

THE DEVELOPMENT MODEL THROUGH THE APPLICATION OF INNOVATIVE CALCIUM CARBONATE SUSPENSIONS FOR THE ACCEPTANCE BEHAVIORS AT PRE-AGRICULTURAL SOIL PREPARATION STAGE

SASIS MONSEREENUSOR AND Dr. SUDAWAN SOMJAI

*Suan Sunandha Rajabhat University, Bangkok, Thailand
Email: sudawan.so@ssru.ac.th*

ABSTRACT

This research aimed to 1) study the elements of the acceptance behaviors of innovative calcium carbonate suspensions at pre-agricultural soil preparation stage, and 2) develop a model for soil preparation through the application of innovative calcium carbonate suspensions at pre-agricultural soil preparation stage. Mixed method research design was employed. Quantitative data was collected from a group of 400 Thai farmers, who joined an over-sized plantation project in 5 districts including Sing Buri, Nakhonsawan, Nakhon Nayok, Ayutthaya, and Phichit. Confirm Factor Analysis was used for the quantitative data analysis. Qualitative data was collected via in-depth interviews with 10 participants and focus groups with 15 relevant persons. Content Analysis was used for the qualitative data analysis. The findings were as follows: 1) the developed model through the application of innovative calcium carbonate suspensions for the acceptance behaviors at pre-agricultural soil preparation stage was a fitting model in six aspects. They were Perceived Usefulness, Perceived Ease of Use, Intention to Use, and Actual Use, 2) the developed model comprised public-relation process, participation, knowledge transfer via variety of procedures, and participatory assessment using empirical data.

Key words: acceptance behaviors, innovative calcium carbonate suspensions

INTRODUCTION

Soil decadence is mainly resulted by the water erosion caused by water forces and loss of soil nutrition due to physical decadence and toxic substances mixed in the soil such as salt, or strong-acid soil. Such the degradation results from incorrect use of land, improper management, and improper soil preservation and a discontinuous process. These effect the soil and lead to it lower productivity. The main problem of soil resources in Thailand was the large number of salty soil, around 14,393,469 Rai, sandy soil, around 12,544,293 Rai, shallow soil, around 46,090,109 Rai, acidic soil, around 6,239,361 Rai, organic soil 260,109 Rai and acid 95,410,591 Rai

Land Development Department, 2559). It was found that newly-developed substance for soil improvement was easy to use. The substance was Calcium carbonate suspension and recommended for the replacement of cement. Comparatively, Calcium carbonate suspension effectively lasts for 6 – 12 months. It is because the particles of the suspension were very fine, and effectively adjust the acidity and alkalinity better than cement materials, whose particles were much bigger. This cause the long lasting effect for the period of 6 -12 months (ภูมิศักดิ์ อินนนท์, 2559). However, the use of Calcium carbonate suspension for solving the acid soil problem and increasing productivity of soil needs to be studied before the use of them in plantations. Research on use of the suspensions should be done in actual plantation of farmers.

The participation of them was a must with the utilization of demonstration model in the cultivation plot of the farmers. Also, it was to learn the farmers' satisfactions. With the study result, it can lead to the behavioral change of the farmers and their acceptance of the innovative substance to be used in actual plantation. This study aims to explore the elements of the farmers' acceptance behaviors of innovative calcium carbonate suspensions at pre-agricultural soil preparation stage, and develop a model for soil preparation through the application of innovative calcium carbonate suspensions at pre-agricultural soil preparation stage. The developed model can be a prototype for supporting and persuading farmers all over the country to utilize calcium carbonate suspensions for the sustainable agriculture.

Research purposes

- 1) To study the elements of the acceptance behaviors of innovative calcium carbonate suspensions at pre-agricultural soil preparation stage
- 2) To develop a model for soil preparation through the application of innovative calcium carbonate suspensions at pre-agricultural soil preparation stage.

Assumption

1. The model of the elements of the acceptance behaviors of innovative calcium carbonate suspensions at pre-agricultural soil preparation stage was a good fitting model
2. The model for soil preparation through the application of innovative calcium carbonate suspensions at pre-agricultural soil preparation stage was accepted by stakeholders.

METHODOLOGY

The population of the study was 1,657 farmers, who joined an over-sized plantation project in 5 districts including Sing Buri, Nakhonsawan, Nakhon Nayok, Ayutthaya, and Phichit. The sampling was 400 farmers in the mentioned province.

The target group in the study included:

- 1) 10 farmers who joined an over-sized plantation project. They participated in an in-depth interview, asking them about their model for soil preparation through the application of innovative calcium carbonate suspensions at pre-agricultural soil preparation stage, 2) 15 persons (e.g., farmers, state officers and community leaders) participate in focus group on supporting the use of calcium carbonate suspensions at pre-agricultural soil preparation.

Studied variables

1. Acceptance behaviors of innovative calcium carbonate suspensions at pre-agricultural soil preparation stage. They included Perceived Usefulness, Perceived Ease of Use, Intention to Use, and Actual Use.

Research tools

1. Questionnaires asking about the acceptance behaviors of innovative calcium carbonate suspensions at pre-agricultural soil preparation stage. The questionnaire employed 5-scale rating and include 30 questions. The item disclination was at the range of .20 - .85. Its confidence was at .78.

2. List of in-depth interview questions asking about how the participants develop soil improvement through the application of innovative calcium carbonate suspensions at pre-agricultural soil preparation stage.

3. List of focus-group questions asking the participants for consensus agreement on the model for soil preparation through the application of innovative calcium carbonate suspensions at pre-agricultural soil preparation stage. This also included their suggestions for further development.

Research procedure

This research employed qualitative and quantitative research design. It started with literature reviews on papers relevant for scoping research framework for the creation of the simulation of acceptance behaviors of innovative calcium carbonate suspensions at pre-agricultural soil preparation stage. The 5-scale rating questionnaire was developed to be launched to 400 farmers, who joined an over-sized plantation project in 5 districts including Sing Buri, Nakhonsawan, Nakhon Nayok, Ayutthaya, and Phichit. After that, Secondary Confirm Factor Analysis was carried through LISREL (linear structural relations).

Then, in-depth interview was conducted. 10 farmers, who joined an over-sized plantation project, were asked about how the participants develop soil improvement through the application of innovative calcium carbonate suspensions at pre-agricultural soil preparation stage. Their verbal accounts were analyzed, and the analysis results was later used as guidance for focus group. The focus group asked 15 stakeholders (e.g., farmers, state officers and community leaders) about their support for the use of the calcium carbonate, as well as the consensus agreement on the model for soil preparation through the application of innovative calcium carbonate suspensions at pre-agricultural soil preparation stage. This also included their suggestions for further development.

Research framework

The research developed the simulated model of acceptance behaviors of innovative calcium carbonate suspensions at pre-agricultural soil preparation stage. The development was based on Chu and Chu's study on "The intranet's role in newcomer socialization in hotel industry in Taiwan-technology acceptance model analysis" (2011). The study was public in The International Journal of Human Resource Management, no 22, volume 5. The study explored Taiwanese people's acceptance behaviors in six aspects: Perceived Usefulness, Perceived Ease of Use, Intention to Use, and Actual Use. The research found that the research framework of the acceptance behaviors about technology was applicable in this study context. The research framework can be showed diagrammatically as follows:

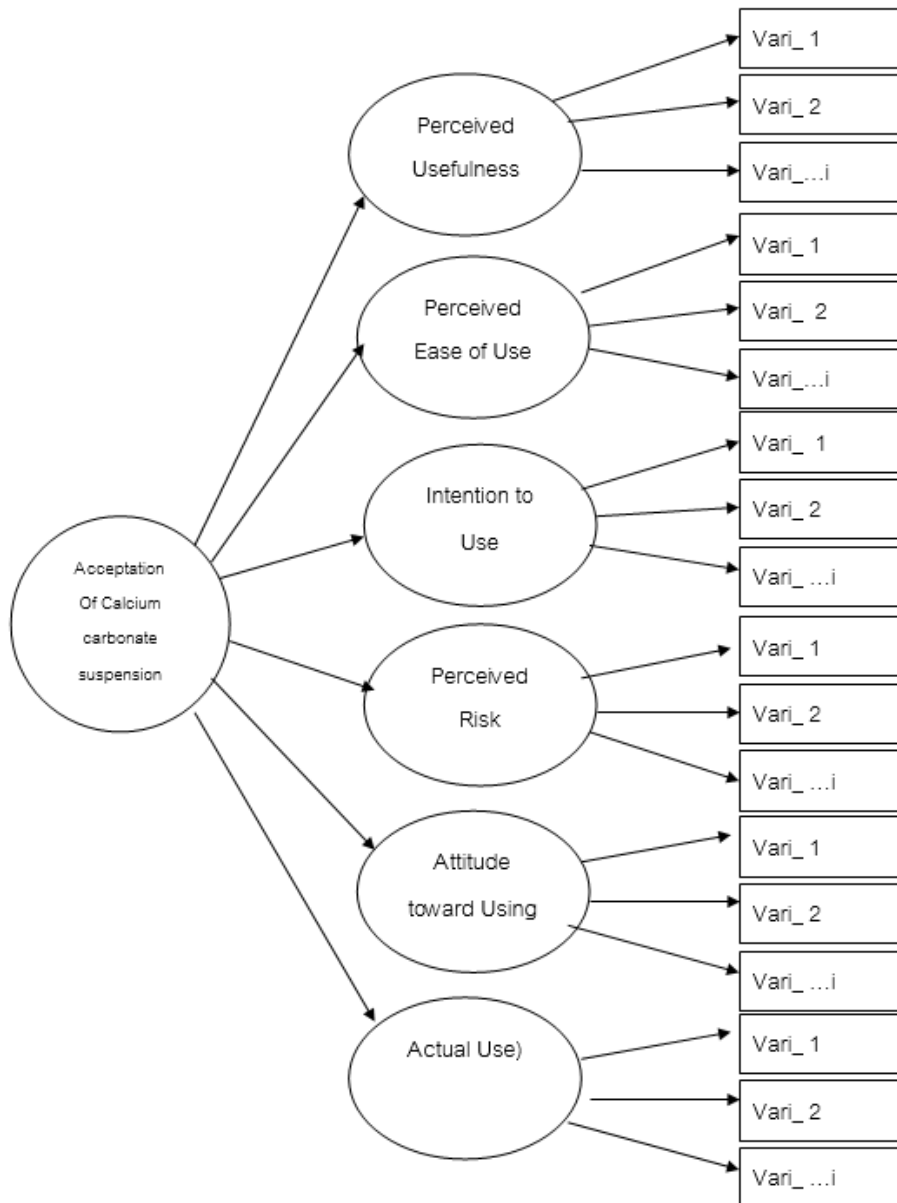


Figure 1 Conceptual framework

FINDINGS AND DISCUSSION

It was reported that the model of the elements of the acceptance behaviors of innovative calcium carbonate suspensions at pre-agricultural soil preparation stage was a good fitting model. The model fitted in six aspects: Perceived Usefulness, Perceived Ease of Use, Intention to Use, and Actual Use. It was Thai farmers, who joined an over-sized plantation project, had been systematically instructed via the technology transference regarding calcium carbonate suspensions. This current study' results agreed with the Chu and Chu's (2011).

The study reported that the developed model for soil preparation through the application of innovative calcium carbonate suspensions at pre-agricultural soil preparation stage comprised public-relation process, participation, knowledge transfer via variety of procedures,

and participatory assessment using empirical data. It was because the use of calcium carbonate suspensions was new to the Thai farmers. It needed to be made known to them through channels such as demonstration, public relation materials, ICT. Assessment should be done via variety of procedures, and participatory assessment using empirical data. This current study's result agreed with Hausman and Siekpe's (2009). Their study found that variety of public relation procedures played an important role for positive perception on benefit and use of the calcium carbonate suspensions.

Suggestions

To support the acceptance behaviors of innovative calcium carbonate suspensions at pre-agricultural soil preparation stage, it was suggested that public relation was a good start for positive perception. The process should done by all stakeholders and participatory assessment that used empirical data.

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