TRENDS IN AGRICULTURAL LAND USE IN NAKHON PATHOM PROVINCE.

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ABSTRACT

Analysis trends in agricultural land use in Nakhon Pathom Province aim to study agricultural holdings area and characteristics changes in land use for recognition and appropriate planning of agriculture land use in Nakhon Pathom Province.

Secondary data was collected (from 2003 to 2015); population, agricultural income, agricultural holdings area and other information in seven districts of Nakhon Pathom; Mueang Nakhon Pathom District, Nakhon Chaisri District, Kamphaeng Saen District, Don Tum District, Bang Len District, Sampran District and Phutthamonthon District. The total area is 1,355,204 rai.

The study results found that

1. Analysis Trends in agricultural land use consisting of dependent variable (agricultural holdings area) and independent variables (population and agricultural income). It can be explained by the quadratic function with two equations: The first equation; if population increases but agricultural holdings area decreases until the relative minimum point (inverse) and if population increases higher than the relative minimum point so agricultural holdings area will increase too (depend on). The second equation can be explained; agricultural income increases but agricultural holdings area decreases until the relative minimum point (inverse) and if agricultural income increases higher than the relative minimum point so agricultural holdings area will increase too (depend on).
2. Characteristics changes in agricultural land use by comparing land use statistics in Nakhon Pathom Province trend to be likely fixed.

Suggestion

1. Area of agricultural holdings in next year will be likely fixed, when the population and income of the agricultural do not change too much. It depends on many factors; birth rates decrease, medical technology innovation therefore population does not change, the economy of Thailand does not expand and agricultural income will not change accordingly.
2. Additional field data collection in this research, it will be more accurate because information is up to date.

Keywords: Land Use, agricultural, Nakhon Pathom Province

INTRODUCTION

Years ago, the Thai's government planned to make Thailand became a hub of industries and developed the economy by made an attractive deal for inside and outside investors to grow their business in Thailand. When they started their own factories by using nature for example; land, water, and tree to support the grown of the business. But the limited of using the nature was uncontrolled since the beginning from the past that was a big impact to Thai's economic and environment nowadays.

Nakorn Pathom province located in the west of the central part of Thailand, has 2 main rivers; Tha-Chin river and Mae-klong river. From the geography, that made this province was perfect location for farming and animal farm. 58.78 percent of the whole area (796,662 rai of 1,355,204 rai) is agricultural area and 17.07 percent is the farmer. The most farmers in this area are using mixed system between plants and animals, and also applied technologies with their local's knowledge for a better product to serve the market. The main products are rice, sugar cane, vegetables, orchids, and animal products.

OBJECTIVE

Study agricultural holdings area and characteristics changes in land use for recognition and appropriate planning of agriculture land use in Nakhon Pathom Province.

METHODOLOGY

Population and sample groups

The population from this research is including seven districts of Nakhon Pathom; Mueang Nakhon Pathom District, Nakhon Chaisri District, Kamphaeng Saen District, Don Tum District, Bang Len District, Sampran District and Phutthamonthon District by use the data from "The Office of the National Economics and Social Development Council" and "The Office of Agricultural Economics".

1. Collected secondary data; population, agricultural income, agricultural holdings area and other information in seven districts of Nakhon Pathom from 2003 to 2015
2. Analyzed secondary data.
   2.1 Input all secondary data.
   2.2 Set dependent and independent variables. (Check correlation by SPSS)
   2.3 Curve fitting with linear and nonlinear regression by SPSS.
   - If it is straight line use linear function ($y = a + bX$).
   - If it is not straight line use quadratic function ($y = a + bX + cX^2$), exponential function ($y = ab^X$), logarithmic function ($y = a + b\log X$) or etc.

   2.4 Calculated trends in agricultural land use to test regression model.
3. Analyzed characteristics changes in land use by Microsoft Excel to comparing land use statistics.

The research tools

The research tools are SPSS (Statistical Package for the Social Sciences) and Microsoft Excel

RESULTS

Set dependent variable (y = agricultural holdings area) and independent variables (x = population and agricultural income) from correlation table in Table 1.

Table 1 Correlation table between population, agricultural income and agricultural holdings

Correlations

		Agri_Land	Population	Income
Agri_Land	Pearson Correlation	1	.445	.373
	Sig. (2-tailed)		.127	.209
	N	13	13	13
Population	Pearson Correlation	.445	1	.958**
	Sig. (2-tailed)	.127		.000
	N	13	13	13
Income	Pearson Correlation	.373	.958**	1
	Sig. (2-tailed)	.209	.000	
	N	13	13	13

**. Correlation is significant at the 0.01 level (2-tailed).

It can be explained by the quadratic function with two equations.

1. $y = 9,858,490.374 - 19494.065x + 10.524x^2$ (x = population, y = agricultural holdings area)

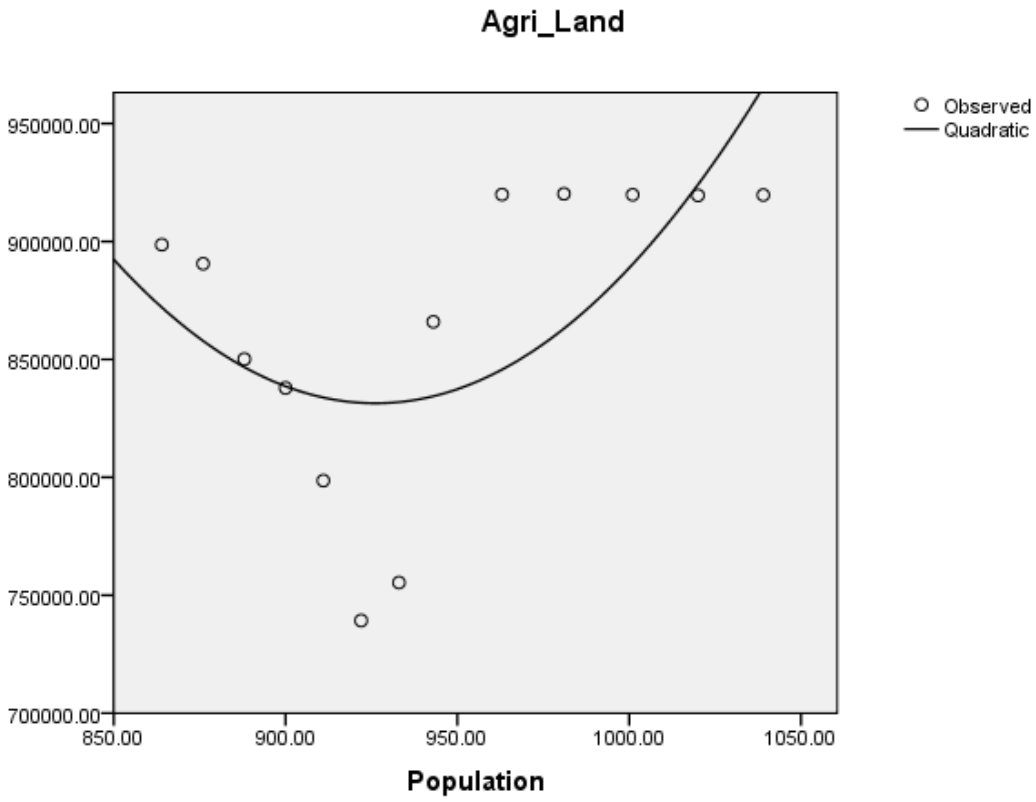


Figure 1 The correlation of population and agricultural holdings area

From Figure 1, if population increases but agricultural holdings area decreases until the relative minimum point (inverse) and if population increases higher than the relative minimum point so agricultural holdings area will increase too (depend on).

Calculated trends in agricultural holdings area to test this regression model 1 shown in Table 2.

Table 2 Agricultural holdings area by regression model 1

Year	Agricultural holdings (Rai)	Population (Thousand people)	$y = 9,858,490.374 - 19494.065x + 10.524x^2$
2003	898,623	864	871,798.278
2004	890,583	876	857,611.398
2005	850,115	888	846,455.43
2006	837,886	900	838,330.374
2007	798,578	911	833,544.978
2008	739,266	922	831,306.39
2009	755,360	933	831,614.61
2010	865,953	943	834,104.85
2011	919,916	963	845,399.73
2012	920,199	981	862,763.538
2013	919,843	1,001	890,054.898
2014	919,540	1,020	923,779.974
2015	919,709	1,039	965,103.378

We found that the result from regression model 1 is seemed like real value.

2. $y = 1,753,769.56 - 130.239x + 0.0045x^2$ (x = income of the agricultural, y = area of agricultural holdings)

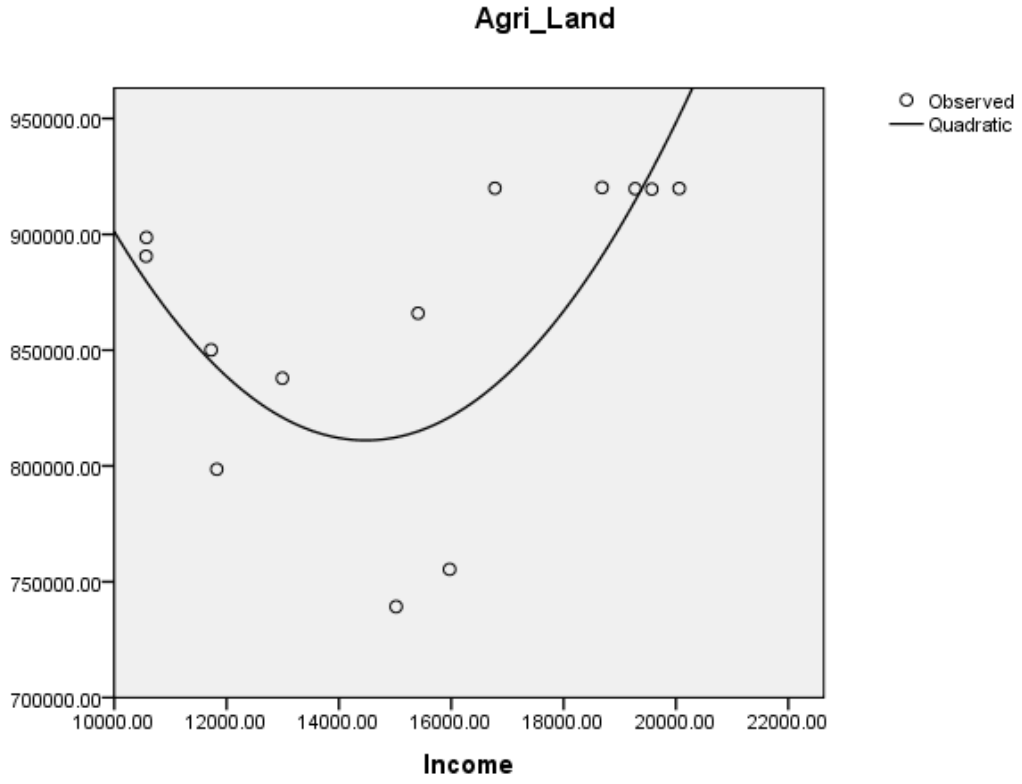


Figure 2 The correlation of agricultural income and agricultural holdings area

From Figure 2, agricultural income increases but agricultural holdings area decreases until the relative minimum point (inverse) and if agricultural income increases higher than the relative minimum point so agricultural holdings area will increase too (depend on).

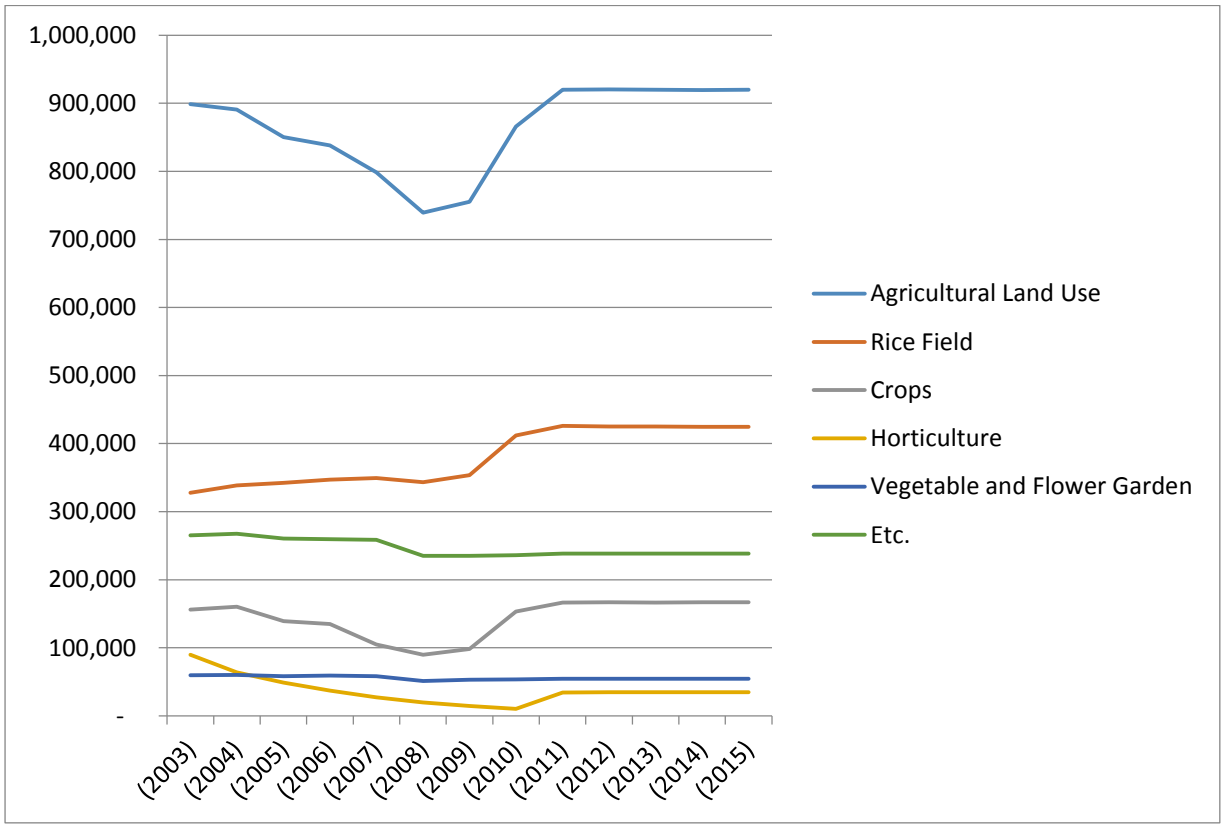
Calculated trends in agricultural holdings area to test this regression model 2 shown in Table 3.

Table 3 Agricultural holdings area by regression model 2

Year	Agricultural holdings (Rai)	Population (Thousand people)	$y = 1,753,769.56 - 130.239x + 0.0045x^2$
2003	898,623	10,572.37378	879,822.0643
2004	890,583	10,566.51225	880,027.8862
2005	850,115	11,724.52729	845,369.2811
2006	837,886	12,992.55614	821,261.3586
2007	798,578	11,825.83461	842,911.3252
2008	739,266	15,017.518	812,769.3442
2009	755,360	15,969.36541	821,528.2206
2010	865,953	15,407.82966	815,374.6997
2011	919,916	16,776.63299	835,347.0212
2012	920,199	18,684.14731	891,303.0217
2013	919,843	20,057.15498	951,848.3491
2014	919,540	19,570.21291	928,434.1509
2015	919,709	19,271.74074	915,137.2779

We found that the result from regression model 2 is seemed like real value.

Figure 3 Characteristics changes in agricultural holdings area from 2003 to 2015



From Figure 3, Characteristics changes in agricultural land use by comparing land use statistics in Nakhon Pathom Province trend to be likely fixed.

CONCLUSION AND FUTURE WORK

Agricultural holdings area in next year will be likely fixed, when population and agricultural income do not change too much. It depends on many factors.

1. Birth rates decrease, medical technology innovation therefore population does not change.
2. The economy of Thailand does not expand and agricultural income will not change accordingly.

Additional field data collection in this research, it will be more accurate because information is up to date.

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