DEMAND FOR ORGANIC AGRICULTURE PRODUCTS IN CHIANG MAI

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ABSTRACT
This study aims to confirm relationship of determinants of demand for organic agriculture products in Chiang Mai. Self-administered questionnaires were sent out to respondents in Chiang Mai and Lampang. Data analysis was done by multiple regression analysis. The results prove demand theory of determinants but various degree of importance. For application of the results, producers should provide more information regarding consuming organic products to increase demand and to consumer with higher income as they tend to consumer more organic food than those of lower income consumers.

KEYWORD: Organic Product Demand

INTRODUCTION
Nowadays, demand for organic products has been increased as consumers realizes the benefits of having good health in the long run. The production of organic products experiences with higher production cost. Regular production utilizes the chemicals pesticide while organic producers choose to use other more expensive methods. Nevertheless, the growth of organic product recently has made the industry experienced with external economics of scale resulting in the lower cost of organic product industry.

The paper of “Organic Thai Product” (Fact & Figure) summaries statistics of production of organic products as follows:

Table 1 Statistics of Organic Production in Thailand in 2012

<table>
<thead>
<tr>
<th>Certified Growing Land</th>
<th>200,000 Rai (0.21% of Total Growing Land)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Organic Farmers</td>
<td>7405</td>
</tr>
<tr>
<td>Major Organic Product</td>
<td>Rice, Fruit and Vegetable, Processed Products such as coconut milk, rice noodle, vinegar, sauces, and organic tea and coffee.</td>
</tr>
</tbody>
</table>

The Exporting Amount 135.44 Million USD (0.23% of Market Share)
Growth Rate 10%
Consumption Rate 50% exported and 50% consumed domestically
Major Market Europe and North America

Source: www.biofach.de

The same article has concluded about the development of organic product in Thailand as follows: Since 2008, the production of organic product has become Thailand National Agenda as the government has appointed the committee comprised of various organizations. For example, NESDB, Ministry of Commerce, Ministry of Agriculture and Cooperatives, and Ministry of Science and Technology. Those are responsible for setting policy in knowledge creation and innovation regarding organic production including publicizing such knowledge and innovation.

Role of Ministry of Commerces is marketing organic products domestically and internationally by applying the following strategies:

- Increasing competency of producer and entrepreneurs of organic product
- Creating products that matches with consumers' needs
- Building facilities both in hardware and software
• Expanding market both domestic and international

In 2010, Ministry of Commerce has supported three organic products which are food, non-food, and service organic products. During 2011-2012, the support has been implemented sustainably and in 2012, the focus was on organic services. This action plan was implemented at Koh Pa-nang, Surat Thani Province where is the production of organic coconut originated including hotel and spa business. The focus was on servicing based on preserving environment.

For 2012-2015 plan, the Ministry vision Thailand as the center of organic product in Southeast Asia; this has been accompanied by new innovation such as IFOAM, close relationship between private and public sector.

Major exporting organic products of Thailand to Europe (certified by BioAgricert, ACT IFOAM, Ecocert, BCS and KRAV) are rice (70%), vegetables (15%), i.e., corn, asparagus, lemongrass and ginger, fruit (10%), i.e., mango, banana, pineapple, mangosteen, including frozen vegetable, herbal tea, coconut milk, sugar, wheat, wild bee honey, processed food, shrimp and coconut oil.

The amount of exporting organic products to Europe is accounted for 50% of total export amount, in the amount of 60 Million USD (2012). Organic rice was 7 million USD and has been increasing annually. Exporting problems are as follows:

• Enforcement of new rules No. 834/2007 requires Thai exporter to label organic logo from many countries; which resulted in higher cost for producers. Thai government has tried to reduce the number of tags by registered to one certified institution. However, the process takes at least three years which means all producers are willing to pay such higher costs until three years.

Marketing Opportunities

Though European companies are considered to be the biggest exporters of organic products to the world market such as milk, fruit and vegetables; those products are different from those of Thai producers. This means that there are still room for Thai products in European market. In the past, Thai exporters found partnership abroad in order to reduce the process in finding the certified logo, namely, reducing the transaction cost. In addition, government institution has coordinated with European Government to match up the supply and demand as the Ministry of Commerces has worked with Whole Food Market and Selfridges from England.

The study of organic product demand would increase comprehension of producers regarding factors affecting such demand so that producers would make products that match with customers’ needs. In addition, price determination would be set accurately after considering the price of other related products, income level of consumers, and taste. In microeconomics, those factors affect demand quantity. Proving those factors toward organic products in Chiang Mai would be of academic benefits. In sum, this study can be beneficial to both pure research (as to prove the theory) and to applied research (as to setting price of producers).

This study focus on organic products in Chiang Mai as Chiang Mai is the second biggest city in Thailand with more than 1 million population from other parts of Thailand and the world (Thai National Bank, 2009). Chiang Mai produces agricultural products with more than 50% of total production apart from tourism, commercial sectors (Chiang Mai Office of Commerce, 2009). There are several organic product markets in Chiang Mai which are Rimping Supermarket (5 branches), 5 Top supermarkets. Products are rice, fruit and vegetable, longan, and oranges. The number of markets represents the increasing demand of organic products.

Chiang Mai Investment Information Center (2012) summarize that factors affecting the production of organic products are the fashion of being healthy in the world. The products increase 10% annually and even the price of such product are more expensive; it seems that the supply has been adequate when compared to growing demand. It has been estimated that organic products are represented for only 2% in the world market, many room to grow.

In the work of Minou Yussefi (2003), it has shown the overall pictures of organic food production as follows:

- Organic agriculture production has become the practices around the world in all countries and the ratio of farm using in producing organic products tend to be increased as in 2003 there have been 144 Million Rai.
- There has been 84 million Rai used in organic production in the preserved forest.
- The size of organic market is growing not only in Europe and North America - which are the major producers- but also in the other part of the world. In 2003, there was 9% increased in organic production.
production or 25,000 million USD.

- Organic production has been accepted by government around the world as it has shown the sustainable growth.

In sum, this research has been the result of the increase in demand of organic products in the world as for health reason of the consumers. In addition, producers are gaining more as there are room for organic product in the world market. As per to the Upper Northern Provincial Policy of Thailand, organic production seems to fit well with the development plan. One of strategic plan is to support the upper northern provinces to be the major producers in producing various types of agricultural products and processed food products. The comprehension of factors affecting such demand would be beneficial to producers and academia.

The study of Pornpratansombat and Boland (2011) under the topic of “Adoption of Organic Rice Farming in Northeastern Thailand” has explained why organic planting had not been widespread despite of its distinct benefits in terms of consumers’ health and the environment. It is found that organic planting is difficult because Northeastern part of Thailand requires massive water reservoir and farmers have not had access to such reservoir. This has caused to both non-organic and organic plantation. It can be inferred that Thai government must provide sufficient water reservoir for farmers and gardeners including effective marketing strategy to support organic products. In the previous section, Pornpratansombat and Boland mentions that the organic planting has been increased as farmers believe that it is the way to sustain growth as it well preserves the environment (FAO, 1999).

In addition, organic planting has become the major marketing and production strategy for farmers as it has its own market sectors and producers can increase prices as they want in case of their higher production cost (Carry & Wilkinson, 1997). The work of Lampkin and Padel (1994) found that drive for organic for planting is farmers’ own health as to reduce the risk of being exposed to chemicals, the deterioration of soil condition and more financial options as it can bring in more income for the family.

In Thailand, the agriculture sector has been the major business sector and has been the key to sustainable economic growth, reduced poverty. There have been at least 5.8 households relating to agricultural production in some ways or another (NSO, 2008). The agricultural products are the major exporting products of Thailand, especially rice; though it has lost the 1st ranking in 2013 (Falvey, 2000). Rice planting is considered to be soil utilizing of more than 50% of the total plantable area in Thailand- more than 60 million Rai (OAE,2000). Thailand has been facing with the fall of rice price while the price of fertilizers has been increasing sharply annually. Farmers has experienced the financial difficulty; thus, the concept of organic planting has been interested by those farmers as it can be the way to fight poverty (Panyakul, 2003).

The production of organic plants has been initiated in 1980 as the disadvantages of consuming non-organic products became distinct; i.e., more number of population got cancer in the early age including with new diseases. The popular organic plants are rice, vegetables, and corn (USDA, 2006; Ratanawaraha et al., 2007). It has been estimated that the organic plantation area in Thailand has been increased from 12,000 Rai to 120,000 Rai (10 times) during 2001-2005. Thai government has set up concrete policy for Thailand to make organic planting to be national mission in 2005 and it has provided 1,200 million baht (approximate 30 million USD) to complete such mission for the related activities during 2005-2008 (USDA, 2006).

**Purpose of the study**

1. To study factors affecting demand for organic agriculture products in Chiang Mai, Thailand.

**Scope of the study**

1. Study organic agriculture product in Chiang Mai which are rice, fruit and vegetables, longan, and orange.
2. Study demand for organic agriculture products in Chiang Mai as it is one of the biggest city in Thailand with over 1 million population.

**Operational Definition**

Organic Products refers to agriculture organic product being sold in Chiang Mai during November 2013-May 2014 which are rice, fruit and vegetables, longan and orange.

Demand for organic products refers to demand for organic product which are rice, fruit and vegetable, longan and orange in Chiang Mai during November 2013-May 2014.

Price of substitution products refers to price of non-organic products in Chiang Mai during November 2013-May 2014.
Price of related products refers to price of all products related to the consumption of organic products in Chiang Mai during November 2013-May 2014 such as sauces, dressing.

Taste refers to the level of wants or preference toward organic products consumption.

Income level refers to the level of income of consumers during November 2013-May 2014.

Literature Review There have been number of works studying factors affecting determinants of demand for organic products including production process. Lourerio and Hine found that products with organic tags are higher than those of without. Suryanata found that prices of macadamia and pineapple are higher in Hawaii than those of other places as they are perceived of higher quality due to better production process. Govindasamy and Italia surveyed consumers from five districts in New Jersey during March 2011 and found that female with high income, younger generations are willing to pay the premium for organic products while Thompson and Kidwell found that consumers with family are willing to pay more for organic products than those who are single.

Athanasios Crystals and George Chryssohoidis (2005) studied willingness to pay -WTP- for organic products whether it has the same factors as of those of non-organics. Data collections was conducted in one of the supermarket in Athens in 2003. It is found that WTP depends on type, size, quality of food, trustworthiness in certification issuers and brand of products. It is also found that there is no significant different on personal characteristics.

Table 2.1 Price Comparison of Organic and Non-organic Products

<table>
<thead>
<tr>
<th>Year</th>
<th>Broccoli</th>
<th>Corn</th>
<th>Green Bean</th>
<th>Bean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1991</td>
<td>2.59</td>
<td>2.1</td>
<td>2.5</td>
<td>2.3</td>
</tr>
<tr>
<td>1992</td>
<td>2.91</td>
<td>2.4</td>
<td>2.9</td>
<td>2.6</td>
</tr>
<tr>
<td>1993</td>
<td>3.28</td>
<td>3</td>
<td>3.7</td>
<td>3.3</td>
</tr>
<tr>
<td>1994</td>
<td>3.46</td>
<td>3</td>
<td>3.9</td>
<td>3.3</td>
</tr>
</tbody>
</table>


Glaser and Thompson (1998) concludes that though there have been the sales increase in organic products but the ratio when compared to the overall market is very little only 1% of the total sales. Based on Table 2 premiums for organic products are high; broccoli 172.1%, corn 125.8%, green bean 209.7% and bean 175.7%. Overall, organic products are higher than those of non-organics about 100-250%. Currently such premium has been decreased resulting in the price decrease. Those reduced premium has been caused by economies of scales both internal and external. This can be expected that the price of organic products would be decreased as it can exploit economy of scale.

Price of organics products has not been changed much or pretty stable during 1991-1996 while the sales have been also increased. Price elasticity of demand is between 0.2-0.3 meaning that the big price change affects the small demand quantity. This means that consumer perceived that organic products are unable to substitute by non-organic products.
RESEARCH METHODOLOGY

The data collection was conducted by self-administered questionnaires in Thai and English as there are many foreigners living in Chiang Mai. The questionnaires was examined by English specialist to ensure that the meaning is comparable. There are 3 parts in the questionnaires: Part I, concerning personal information of respondents; Part II, concerning attitude toward consuming organic products; Part III, concerning factors determining demands. Likert scale was used as follows: 5 means strong agree, 4 agree, 3 indifferent, 2 disagree, and 1 strongly disagree.

In Part 3, determinants of demands are price of organic products, taste in consuming organic products, price of non-organic products, price of complimentary products and income.

Data collection was done in Rim Ping Supermarket at Meechok, Ta Pae, Prommonada and Top Supermarket at Kad Suan Kaew and Robinson Airport Mall, Lampang Branch and City Hall of Chiang Mai Province. It was done during March 2013-June 2013. After the questionnaires was collected, they were checked for completeness, accuracy, and validity by apply outlier technique. There were 37 questionnaires taken out due to its incompleteness and outlier reason.

Data analysis was done into 2 parts which were descriptive analysis to present characteristics of respondents in terms age, income, occupation and so on by using frequency and percentage analysis, multiple regression analysis to create linear regression equation to find relationships of determinants in determining demand quantity for organic products. In sum, this research tried to come up with the linear equation in the following form.

\[ D = a + b_1P + b_2T + b_3S + b_4C + b_5Y \]

by

\[ D \] - Demand; demand for organic products

\[ P \] - Price; price of organic products

\[ S \] - Price of substitution products

\[ C \] - Price of complimentary product

\[ Y \] - Income level.

We have discussed data collection method and data analysis method including equation as the results for the analysis. In the later section, the results of the research are presented.

Results of the study

This section presents the results of the research as follows

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>114</td>
<td>38</td>
</tr>
<tr>
<td>Female</td>
<td>186</td>
<td>62</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15-20</td>
<td>12</td>
<td>4</td>
</tr>
<tr>
<td>21-25</td>
<td>24</td>
<td>8</td>
</tr>
<tr>
<td>26-30</td>
<td>24</td>
<td>8</td>
</tr>
<tr>
<td>31-35</td>
<td>24</td>
<td>8</td>
</tr>
</tbody>
</table>
Majority of respondents are female in the amount of 186 (62%), and male of 114 (38%) in the total of 300 respondents. Regarding the age of respondents, majority of respondents are in 41-45 years old age group in the number of 55 respondents or 25%, the second biggest was 46-50 in the number of 45 or 15%, the third was 36-40 of 36 or 12%, the fourth was 51-55 and more than 55 in the number of 30 or 10%. Regarding marital status, it was found that the majority of respondents are married -186 or 62%, single of 99 (33%) and divorced/widow of 15 (5%).

Majority of respondents earned bachelor degree -141 or 47%, the second biggest got vocational degree in the number of 54 or 18%, the third were master and high school with equal number of 45 or 15% and the least was doctorate degree or higher of 15 or 5%. Regarding profession of respondents, the majority was employee of 145 or 48%, government servant 105 or 35%, students 30 or 10% and there were only 17 self-employed respondents or 6%.

Based on multiple regression analysis, it is found the results as follows:

**Table 4.3 Results of Multiple regression analysis**

<table>
<thead>
<tr>
<th>Variables Entered/ Removed</th>
<th>Model</th>
<th>Variables Entered</th>
<th>Variables Removed</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>C.S,P1, T, I^b</td>
<td></td>
<td>ENTER</td>
</tr>
</tbody>
</table>

**Model Summary**

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.492^A</td>
<td>0.242</td>
<td>0.231</td>
<td>2.867</td>
</tr>
</tbody>
</table>

**ANOVA**

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>773</td>
<td>5</td>
<td>193</td>
<td>23.5</td>
<td>0.000^b</td>
</tr>
<tr>
<td>Residual</td>
<td>2425</td>
<td>294</td>
<td>8.22</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>3198</td>
<td>294</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
It was found that $R^2$ equals to 0.231 or 23.1% meaning that the equation can explain the demand in 23.1% degree (or 79.90% is unable to explain by the equation or there are other variables of 79.90% that can explained the variation of demand). The multiple regression analysis were as follows:

$$Y \ (Demand) = 6.75 - 0.147 \ Price + 0.28 \ Taste* + 0.01 \ Substitution - 0.16 \ Complimentary* + 0.29 \ Income$$

The sign (+, -) shows the relationship of determinants toward demand whether plus or minus (positive or negative). If the sign is positive, it means that the determinants has positive relationship with demand. Based on the results, determinants that has positive relationship with demand were taste, price of substitution product and income level of consumer. The self-administered questionnaires were distributed in Thai and English, depending nationality of respondents, in Chiang Mai and Lampang Province.

The results confirms demand theory in terms of relationship of those determinants; i.e., price, price of complimentary products has negative relationship with demand and it is also found that the predictability of equation is 23.1%, inferring that there are other 76.90% determinants that are subject to be explored by other research. The following table show the comparison of previous research results.

<table>
<thead>
<tr>
<th>Author and Published year</th>
<th>Reason to consume organic products or other related issue</th>
<th>Discussion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loureiro &amp; Hine</td>
<td>Organic tag can charge more</td>
<td>Not discusse d</td>
</tr>
<tr>
<td>Suryanata</td>
<td>Price of organic</td>
<td>Price of</td>
</tr>
</tbody>
</table>
Table 5.1 shows that the results of research supported several other research’s results especially in taste dimension; i.e., health, environment. Income dimension shows similar results with the work of Gavindasamy and Italis stating that higher income family tends to consume organic products more than those of lower income family. This can be concluded that organic products are ‘normal good’ - as when having more income, the demand is higher. Please note that results based on literature review focused on clear determinants affecting demand such as health reason, or preservation of environment but this study focus on general taste of consumers by dividing dimension of taste to personal preference, frequency of consuming organic products, taste of organic food but exclude environment perspective.

The multiple regression was

\[ Y (\text{Demand}) = 6.75 - 0.147 \text{Price} + 0.28 \text{Taste}^* + 0.01 \text{Substitution} - 0.16 \text{Complimentary}^* + 0.29 \text{Income}^* \]

I strongly recommend that producers should increase demand by providing more information regarding benefits to consumers including benefits on protecting environment. This should stimulate demand as Taste has the highest degree of 0.28 (the second biggest). The 0.29 Income infers that marketing of organic products must be targeted at higher income level.

<table>
<thead>
<tr>
<th>Products are higher</th>
<th>Complimentary products</th>
<th>Environment preservation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gavindasamy &amp; Italia</td>
<td>High level of income</td>
<td>Income level</td>
</tr>
<tr>
<td>Thompson &amp; Kidwell</td>
<td>Consumer with children and married</td>
<td>Not Discussed</td>
</tr>
<tr>
<td>Anthanasios Crystals &amp; Chrysschoiass (2005)</td>
<td>Confidence to organic product</td>
<td>Taste</td>
</tr>
<tr>
<td>Marijo Rodman (2005)</td>
<td>Good for Health</td>
<td>Taste</td>
</tr>
<tr>
<td>Roites-Schobesberg er et al. (2008)</td>
<td>Fear of Pesticide</td>
<td>Taste</td>
</tr>
<tr>
<td>Gracia &amp; Magistris (2005)</td>
<td>Safety and more information on organic product</td>
<td>Taste</td>
</tr>
<tr>
<td>Emma Lea &amp; Worsley (2005)</td>
<td>Better Taste, protect environment Preference to Female consumers</td>
<td>Taste</td>
</tr>
<tr>
<td>Carolen Dimitri &amp; Green; Wessels (1999); Nimon &amp; Begin (2000); Bibery &amp; Knifes (1999); Wang &amp; Sun (2003)</td>
<td>Organic tags increase demand</td>
<td>Not Discussed</td>
</tr>
<tr>
<td>Li, Zepada &amp; Gaucea (2005)</td>
<td>More info on organic products</td>
<td>Not Discussed</td>
</tr>
<tr>
<td>Sungkumcha</td>
<td>Health, and</td>
<td>Taste</td>
</tr>
</tbody>
</table>
consumers to ensure the increase of demand. Determinants of price and price of complimentary products confirm demand theory; and there is no use of managerial perspective. In sum, to increase organic products demand, information about benefits of consuming it must be publicized as much as possible and to higher income consumers.

REFERENCES


