Determination of Factors Influencing the Decision on Purchasing Organic Food

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KEYWORDS
Environmental issues, Purchase behaviour, Organic food, Logistic regression, ROC analysis

ABSTRACT
Since there has been a rising awareness about health, food safety and environmental issues, the demand for organic food has grown rapidly among consumers. However, information and profiling of consumers in Bangkok, which is the capital of Thailand, are not yet well reported. As such, this study aims at analyzing factors affecting consumers’ organic food purchase intention. Cross-sectional data were carried out with the respondents in Bangkok through questionnaires. Data were analyzed using a logistic regression model employed to test the proposed hypotheses. The results revealed that education level and attitude towards place had positively influenced consumer's decision in buying organic food. Although the respondents had high score on attitude about healthfulness and food safety towards organic food, it was found that they had little knowledge about them. Evidence provided in this study could be employed as a reference information for policy makers and marketers regarding such issue.

INTRODUCTION
Over the past decades, it is widely recognized that patterns of food consumption have rapidly changed as a consequence of consumers becoming concerned on environmental sustainability, food safety and health issues. Not only does it affects consumer's health but unsafe food can also lead to great economic impacts on people in the country. Along with this trend, nowadays organic agriculture has been expanding quickly everywhere across the globe. According to the latest survey by FiBL, statistical information on certified organic agriculture is now available from 172 countries (Willer and Lernoud 2016). Thailand, which is known as "The Food Basket of Asia", not only produces agricultural products but is also concerned with food safety standards (Supaphol 2010). Organic agricultural development has been recently included in the top five “urgent agendas” of Ministry of Agricultural and Cooperative (Wai 2016). The total organic agricultural land is expanding as the demand for organic food within the country has grown rapidly. However, similar to other developing countries, local market for organic food is still a tiny market shared. Understanding about attitudes of customers and purchasing behaviors intention towards organic food may help relevant agencies facilitate and develop programs to drive organic consumption which are free from chemical residues, toxic elements and pesticides (Fotopoulos and Krystalis 2002). Since information and profiling of consumers behavior is infant and not yet well reported in Thailand, the primary objective of this research is to investigate purchasing behavior intention towards organic food of consumers in Bangkok. This study focuses on Bangkok as Bangkok is the capital and the largest city in Thailand with about 5.69 million registered residents (https://en.wikipedia.org/wiki/Bangkok). In sum, the findings of this study will be of great contribution for retailers and marketers in providing fruitful information to stimulate organic food purchasing behavior and for producers in developing domestic organic production to meet consumers’ requirements.

The structure of the remainder of this paper is, therefore, organized as follows. The following section reports definition of organic food and organic products in Thailand, followed by literature survey adapted to this research. Next, research methodology is presented and then results obtained from the survey are described. Finally, conclusion remarks and discussion of the results as well as practical implications for relevant agencies are then discussed in the last section of the paper.

LITERATURE REVIEW
Definition of Organic Food
The board definition of “organic food” is food which is produced by methods that comply with the standards of organic farming system (Allen and Albala 2007). Organic farming refers to a farming system which enhances agro-ecosystem health, including biodiversity, biological cycles and soil biological activity (United Nations Food and Agriculture Organization 1999). A definition of organic farming varies considerably among countries depending upon regulations. Organic food is...
produced in a way that the production will not contaminate with any artificial or chemical fertilizers, pesticides synthetic or the use of genetically modified organism. Specifically, organic food are also usually processed using natural production system which does not have effects on the environment. Uma and Selvam (2016) divided organic food into three major categories i.e. organic vegetables and fruits, organic dairy products (such as milk, cheese and ice cream, etc.) and organic fish & meat.

**Organic Food in Thailand**

Thai organic agriculture has been introduced to Thailand in the 1970s resulting from green revolution. At present, Thailand’s organic sector is probably in the growth stage of development. The total organic agricultural land is expanding as the demand for organic food within the country has grown rapidly. Recently statistics has disclosed that production areas under organic farming in Thailand increased from 1,6483 hectares in 2000 (Green Net/ Earth Net Foundations 2013) to 33,600 hectares in 2015 (FIBI & IFOAM-Organic International 2016). Organic agricultural development has recently been included in the top five "urgent agendas” of Ministry of Agricultural and Cooperative (Wai 2016). The emerging attractiveness of organic and environmentally friendly products in Thailand has resulted from a combination of reasons. At the beginning, it starts from people’s general concern with healthy living and food safety, but later on the crisis faced in the farm sectors has enforced sustainable development of agricultural production system. Currently, the trend is transforming into a broader scheme covering environment awareness, ecology and biodiversity. Nonetheless, organic products is only accounting for 1 per cent of Thai food market.

In 2014, organic products produced at 71,847 tons accounted for 2,331.55 million, of which about three fourths was for the export market. Most of organic products were exported to Europe and North America (Kongsom and Panyakul 2016). It is revealed that the production process for organic farming in Thailand is still being in a conventional way and uses simple and limited technology. Furthermore, the products to produce are still basic and unprocessed, for instance, rice, vegetable and fruit whereas processed organic produce, as finished consumer products, are quite few in the market due to insufficient raw materials. The supply of organic products is not continuous to support the plants, many of them are imported in unprocessed commodities.

**Previous Studies**

Several research have examined consumers’ behavior towards environmentally friendly products in Thailand. However, there has been limited academic study on consumers’ purchasing behavior with regard to organic products (Sangkumchaliang and Pakdee 2012). The followings are the review of previous researches in organic food conducted in Thailand five years ago (during 2012-2016):

Sangkumchaliang and Huang (2012) explored consumers’ perceptions and attitudes towards organic food products in Chiang Mai province of Thailand. Questionnaire was employed to gather information from 390 respondents who bought products in different markets i.e. the Multiple Cropping Centre, the Royal Project shop and Top supermarkets. Chi-square test was used to analyze data. An expectation of a healthy and environment friendly was the main reason for purchasing organic food products. There was a significant difference between the groups of buyers and non-buyers in their demographic characteristics. The study also highlighted that information available is a key barrier to increase market share of organic products.

Sangkumchaliang and Pakdee (2012) investigated factors affecting consumers intention to purchase agricultural product based on the Theory of Planned Behavior (TPB) model. Data were gathered through a questionnaire conducted in supermarkets and a fresh market in Khon Kaen province where organic or safe food produce is available. Descriptive statistics and Structural Equation Modeling (SEM) were used to analyze data. The results indicated that positive attitude towards organic agriculture had increased consumer intention to buy organic agricultural products. Subjective norm and perceived behavior control directly affected consumers' intention to purchase organic agricultural products. Additionally, demographic characteristics and the reasons whether to purchase an organic product or not were included in this study.

The study of Pomsanam et al. (2014) explored factors driving Thai consumer intention to purchase organic food. The objective of this research is to analyze factors affecting consumers in Sa Kaeo province of Thailand intent to buy organic food. Data were collected via a questionnaire with 400 participants. Factor analysis and multiple regression analysis were employed to analyze data. The findings of this research indicated that factors driving consumers purchase intention were subjective norms, environmental protection, trust in label, food quality and availability and convenience in accessing organic food. The suggestion of this study was to provide knowledge of environment awareness to consumers through social media. Moreover, relevant agencies should provide a more effective organic certification system so that consumers can check whether products are from real organic process.

Songkroh (2015) explored the relationship of determinants of demand for organic agriculture products. Data were gathered from respondents in
Chiang Mai by using questionnaires both in Thai and English versions. Multiple regression analysis was applied to analyze information. The study showed that determinants of demand for organic agriculture products were price, price of substitution product, price of complementary product and income level of consumer. Only price of complementary product and income level of consumer had positive relationship with demand. It was found that $R^2$ equaled to 0.231, meaning that the equation can explain the demand in 23.1 per cent.

Recently, Ueasangkomsate and Santiteerakul (2016) presented the relationship between Thai consumers’ attitudes and intention to buy organic food. A self-reported questionnaire survey was conducted on 316 respondents across Thailand. Pearson correlation coefficient was conducted to test the relationship between attitude towards organic food and intention to buy. The study showed that the local origin is the highest correlation to buying intention organic food in positive way, followed by animal welfare and environment attribute. The authors also suggested researchers to study more in buying behaviors on organic food of consumers.

In addition, Kongsom and Panyakul (2016) investigated the production and market of certified organic products in Thailand. Data were collected via a survey and in-depth interview. Secondary data from organic agriculture certification body and publications were also explored. The study revealed that the largest exports of certified organic products were processed food accounting for 66.1 per cent of total export value, followed by organic rice accounting for 30.4 per cent. Modern trade was the largest domestic channel (59.48 per cent of total domestic sales, followed by green shop (29.47 per cent) and food establishment (5.85 per cent). In order for Thailand to become a center of organic farming and trading within ASEAN, there is a need to gain more policy supports and appropriate strategies from the government and relevant agencies.

Kongsom and Kongsom (2016) investigated the awareness, knowledge and consumer behavior towards organic products in Thailand. Data were collected across the country with 2,575 consumers over the age of 20 years who intended or made purchases from 1) green shops, 2) supermarkets with branches, and 3) green markets using a purposive sampling technique. Descriptive statistics were employed to analyze data from the questionnaires. The outputs indicated that more than 92 per cent of consumers were aware of organic agriculture production but had less knowledge about it. Almost half of respondents had confused between the food safety logo and the certified organic logo, and whether GMO was allowed in organic agriculture practice or not. Respondents also felt that processed organic products in Thailand were relatively small in quantity.

Even though there have been few studies in Thailand that provided empirical evidence in this area, it is wise to further investigate to a deeper understanding in underlying motive driving purchase intention of organic food products. This type of research will allow richer insights into customers motivation for purchase decision. Likewise, such research will be of assistance in providing more reliable and accurate results. Additionally, it will be of great value especially to policy makers by developing sustainable strategies specific to the target groups.

**MATERIAL AND METHODS**

**Sampling Technique**

Data for this research were carried out by means of hand-delivered questionnaire during November and December 2016. The study’s scope was with consumers whose ages are more than or equal to 18 years old. The number of respondents in Bangkok (N) was 5,696,409 people in 2015 (https://th.wikipedia.org/). Due to the population being enormous, a total of 384 sample sizes (n) were selected for this study (Yamane 1973).

**Research Instruments**

Data employed in this study were obtained from structured questionnaires design, which is considered as one of the most common and widely used research tools in the field of survey research. The questionnaire was divided into four sections.

The first part includes socioeconomic and demographic variables (inquiries about general information, socioeconomic characteristics of organic food consumption. In the second part, the respondents were asked whether they have knowledge and understanding about organic food products. The third part was the main part of the questionnaire. A question of 33 items was developed regarding literature review and previous studies. All statements were formulated on 5-point Likert-type scale (Wolfer 2007) ranging from “strongly disagree (1)” to “strongly agree (5)”. The final part is inquiries about opinions and ideas on how to promote organic food products in practices.

**Validity and Reliability**

Prior to data collection, the quality of the research instrument or questionnaire was examined by assessing the face validity and the reliability (Hair et al. 2006). Cronbach's Alpha coefficient was employed to evaluate the quality of the survey instrument in Section 3 whether it is appropriate to complete the goal it was used for or not. Thirty respondents took part in pre-test process. As shown in Table 1, the total Cronbach's Alpha coefficient is reached at 0.916 which implies that the tool is sufficient and reliable for being used to collect data in primary source (Creswell 2002).
Analytical Techniques

Descriptive statistics i.e. mean, standard deviation and percentage were used to explain demographic characteristics, the level of knowledge of organic food products as well as the level of attitude of the sample. A binary logistic regression model was adopted to determine the extent to which selected demographic characteristics, knowledge on organic food products, attitude and behavior influence customers’ intention to buy organic food. Binary logistic regression, also called a logit model, is usually employed when the dependent variable is dichotomous and the independent variables are either continuous or categorical variables. Specifically, it is used to model the relationship between the categorical dependent variable and one or more independent variables by estimating probabilities using a logistic function. Normally, the outcome in logistic regression analysis is coded as 0 or 1, where 1 indicates that the outcome of interest is present, and 0 indicates that the outcome of interest is ignored (Hair et al. 2006). As such, if \( p \) is defined as the probability that the outcome is 1, the multiple logistic regression model can be expressed as follows:

\[
\hat{p} = \frac{\exp(b_0 + b_1X_1 + b_2X_2 + \ldots + b_pX_p)}{1 + \exp(b_0 + b_1X_1 + b_2X_2 + \ldots + b_pX_p)} \tag{1}
\]

where \( \hat{p} \) is the expected probability that the outcome is present, \( X_1, \ldots, X_p \) are independent variables and \( b_0 \) through \( b_p \) are the regression coefficients. The multiple logistic regression model is sometimes written differently. In the following form, the outcome is the expected log of the odds that the outcome is present in equation (2).

\[
\ln\left(\frac{\hat{p}}{1-\hat{p}}\right) = b_0 + b_1X_1 + b_2X_2 + \ldots + b_pX_p \tag{2}
\]

An iterative likelihood methods is normally employed to estimate the regression coefficient (Hair et al. 2006). In order to discover the effect of the explanation variables on the decision to buy organic food, descriptions of each variable can be explained in Table 2.

\[\text{RESULTS}\]

384 surveys were distributed and 349 questionnaires were returned during the data collection period. 320 questionnaires in total were completed and included in the analysis, which produced a high response rate of 83.3 per cent. The results of demographic profile revealed that 62.5 per cent of the respondents were female. The majority of the residents (69.1 per cent) consisted of single people. Half of them (49.4 per cent) had achieved undergraduate level, followed by lower undergraduate level (29.4 per cent). Over half of the sample (61.6 per cent) lived in their own houses. The study found that a majority (67 per cent) of the respondents had received information about the organic food products from social network, followed by from television /radio (17.8 per cent).

### Table 1: Reliability Statistics

<table>
<thead>
<tr>
<th>Cronbach’s Alpha coefficient</th>
<th>Cronbach’s Alpha Based on Standardized items</th>
<th>Number of items</th>
</tr>
</thead>
<tbody>
<tr>
<td>.916</td>
<td>.926</td>
<td>33</td>
</tr>
</tbody>
</table>

### Table 2: Dependent and Independent Variables and Scale Used in the Model

<table>
<thead>
<tr>
<th>Variables</th>
<th>Description</th>
<th>Variable scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>( X_1 )</td>
<td>Gender</td>
<td>1 = male; 0 = otherwise</td>
</tr>
<tr>
<td>( X_2 )</td>
<td>Age</td>
<td>1 = above or equal to 41 years old; 0 = otherwise</td>
</tr>
<tr>
<td>( X_3 )</td>
<td>Marital status</td>
<td>1 = married; 0 = otherwise</td>
</tr>
<tr>
<td>( X_4 )</td>
<td>Education level</td>
<td>1 = undergraduate level or above; 0 = otherwise</td>
</tr>
<tr>
<td>( X_5 )</td>
<td>Income per month</td>
<td>1 = more than 30,000 baht; 0 = otherwise</td>
</tr>
<tr>
<td>( X_6 )</td>
<td>Employment</td>
<td>1 = employment; 0 = Student/ Unemployment</td>
</tr>
<tr>
<td>( X_7 )</td>
<td>Type of resident</td>
<td>1 = home; 0 = otherwise</td>
</tr>
<tr>
<td>( X_8 )</td>
<td>Type of information</td>
<td>1 = social network; 0 = otherwise (e.g. television/radio, etc.)</td>
</tr>
<tr>
<td>( X_9 )</td>
<td>Shopping place</td>
<td>1 = heath shop; 0 = otherwise</td>
</tr>
<tr>
<td>( X_{10} )</td>
<td>Attitude toward healthfulness</td>
<td>1 = strongly disagree; 5 = strongly agree</td>
</tr>
<tr>
<td>( X_{11} )</td>
<td>Attitude toward food safety</td>
<td>1 = strongly disagree; 5 = strongly agree</td>
</tr>
<tr>
<td>( X_{12} )</td>
<td>Attitude towards taste</td>
<td>1 = strongly disagree; 5 = strongly agree</td>
</tr>
<tr>
<td>( X_{13} )</td>
<td>Precieved value</td>
<td>1 = strongly disagree; 5 = strongly agree</td>
</tr>
<tr>
<td>( X_{14} )</td>
<td>Promotion</td>
<td>1 = strongly disagree; 5 = strongly agree</td>
</tr>
<tr>
<td>( X_{15} )</td>
<td>Image</td>
<td>1 = strongly disagree; 5 = strongly agree</td>
</tr>
<tr>
<td>( X_{16} )</td>
<td>Attitude towards place</td>
<td>1 = strongly disagree; 5 = strongly agree</td>
</tr>
<tr>
<td>( Y )</td>
<td>Decision to buy organic food</td>
<td>1 = yes; 5 = no</td>
</tr>
</tbody>
</table>
Knowledge on Organic Food Products

Results from Table 3 show that a mean score of knowledge on solid waste management equals to 4.77 (S.D.=1.56) out of 10. It indicates that the respondents still had less knowledge on organic food products.

Table 3: Knowledge on Organic Food Products

<table>
<thead>
<tr>
<th>Level of knowledge in organic food products</th>
<th>n</th>
<th>$\bar{X}$</th>
<th>S.D.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>320</td>
<td>4.77</td>
<td>1.56</td>
</tr>
</tbody>
</table>

Consumers’ Attitudes and Influencing Factors toward Purchasing Organic Food Products

The mean score of each variable of attitudes and influencing factors toward organic food products are showed in Table 4. Compare to 7 variables, the table indicates that promotion ($X_{16}$) has the highest score, followed by attitude toward healthfulness ($X_{10}$) and attitude toward food safety ($X_{11}$), respectively. While attitude towards taste ($X_{12}$) receives least concerns from the respondents. However, all of them are ranged in the class interval of 3.48 to 4.18. It is implied that the respondents had high level on attitudes and influencing factors toward organic food.

Table 4: Consumers’ Attitudes and Purchase Behaviour toward Organic Food

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean</th>
<th>S.D.</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attitude toward healthfulness ($X_{10}$)</td>
<td>4.092</td>
<td>0.616</td>
<td>2</td>
</tr>
<tr>
<td>Attitude toward food safety ($X_{11}$)</td>
<td>3.977</td>
<td>0.729</td>
<td>3</td>
</tr>
<tr>
<td>Attitude towards taste ($X_{12}$)</td>
<td>3.478</td>
<td>0.924</td>
<td>7</td>
</tr>
<tr>
<td>Precieved value ($X_{13}$)</td>
<td>3.940</td>
<td>0.613</td>
<td>4</td>
</tr>
<tr>
<td>Promotion ($X_{14}$)</td>
<td>4.178</td>
<td>0.671</td>
<td>1</td>
</tr>
<tr>
<td>Image ($X_{15}$)</td>
<td>3.644</td>
<td>0.744</td>
<td>6</td>
</tr>
<tr>
<td>Attitude towards place ($X_{16}$)</td>
<td>3.659</td>
<td>0.634</td>
<td>5</td>
</tr>
</tbody>
</table>

Model Results

a. Partial Test and Model Building

Out of 318 respondents about 320 were involved into the model as other cases are deleted for having missing information. The empirical results using forward stepwise logistic regression model based on the survey data are displayed in Table 5. The model is employed to predict whether consumers purchase organic food with respect to factors affecting the decision. The results of the survey reveal that education level ($X_{4}$) and attitude towards place ($X_{16}$) were important predictors of decision to buy organic food.

Table 5: The Result of Logistic Regression Analysis

<table>
<thead>
<tr>
<th>Step</th>
<th>B</th>
<th>S.E.</th>
<th>Wald df Sig.</th>
<th>Exp(B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>X_{16}</td>
<td>.737</td>
<td>14.999 1 .000</td>
<td>2.090</td>
</tr>
<tr>
<td></td>
<td>Constant</td>
<td>-3.005</td>
<td>.713 17.755 1 .000</td>
<td>.050</td>
</tr>
<tr>
<td>2</td>
<td>X_{4}</td>
<td>.328</td>
<td>10.529 1 .001</td>
<td>1.388</td>
</tr>
<tr>
<td></td>
<td>X_{16}</td>
<td>.669</td>
<td>11.755 1 .001</td>
<td>1.952</td>
</tr>
<tr>
<td></td>
<td>Constant</td>
<td>-3.630</td>
<td>.767 22.433 1 .000</td>
<td>.027</td>
</tr>
</tbody>
</table>

a. Variable(s) entered on step 1: $X_{16}$
b. Variable(s) entered on step 2: $X_{4}$

b. Significance Test Model

Based on Chi Square calculation as demonstrated in Table 6, the significance value is lower than 0.05 which means that $H_{0}$ is rejected. It indicates that the model is very meaningful and passes the minimum standard which suggests that education level, attitude towards taste and image significantly influence decision to buy organic food.

Table 6: Omnibus Tests of Model Coefficients

<table>
<thead>
<tr>
<th>Step</th>
<th>Chi-square</th>
<th>df</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Block</td>
<td>15.957</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Model</td>
<td>15.957</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>Block</td>
<td>11.303</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Model</td>
<td>27.260</td>
<td>2</td>
</tr>
</tbody>
</table>

c. Odds Ratio Interpretation

Table 5 also displays odd ratio value which is an important information to explain the influence of the independent variables on the increasing or decreasing of probability to occur the event measure by the dependent variable. Based on the statistically significant coefficients, the findings show that the respondents who had high education level were 38.8% more intend to buy organic food products than respondents’ who had a lower education level in a positive way. Additionally, consumers who had high concern on attitude towards place for selling organic food products were 95.2% more intent to purchase compared to consumers who were less concerned.

d. ROC Analysis

ROC Curve demonstrates the amount of area covered by the predictive model graphically. It can be seen in Figure 1 how true positive rate (specificity) is plotted against the false positive rate (1-specificity). Although the curve is above base line but is not close to upper left corner which the classifier performance equals to 66.2 per cent.
The aim of this study was to investigate purchasing behavior intention towards organic food among Bangkok consumers. The empirical findings indicate that the respondents in Bangkok have high attitudes on organic food products; however, they still have little knowledge and understanding about organic food products. The results of the logistic regression analysis demonstrate that the socio-demographic profile of organic food buyers is education level. This finding is consistent with similar studies on organic or green products. For instance, Rezai et al. (2011) found that demographic characteristic i.e. education level significantly influence Malaysian consumers to purchase green produced food. Magnusson et al. (2001) also claimed that people who have higher education are more likely to convey positive attitudes towards organic products and also are willing to pay for organic food. However, it seems that in this study income does not positively correlate to the decision to buy organic food which is in line with the study of Fotopoulos and Krystallis (2002). Generally, having higher income does not necessarily imply that customers have higher likelihood of buying organic food.

In addition, based on the empirical results, it is interesting to note that attitude towards place was a significantly positive relationship with the decision on buying organic food. According to Kotler and Keller (2009), place decision involves activities that make products available to end customers. Convenience location, easy accessibility and comfortable atmospherics could determine consumers’ buying behavior resulting in increasing consumers’ purchase.

Surprisingly, this empirical study did not show that decision to buy organic food is influenced by other factors, especially attitude toward healthfulness and food safety. These findings may suggest that although respondents had high attitude towards health and safety organic food, they may have fewer health benefits from organic food such as health improvement. The evident shows that the respondents still had little understanding and knowledge about it. Accordingly, the knowledge and public awareness regarding organic food should be created and promoted by policy makers and marketers for stakeholders especially target consumers. More importantly, it is necessary to emphasis on environmental issues, food safety, eco-friendly and perceived value but not for profit purpose in order to increase understanding and raising demand in the future.

Although the study had been conducted only in the capital of Thailand, the findings can be applied or extended in other cities in Thailand to obtain a reliable and more accuracy results. Furthermore, it is wise to carry out the similarly studies in other countries such as in ASEAN region which can enhance the development of organic markets. As suggested by Petrescu and Petrescu-Mag (2015), learning and understanding more about target customers will help marketers and retailers create appropriate strategies in order to sustainable behaviors and encourage their development for further environmental benefits. Finally, the interaction among psychological factors, personal norms, social factors, intention behavior, knowledge and other motives factors is also remarkable to investigate.

CONCLUSION AND RECOMMENDATION

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