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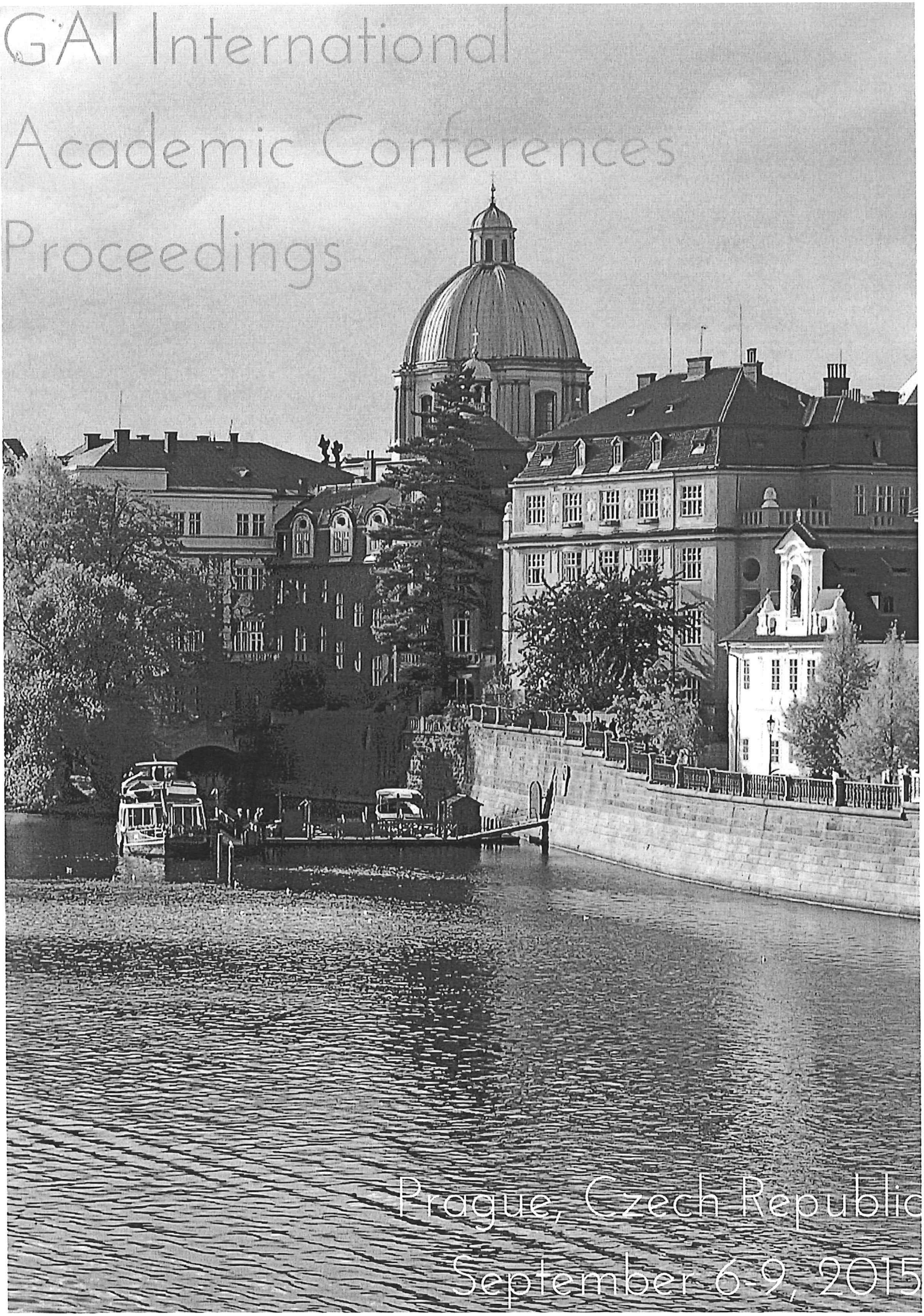

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# An Efficiency Evaluation on Agricultural Cooperative Operation in Thailand

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**Abstract**

Acomponent of this research is concerned about an efficiency evaluation of agricultural cooperative operations in Thailand. It was aimed to study an operation of agricultural cooperatives by focusing on their problems and efficiency. A mixed method was applied in the research. A qualitative research methodology was used for studying operation condition of the cooperatives with grounded theory approach, while a quantitative research methodology was used for evaluating an efficiency of the cooperatives with CCR (Charnes Cooper and Rhodes Model) and BCC (Banker Charnes and Cooper Model) of the Data Envelopment Analysis (DEA). The study focused on a location in Thailand in which the agricultural cooperative provided a best practice concept. The results revealed operation efficiency in an agricultural cooperative system in Thailand which was improved in various fields. Agriculturists understood more about the cooperative concept and became members since a policy about agricultural cooperative promotion was launched. However, there were five issues for management: personnel issues, management issues, governmental issues, political effect issues, and law issues. The researchers propose theoretical and practical suggestions from the research at the end of the article. In the efficiency evaluation, we found that among the efficiencies of the cooperatives from CCR efficiency points from every combination, two factors including the total efficiency factor and the cost efficiency factor were the most significant. Considering the BCC efficiency score, two other factors rated very significantly: the efficiency factor in specific cost management in business and operation, and efficiency factor assets.

**Keyword:** Agricultural Cooperative Issue, Agricultural Cooperative, Efficiency Evaluation.

## Introduction

Currently, there are 7,837 cooperatives in Thailand with 10,563,375 members and assets of 2.2 trillion baht approximately calculated to be 18.95% of gross domestic product (GDP) (Cooperative Promotion Department, 2012). Developing the agricultural cooperative would be a mechanism helping to develop society, economy, and culture. This development would be a tool for looing after and securing the living of farmers. Thailand's cooperatives are divided in to 2 main types including: 1) agricultural cooperative group consisted of 3 subtypes including: agricultural cooperatives, fishery cooperatives, and land settlement cooperatives; and 2) non-agricultural cooperative group consisted of 4 subtypes including: saving cooperatives, credit union cooperatives, consumer cooperatives, and service cooperatives. Agricultural cooperatives are considered as the highest amount of cooperatives in Thailand calculated to be 54.24% of total of cooperatives consisted approximately of 6,116,121 members (Cooperative Promotion Department, 2012).

This research focuses on developing agricultural cooperatives to be strong and grown sustainably in order to give good effects to Thailand's economy in overall picture. Farmers are often ignored, received no attention, and taken advantages by unfair competition of capitalism. As a result, cooperative practices are a way of helping to improve the lives of farmers or cooperative's members through efficiency measurement on the operation of agricultural cooperatives in Thailand. It can be said that efficiency measurement of production unit at the level of producer, organizations or agencies is necessary for current operations because it supports planning or establishing future policies as well as adaptation for being ready for competition. Moreover, it also helps to provide some information for improving the efficiency of each production unit. A guideline for measuring the efficiency of production

unit with the identical characteristics of operation is utilizing Data Envelopment Analysis (DEA) by applying DEA method to measure the efficiency of production unit based on the relationship between inputs and outputs, especially for measuring the operation of cooperatives in Thailand. How DEA methods reflect the efficiency of production unit clearly depends on how to select the relevant inputs and outputs that are important for operational efficiency (Prasopchai, 2006).

Hence, the researchers were interested in evaluating the efficiency of agricultural cooperatives in the area of Petchaburi province that was determined as the main research area. This research was considered as the pilot study before expanding to study in other provinces and it may be upgraded as the regional research of Thailand because there were 37 agricultural cooperatives in Petchaburi province and 24 of them were operating their operation normally while 13 of them was closed. The total members of those cooperatives were 46,853 with the approximate working capital of 2,976,355,898.01 baht and the total business volume was approximately 2,693,598,353.64 baht (Petchaburi Provincial Cooperative Office, 2013). Most of the population of Petchaburi province work agricultural fields including paddy farming, fruit gardening, palm sugar producing, livestock, and fishery, etc. The agricultural cooperatives are considered as an important financial institution for their occupation.

However, the researchers emphasized studying them for evaluating the operational efficiency of agricultural cooperatives in Thailand. To do a study on the operational conditions focusing on identifying the problems of Thailand's agricultural cooperatives and evaluating the efficiency of agricultural cooperatives, a mixed method between qualitative research for studying the operational conditions of agricultural cooperatives and quantitative research for evaluating the efficiency of agricultural cooperatives was utilized to lead to planning and establishment of strategies for further operation of Thailand's agricultural cooperatives.

**Objectives**

1. To study the operational conditions focusing on specifying the problems of agricultural cooperatives in Thailand.
2. To evaluate the efficiency of agricultural cooperatives in Thailand.

**Conceptual Framework**

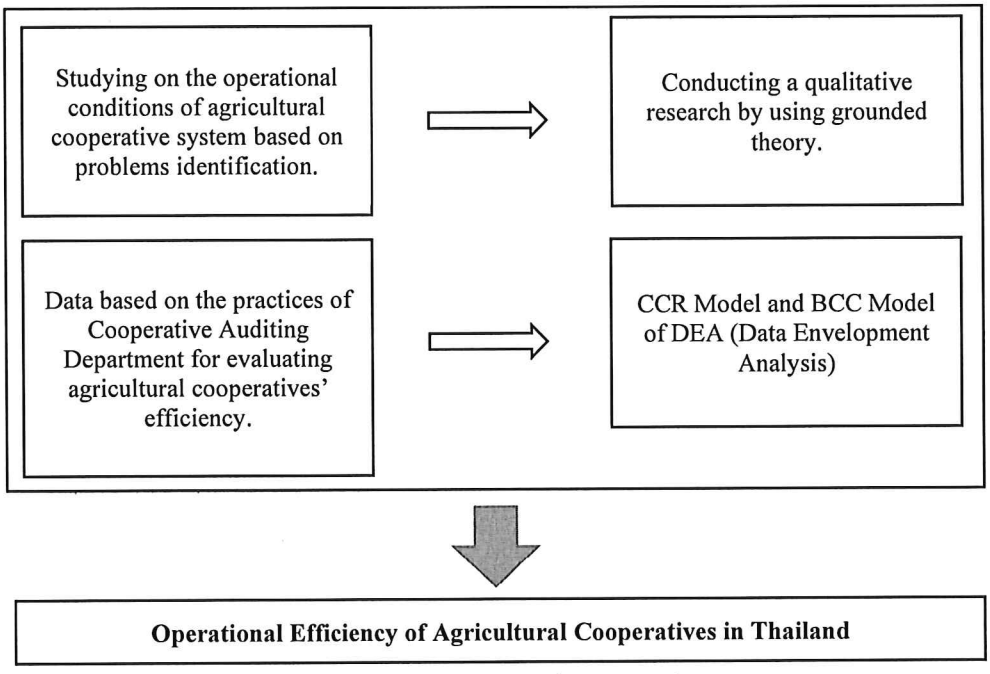


**Figure 1:** Conceptual Framework

**Methodology**

In this research, a Mixed Method was utilized between qualitative research for studying the operational conditions of cooperatives and quantitative research for evaluating the efficiency of agricultural cooperatives. As a result, the methodology of this research was divided into 2 parts as follows:

Part 1: It was the study on the operational conditions focusing on identifying the problems of agricultural cooperatives in Thailand by using grounded theory. This stage was a qualitative research based on grounded theory and the researchers used interpretivism and creativism according to the practices of (Charmaz. K.,2006) of government officers with experience in managing agricultural cooperatives in Thailand. The key informants were government officers with working experience in agricultural cooperatives not less than 20 years for providing in-depth information via in-depth interview as well as participating in providing their opinions toward the problems of agricultural cooperatives clearly in order to be able to create the data required for the study (Patton, M. Q., 1900). The key informants also consisted of some government officers of the Cooperative Promotion Department and Cooperative Auditing Department because these agencies were under Ministry of Agriculture and Cooperatives with direct and legal responsibility on the operation of agricultural cooperatives. The samples were selected by using purposive sampling and snowball sampling (Prasopchai Pasunont, 2012). The tools used in this research were research questions created through conceptual framework and theories in the form of open ended questions. The topics of those questions were related to the operation of the agricultural cooperatives that became problems or obstacles in various fields. In addition, there was also the observation in the operation of the agricultural cooperatives. The reliability of this research was inspected by using Theoretical Triangulation (Denzin, N. K., and Lincoln, Y. S., 2008).

Part 2: It was the evaluation on the efficiency of agricultural cooperatives in Thailand that was conducted in the form of the quantitative research for evaluating the efficiency of the agricultural cooperatives by using CCR model (Charnes Cooper and Rhodes Model) and BCC model (Banker Charnes and Cooper Model) of DEA (Data Envelopment Analysis) (Zhu, 1998; Jenkins and Anderson, 2003; Ho and Wu, 2009). The populations and data collection were obtained from 24 agricultural cooperatives in Petchburi province that were operating their operation normally. Primarily, the cooperatives' data was inspected and the researchers determined the variables of data analysis based on the practices of Cooperative Auditing Department (Cooperative Auditing Department, 2011) in order to calculate the DEA method. The unit of these five variables was baht as shown in Table 1.

Table 1: Variables Used in Part 2 of the Research

| 4 Input Variables | 5 Output Variables |
|---|---|
| 1) Main business cost represented by 1, i.e., the costs of selling products gained from credit business, products supplying business, product collection business, agricultural promotion and services business.<br>2) Specific costs in business and operation were represented by 2, i.e., remaining expenses from operational expenses, specific business expenses, and expenses of special transactions.<br>3) Total amount of debts were represented by 3, i.e., total debts were consisted of current liabilities, long-term liabilities, and other liabilities.<br>4) Cooperative capital was represented by 4, i.e., total capitals including equity capital, reserve capital, and other capitals. | 1) Revenue was represented by Y, i.e., total revenue earned from credit business, products supplying business, product collection business, agricultural promotion and services business, revenue from specific business, other revenues, and revenues from special transactions. |

**Results**

From the conclusion of the results of Part 1: the operational conditions focusing on identifying the problems of agricultural cooperatives in Thailand based on grounded theory, it was found that the results could be synthesized as the research's theoretical conclusion as follows:

1. The operation of the agricultural cooperatives may be unsuccessful if there was no participation of members and if there was a lack of vision and explicit policies of cooperative committees as well as a lack of transparency and managerial skill of management department and failure of audit department to perform their duties accurately. The key of agricultural cooperative's progress was the sense of cooperative's ownership of personnel in 4 sectors.

2. Whenever the agricultural cooperatives were able to manage their knowledge and utilize information on business management, their services would be complete meeting with the demands of members and improving the competitive efficiency against the private sector.

3. If the Cooperative Promotion Department and Cooperative Auditing Department that are the government agencies with direct responsibility for supervising the cooperatives established the explicit and consecutive policies by solving the problem on workforce shortage through providing knowledge on new technology to all personnel sufficiently and supervising all cooperatives extensively as well as emphasizing the integration between the two departments, so the cooperatives development would be efficient and sustainable.

4. Political problems occur in agricultural cooperatives, local and national government agencies affected to the development's direction of cooperatives in Thailand. Moreover,

exploitation of the political sector from agricultural cooperatives was also the danger threatening the living of farmers who were the members of the cooperatives.

5. Laws are the tools of government sector for supervising and auditing the cooperative's operation that can be positive and negative tools. Since it is difficult to bill only one law to meet with all demands of all types of cooperatives, law enforcers must understand cooperative history and must be transparent and always consider the cooperative's benefits.

6. Whenever any political party exploits any benefit under the cooperation of any government officer by using any legal policy and any gap in law, this may damage the operation of the cooperative and the adverse results of such action may affect cooperative members. Moreover, such political party may establish some policies to solve such problem for claiming favor from the cooperatives.

7. Although the overall picture of knowledge and skills on agricultural cooperatives management was improper, farmers were able to rely on it because it provided stable capital with non-performing loans and bad debt compared to other business units. As a result, if knowledge and skills in business operation of the agricultural cooperatives was improved along with morality, ethics, and loyalty, cooperatives can become another backbone of Thailand's society and economy.

8. To develop cooperatives, it is impossible to consider any dimension specifically. To develop cooperatives sustainably for optimal benefits, it is necessary to consider the overall picture in all its dimensions. When considering personnel and management, they are considered as internal inputs requiring adaptation to meet with the stream of the world. Simultaneously, external inputs (e.g., public sector, politics, and laws) must facilitate and be consistent with internal inputs. This is because the good quality of life of farmers who are the majority of Thai populations should provide good conditions for developing Thailand in other fields.

In this research, the problems could be concluded from the study on the operational conditions focusing on identifying the problems of agricultural cooperatives in Thailand based on grounded theory as shown in Figure 2.

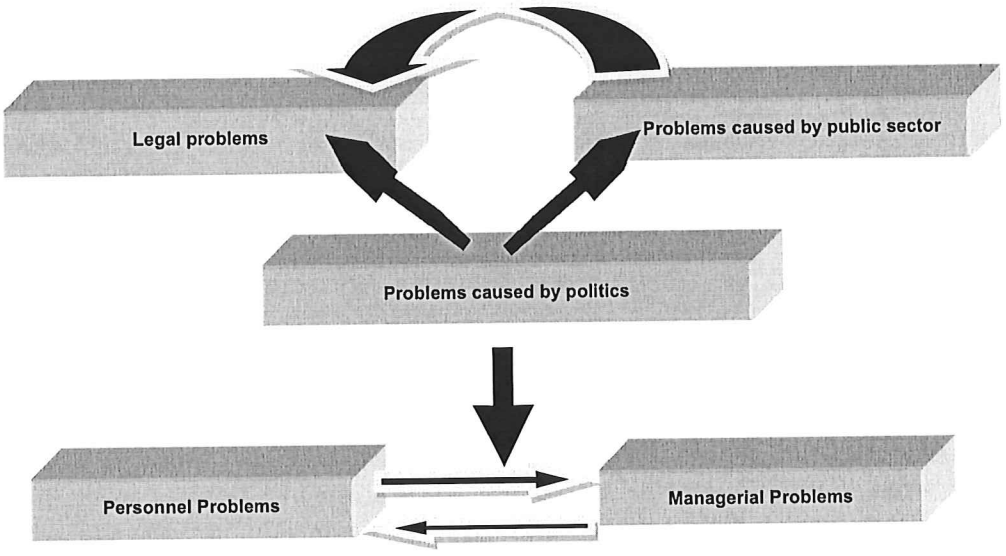


**Figure 2:** Relationship of the Operational Problems of Agricultural Cooperatives in Thailand reflected by the Opinions of Government Officers of Cooperative Promotion Department and Cooperative Auditing Department

The results of Part 2: the evaluation on the efficiency of agricultural cooperatives were able to be concluded by using CCR model (Charnes Cooper and Rhodes Model) and BCC model (Banker Charnes and Cooper Model) through DEA (Data Envelopment Analysis). From the result of calculation

of descriptive statistics of variables used in this research, it was found that most agricultural cooperatives had the lowest costs of 3 inputs including the main business cost, specific costs in business and operation, and total amount of debts. The overall result of calculation of the efficiency score on the operation of the agricultural cooperatives in Thailand showed that their costs were quite low with high operational efficiency as shown in Table 2.

Table 2: The Overall result of Evaluation on the Efficiency of Agricultural Cooperatives by Using CCR Model and BCC Model

| CCR Model | | BCC Model | |
|---|---|---|---|
| Average Efficiency Scor | SD | Average Efficiency Score | SD |
| 0.651 | 0.362 | 0.612 | 0.254 |

The results of analysis on the operational efficiency of agricultural cooperatives in Thailand within the studied area were shown in Table 3.

**Table 3:** Cooperative Clusters Classified by Characteristics, Efficiency, and Inputs from Efficiency Score

| Cluster | Cooperative Members | Efficiency from all Classifications | | Inputs from Efficiency Score | | | |
|---|---|---|---|---|---|---|---|
| | | Overall (CCR) | Real Technique (BCC) | Overall (PC_CCR1) | Capital (PC_CCR2) | Costs Management (PC_BCC1) | Assets (PC_BCC2) |
| 1 | DMU1<br>DMU2<br>DMU3<br>DMU7<br>DMU18 | Low | | Very Low | Low | Very Low | Low |
| | | | | | | Low | Very Low |
| 2 | DMU4<br>DMU5 | Low | Moderate | Very Low | Low | Low | High |
| 3 | DMU6<br>DMU9<br>DMU14 | Moderate | | High | Very Low | High | Very Low |
| | DMU10 | | | Moderate | Low | Quite Low | Low |
| | DMU11 | | | | | | Very Low |
| 4 | DMU8 | High | | Very High | Low | Very High | Low |
| | DMU16 | | | | | High | High |
| | DMU12 | | | | Moderate | | Very High |
| | DMU13 | | | Quite Low | Remarkable High | Quite Low | |
| 5 | DMU15 | Moderate | | Low | | Very High | Very Low |
| 6 | DMU17 | Low | High | Very Low | Low | High | |

From Table 3, it was found that Cha-am Agricultural Cooperative Limited (DMU1), Hub Kapong Agricultural Cooperative Limited (DMU2), Ta Yang Agricultural Cooperative Limited (DMU3), Khao Yoi Agricultural Cooperative Limited (DMU7), and Dr. Soil's Organic Fertilizer Production of Ban Nai Dong Sub-District, Ta Yang District, Petchaburi Agricultural Cooperative Limited (DMU18) had low efficiency scores in all models of input classification, both CCR and BCC models. It was indicated that the operational efficiency of the cooperatives was at a low level compared with other cooperatives that was consistent with the score of PC_CCR1, PC_CCR2, PC_BCC1, and PC_BCC2, reflecting the overall efficiency on costs, specific costs in business and operation, and assets, respectively. It was found that the score of those 4 inputs was negative, especially PC_CCR1 and PC_BCC1, showing the inefficiency on their sizes explicitly.

Mueang Petchaburi Agricultural Cooperative Limited (DMU4) and Ban Lad Agricultural Cooperative Limited (DMU5) had low scores of overall efficiency and moderate scores of real technique in all models of input classification, for both CCR and BCC models. Both cooperatives had low efficiency on size, i.e., Mueang Petchaburi Agricultural Cooperative Limited was IRS requiring size increasing. For Ban Lad Agricultural Cooperative Limited, since it was DRS, its size should be reduced. When considering input scores, it was found that PC_CCR1 PC_CCR2, and PC_BCC1 were negative, especially PC_CCR1 that was quite low. On the other hand, the score of PC_BCC2 was explicitly outstanding.

Nong Prong Water User Cooperative Limited (DMU6), Song Tham Water User Cooperative Limited (DMU9), Nong Ya Plong Agricultural Cooperative Limited (DMU10), Nong Tien Water User Cooperative Limited (DMU11), and Don Sai Water User Cooperative Limited (DMU14) had moderate score of overall efficiency and efficiency of real technique in all input classifications with specific costs in business and operation (2). When considering the score of inputs, it was found that all cooperatives could be divided into 2 groups. The first group consisted of DMU6, DMU9, and DMU14, with the remarkable scores of overall efficiency (PC_CCR1) while the score of management of specific costs in business and operation (PC_BCC1) was moderate and the efficiency of costs (PC_CCR2) and assets (PC_BCC2) still required more emphasis. The second group was consisted of DMU10 and DMU11 with low scores of PC_CCR1 while PC_CCR2 was negative but not very low. In addition, PC_BCC1 and PC_BCC2 were quite swayed.

Kao Na Petchaburi Dairy Cooperative Limited (DMU8), Chaam-Huai Sai Dairy Cooperative Limited (DMU12), Don Khun Huai Agricultural Cooperative Limited (DMU13), and Petchaburi Agricultural Marketing Cooperative Limited (DMU16) were classified in a group with high score of overall efficiency and efficiency of real technique. Since DMU8 and DMU16 had the low score of efficiency in Y1, Y4, and Y14 models, both cooperatives had the drawback on the efficiency of cost but they were outstanding on the overall efficiency and efficiency on specific costs in business and operation. For DMU12, its full score was 1 in all models with the inputs of specific costs in business and operation (2) but it had low score in Y4 model. For BCC model, its full score was 1 in all model classifications and the operational efficiency of the cooperatives was at a high level. Compared with other cooperatives, it was outstanding on the overall efficiency, efficiency of specific costs in business and operation, and efficiency of assets. For DMU13, its full score was 1 in all models with the inputs of main business cost (1) and/or cooperative capital (4). It was a cooperative with high PC_CCR2 that was very different from other cooperatives but it had low score in models with input of all amount of debts (3) (or Y3 model). As a result, it was a cooperative with high score of efficiency on cost and assets but its drawback was the input of all amounts of debt.

Mae Prachan Water User Cooperative Limited (DMU15) had a moderate score of overall efficiency and high score of efficiency of real technique, especially in models with input of specific costs in business and operation (2). In addition, it also had low score of efficiency in models with input of all amount of debts (3) and/or cooperative capital (4) (Y3, Y4, and Y34), namely, this cooperative was outstanding on specific costs in business and operation with serious drawbacks inthe efficiency of assets.

Raisom Sub-District Agricultural Cooperative Limited (DMU17) had low score of the overall efficiency with high score of the efficiency of real technique in all models of input classifications, for both CCR and BCC models, except for Y4 model that used only cooperative capital (4) as input with a very low score. As a result, the drawback of this cooperative was cooperative capital. However, its score on the efficiency of specific costs in business and operation and efficiency on assets was quite high.

However, most agricultural cooperatives in Thailand had good inputs on the efficiency of management of specific costs in business and operation and efficiency on assets.

**Discussion**

This research was conducted to evaluate the efficiency of the agricultural cooperatives by using DEA method for analyzing the efficiency score caused by all input and output classifications in order to find the outstanding and drawback inputs or outputs of the cooperatives in the studied area. The executives of agricultural cooperatives are able to implement the results of this research, especially the results of efficiency on management of specific costs in business and operation and efficiency on assets, as the guideline for planning the action plan or establishing strategies. Since financial information was used as the factor of efficiency evaluation based on DEA method, it was another dimension of preferring efficiency evaluation of the operation of the agricultural cooperatives in Thailand. The operation of Thailand's agricultural cooperative system was started to be developed in several dimensions and larger amount of farmers started to understand and participate as the members due to the agricultural cooperative promotion policies of public sector. However, there were 5 problems of management found in this research including personnel problems, managerial problems, problems caused by public sector, problems caused by politics, and legal problems. The problems of management of agricultural cooperatives were able to be divided into 2 factors including: 1) Internal Inputs consisting of personnel and managerial problems; and 2) External Inputs consisted of problems caused by public sector, problems caused by politics, and legal problems. These factors led some theoretical suggestions and practical suggestions obtained from this research that are at the end of this article. From evaluating the operational efficiency, it was found that the agricultural cooperatives had efficiency with respect to the factors from the CCR efficiency score. In all classifications, it was found that there were 2 factors including the overall efficiency and the efficiency on capital. When considering on BCC efficiency score, there were two factors including the efficiency on management of specific costs in business and operation and the efficiency on assets. Since the objective of the cooperative's operation is not only earning revenue but the successful cooperative must also promote members' participation and mutual assistance for benefits of members, communities, and society, for gaining better quality of life on living, economy, and other dimensions. As a result, evaluating efficiency in its various dimensions, both

quantitative and qualitative dimensions, is challenging and interesting for further researches in the future.

**Suggestion**

From the results, it was found that there were five dimensions of operational problems of agricultural cooperatives including personnel, management, public sector, politics, and laws. In addition, several problems are linked to one another. To improve the efficiency of the cooperatives for becoming the tool for helping farmers who are majority of Thailand's population, the Thai government should address those problems as the primary problems prior establishing the national strategies on cooperatives in order to gain integrated solutions. However, although the information used in this research was obtained from agricultural cooperatives in Petchaburi province, the concept of this method is able to be expanded for using with agricultural cooperatives in other provinces or it may be even upgraded as the regional research or national research proceeds further.

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