DETERMINANTS OF EMPLOYEE INNOVATION BEHAVIOR WITHIN THE ASEAN ECONOMIC COMMUNITY'S THAI FEED MILL PRODUCTION INDUSTRY: A CONCEPTUAL FRAMEWORK

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Abstract- Projections for world population growth in 2050 show an increase to 9.6 billion from the 7.2 billion today. With this growth, research must be given to how and what type of innovation is needed to improve the global agriculture, nutrition, and health care systems to feed this additional 2.4 billion, which requires a 70% increase in food production to meet these needs. In Asia, Thailand serves as an agricultural 'breadbasket', with home to one of the world's largest agricultural conglomerates. Also, directly or indirectly, Thailand employs 40 million in the sector, from a total population of 67 million. Given Thailand's importance in the region's food security, the researchers have therefore undertaken a study of Thailand's industrial feed mill industry utilizing structural equation modeling to test the seven hypotheses of variables affecting innovation behavior. With animal feeds accounting for up to 70 percent of the cost of production, key industry leaders are embracing innovation as the critical component at maintaining competitiveness and profitability. It is therefore important that further research be conducted to determine the variables and their effects on reducing costs while increasing the efficiency of the Thai animal feed mill production industry.

Keywords- Innovation Behavior, Innovative Climate, Intrinsic Task Motivation, Organizational Innovation.

I. INTRODUCTION

In 2015, Milan, Italy hosted the Universal Exposition with the theme - "Feeding the Planet, Energy for Life." As the world considers what innovation is needed to improve our global agriculture, nutrition, and health, we also must consider the demographics of the changes underway. Between now and 2050, the world's population will increase from 7.2 billion today to 9.6 billion in 2050, requiring a 70% increase in food production, without additional land or natural resources to do so [1].

With finite resources, it will take innovation and a variety of technologies, both old and new, to meet the world's food demand. Of the current 7.2 billion people on earth, in 2014, 4.427 billion resided in Asia. In Southeast Asia's Thailand, is also the headquarters of one of the world's largest feed producers and agricultural conglomerates, Charoen Pokphand Group (C.P. Group). This massive agribusiness conglomerate has contributed significantly to Thailand's rapid agribusiness growth over the years, owing to an ever increasing demand in consumer markets, both domestically and internationally. In order to meet an escalating trade in processed food products, the Thai Government has also set out to transform Thailand into Asia's largest food trade and distribution center [2]. The global Animal Feed Industry output was estimated at US$240 billion annually in 2010 with the United States accounting for 21.6% of world production. Global output of commercial compound feeds in 2010 was 725 million tons with 2011 estimated at a volume of over 734.5 million tons, with the largest regional share of world feed production being held by the Asia-Pacific countries [3].

On a regional level within the ASEAN community (Association of Southeast Asian Nations), Thailand's agricultural industry is a major economic engine which employs 40% of the country's labor force contributing to a sizable food-processing industry generating exports of over USD$32 billion in 2011 [4]. The animal feed sector therefore represents a key component for Thailand's food production export engine to the ASEAN community as well as the rest of the world.

While annual feed consumption stood at approximately 114 million tons in the mid-1980s, this number had increased to about 358 million tons in 2009-2011, of which 183 million tons were cereals. Cereals are, therefore, estimated to account for 51 percent of total feed use, which is very similar to the share in the United States of 53 percent.

With the rising populations along with the associated sophistication of the methods to provide ever increasing yields, Thailand must find the tools to keep pace with the change as animal feeds account for up to 70 percent of the cost of food production [5].

In a 2012 interview, C.P. Group's C.E.O. stated that technology and innovation were keys to the company's success at becoming the global top maker of animal feed and that "a trade secret of CP" was that wherever CP went, "they brought the latest technology to increase efficiency and increase income with more than 90% of the technology coming from the US." [6]. Also, helping local's with knowledge transfer on how to operate and use the technology was paramount to the business model success.

To meet these ever increasing needs, Thailand's feed consumption has grown from 10 million tons in 2004 to over 16 million tons in 2014, with the keys to

achieving sustainable growth being the innovative climate of the agribusiness organizations, the leadership behavior of management, external work contacts and relationships leading to innovation behavior assuring sustainability for the enterprise.

This study is therefore being undertaken to: 1) study the variables and the management of innovation in the agribusiness feed production sector; 2) to determine the effects, both directly and indirectly, of the variables on innovation behavior within Thailand's industrial feed production business; 3) to develop a structural equation model of the variables that influence the management of innovation within the animal feed production industry in Thailand in order to determine the benefits and value to the animal feed industry in both the short and long terms so that enterprises and businesses can compete more effectively within the upcoming integration of the AEC (ASEAN Economic Community).

II. CONCEPTUAL DEVELOPMENT

2.1. Innovative Climate

Research from Teece indicated that to profit from innovation, business pioneers need to excel not only at product innovation but also at the business model design, understanding business design options as well as customer needs and technological trajectories [7].

This is consistent with C.P. Group's Chairman Dhanin Chearavanont's contention that innovation is an important and essential requirement in the 21st century and the company must prepare itself in an ever changing world [8]. C.P. Group also sees success in developing innovation originating from 'people' who become proficient and skilled with innovation a key corporate value. Research by De Jong [9] determined that leaders with a desire to stimulate individual innovation used innovation-stimulating leadership. The more employees can participate in decision-making, have freedom to plan and act, and feel challenged by their tasks, the more enthusiastic and committed they will be to innovate. This is also consistent with Isaksen and Akkermans [10], which indicated that the working atmosphere within an organization has an important influence on its level of innovative productivity and that organizational leaders influence innovative productivity as well as the climate for creativity and innovation. In research from the ILO (International Labor Organization) report authors Rogovsky and Tolentino [11], stated that because of dynamic markets, rapid advance of production and information technology, changes in resource availability and constantly changing customer expectations, on-going innovations in products, processes and organizations are essential for productivity.

2.2. Organizational Innovation

Nowadays, the ability to continuously improve and innovate products, services and work processes is crucial for organizations. According to research from De Jong and Den Hartog [12], both scientists and practitioners emphasize the importance of innovative work behavior (IWB) of individual employees for organizational success. In the study of IWB relationships, participative leadership, external work contacts and innovative output were examined. Also, IWB was shown to be positively related with participative leadership, external work contacts and innovative output.

2.3. External Work Contacts

From the research it can be seen that a key to innovation has been external (foreign) working relationships, especially focused on the US and Europe. Another key component has been the vertical integration while controlling the entire process from production of raw materials up to marketing of final products [13]. Sriboonchitta and Wiboonpoongse [14] defined contract farming is a means to assist small growers in gaining market access and reducing price risk, and as such it has attracted attention from development agencies and governments in developing countries. In the long run, small farmers were able to accumulate production and management skills, thus improving their bargaining position. These external work contacts involved the supplier, foreign institutions such as NGOs, universities and trade associations, as well as customers and competitors.

2.4. Intrinsic Task Motivation

The componential theory of creativity is recognized as one of the major theories of creativity in individuals and in organizations, serving as a partial foundation for several other theories and for many empirical investigations. In it, there are four key components, three of which are inside the individual. They are; domain-relevant skills, creativity-relevant processes, and intrinsic task motivation. One component however exists outside the individual which is the social environment in which the individual is working [15].

2.5. Innovation-Stimulating Leadership Behavior

Organizations constantly encounter forces driving them to change. Because change however means doing something new and unknown, the natural reaction is to resist it Management is therefore concerned with the optimum attainment of organizational goals and objectives with and through other people [16]. This is consistent with Mintzberg who showed managers spend most of their time reacting to events and almost no time planning [17]. From the research, Mintzberg developed ten management roles which were then placed into 3 categories including; Interpersonal, Informational and Decisional.

2.6. Innovation Behavior

According to Li and Zheng [18], in order to obtain and maintain a competitive advantage, the

organizations must innovate continuously. There is no doubt that the employees are the main force for the organizations, and their innovative behaviors are vital for innovation performance of an organization.

Boehlje, Roucan-Kane and Bröring [19] also stated that the global food and agribusiness industry is in the midst of major changes, and the pace of change seems to be increasing. These changes suggest three fundamental critical future issues for the sector including increasing risk and uncertainty, developing and adopting technology and new innovations is critical to long- term financial success, and finally responding to changes in industry structure and the competitor landscape and industry boundaries is essential to maintain market position.

Research from Wong and Chin also supports the above in that it was stated that organizational innovation management (OIM) is one of the critical means to sustain competitiveness in organizational innovation in the long term [20].

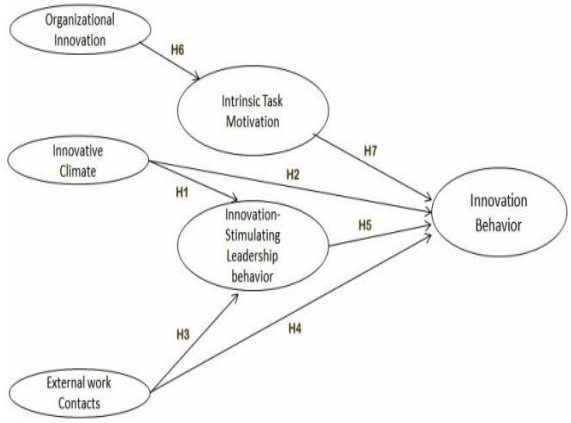
Cormican and O'Sullivan added to this by stating that the product innovation process is extremely complex and involves the effective management of many different activities [21].

Furthermore, Carmeli, Meitar and Weisberg studied self-leadership skills and innovative behavior and concluded that self-leadership skills are positively associated with both self and supervisor ratings of innovative behaviors. The findings also showed that income and job tenure are significantly related to innovative behaviors at work [22].

2.7. Proposed Conceptual Framework (Fig.1)

The theory of creativity from Amabile described the causal factors of the creative individual. These steps are consistent with the behavior aimed at innovation with people dependent on external factors, including environmental organizations or the style of management. In this research therefore, the factors that have been hypothesized as having a direct influence on innovation behavior include organizational innovation, innovative climate, external work contacts, intrinsic task management and innovation-stimulating behavior (Fig.1)

Fig.1. Determinants of Innovation Behavior within the AEC's Thai Feed Industry



2.8. Research Hypothesis

H1: The Innovative Climate has a direct effect on Innovation-Stimulating Leadership Behavior.
H2: Innovative Climate has a direct effect on Innovation Behavior.
H3: External Work Contacts has a direct effect on Innovation-Stimulating Leadership Behavior.
H4: External Work Contacts has a direct effect on Innovation Behavior.
H5: Innovation-Stimulating Leadership Behavior has a direct effect on Innovation Behavior.
H6: Organizational Innovation has a direct effect on Intrinsic Task Motivation.
H7: Intrinsic Task Motivation has a direct effect on Innovation Behavior.

III. METHODOLOGY

This research aims to model the structure of the factors influencing the innovation behavior of industrial feed production in Thailand, so the researchers wish to determine the details and procedures from the methods below:

3.1. The study's approach

For this research the researchers used both quantitative and qualitative research from both primary and secondary data. The researchers have determined the following steps for this study:

3.1.1. Primary and Secondary Data Research

Primary data is most generally understood as data gathered from the information source and which has not undergone analysis before being included in the analysis. Primary data is collected directly from the surveyed population and involves face to face interviews or discussions with members of the surveyed community [23]. Secondary data can comprise published research, internet materials, media reports, and data which has been cleaned, analyzed and collected for a purpose other than the needs assessment.

3.1.2. Quantitative Research Study

Quantitative research will be undertaken by collecting a questionnaire from the target sample. Questionnaires are designed to be easily understood and structured. Further reliability validation will be undertaken as follows:

3.1.2.1 Review of the questionnaire will be conducted by academic scholars to validate the investigation questions and the use of rhetoric and the simplicity and comprehension of the questions.

3.1.2.2 During the question trial period, questions will undergo and continual review for their clarity and ability to the meet the objectives of the research.

3.1.2.3 Update the survey questions after completion of the trial period.

3.1.2.4 Perform both data collection and statistical analysis.

3.1.2.5 Review of the questionnaire will be conducted by academic scholars to validate the investigation questions and the use of rhetoric and the simplicity and comprehension of the questions.

3.1.3. Qualitative Research Approaches

Qualitative research will involve confirming the model of quantitative research. It is a collection of interviews with those involved in innovation, including plant managers, production managers and animal feed mill managers.

3.2 Population and Sampling

The population in this study is 699 animal feed mill factories in Thailand compiled by Thailand's Ministry of Agriculture Food and Drug Control Division's Department of Livestock

Questionnaires are constructed as a tool to measure concept definition and practice using a 5-Point Likert Scale [24]. Structural Equation Modeling (SEM) used in the research will use several statistical tests to determine the adequacy of model fit to the data. Specifically, confirmatory factor analysis (CFA) will be used to verify the factor structure of the observed variables. The chi-square test is also employed which indicates the amount of difference between expected and observed covariance matrices.

3.2.1 Sample

The sample used in this study was drawn from managers involved in various capacities in Thailand's feed factories including plant managers, production managers, engineering managers or feed mill managers.

3.2.2 The Sample Size

Quantitative research is currently envisioned using the structural equation model and hypothesis testing with AMOS Software [25], which analyses the display and model structure associated with the observed manifest variables with latent variables.

Cronbach's alpha will be used to verify the accuracy and reliability of the measurements of each construct [26]. Schumacker and Lomax [27], stated that Structural Equation Modeling (SEM) uses a variety of models to show the relationships between observed variables with the same basic goal of providing a quantitative test of a theoretical model hypothesized by a researcher.

Another very important consideration is the intended sample size with many authors recommending a sample size of at least 100 to generate good results, so, therefore, a sample size smaller than 100 should not be used as it is unreliable and consequently SEM should not be used [28], Qualitative Research is to be undertaken through the use of in-depth interviews with those involved in innovation, including plant managers, production managers and engineering managers. To confirm the model of quantitative research, the sample size of the research to be used will be 10 individuals.

3.3 Tools used in research

Tools used in the research will include the following steps:

3.3.1 Self-administered questionnaire (SAQ)

The measurement instrument or questionnaires utilized was prepared from the literature. A self-administered questionnaire (SAQ) is being used as it is exploratory in nature and serves as a starting point for other methodologies.

3.3.2 Research Quality Inspection Tools

The research will be conducted to determine the quality of the instruments used in the research. Tools used to measure quality are divided into 2 phases including content validity and reliability [29]. The research is therefore divided into two phases.

Phase I consists of inspection by 5 experts in their respective fields. These include managers at factories, in production, engineering and technical innovation.

Phase II consists of measures to ensure the quality of the questionnaire. In this study, the draft questionnaire was created with 16 main items which were later checked for their content validity by five experts in their related fields of feed production management and were based on the Item-Objective Congruence (IOC) Index. The questionnaire will be piloted with 30 feed service production businesses using both lower and middle-level managers and calculated for proper reliability value by using Cronbach's Coefficient Alpha.

3.4 Data Collection

3.4.1 Primary Data

Primary data will come from a collection of factors influencing the innovation behavior of industrial feed mill production in Thailand.

3.4.2 Secondary Data

By studying theories related to the research from various sources, including books, articles, research papers, instruction manuals, etc., to frame concepts and theories used in the study.

3.5 Data Analysis and Statistics Used

3.5.1 The analysis of quantitative data will be conducted using statistical analysis as follows:

3.5.1.1. An analysis will be conducted by descriptive statistics by characterizing the frequency, percentage, mean and standard deviation.

3.5.1.2. Analysis will be conducted using structural equation analysis (SEM) to determine the relationship

of the factors influencing the innovation behavior of industrial feed production in Thailand.

3.5.2 Qualitative Data Analysis

To confirm the results of the quantitative analysis, the researchers conducted interviews with those involved as plant managers, production managers or engineering managers involved with animal feed mills in Thailand.

CONCLUSION

With the approaching integration of the ASEAN community at the end of 2015, competition within the region is expected to increase. With labor cost being a significant component of profitability and thus sustainability of a feed factory, Thailand must embrace innovation as a way to offset having one of the highest labor costs within the 10 nation community. From the review of the literature, numerous studies enforce the idea that innovation is a key component of enterprise profitability, competitiveness and sustainability. Employee behavior innovation and contribution is therefore a crucial element in an organization's potential for success including the feed mill factory industry.

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