

# A GIS Assessment of the Successful Transformation of Agricultural Cooperative Groups Based on Vietnam Cooperative Law In 2012

Le Thi Le<sup>1</sup> and Tran Thi Thai<sup>2</sup>

<sup>1</sup>Thanh Hoa University of Culture, Sports and Tourism.

<sup>2</sup>Ho Chi Minh National Academy of Politics, Hanoi, Vietnam.

Corresponding Author E-mail: lethiledhvhttdl@gmail.com; tranthai.lsd@gmail.com

**Received:** May 14, 2019; **Accepted:** May 21, 2019; **Published:** May 25, 2019

**Abstract:** At present, Vietnam's agricultural cooperatives is transforming under the Vietnam Cooperative Law in 2012. To assess the quality of transformation, the National Project "Research and propose solutions to promote the conversion of organization form and operation mode of Vietnam cooperative, for the effective implementation of the Cooperatives Law 2012" which were surveyed 90 agricultural cooperatives in 9 provinces representing seven economic regions of Vietnam. The research applied GIS technology to classify and evaluate successfully transformed agricultural cooperatives according to the Vietnam Cooperative Law in 2012.

**Keywords:** GIS, agricultural cooperatives, Vietnam Cooperative Law in 2012.

**Citation:** Le Thi Le and Tran Thi Thai. 2019. A GIS Assessment of the Successful Transformation of Agricultural Cooperative Groups Based on Vietnam Cooperative Law In 2012. International Journal of Recent Innovations in Academic Research, 3(5): 236-244.

**Copyright:** Le Thi Le and Tran Thi Thai., **Copyright©2019.** This is an open access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

## Introduction

According to the report on the impact assessment of policies issued by the Government on the agricultural cooperatives, on 9<sup>th</sup> September 2015 of the Ministry of Agriculture and Rural Development, there are about 76.7 % of agricultural cooperatives which have not registered to operate under the cooperative law in 2012 (MOLISA, 2015; 2016). Most of the agricultural cooperatives currently focus on agricultural inputs such as seed supply, supplies, fertilizers, plant protection, irrigation, etc. Other essential services such as preservation, processing, and marketing of products are not paid attention, so currently, the number of cooperatives that implement the agricultural products for farmers only accounts about 10% of agricultural cooperatives. For successfully transformed cooperatives, it is also necessary to evaluate the quality of the transforming to help managers capture the issues that have already been or remain an overall, objective, and comparable on many different aspects. The quality of the transformation needs to build a large enough system database that must be organized scientifically and logically to be able to analyze in detail quickly and efficiently.

Nowadays, GIS technology has been applied in many fields of economics, socio-economic, environment, etc and many countries in the world (CIBA Foundation Symposium 210, 1997; Monica Hansen, *et al.*, 2004; K.T. Chang, 2008; McCall M. K., 2003) as well as used in some

fields in Vietnam, such as environmental assessment (Lan *et al.*, 2013), plant disease management, forest management, production management for agricultural cooperative (Christopher Edmonds, 2002; Francis J. Pierce and David Clay, 2007; Mekong river delta, 2002). GIS technology has demonstrated the ability to quickly and efficiently manage, update, extract, link, and process information.

### Establishment of a cooperative GIS database of cooperatives successfully transformed under the Vietnam cooperative law 2012

Database of 90 agricultural cooperatives in 9 provinces representing seven regions of Vietnam was developed into thematic information databases. Thematic databases are made after field survey data is synthesized and normalized according to the structure database before entering into the GIS database. The technology solution was implemented on the computer by ArcGIS software (integration, storage, display graphics data, and attribute data), and the indispensable part is the staffs of specialists processing the thematic information collected.

The basic steps to be taken in setting up this information include:

- ✓ Design of the main topical database structure in ArcGIS software ensures that: the contents of the questionnaire were re-coded to perform data analysis problems.
- ✓ Import data into ArcGIS software. It is an especially important step to bring all attribute information of the cooperatives collected into the database. Fig 1 shows the spatial and attribute information that has been updated to the database to serve the quick query of the cooperatives that have transformed under the Cooperative Law in 2012.

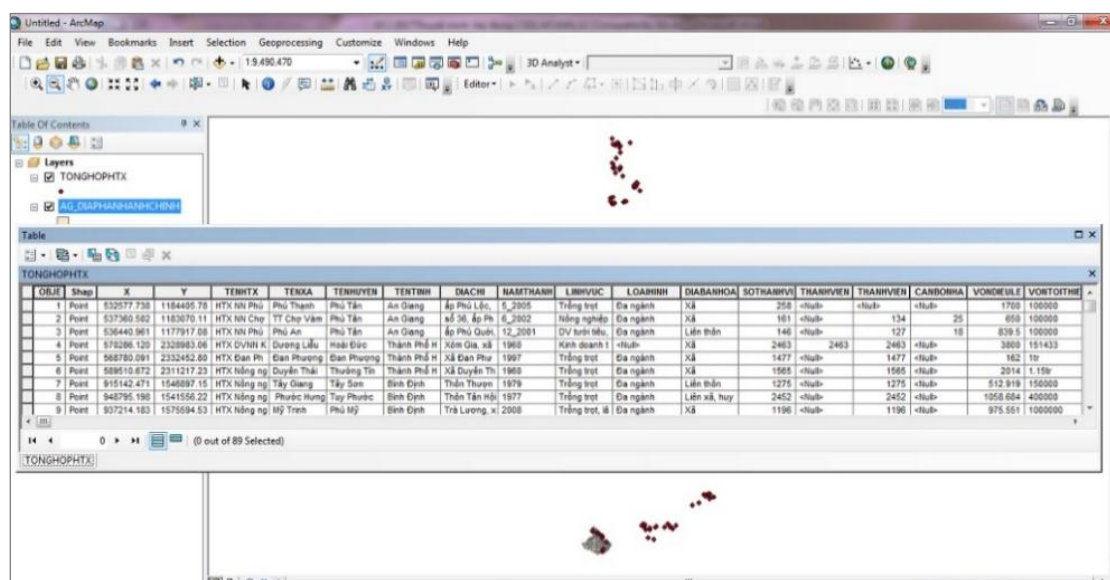


Figure 1. Thematic data is entered into the database in ArcGIS

From the GIS database that has developed, we can: visualize the locations of the surveyed provinces in 63 provinces of Vietnam. Visualize the location of cooperatives surveyed in each province. Visual and informative observations on cooperatives were investigated by each cooperative or by a total of 90 cooperatives (Figure 2). Analysis of the data to assess the transformed cooperative has achieved by the evaluation criteria proposed by the research team.

The criteria for the classification of successful transformed agricultural cooperatives have been done as follow:

Criterion 1: The cooperative has implemented procedures for cooperative conversion under the Cooperative Law in 2012 and authorized business license under the Cooperative Law in 2012 at the time of survey (in 2016).

Criterion 2: Profits before tax at the time of the survey is compared to previous years grew. Based on the two basic criteria analyzed above and executed the Query command very quickly by ArcGIS software to separate groups of cooperatives.

### Apply criterion 1 in analyzing attribute data, execute query command 1 as follows:

{[ChuyenDoiHTXTheoLuat2012] = 'Done or' OR [ChuyenDoiHTXTheoLuat2012] = 'Done'}  
The result, after query command 1 has selected 73 cooperatives (Table 1).

After the query command 1, it divided into two groups of cooperatives: transformed cooperative group (73 cooperatives) and untransformed cooperative group (17 cooperatives). In order to classify successfully transformed and unsuccessful cooperatives (Figure 3), it is necessary to apply criterion 2 as follows :

Using criterion 2 (Figure 4) to compare pre-tax profit between 2016 and 2013 in the thematic database, by adding an information field column, SoSanhLoiNhuonTruocThue, and then executing the Calculate command:

{SoSanhLoiNhuonTruocThue = [LOINHUANTRUOCTHUE\_2016\_TRIEUDONG]-[LOINHUANTRUOCTHUE\_2013\_TRIEUDONG]}

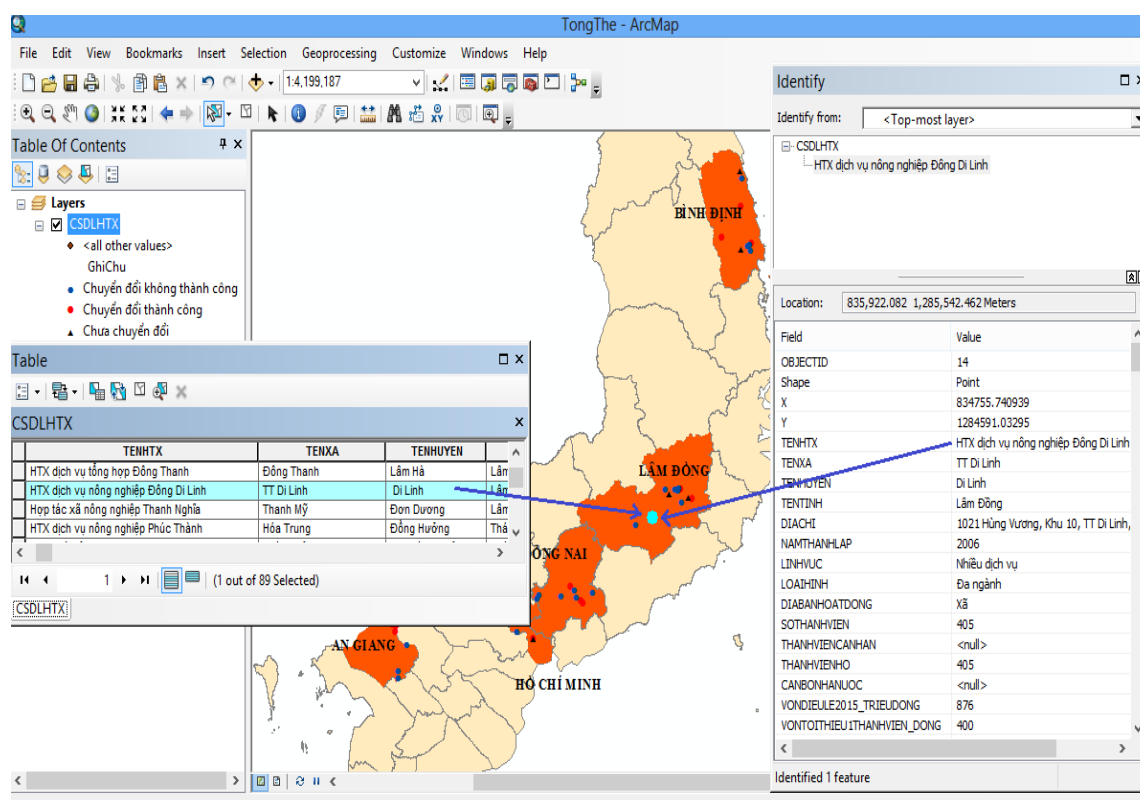


Figure 2. Location and attributes of cooperatives in the database

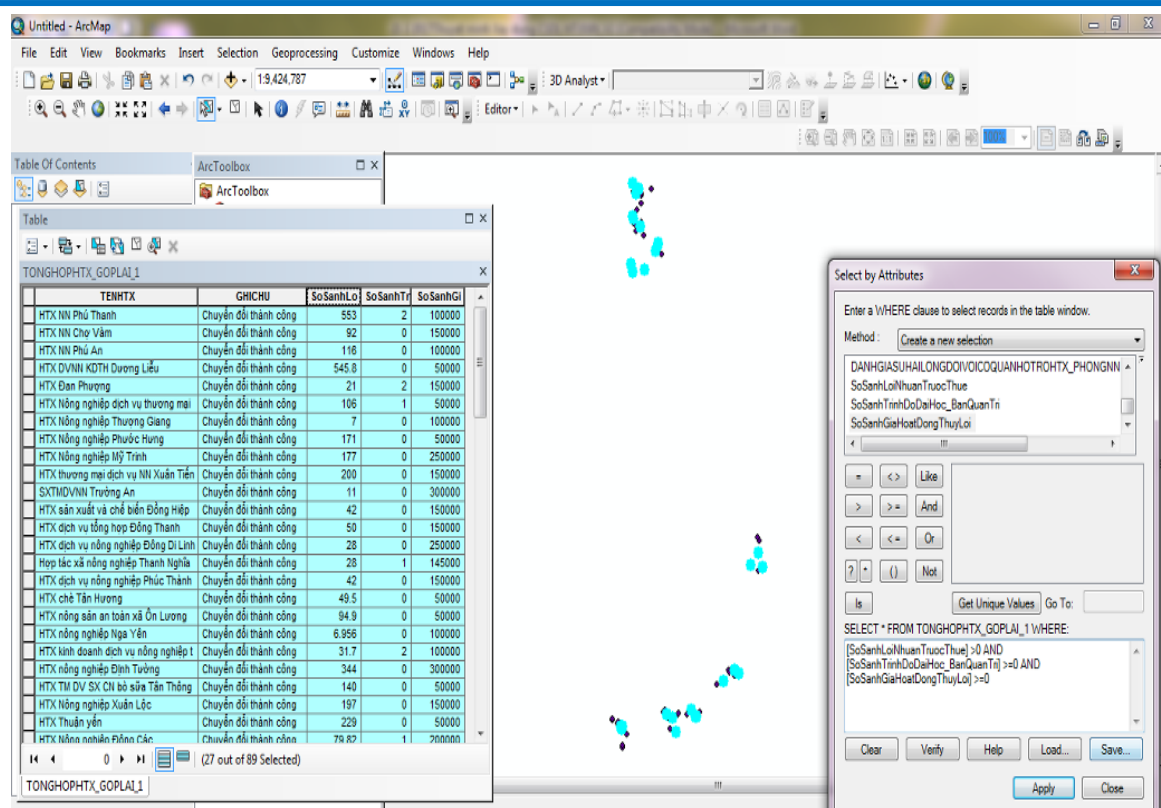


Figure 3. Demonstration of the query command 2 by the attribute field in the database

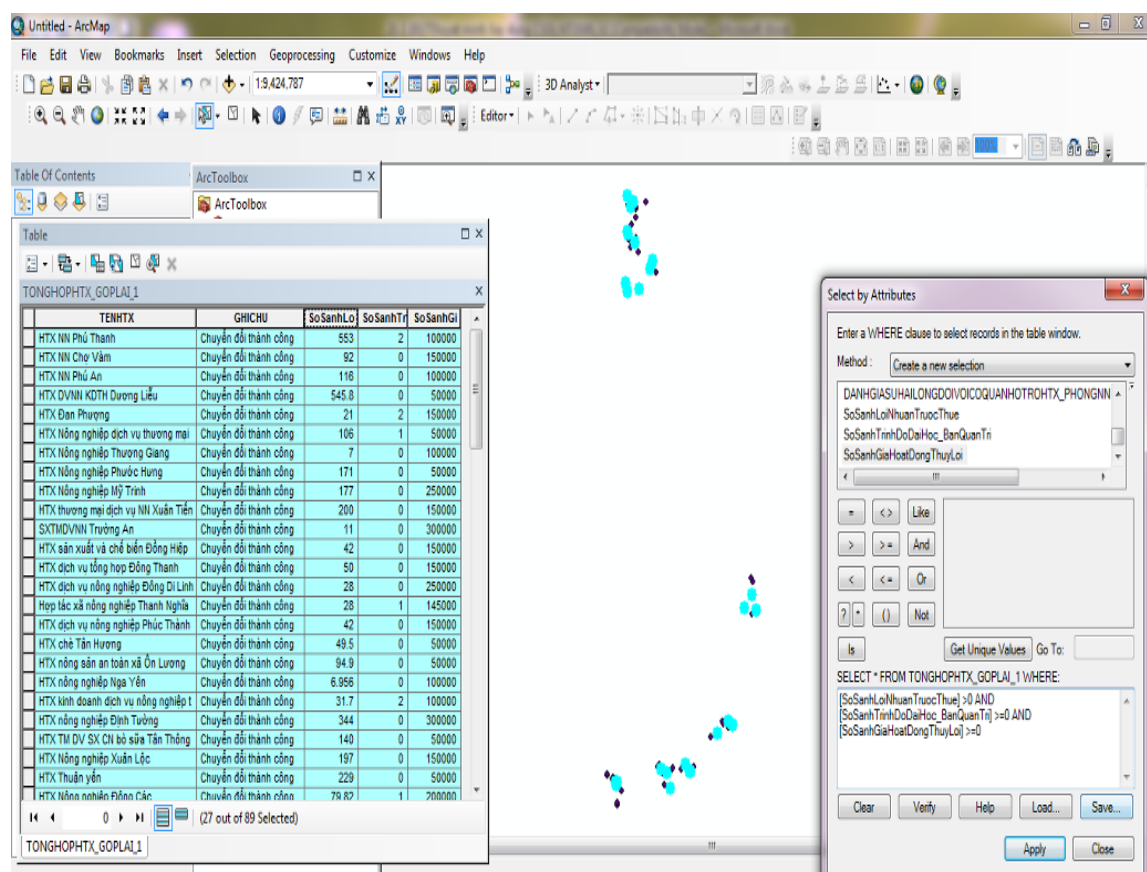


Figure 4. Describe the comparison of pre-tax profit between 2016 and 2013 under Cooperatives Law 2012

**Table 1. The successful transformed agricultural cooperatives under the Cooperative Law in 2012 on nine provinces of seven economic regions of Vietnam**

No	Name of Cooperative	Province	Pre-tax Profit (mill. VND)		
			2013	2016	Pre-After transform
1	Phu Thanh	An Giang	564	1117	553.0
2	Cho Vam	An Giang	527	619	92.0
3	Phu An	An Giang	479	595	116.0
4	Thuong Giang	Binh Dinh	500	507	7.0
5	Phuoc Hung	Binh Dinh	503	674	171.0
6	My Trinh	Binh Dinh	177	354	177.0
7	Phuoc Hiep	Binh Dinh	192.8	284.7	91.9
8	Xuan Tien	Dong Nai	600	800	200.0
9	Truong An	Dong Nai	76	87	11.0
10	Dong Hiep	Dong Nai	355	397	42.0
11	Duong Lieu	Ha Noi	872.2	1418	545.8
12	Dan Phuong	Ha Noi	600	621	21.0
13	Duyen Thai	Ha Noi	200	250	50
14	Lam Vien	Lam Dong	200	250	50.0
15	Dong Di Linh	Lam Dong	125	153	28.0
16	Dong Phat	Lam Dong	134	162	28.0
17	Dong Cac	Thai Binh	50.18	130	79.8
18	Nguyen Xa	Thai Binh	98.4	110.81	12.4
19	Dong Ha	Thai Binh	30.1	50.31	20.2
20	Phuc Thanh	Thai Nguyen	178.5	220.5	42.0
21	Tan Huong	Thai Nguyen	261.6	311.1	49.5
22	Nga Yen	Thanh Hoa	46.876	53.92	7.0
23	Thanh Long	Thanh Hoa	321.4	353.1	31.7
24	Dinh Tuong	Thanh Hoa	200	295	95
25	Tan Thong Hoi	Ho Chi Minh	265	405	140.0
26	Xuan Loc	Ho Chi Minh	430	533	103.0
27	Phuoc An	Ho Chi Minh	590	961	371.0

### **Establishment of the GIS database to evaluate 27 successful transformed cooperatives under the cooperative law in 2012 among 90 Vietnam's agricultural cooperatives**

There are some baseline criteria for evaluating the transformation quality of agricultural cooperatives that are considered to be successful. The paper only mentioned some standard criteria as follows:

*Firstly*, the change in the quantity and quality of personnel in the organizational structure of the cooperative.

After transformed, the successful agricultural cooperatives have a significant increase in the number and quality of personnel in the organization chart.



**Table 2. Quantity, qualification level of the post-transformed management compared to pre-transforming**

No	The title of leadership		Educational level and specialize (Medium)												Fostering knowledge Cooperative	
			Sum		University		College		Middle		High school		Secondary school			
	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P
1	Management board	Cooperative Board	3.2	3.7	0.9	1.2	0.2	0.3	1	1	0.8	0.9	0.3	0.3	2.7	3.1
2	Board of Cooperatives leader	Board of Directors	2.5	2.6	0.8	1	0.2	0.4	0.7	0.8	0.6	0.3	0.2	0.1	2.3	2.6
3	Control Board	Control Board	1.5	1.9	0.1	0.2	0.1	0.1	0.4	0.5	0.6	0.8	0.3	0.3	0.9	1.4
4	Accountant, treasurer	Accountant, treasurer	2.2	2.3	0.6	0.5	0.3	0.4	0.6	0.7	0.6	0.5	0.1	0.2	1.6	1.4
5	Technical staff	Technical staff	2.0	1.9	0.5	0.9	0.8	0.6	0.6	0.6	0.1	0	0	0	1.6	0.3

where,

B: Before transforming of cooperative, P: Post transforming of cooperative.

Second, the implementation of capital contribution.

After the transformation, the members of the cooperative made the obligation to contribute capital to the cooperative to confirm the membership.

**Table 3. Average contribution status of 27 successful transformed cooperatives pre and post-transforming**

TT	Evaluation Criteria (medium)	Unit	Quantity		Comparision	Note
			P	B		
1	Number of members contributing capital		889	833	56	increase
2	Total charter capital	Member	2.543	1.615	928	increase
3	Maximum capital of one member	Million VND	429.903	242.197	187 706	increase
4	Minimum capital of one member	Thousand VND/member	587.547	50.984	536 563	increase
5	The number of cooperatives is equal	Thousand VND/member	8	10	-2	decrease
6	The number of cooperatives is not equal	Cooperative	18	17	1	increase
7	Capital contribution ratio of the	%	20,7	21,6	-0,9	decrease

	Management Board					
8	Capital contribution rate of the Chairman of the Board	%	8,9	8,2	0,7	increase
9	Capital contribution ratio of the director	%	8,1	10,2	-2,1	decrease

Third, on the profit sharing of 27 successful transformed cooperatives.

After transformed, the successful transformed agricultural cooperatives gradually divide the profit according to the level of service used by members.

**Table 4. The profit distribution priority of the cooperative for the members of the successful transformed cooperatives group**

No	Rating criteria	Most priority			
		Number of Cooperatives		Proportion (%)	
		B	P	B	P
1	Divide by the capital of the cooperative members	27	17	100	63
2	Divided by the efforts of the members	5	7	18,5	26
3	Divided by usage level	0	18	0,0	67

Fourthly, on expanding the linking activities to serve the demand for the using of members' products and services.

After the transformation, the successful transfer of cooperatives has expanded the scope of activities of linking to processing and marketing of products to members.

Figure 5 shows the transforming quality of the successfully transformed cooperatives under the Vietnam Cooperative Law in 2012 through several criteria.

**Table 5. The linkage activity of the 27 successful transformed cooperatives before and post transforming**

Rating criteria	Number of Cooperatives		Proportion		Comparison
	B	P	B	P	
Signing contracts with input service providers	16	19	59.3	70.4	11.1
To sign contracts with enterprises for processing products for cooperative members	4	6	14.8	22.2	7.4
Link with other organizations and individuals to consume SP	8	12	29.6	44.4	14.8
Links with other cooperatives are expanding	2	5	7.4	18.5	11.1
Link to create jobs for members	9	11	33.3	40.7	7.4

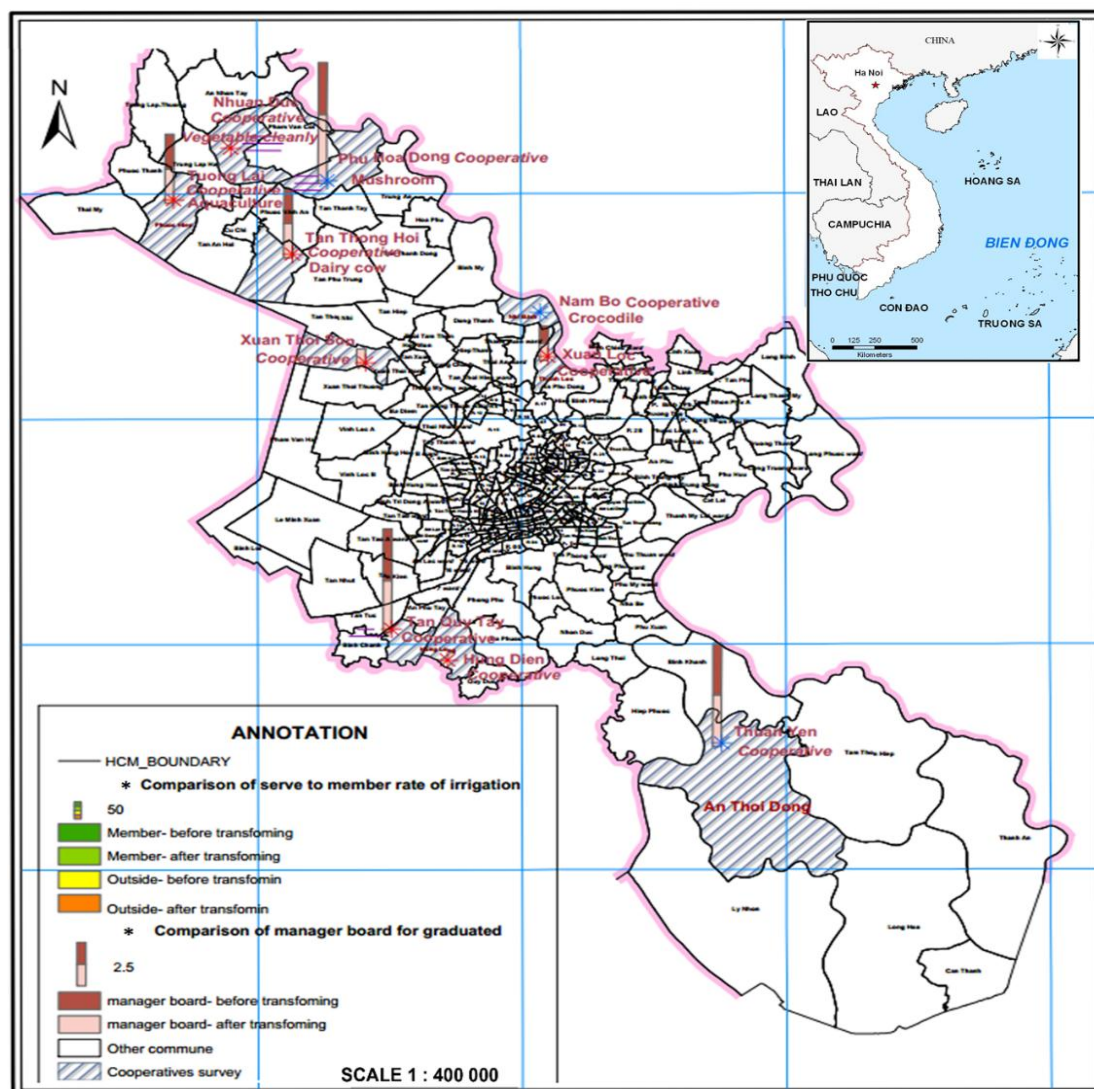


Figure 5. Map of the quality of the successfully transformed cooperatives under the Vietnam Cooperative Law in 2012 of Ho Chi Minh city

## Conclusion

The cooperative is considered as a successful transformed under the Vietnam Cooperative Law in 2012 when the cooperative has complied with the suitable regulations with the real progress of the Cooperative Law in 2012, that on the form of organization and effective operation of the socio-economic base on the new organizational foundation.

Based on the classification and evaluation criteria by GIS technology, that estimated the transforming quality of 27 cooperative models, which were considered successful transformed in a total of 90 surveyed cooperatives. However, this success is only relative because, in fact, the agricultural cooperatives also have weaknesses to overcome.

## Acknowledgment

This work is funded by the National Project “Research and propose solutions to promote the conversion of organization form and operation mode of Vietnam cooperative, for the effective implementation of the Cooperatives Law 2012”, to Thai Tran Thi under the Nation Target Programme on New Rural Development led by the Ministry of Agriculture and Rural Development



## References

1. Chang, K.T. 2008. Introduction to Geographic Information System, Tata McGraw - Hill Edition.
2. Christopher Edmonds, 2002. The role of infrastructure in land-use dynamics and rice production in Vietnam.
3. CIBA Foundation Symposium 210, 1997. Precision Agriculture: Spatial and Temporal Variability of Environmental Quality. John Wiley & Sons.
4. Francis J. Pierce and David Clay, 2007. GIS Applications in Agriculture. Taylor & Francis, USA.
5. Mekong River Delta, 2002. Mekong river delta, 2002Asian Development Bank, July 2002, ISSN 1655-5252.