of agricultural land use.

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