The Adoption of Sustainable Agricultural Practices:
An Integrative Approach for Malaysian Vegetable Farmers

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Abstract

Sustainable agricultural practices (SAPs) have been promoted as a mechanism for improving sustainable development in agriculture. Their adoption, however, has been low in many countries. Motivated by this phenomenon, a better understanding of the adoption of SAPs is provided in this thesis, using the Malaysian vegetable production sector as a case study.

This thesis is guided by an integrative framework encompassing the theory of interpersonal behavior and the theory of diffusion of innovation. Consistent with the literature, this framework addresses adoption as a complex behavior, which develops from both economic and psycho-social considerations. Applying this framework, focus groups were conducted to explore research hypotheses, and to assist questionnaire design and survey operations. The subsequent questionnaire was used to interview 1,168 randomly selected vegetable farmers from all five regions in Malaysia.

Confirmatory factor analysis indicates that farmers’ perceptual structure was built by four attributes of SAPs: relative advantage, compatibility, complexity, and trialability. Guided by their relative importance, extension efforts can be designed accordingly. Among these attributes, relative advantage was rated poorly. This requires corrective measures since excellence in the core attribute is the key to convincing potential adopters. These corrective measures may include education on SAPs’ agronomic and economic potentials, marketing sustainable produce as a premium product, and financial incentives.

Structural equation modeling of the overall framework shows that adoption was determined by both economic and psycho-social considerations. As no single aspect offers the best explanation, a wider understanding is necessary prior to policy development.
Nevertheless, the economic aspect seemed more influential. Thus, policy and research efforts should pay attention to the economic motivations underpinning adoption in SAPs’ promotion.

Focusing on the economic aspect, logistic regression reveals that adoption depended on a range of socio-economic, agro-ecological, institutional, informational, and psychological factors as well as the perceived attributes of SAPs. Policy understanding in this regard should, therefore, be multidimensional. Additionally, the more influential factor was the resource distribution across geographical locations, followed by financial capital, workforce size, information usefulness, ethnicity, and the perceived relative advantage of SAPs. Such relative importance informs a knowledge base for guiding policy emphasis, such as promoting SAPs to prioritized places and segments through tailored information, education, and financial measures.

A two-stage regression model highlights that the use of intercropping and organic fertilizers/composts resulted in greater farm profits, as these SAPs are more effective in cost savings and productivity than other SAPs. Such evidence suggests how policymakers can design an economically attractive package of SAPs for potential adopters to increase adoption rates.

Overall, the findings of this thesis suggest a strategic extension plan for advocating SAPs. Profitable SAPs form an economically attractive package of products. Underperforming attributes require educational and promotional efforts to aim at improving performance realistically or perceptually. Characteristics of potential adopters identify productive segments and targets. Geographical endowments (e.g., uplands/lowlands, regions) and information sources favoring adoption depict places on which to focus.
Declaration

I certify that this work contains no material which has been accepted for the award of any other degree or diploma in any university or other tertiary institution and, to the best of my knowledge and belief, contains no material previously published or written by another person, except where due reference has been made in the text. In addition, I certify that no part of this work will, in the future, be used in a submission for any other degree or diploma in any university or other tertiary institution without the prior approval of the University of Adelaide and where applicable, any partner institution responsible for the joint-award of this degree.

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Yeong Sheng Tey

December 2013
Publications arising from this thesis


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<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>ASEAN</td>
<td>Association of Southeast Asian Nations</td>
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<tr>
<td>ASI</td>
<td>Adelaide Scholarship International</td>
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<tr>
<td>AVE</td>
<td>Average variance explained</td>
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<td>CAP</td>
<td>Conventional agricultural practice</td>
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<td>CAT</td>
<td>Coding analytical toolkit</td>
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<tr>
<td>CETDEM</td>
<td>Centre for Environment, Technology &amp; Development, Malaysia</td>
</tr>
<tr>
<td>CFA</td>
<td>Confirmatory factor analysis</td>
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<td>CFI</td>
<td>Comparative fit index</td>
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<tr>
<td>CR</td>
<td>Construct reliability</td>
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<tr>
<td>DOA</td>
<td>Department of Agriculture</td>
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<tr>
<td>DOI</td>
<td>Diffusion of innovation</td>
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<tr>
<td>FAMA</td>
<td>Federal Agriculture Marketing Authority</td>
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<tr>
<td>FAO</td>
<td>Food and Agriculture Organization of the United Nations</td>
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<tr>
<td>FGD</td>
<td>Focus group discussion</td>
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<td>GAP</td>
<td>Good agricultural practice</td>
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<tr>
<td>GFP</td>
<td>Gross farm profit</td>
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<td>GOF</td>
<td>Goodness-of-fit</td>
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<tr>
<td>IPM</td>
<td>Integrated pest management</td>
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<tr>
<td>MAFC</td>
<td>Malaysian AgriFood Corporation</td>
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<tr>
<td>NGOs</td>
<td>Non-governmental organizations</td>
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<tr>
<td>PhD</td>
<td>Doctor of Philosophy</td>
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<tr>
<td>RMSEA</td>
<td>Root mean square error of approximation</td>
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<tr>
<td>Acronym</td>
<td>Full Form</td>
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<td>SAPs</td>
<td>Sustainable agricultural practices</td>
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<tr>
<td>SC</td>
<td>Standardized coefficient</td>
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<tr>
<td>SEM</td>
<td>Structural equation model</td>
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<td>SEU</td>
<td>Subjective expected utility</td>
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<tr>
<td>SPSS</td>
<td>Statistical Package for the Social Sciences</td>
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<tr>
<td>ST</td>
<td>Structuration theory</td>
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<tr>
<td>TIB</td>
<td>Theory of interpersonal behavior</td>
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<tr>
<td>TLU</td>
<td>Tropical livestock unit</td>
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<tr>
<td>TPB</td>
<td>Theory of planned behavior</td>
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<tr>
<td>TRA</td>
<td>Theory of reasoned action</td>
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<tr>
<td>UC</td>
<td>Unstandardized coefficient</td>
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<tr>
<td>UMS</td>
<td>Universiti Malaysia Sabah</td>
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<tr>
<td>UNAPCAEM</td>
<td>The United Nations Asian and Pacific Centre for Agricultural Engineering and Machinery</td>
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<tr>
<td>UPM</td>
<td>Universiti Putra Malaysia</td>
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<tr>
<td>UNCED</td>
<td>United Nations Conference on Environment and Development</td>
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<tr>
<td>USA</td>
<td>United States of America</td>
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<tr>
<td>WSSD</td>
<td>World Summit on Sustainable Development</td>
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<td>$\chi^2$</td>
<td>Chi-square</td>
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