# EXPLORING
# THE EFFICACY OF
# INTEGRATED PEST MANAGEMENT
# TECHNOLOGY AND INNOVATION DIFFUSION
# IN MALAYSIA: A CASE STUDY APPROACH

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## ABSTRACT

In spite of advancements in integrated pest management technology and innovation in the 1990's, there was a growing interest in the international scene that rice farmers' pest management decision making had changed little over the years. This alarming discovery was made in comparison to the 1970's era, where agrochemical organisations played a vital role in the development of integrated pest management practices and farmers were encouraged to use pesticides as necessary inputs. Today most rice farmers strongly relied on these pesticides as they perceived that pesticides were necessary for high production, contrary to the advancements made in pest management.

The objective of this study was to conduct an exploratory research to identify the conglomerate factors that could facilitate the successful diffusion of the Integrated Pest Management (IPM) technology and innovation in Malaysia. Various commonly used exploratory research techniques were employed in conducting this study, viz., experience survey, pilot study, secondary data analysis, case-study and focus-group interviews.

The underpinning theory on diffusion of technology and innovation as created by Rogers (1995) was used as the framework on which this research was based. His theory focused on five key stages that traced the behavioural patterns of potential adopters until they made a decision to either adopt the innovation or reject it.

The next process led to the identification of the first target respondents group of this study. These were the agricultural extension officers. They were specifically chosen as they were the key influencers of the end-users of the IPM technology and innovation in

Malaysia, viz., the rice farmers. The second targeted group for this exploratory research were the Heads of the Extension Departments of these agricultural extension officers. The reason being they played a powerful role in ensuring the success of the diffusion of IPM technology and innovation. These agricultural extension officers and Heads of the Extension Departments were from the two largest rice granaries in Malaysia (MADA and KADA).

An analysis of the literature was conducted to identify the factors that could be classified as drivers or motivators for the successful diffusion of IPM technology and innovation. The literature review revealed six key factors that were deemed to be motivators or drivers. These comprised; the role of top management, the system of communication, the prevalent structure and culture, the status of the social system, the role of the intermediaries and also the innovation's attributes. The existence of these six key drivers or motivators was deemed to have a positive correlation to the level of knowledge, attitude and practices (KAP) of the agricultural extension officers, who were the front-liners to the end-users (rice farmers).

A strong KAP level among these agricultural extension officers would indicate that they were able to influence the rice farmers to adopt the new IPM technology and innovation. Some of the performance indicators that could validate their influence on enhancing the level of efficacy were identified by the respondents of this study during the interviews. These included; major pest attacks, yield per granary, usage levels of insecticides, herbicides and rodenticides.

The exploratory research was conducted over two periods of time, in 2001 when the initial interviews were conducted and also in 2007 when the subsequent interviews were done. The key objective was to assess the change (if any) to the key drivers or motivators in the two granaries, and benchmark the latter results to the results secured in 2001.

The findings from this research revealed that there were six key drivers or motivators prevalent in MADA in 2001. This result was validated through the interviews with the MADA agricultural extension officers, as well as through a set of suggested performance indicators. Using similar exploratory research methodology, it was discovered that most of these key drivers were absent in KADA in 2001, hence they were classified as 'inhibitors' to the efficacy of IPM technology and innovation diffusion. Subsequently, in 2007, vast improvements were witnessed in KADA, as most of the 'inhibitors' had become 'drivers', whereas, the drivers were further fortified, in the case of MADA.

The originality of this research was to lead to the development of a systematic, prescriptive model of IPM technology and innovation adoption and diffusion, which would augment the prevailing literature and guide the process of adoption and diffusion, leading to a higher level of efficacy and success. A set of recommendations were proposed to enhance the attitude of the agricultural extension officers so as to improve the efficacy of the IPM technology and innovation diffusion process. Future research areas were also identified in this research study.

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