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## ECO-TECHNOLOGIES AND PRODUCT QUALITY IN OTOP<sup>2</sup> PRODUCTION: NONTHABURI PROVINCE CASE STUDY

*The article studies the current development of OTOP manufacturing in Thailand with special emphasis on product quality, environmental protection and workplace safety. Results of the OTOP manufacturers' survey were interpreted by means of statistical analysis to show how quality and safety are interrelated in the OTOP context. Author's recommendations are provided concerning further development of OTOP manufacturing and local economies as such with the emphasis on employees' protection and higher standards guaranteed.*

*Keywords: OTOP; product quality; environmental protection; workplace safety; Thailand.*

Віттайя Мекхум

## ЕКО-ТЕХНОЛОГІЇ ТА ЯКІСТЬ ПРОДУКЦІЇ У ВИРОБНИЦТВІ ФОРМАТА ОРОП<sup>3</sup>: ЗА ДАНИМИ ПРОВІНЦІЇ НОНТХАБУРІ

*У статті описано сучасний стан та розвиток виробництв формату ОТОП у Таїланді з наголосом на якості продукції, захисті навколишнього середовища та безпеці виробництва. Результати опитування виробників ОРОП, що підтверджуються статистичним аналізом, демонструють взаємозв'язок між параметрами якості продукції та безпеки виробництва на прикладі ОРОП. Авторські рекомендації стосуються подальшого розвитку виробництва формату ОРОП та місцевих економік в цілому, а також захисту робітників на таких виробництвах та підвищенню гарантій якості продукції.*

*Ключові слова: ОРОП; якість продукції; захист навколишнього середовища; безпека праці; Таїланд.*

*Табл. 3. Літ. 10.*

Виттайя Мекхум

## ЭКО-ТЕХНОЛОГИИ И КАЧЕСТВО ПРОДУКЦИИ В ПРОИЗВОДСТВЕ ФОРМАТА ОРОП<sup>4</sup>: ПО ДАННЫМ ПРОВИНЦИИ НОНТХАБУРИ

*В статье описано сегодняшнее состояние и развитие производств формата ОРОП в Таиланде с акцентом на качество продукции, защите окружающей среды и безопасности производства. Результаты опроса производителей ОРОП, подтвержденные статистическим анализом, демонстрируют взаимосвязь между параметрами качества продукции и безопасности производства на примере ОРОП. Авторские рекомендации касаются дальнейшего развития производства формата ОРОП и местных экономик в целом, а также защиты работников таких производств и повышения гарантий качества продукции.*

*Ключевые слова: ОРОП; качество продукции; защита окружающей среды; безопасность труда; Таиланд.*

**Introduction.** The National Social and Economic Development Plan No. 11 (2012–2016) was prepared at the time when Thailand was facing a situation of social, economic and environmental rapid changes so that the 8–10 Social Development

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<sup>2</sup> One Tambon One Product – Thailand state programme for local entrepreneurship stimulation which is supporting unique product in each district (tambon).

<sup>3</sup> ОРОП – «Один район – один продукт» – державна програма у Таїланді, що стимулює розвиток місцевого підприємництва шляхом підтримки унікального продукту в кожному окремому районі (тамбоні).

<sup>4</sup> «Один район – один продукт» (ОРОП) – государственная программа в Таиланде по стимулированию местного предпринимательства, которая поддерживает развитие уникального продукта в каждом отдельном районе (тамбоне).

Plan has summoned the "philosophy of sufficiency economy" applied widely at all levels. Its environmental and safety features were referred to the environment, both physical and psychological, that is, working conditions must not be too risky, they must allow workers feel comfortable and unharmed. The wisdom of local community to develop the sustainable quality of life, physical, social, spiritual and emotional, recognizes the importance of life quality for working people. This is important for economic and social development of the country, which has initiated "Development of Quality of Working Life in the Workplace" to strengthen and improve the lives of people who work in the establishments that will be stable and lasting. Due to the support from the budget of the Department of Health (SSS), the work life with better quality reduces unemployment rate and standardizes the quality of life for all people. Thailand has accepted this widespread practice in order to promote physical, emotional, social and spiritual health of people working at enterprises by focusing on the integration of links with "people" in the center.

The key idea is to make a research on the development of air filters at OTOP enterprises. Air filters would reduce the symptoms caused by the common reason (dust) in operations then performance before and after the installation of the air filter can be compared along with work results. The study would provide information to the Department of Community Development, Industry Council and Department of Health (SSS). It can also help improving manufacturing practice in relation to employee health, specifically 4 aspects: physical, emotional, social and spiritual.

So the impact on OTOP producers would be direct. Therefore, it is necessary for the development of OTOP to integrate local knowledge and technology ecosystem to enhance the quality of life sustainably, since it is not sufficient to improve only the quality of economic life. This new guidance combining the improvement of life quality, the philosophy of sufficient economy and the quality of working life would bring benefits thus, leading to a more balanced life that would create the potential to produce better OTOP quality for better public well-being.

**Research objective.** This is a study concerning conditions and requirements for technology ecosystem use in the OTOP industry, based on local knowledge.

**Methodology.**

**1. Research scope.** Data for this article was obtained from other research papers, information from producer groups, community leaders, community organizations, the Department for Community Development and networks of community organizations in 6 districts of Nonthaburi Province out of 52 districts in province. The population was the group of OTOP producers in Nonthaburi Province in the year 2556<sup>5</sup> registered with the Department for Community Development and who lived in Nonthaburi, within 6 districts of Mueang, Bang Bua Thong, Bang Yai, Sainoi, Bangkruay and Pak Kret. Local OTOP community included those who were registered with the total of 260 manufacturing OTOP products.

Scope and contents of the study concerned mostly the nature of technologies used, technological and working environment in the companies.

**2. Research methodology.** This research was a survey using qualitative and quantitative data analysis and questionnaire.

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<sup>5</sup> local Thailand calendar = the year 2013 in Europe.

The population of this study covered the producers of OTOP in Nonthaburi Province, 6 districts in total, with 260 manufacturing OTOP productions in the community.

The sample was selected from the population of 260 manufacturers, registered by the Department for Community Development by selecting specific research methods were, however, with voluntarily participation, which ended up with 155 respondents.

**3. Research tools.** For consideration of technological and environmental aspects in the questionnaire and study overall the questions were divided into 3 sections.

*Section 1:* included technology management, planning, control procedures, training, budgeting and accounting.

*Section 2:* concerned technology and quality, there were questions on manufactured products that met customer requirements, ways to ensure product quality, product checking before distribution, quality standards, shipment procedures, warranty after sales, chemicals in products, materials used in production etc.

*Section 3:* environmental technology and safety of the workplace: noise at work, temperatures in operation, dust / chemicals in the workplace, fire prevention, problems with water pollution, smell disturbance, controlled areas with risk of harm, vibration that affect work.

The research used the following division of tools:

1) Using other research and textbooks on management, production and development of products and environments to work with interviews of other OTOP producers and other relevant agencies in order to determine the issues to be asked.

2) Check the questions and make some improvements.

3) Carry out the survey and the revision. Then the experts reviewed 5 trial surveys to determine the appropriate contents, and other experts reviewed the questionnaires and agreed on further improvements in some statements. Therefore, the survey became more clear and complete.

4) Performing the survey, trial, now on the sample of 30 people.

5) Detecting the reliability by means of Cronbach alpha coefficient, with the reliability of 0.97.

6) Data was again revised prior to the actual query.

7) Completing the survey and provide copies for further storage.

**Result.** The study is a quantitative research, where the data were analyzed using statistics tools. The information from the rating scales was analyzed using statistical averages and standard deviation, then the conclusion was formed.

The key result concerning management technologies in OTOP manufacturing are presented in Table 1.

Table 2 show that the result for such parameters of technology, quality and standards of OTOP producers are overall quite low.

Table 3 demonstrates the results for technology, environment and safety in the work of OTOP producers with the overall low level of 2.43.

**Discussion.** Technological and quality standards are quite an issue for all manufacturer, since most of OTOP producers receive very little (or none) funding from outside agencies and this is consistent with (Jiankul, 2014). Relevant authorities should support OTOP with more funding sources (Santipollavut, 2009) also found lack of information dissemination about the industry and lack of funding to support

such projects. It should be clearly in the development and management model for the integration of this young industry that the community at all levels need to contribute to planning and to participate in joint monitoring and evaluation together with the group of producers. To find better solutions to economic problems of the community, participation of citizens in planning in accordance with the needs and roles of the community would be vital, as emphasized by (Wedhapan, 2012). All members involved should understand how to use the guidelines and the benefits under the ASEAN FTA, while manufacturers should check their products before actual distribution. Training on technology and quality standards for manufacturers are a "must-have" because OTOP products are often not fully approved by other organizations. Scholars and relevant authorities should provide more information on production and consumption safety for end users as consistent with the standards of safety monitoring. So that a consumer could choose food or other product of certain quality and safety, including that of the workplace. Manufacturers needed to plan and implement fire prevention awareness campaigns as already being noted in (Makhum, 2014). Overall OTOP producer should be aware of all aspects of work safety as such.

**Table 1. Mean and standard deviations in the management technology group of questions, author's**

<b>Technology management issues for estimation</b>	$\bar{X}$	<b>S.D.</b>	<b>Evaluation</b>	<b>Order</b>
Advance planning of work	3.81	0.78	Max	3
Delegating responsibilities	4.32	0.58	Max	1
There is proper place of work	4.09	0.67	Medium	2
Controlled assessment of work	2.89	0.74	Medium	6
A reserve supply of raw materials for production	3.08	0.79	Min	5
The available market of distributors	2.43	0.86	Min	7
Preparation of customer data records	2.01	0.64	Min	9
Gaining knowledge from outside agencies	2.31	1.01	Min	8
Funded by outside agencies	2.27	0.42	Min	10
Bookkeeping of income / expense	3.54	0.72	Min	4
<b>Total</b>	<b>3.31</b>	<b>0.79</b>	<b>Medium</b>	

**Table 2. Mean and standard deviations of technology, quality and standards in OTOP manufacturing, author's**

<b>Technology, quality and standards in manufacturing OTOP</b>	$\bar{X}$	<b>S.D.</b>	<b>Evaluation</b>	<b>Order</b>
Manufactured products meet customer requirements	2.07	0.78	Min	7
There are certain ways to ensure product quality	3.31	0.53	Medium	3
Checking products before distribution	3.34	0.71	Medium	2
Quality standards	2.09	0.65	Min	8
Shipment renders	2.31	0.40	Min	5
Warranty after sales	2.38	0.76	Min	6
There are chemicals in products	3.40	0.98	Medium	1
A standard set of materials used in production	2.51	0.78	Min	4
Approved by organization 's credibility	1.52	0.54	Min	10
All participants have technologies of good quality	1.50	0.63	Min	9
<b>Total</b>	<b>2.43</b>	<b>0.79</b>	<b>Min</b>	

Table 3. Mean and standard deviations of the environmental technology and safety parameters in the work of OTOP producers, author's

Environmental technology and safety	$\bar{X}$	S.D.	Evaluation	Order
Well-lit work area	4.90	0.46	Max	1
Loud noise in the workplace	1.54	0.58	Min	9
Hot / cold temperatures	2.24	0.79	Min	4
Dust / chemicals in the workplace	1.79	0.69	Max	5
Complains about the area of operation	3.77	0.77	Medium	2
Fire prevention in the workplace	2.71	0.81	Min	10
Water pollution from manufacturing	2.19	0.79	Min	3
Operational odors in the workplace	1.59	0.44	Min	7
Controlled areas with risk of harm in the workplace	1.88	0.72	Min	6
Vibration that affects work	1.68	0.66	Min	8
<b>Total</b>	<b>2.43</b>	<b>0.67</b>	<b>Min</b>	

**Conclusion.** Technological management in OTOP manufacturing overall got the average of 3.31 which is moderate. When considering organized and assigned responsibilities, the average of 4.11 was way below the average as such, venue fit to work got the average of 4.06 under the high level funding by external agencies with the average of 2.20 at the low level.

The average of 2.43 was individually found for pesticide residues in products, with the average of 3.40 for product inspection, while the previous distribution was moderate with the average of 3.30, which was certified by a trusted organization with the average of 1.52 at the low level, respectively.

For technology standards and OTOP maintenance we found the overall low level of 2.43, considering the item of well-lit work with the average of 4.90 being the highest, with minor problems with the operational area (the average of 3.86) at the high level, planning and fire prevention, with the average of 2.71 were moderate.

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