



How much Do Farmers Care about Pesticide Externalities? A Choice Experiment among Thai Vegetable Farmers

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Introduction

- **Agricultural pesticides are widely used to control pests globally in market-oriented farming systems, especially in vegetable production.**
- **High and incorrect use of pesticide has led to high externalities to ecosystems and human health.**

Objectives

- **The study aims to explore and value farmers’ preference for alternative pest management options.**

Methods

Choice Experimental design

Table 1: Attributes and attribute levels

Attributes	Levels			
	1	2	3	4
1) Impacts on Ecological Environment and Certification for Environmentally Friendly Pest Management Practices.				
2) Impacts on Human Health in the long term (farmers, and family members)				
3) Market Opportunity for Environmentally Friendly Pest Management Products				
4) Knowledge Training on Integrated Pest Management				
5) Additional Costs of Production (USD/ha/Crop)	0 USD	313 USD	625 USD	1250 USD

303 vegetables farmers were interviewed in 2016 from Pathum Thani, Nakhon Pathom and Ratchburi provinces.

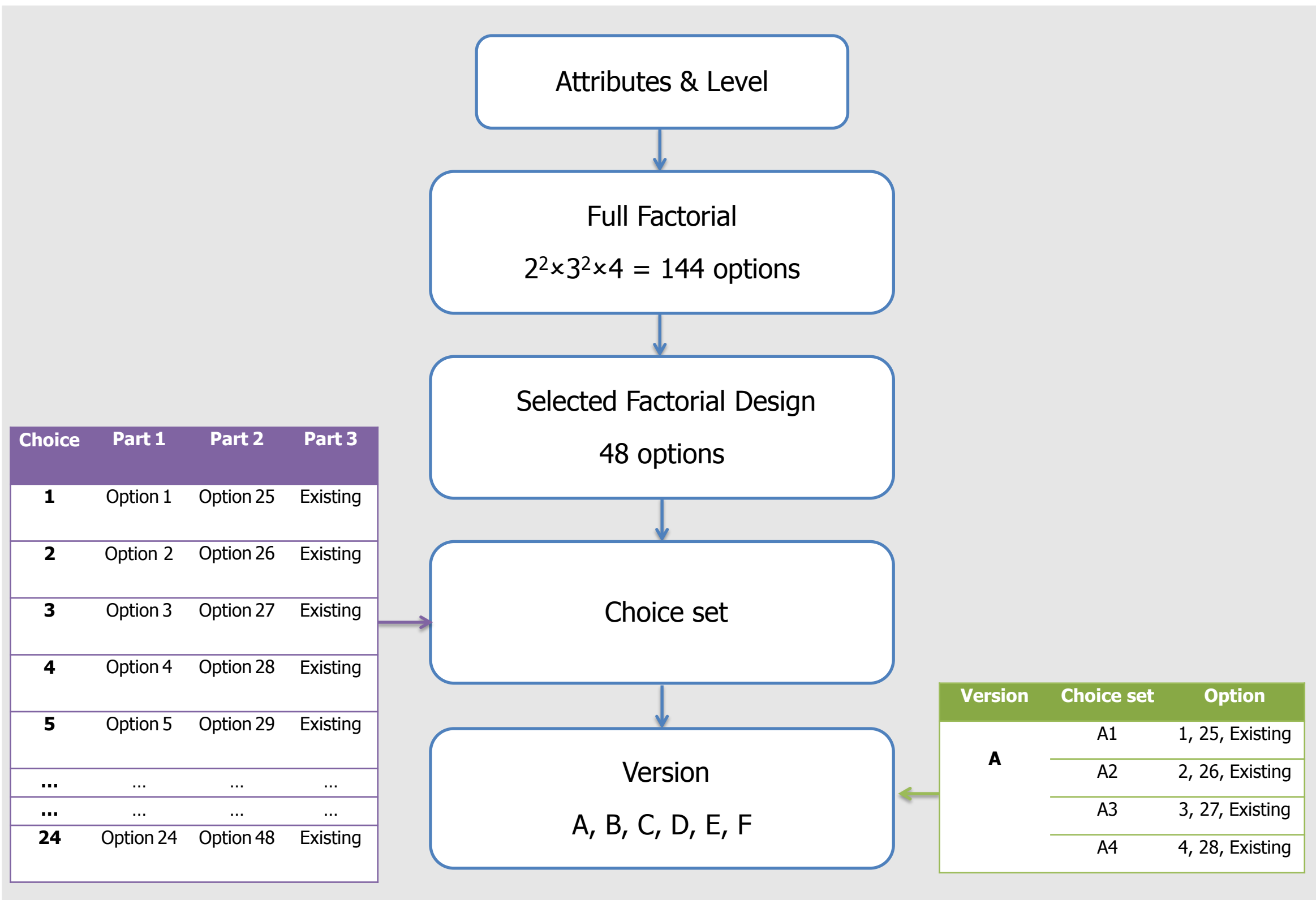


Figure 2: Steps of choice experiment

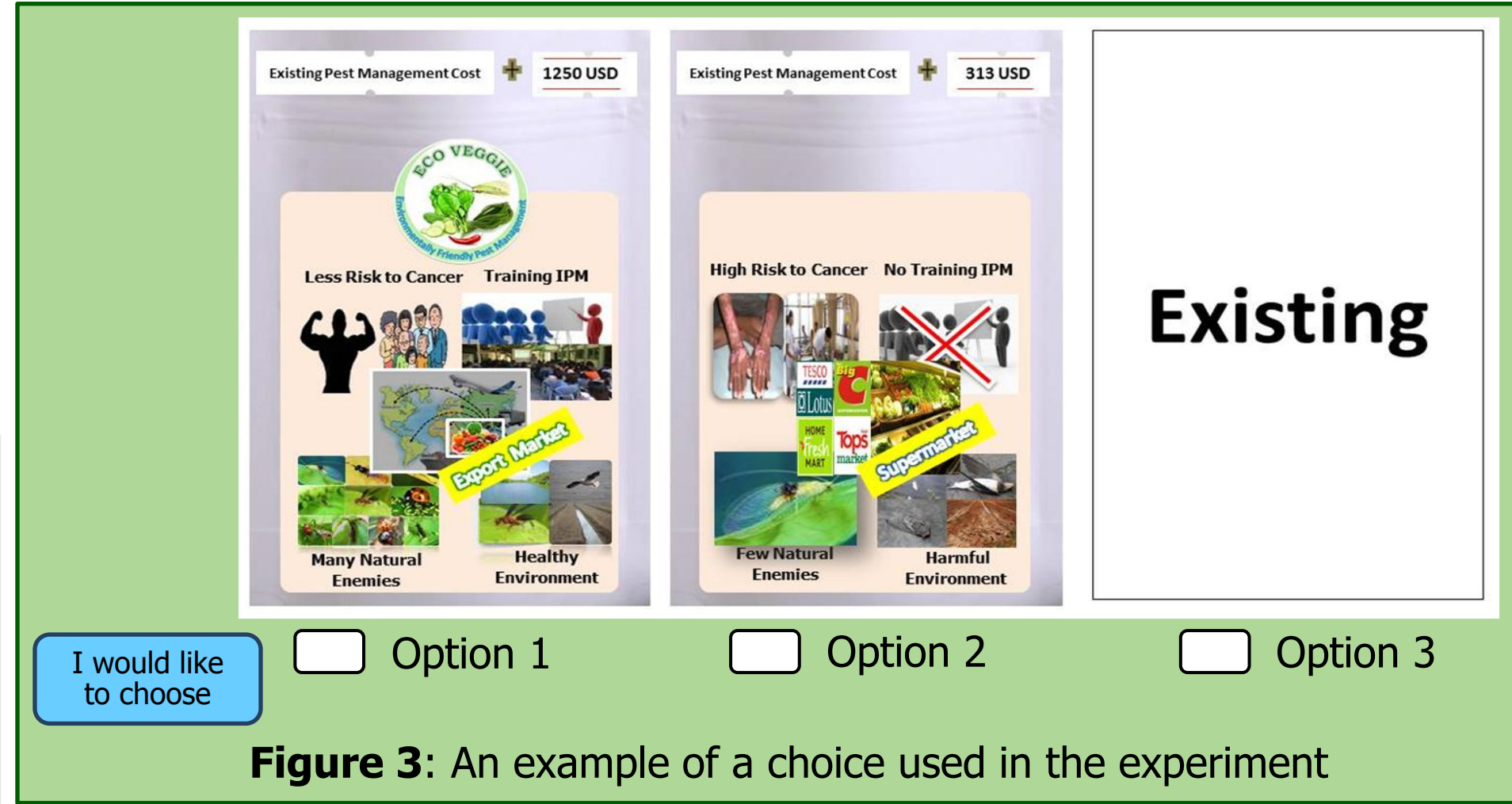


Figure 3: An example of a choice used in the experiment

The Choice Model

- The final specification of the utility function includes an alternative-specific constant representing the ‘Existing’ option choice (β_0) and the other attributes and attribute levels considered in the choice design. Thus, in all models the utility that individual n obtains alternative j is

$$V_i = \beta_0 \text{Existing} + \beta_1 \text{Ecosystem} + \beta_2 \text{Ecolabel} + \beta_3 \text{Health} + \beta_4 \text{Store} + \beta_5 \text{Export} + \beta_6 \text{IPM} + \text{Price}$$

- The marginal willingness to pay (MWTP) for attribute i can be calculated as:

$$MWTP_k = -\frac{\beta_k}{\delta}$$

Results

Table 2: Factors influencing farmers’ preference for pest management options in vegetable cultivation in Thailand, 2016

Attributes	Vegetable Farmers	
	Coefficient	Z
Ecosystems	1.660***	7.07
Eco Veggie Cert.	1.828***	7.52
Health	2.383***	8.20
Store	-0.262	-1.36
Export	-0.210	-0.83
IPM	0.963***	4.72
Existing	1.544***	4.33
Price	-0.0007556**	-2.44
Log likelihood	-908.78234	
LR ch2 (8)	349.18	
Prob>chi2	0.0000	

Notes: * p < 0.1 , ** p < 0.05 , *** p < 0.01

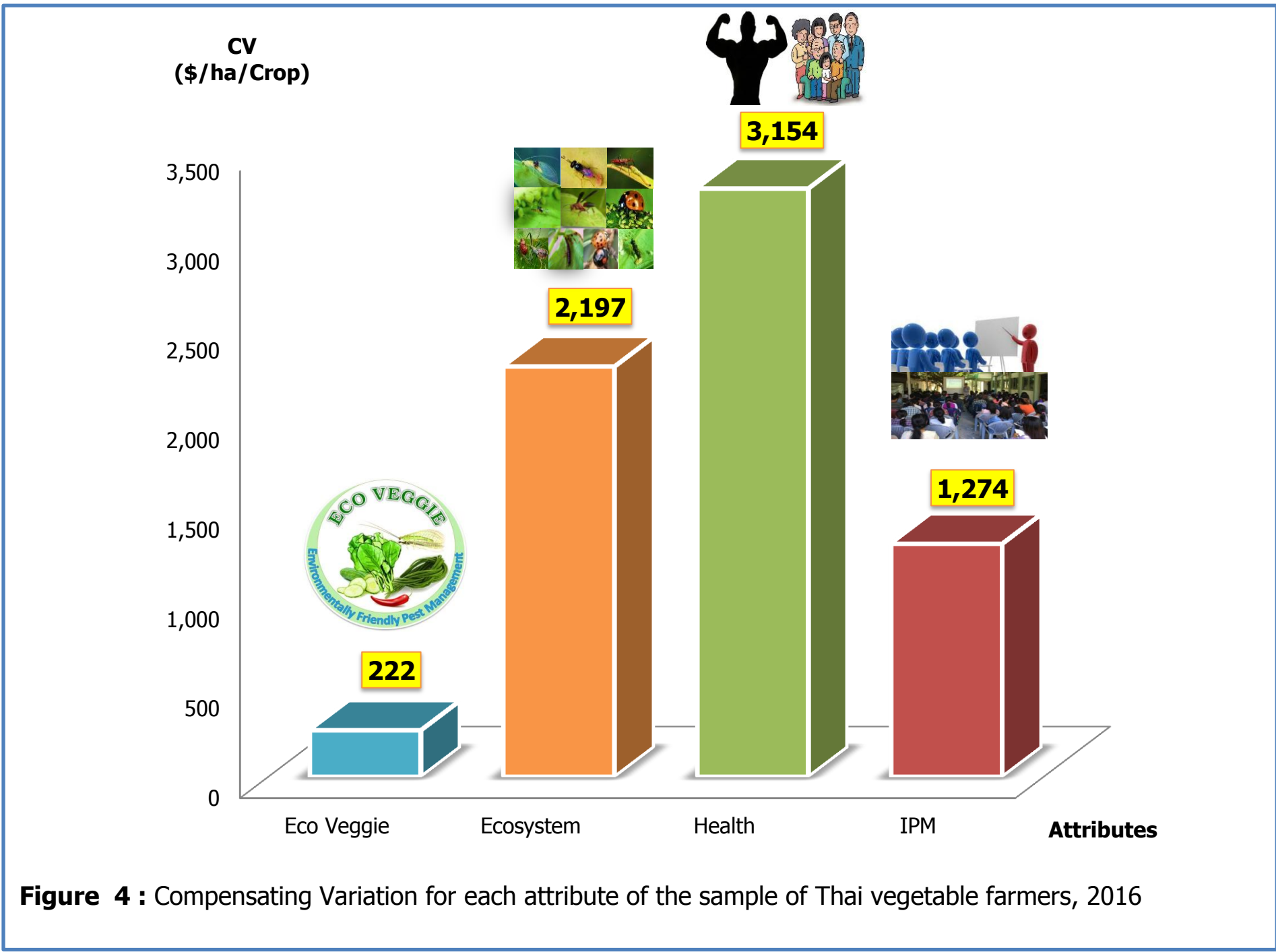


Figure 4 : Compensating Variation for each attribute of the sample of Thai vegetable farmers, 2016



Figure 5 : Mean Compensating Variation per attribute of Thai vegetable farmers, 2016

Farmers valued health as the most important aspect in pest management choices (3,154 USD), followed by Ecosystems (2,197 USD), IPM training (1,274 USD), and Eco Veggie Certification (222 USD) (Figure 4 and 5).

Conclusion and Suggestion

Conclusion

- Farmers did care about pesticide externalities as they were highly willing to pay to protect their health when given alternative pest management options.
- Ecosystems was considered as the second most important attribute which farmers were willing to pay for to control agricultural pests.
- Integrated Pest Management (IPM) training was very important to enhance farmers’ knowledge to cope with pesticide externalities.
- Certification of environmentally friendly pest management appears important to consider as alternative option.

Suggestion

- To make vegetable farming in Thailand more environmentally friendly, alternative pest management practices need to be disseminated in combination with intensive farm-level training.

Main References

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