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## Impact of Integrated Organic Farming Practice on Health of People in Ubolratana District, Khon Kaen Province

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### Abstract

**Objectives:** To explore the physical health, psychosocial health (time for the family, interaction with the community and generosity among the community), family finance (savings, household debt and expenditure on food), agricultural land and happiness of Ubolratana community-dwellers.

**Methods:** Participants were 2,500 residents of Ubolratana District, Khon Kaen Province, who participated in a 3-day integrated organic farming training course during 2007-2009. By using an interview form, the participants were asked to compare their psychosocial health, family finance and the quality of their agricultural land at the study time with those at the pre-training period. Furthermore, they were interviewed about their perception of physical health condition within the past year. Their level of happiness was evaluated by using a numeric rating scale (1-10). Descriptive statistics, Chi-square test and T-test were applied for data analysis.

**Results:** Of the 2,500 participants, 1,695 (67.8%) were practicing integrated organic farming (IF group). The rest of them (non-IF group) did not currently practice because of the lack of their own land, sources of water or time. The number of IF participants who perceived themselves as having good physical health within the past year was significantly greater than that of the non-IF participants (79.6% vs. 70.4%,  $p < 0.001$ ). Positive findings in psychosocial health, family finance and quality of agricultural land were also significantly greater in the IF group than in the non-IF group. The self-reported level of happiness was higher in the IF group than in the non-IF group ( $7.5 \pm 1.9$  vs.  $5.3 \pm 1.0$ ,  $p < 0.001$ ).

**Conclusion:** Community-dwellers could benefit from integrated organic farming practice in aspects of their physical and psychosocial health as well as family finance, thereby increasing personal happiness.

**Keyword:** *integrated organic farming, health promotion, Sufficiency Economy*

## 1. Introduction

Health has been defined as the state of human well-being which is perfect in physical, mental, spiritual, and social aspects; all of which are holistic in balance<sup>1</sup>. The current health system requires empowering the people to conduct the “healthy community” on their own, and promoting the people to take care of their own health rather than depending on health personnel<sup>2</sup>. Ubolratana, a district of Khon Kaen Province, Thailand comprises of about 7,500 households with 39,000 residents<sup>3</sup>. The main occupation of the residents is farming. Most of the farmers have several problems including high expenditure and debt, no savings and environmental degradation. Furthermore, the main health problems of Ubolratana farmers are preventable conditions such as low back pain and health symptoms related to pesticide exposure including irritation of the throat, blurred vision, skin problems and headaches<sup>4</sup>. These health problems are in line with the ones reported in previous studies<sup>5-8</sup>. It was demonstrated that the lifetime, 1-year and point prevalence rates of low back pain among Thai rice farmers were 77%, 56% and 49%, respectively<sup>5</sup>. Pesticide intoxication was reported in 39% of rice farmers<sup>6</sup>. There were about 49,000 to 61,000 reported cases of pesticide intoxication each year with morbidity rate between 76.4 and 96.6 per 100,000 populations<sup>7</sup>.

Ubolratana Hospital is a 30-bed community hospital. The estimated ratio of a medical doctor per person is about 1:15,500. Because of this high ratio, a gradual decline in the level of health of Ubolratana residents and the current health system of the country, the concept of health promotion by building good health before repairing ill

health has been adopted by the hospital’s mission to provide better health and greater happiness to the residents. In pursuit of this mission, the encouragement of integrated organic farming practice for Ubolratana residents has been chosen as a strategy of the hospital. With the support of the Thai Health Promotion Foundation, Ubolratana Hospital in cooperation with the Sustainable Community Development Foundation has designed a 3-day integrated organic farming training course based on the philosophy of Sufficiency Economy<sup>9</sup> and has conducted this course for Ubolratana residents since 2007. The training course, led by nurses and other health professionals of Ubolratana Hospital, is given in groups with 50-60 trainees per group. The course does not directly support specific agricultural activities but provides the trainees with the knowledge and skills about how to be self-sufficient, how to form strong groups to solve community problems as well as create community well-being and how to create small-scale, well-planned intensive organic farming. During the training, the trainees are facilitated to focus their own resources to produce self-sufficiency, income for debt relief, a life pension in the form of large timber trees and healthy life in all 4 dimensions of health (physical, mental, spiritual and social)<sup>10</sup>. They will get the opportunity to visit and share experiences with a number of successful farmers who are self-sufficient, lead their life based on integrated organic farming and rely on their own resources in order to build their healthy life. In each year, nearly 1,000 residents were trained. A cross-sectional survey was undertaken to study the impacts of this 3-day training course on the way of life of Ubolratana residents who participated in the course during 2007-2009. This report

reveals only some part of the research. The underlying objective of this part was to explore the physical health, psychosocial health (time for the family, interaction with the community and generosity among the community), family finance (savings, household debt and expenditure on food), agricultural land and happiness of the residents who participated in the 3-day integrated organic farming training course arranged by Ubolratana Hospital.

## 2. Materials and methods

### 2.1 Participants

This cross-sectional survey study was carried out from January until September 2010. Two thousand five hundred residents (both male and female) of Ubolratana District, Khon Kaen Province who participated in the 3-day integrated organic farming training course arranged by Ubolratana Hospital during 2007-2009 served as the target population of this study. The participants were invited to take part in the study if they were able to verbally communicate and willing to comply with the study procedures. Ethical approval review for this study was not carried out via a formal process because of the time limitation. However, the researchers were aware of general ethical principles of health care research. Therefore, before commencing the study, the researchers wrote an official letter to the director of Ubolratana Hospital to explain the objective and details of the study and to ask for the approval for the conduct of the study. Furthermore, all participants were informed of the purpose of the study and were assured of confidentiality. Each of them was given opportunity to ask questions and decline or agree to participate. The participation was voluntary and without financial remuneration.

### 2.2 Measurement

A structured interview form designed by the researchers was an assessment tool of the study. The current practice of integrated organic farming of the participants was explored first. After that, the participants were asked to compare their psychosocial health (i.e. time for the family, interaction with the community and generosity among the community), family finance (i.e. savings, household debt and expenditure on food) and the quality of their agricultural land at the study time (post-training period) with those at the pre-training period. An example of questions was “When compared with the year before participating in the integrated organic farming training course arranged by Ubolratana Hospital, how is the current status of your household debt?” Standardized answer options for those questions were given in 3 choices: increase, decrease and no change. Furthermore, the participants were asked about their perception of physical health condition within the past 12 months by using the following question: “How is your physical health within the past 12 months: good, moderate or poor?” Before commencing the data collection, the interview form was examined for its content validity by 2 lecturers in nursing and physical therapy who had experiences in teaching and research skills in community work.

Additionally, the participants' level of happiness was evaluated by a numeric rating scale (NRS) using a horizontal line with words that conveyed “least happiness” at the scale 1, “moderate happiness” at the scale 5, and “most happiness” at the scale 10. The participants were asked to place a mark along the line that indicated their happiness level. The NRS was chosen because it demonstrated reliability

( $r = 0.56-0.89$ )<sup>11</sup> and was easy for the participants to understand and for the researchers to score<sup>12,13</sup>.

**2.3 Procedures**

All participants were interviewed by 10 research assistants. The interview took about 20 minutes per person. Prior to commencing the study, training of the research assistants to administer the interview form was conducted with 30 community-dwellers who were not involved in the current study.

**2.4 Data analysis**

On completion of the study, descriptive statistics were calculated for demographic variables. The data were divided into 2 participant groups: participants who were practicing integrated organic farming (IF group) and who did not practice (non-IF group). Comparisons of the number of participants who reported positive changes in the outcome measures between the IF and

non-IF groups were analyzed through the Chi-square tests. T-test was used for a comparison of happiness level between the 2 groups of participants. All analyses were performed using the STATA statistical software package version 10.0. A value of  $p < 0.05$  was used to decide the significance for all analyses.

**3. Results**

The participants were 1,345 females (53.8%) and 1,155 males (46.2%) aged between 25 years and 75 years. Of the 2,500 participants, 1,695 (67.8%) of them were practicing integrated organic farming. The rest of them (32.2%) did not currently practice because of the lack of their own land, sources of water or time (Table 1). It was found that whether or not the participants practiced integrated organic farming was independent of gender and age.

**Table 1.** Reasons of the participants who did not practice integrated farming (n=805)

Reasons	Number of participants (%)
lack of their own land	365 (45.4)
lack of sources of water	245 (30.4)
lack of time	190 (23.6)
poor health status	5 (0.6)

Comparisons between the 2 groups revealed that the number of IF participants who perceived that they had good physical health within the past year was significantly greater than that of the non-IF participants (79.6% vs. 70.4%,  $p < 0.001$ ) (Table 2). When being asked to compare the psychosocial health, family finance and quality of the agricultural land at the study time with the year before participating in the integrated organic farming training course arranged by Ubolratana Hospital, the IF and non-IF

groups presented significantly different results ( $p < 0.001$ ) (Table 2). The number of participants who reported positive changes in those outcome measures was significantly greater in the IF group than in the non-IF group, i.e. more time for his/her family (62.7% vs. 47.5%), more interaction with the community (84.5% vs. 34.0%), more generosity among the community (71.4% vs. 63.1%), more savings (68.0% vs. 29.1%), less household debt (46.1% vs. 19.4%) as well as expenditure on food

(58.3% vs. 42.9%) and more fertile and productive soil (84.5% vs. 75.9%). The self-reported level of happiness evaluated

by the NRS (1-10) was also higher in the IF group than in the non-IF group ( $7.5 \pm 1.9$  vs.  $5.3 \pm 1.0$ ,  $p=0.001$ ).

**Table 2.** Comparisons of physical and psychosocial health, family finance and agricultural land between the integrated farming (IF) and non-integrated farming (non-IF) groups (p-values obtained through Chi-square tests)

Items	IF group (n=1,695) (n (%))	Non-IF group (n=805) (n (%))	Mean difference (95% CI <sup>a</sup> )	p-value
Having good physical health within the past year	1,350 (79.6)	567 (70.4)	9.2 (5.5, 12.9)	<0.001
More time for his/her family	1,062 (62.7)	382 (47.5)	15.2 (11.0, 19.4)	<0.001
More interaction with the community	1,432 (84.5)	274 (34.0)	50.4 (46.8, 54.2)	<0.001
More generosity among the community	1,210 (71.4)	508 (63.1)	8.36 (4.3, 12.2)	<0.001
More savings	1,153 (68.0)	234 (29.1)	39.0 (35.1, 42.8)	<0.001
Less household debt	782 (46.1)	156 (19.4)	26.8 (23.1, 30.4)	<0.001
Less expenditure on food	988 (58.3)	345 (42.9)	15.4 (11.3, 19.6)	<0.001
More fertile and productive soil	1,432 (84.5)	611 (75.9)	8.6 (5.2, 12.0)	<0.001

<sup>a</sup>95% confidence interval

#### 4. Discussion

The integrated organic farming practice used by Ubolratana Hospital is based on the philosophy of Sufficiency Economy brought up in the 1970s by His Majesty the King<sup>9</sup>. This philosophy stresses the distribution of income to decrease the dependence and increase the ability to control the market system themselves<sup>14</sup>. It can be applied to all sectors of the economy. The integrated farming practice is the most distinct example of the application

of the philosophy of Sufficiency Economy to the agricultural sector<sup>15</sup>. The philosophy suggests the farmers apply the essential pillars of the philosophy, i.e. moderation, rationality and self-immunity, to their practice of farming<sup>14</sup>. A system of integrated and sustainable agriculture advised by His Majesty the King has made efforts on water resource development and conservation, soil rehabilitation and conservation, sustainable agriculture and self-reliant community

development. Farmers are encouraged to follow 3 steps: 1) farmland division for optimum benefits, 2) communal cooperation to carry out farming and agricultural activities in production, marketing, living conditions, welfare, education, society and religion, and 3) loan and credit outreach to obtain funds to assist with investment or developing the quality of life<sup>9</sup>. It seems that the benefits of this system are not just in the agriculture sector but go beyond to healthy life-styles and well-being.

The main objective of this report was to explore the physical and psychosocial health, family finance, agricultural land and happiness of the residents who participated in the 3-day integrated organic farming training course based on the philosophy of Sufficiency Economy. To the best of our knowledge, this is the first formal study of this issue. The results revealed that after participating in the training course, about one-third of the participants did not practice integrated organic farming. One of the reasons reported was the lack of sources of water. This was not a surprise as a sufficient reserve of water for cultivation the whole year round is very important for integrated farming practice<sup>9</sup>.

At the study time, there were more IF than non-IF participants who perceived themselves as having good physical health within the past year. Furthermore, the number of participants who reported positive changes in psychosocial health, family finance and agricultural land after participating in the integrated organic farming training course was greater in the IF group than in the non-IF group. This is probably due to the holistic approach of integrated farming. Apart from agricultural activities, the

integrated farming practice involves the living conditions, welfare, education, society and religion<sup>9</sup>. Thus, improvements in family finance and agricultural land could result in positive changes in the health of the participants. All of these changes may lead to greater happiness in the individuals who were practicing integrated organic farming. In addition, an increased interaction with the community of the IF participants could have an effect on the happiness level as social support was associated with happiness<sup>16</sup>. These greater positive findings in the IF participants add support to a notion that health is not merely the absence of disease or infirmity but the state of human well-being, which is an interaction of physical, mental, spiritual and social dimensions of our life<sup>1</sup>. These findings are also consistent with the concepts of the Ottawa Charter for Health Promotion that health promotion is not just the responsibility of the health sector; improvement in health requires a secure foundation in several basic prerequisites including peace, shelter, education, food, income, a stable eco-system, sustainable resources, social justice and equity<sup>17</sup>.

Since the study had a cross-sectional design and no data about how long the participants had been practicing integrated farming, future studies with a prospective design are needed. Regarding the success of the training course, sustainability is considered as an indicator. Thus, a further study should be conducted for follow-up. In addition, to explore in-depth understanding of the benefits of integrated farming practice as well as problems and barriers to its implementation requires further qualitative study.

## 5. Conclusion

In conclusion, the community-dwellers could benefit from integrated organic farming practice based on the philosophy of Sufficiency Economy in aspects of their physical and psychosocial health as well as family finance, thereby increasing personal happiness. Future studies with a prospective and longitudinal design and in a qualitative manner are recommended to reveal further benefits of the integrated farming practice.

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## 7. References

- (1) National Health Act [Internet]. 2007 [cited 2014 Mar 25]. Available from: [http://www.hsro.or.th/Con\\_apil/ty.pdf](http://www.hsro.or.th/Con_apil/ty.pdf).
- (2) Bureau of Policy and Strategy, Ministry of Public Health. Thailand Health Profile 2005-2007. **Bangkok:** The War Veterans Organization of Thailand; 2007. Thai.
- (3) Information and Communication Technology Center, Ministry of Public Health. Population of Ubolratana District, Khon Kaen Province [Internet]. 2013 [cited 2014 Mar 25]. Available from: [http://provis.kkpho.go.th/provis/population/popsubdist\\_agegroup\\_dbpop.php?distid=4008&popyear=2013](http://provis.kkpho.go.th/provis/population/popsubdist_agegroup_dbpop.php?distid=4008&popyear=2013). Thai.
- (4) Ubolratana Hospital. Performance of the organization 2008-2010 [Internet]. 2011 [cited 2013 July 14]. Available from: <http://www.ubrh.org>. Thai.
- (5) Taechasubamorn P, Nopkesorn T, Pannarunothai S. Prevalence of low back pain among rice farmers in a rural community in Thailand. *J Med Assoc Thai.* 2011;94(5):616-21.
- (6) Ngamkamol K. Health status and occupational safety behaviors among rice farmers [dissertation]. Chiang Mai: The Graduate School, Chiang Mai University; 2009. Thai.
- (7) Thailand Pesticide Alert Network. The effects of pesticides on health of Thai people [Internet]. 2011 [cited 2015 June 10]. Available from: <http://www.biothai.net/sites/default/files/BriefingPesticide-HEALTH.pdf>. Thai.
- (8) Tawatsin A. Pesticides used in Thailand and toxic effects to human health. *Medical Research Archives* [Internet]. 2015 [cited 2015 June 9]. Available from: <http://www.journals.ke-i.org/ojs3/index.php/mra/article/view/176>.
- (9) Chaipattana Foundation. Philosophy of Sufficiency Economy [Internet]. 2012 [cited 2013 July 14]. Available from: [http://www.chaipat.or.th/chaipat\\_english/index.php](http://www.chaipat.or.th/chaipat_english/index.php).
- (10) Raeburn J, Akerman M, Chuengsatiansup K, Mejia F, Oladepo O. Community capacity building and health promotion in a globalized world. *Health Promot Int.* 2006;21(S1): 84-90.

- (11) Hollen PJ, Gralla RJ, Kris MG, McCoy S, Donaldson GW, Moinpour CM. A comparison of visual analogue and numerical rating scale formats for the Lung Cancer Symptom Scale (LCSS): does format affect patient ratings of symptoms and quality of life? *Quality Life Res.* 2005;14(3):837-47.
- (12) Joos E, Peretz A, Beguin S, Famaey JP. Reliability and reproducibility of visual analogue scale and numeric rating scale for therapeutic evaluation of pain in rheumatic patients. *J Rheumatol.* 1991;18(8):1269-70.
- (13) Serlin RC, Mendoza TR, Nakamura Y, Edwards KR, Cleeland CS. When is cancer pain mild, moderate or severe: grading pain severity by its interference with function. *Pain.* 1995;61(2):277-84.
- (14) Government Public Relations Department. King Bhumibol's Philosophy of Sufficiency Economy for the Thai Nation [Internet]. 2012 [cited 2013 July 14]. Available from: [http://thailand.prd.go.th/view\\_news.php?id=6290&a=4](http://thailand.prd.go.th/view_news.php?id=6290&a=4).
- (15) Chaipattana Foundation. New Theory: His Majesty's guideline on integrated farming practice on the Chaipattana Foundation's land, Wandao Subdistrict, Pak Tor District, Ratchaburi Province [Internet]. 2012 [cited 2013 July 14]. Available from: [http://www.chaipat.or.th/chaipat\\_old/journal/apr01/eng/e4.html](http://www.chaipat.or.th/chaipat_old/journal/apr01/eng/e4.html).
- (16) Carpenter C, Forwell SJ, Jongbloed LE, Backman CL. Community participation after spinal cord injury. *Arch Phys Med Rehabil.* 2007;88(4):427-33.
- (17) World Health Organization. Ottawa Charter for Health Promotion [Internet]. 1986 [cited 2014 Dec 9]. Available from: <http://www.euro.who.int/en/publications/policy-documents/ottawa-charter-for-health-promotion,-1986>.