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Citizen Participation in the Management of Natural Resources and Environment in Don Ruak Subdistrict, Nakhon Pathom Province, Thailand

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Abstract

This study is quantitative research which has an objective to study participation level, and a comparison between individual factors that have influence on this participation in the management of natural resources and environment in Don Ruak Subdistrict, Don Tum district, Nakhon Pathom province. Population and sample group are citizens aged 20 years old and more who reside in this settlement. In this method, 400 samples are randomly collected through various phases by using questionnaire as research tool. Additionally, data collection, direct interview with respondents, and data analysis that uses descriptive statistics such as frequency distribution, percentage, mean, standard deviation, and inferential statistics (t-test and F-test) are applied in the research methods. The result of this study suggests that participation in the management of natural resources and environment in Don Ruak Subdistrict brings about an overall score for the medium range of income. The highest participation is implementation, the lesser extent is benefit gaining, follow up and evaluation, search for cause and problem, as well as planning and decision-making, respectively. For a comparison on individual factors that reflects participation in the management of natural resources and environment in different areas of this suggest difference in their assessment. Notably resources and environment in Don Ruak Subdistrict, Don Tum District, Nakhon Pathom Province, different education and monthly income levels both neutrally affect the participation of the management of natural resources and environment.

Keywords: *Participation, Management, Natural Resources and Environment*

1. Introduction:

In recent years, Thailand has focused on economic development by relying on natural resources which is the fundamental element in production and the service sectors. This is to increase the country's ability to compete and overcome middle-income trap. As a result, this type of economic development has resulted in the depletion of the country's natural resources to decrease and a deterioration in environmental quality. Uneven access to the natural resources has also widened the inequality gap in the society (Kokamai & Weerapalangkoon, 2019, p. 27).

Although, in the past, it was the public sector which was responsible for managing natural resources and environment, principally, in Thailand, it has been the Ministry of Resources and Environment. Its main function was to design and impose plans for managing the natural resources and environment for the country as a whole. This would result in the sustainable use of natural resources in the natural environment. The government ministry was expected to enact various laws for the prevention and preservation of natural resources and environment with respect to sustainability at the macro level. However, many locals were not fully aware of the vulnerability of natural resources, nor the possibility of their extinction. As a consequence many local communities were unconsciously wasting their natural resources (Soonthonwaritthichod & Sukhaboon, 2013, Page 1).

Nakhon Pathom province is in the central region of Thailand. The Tha Jeen river area is the center of economic activities and to where many ethnic people had migrated in earlier times. The province is home to many well-known tourist attractions including Wat Phra Pathommachedi Ratcha Wora Maha Wihan, Sanam Chan Palace, Don Wai Floating Market, and the Lam Phaya Floating Market. The province is an important food production center that includes monoagricultural, and mixed farming systems. The area size is 2,168.3 km² (Energy and Planning Office, Ministry of Energy).

Nakhon Pathom Provincial Agriculture Office has reported that agricultural production has been affected by natural and uncontrollable causes such as drought, and brackish water. Among the current problems affecting its natural resources and environment include water pollution in Tha Jeen river Its overall water quality index is poor-very poor. Water contamination in the river and canal has been mainly caused by community and farming practices, including livestock. Land resources in Nakhon Pathom province have an acid soil problem, as well as soil erosion. The use of fertilizers in farming has caused sedimentation of chemical substances, which, in turn, has degrade land quality (Nakhon Pathom, 2018, Page 85).

Therefore, the topic of management of natural resources and environment is truly important for the future wellbeing of the province. This present paper focuses on an initiative in which the communities are involved in managing its natural resources and environment, as well as a study of various factors related to community participation.

It is believed that participation will increase the community's awareness of the importance of protecting, preserving, and regeneration of natural resources and environment in their Subdistrict, Don Ruak.

2. Research Objectives

1. To study the level of participation in the management of natural resources and environment in Don Ruak Subdistrict, Don Tum district, Nakhon Pathom province, and
2. To compare factors that affects their participation in the management of natural resources and environment in their Subdistrict, Don Tum.

3. Literature Review

The management of natural resources and environment is a concept as well as a systematic process for managing natural resources and environment in order to preserve the existing resources, and to enhance their wellbeing. This implies preventive measures, treatment, and correction through local activity which involves the participation of the people for the preservation and sustainable use of the natural resources and environment.

Beneficial use of resources supports involves cultivating the people's consciousness about preserving natural resources. In addition, there are penalties for those intruders who destroy community resources and a commitment to restore, revive, and reestablish such resources to their original condition. This may entail searching for more natural resources, together with implementing what Mahapian (2016, p. 131) refers to as the circular economy.

Community participation involves the local people in planning, implementing, using, benefit sharing, and in evaluation (Yuekyen, 2012, Page 31; Chooprasoot & Choengthong, 2015, Page 423; Bamrungsuk, 2012, p. 2492).

4. Research Methodology

This research was quantitative analysis. Area of study was Donruak subdistrict, Dontum district, Nakhon Pathom province. Populations were 3,155 participants aged over 20 years old who resided in Donruak subdistrict, Dontum district, Nakhon Pathom province. Bureau of Registration Administration (BORA), Department of Provincial Administration year B.E. 2563.

Permission to undertake this research project was obtained from the Human Research Ethics Committee, Institute of Research and Development, University of Technology Nakhon Ratchasima (Certificate registration no. NMCEC – 0027/2564). Moreover, permission to carry out this research was received from the relevant governmental agencies.

4.1 Sample Size Determination

This research selected the sample size by applying the formula of Taro Yamane (Yamane, 1973) as follows

$$n = \frac{N}{1 + Ne^2}$$

Where n = a sample size:

N = the number of people who resided in Donruak subdistrict, Dontum district, Nakhon Pathom province, aged over 20 years (total number of 3,155 people, Department of Provincial Administration, 2020)

e = discrepancy to be allowed (e=0.05)

N= 355 units, according to the mult-stage sampling technique. In this research the study of data collection was carried among more than 400 units.

4.2 Research Tools

A questionnaire was the research tool. It was first evaluated by 3 experts with respect of agreement between content and language use (Index of Item-Objective Congruence: IOC). The result showed the IOC was 0.66-1; then the questions were edited and revised to improve their clarity and level of understanding (Murnpho & Unaromlert, 2018, Page 136). 2)

The reliability of the questionnaire, using Cronbach's Alpha Coefficient on 30 samples of the experimental group, measured which of the listed questions in the questionnaire aligned in a similar direction, and whether they corresponded to each other. When this method considered the 5 levels of the rating scale, it yielded a Cronbach's Alpha Coefficient = 0.958 which confirmed that the questionnaire was acceptable and reliable, and could be used in the present study.

4.3 Data Analysis

Data analysis consisted of 1) descriptive statistics that included frequency distribution, percentage, mean, and standard deviation. To study the level of participation an ordinal scale was used:

4.21-5.00 is the highest level of participation

3.41-4.20 is a high level of participation

2.61-3.40 is a medium level of participation

1.81-2.60 is a low level of participation

1.00-1.80 is the lowest level of participation

2) Inferential statistics were used to examine and to compare individual variables related to the management of natural resources and environment by using the t-test and F-test.

Hypothesis 1 : Different genders can affect participation in community management of natural resources and environment.

Hypothesis 2: Differences in age can affect community participation in the management of natural resources and environment.

Hypothesis 3: Differences in education levels can affect the level of community participation in the management of natural resources and environment.

Hypothesis 4: Different occupations affects community participation in the management of natural resources and environment.

Hypothesis 5: Different income levels can affect community participation in management of natural resources and environment.

Hypothesis 6: Different length of stay periods in the region can affect community participation in the management of natural resources and environment.

5. Results

Research results reveals that the sampling group consisted of 223 females (55.7%) – the majority; under 30 years of age, 92 participants (23%); some 215 were married (53.75%); and, 400 stated they were Buddhists (100%).

Some 110 of the sampling group had completed elementary school (27.50%); 142 (35.59% were farmers, who reported an average monthly income of 10,001 - 20,000 Baht; 214 participants (53.50%), and some 323 locals who had lived in the area for more than 19 years³ that make up the number of 53.50 percent, and 323 locals who live in the area for more than 19 years (80.75 percent).

Details concerning community participation in the management of natural resources and environment is displayed in Table 1.

It shows that the mean of overall community participation level was 3.00; the highest level was in implementation where the mean was 3.29. Profit gain had a mean of 3.25. Monitoring and evaluation, had a mean was 3.03. For ‘search of cause and problem’, the mean was 2.77. Lastly, on ‘planning and decision making’ the mean was 2.66.

Table 1. Community Participation in the Management of Natural Resources and Environment

	\bar{X}	S.D.	scale	Ranking
1. Search of cause of problem	2.77	1.01	medium	4
2. Planning and decision making	2.66	0.97	medium	5
3. Implementation	3.29	0.97	medium	1
4. Profit gain	3.25	1.11	medium	2
5. Monitoring and evaluation	3.03	1.09	medium	3
Total	3.00	0.89	medium	

Table 2 reveals few differences between males and females with respect to community participation. Implementation and Profit gain were the two factors where there were significant differences between female and male respondents.

Table 2 Comparison of the Level of Community Participation by Gender

	Males	Female	t-value	Sig. (2-tailed)
Search of cause of problem	2.67 (1.01)	2.85 (1.02)	-1.719	0.086
Planning and decision making	2.61 (0.99)	2.69 (0.95)	-0.770	0.442
Implementation	3.16 (0.95)	3.40 (0.98)	-2.389	0.017*
Profit gain	3.06 (1.15)	3.40 (1.06)	-3.073	0.002*
Monitoring and evaluation	2.94 (1.10)	3.09 (1.08)	-1.423	0.155

* The hypothesis is rejected at the 0.05 level of significance

Table 3 Comparison of Community Participation by Age, Education Level, Occupation, Income and Length of stay in the Area

Individual factor		Search of cause and problem	Planning and decision making	Implementation	Profit gain	Monitoring and evaluation
Age	F (Sig.)	5.880 (0.000)*	4.358 (0.002)*	6.803 (0.000)*	6.525 (0.000)*	7.007 (0.000)*
Education	F (Sig.)	0.622 (0.683)	0.266 (0.932)	1.563 (0.169)	2.067 (0.069)	1.408 (0.220)
Occupation	F (Sig.)	7.104 (0.000)*	7.072 (0.000)*	7.061 (0.000)*	9.981 (0.000)*	8.731 (0.000)*
Income	F (Sig.)	1.514 (0.197)	1.567 (0.182)	1.363 (0.246)	0.937 (0.442)	2.076 (0.083)
Stay period in locations	F (Sig.)	1.258 (0.270)	0.832 (0.561)	5.117 (0.000)*	2.534 (0.015)*	1.435 (0.190)

* The hypothesis is rejected at the 0.05 level of significance

Table 3 indicates that age affects different levels of community participation in the management of natural resources and environment when searching for causes and problems. For planning and decision making, implementation, benefits gained, and follow up and evaluation, the statistical significance is 0.05.

Level of education does not affect community participation in the management of natural resources and environment indifferently, the statistical significance is 0.05. Career (occupation) affects levels of community participation in the management of natural resources and environment differently as does the search for causes and problems. The statistical significance is 0.05 for planning and decision, implementation, benefit gaining, follow up and evaluation.

Monthly income does not affect the level of community participation in the management of natural resources and environment, with a statistical significance of 0.05. Length of stay in the area appears to be related to the level of community participation in management of natural resources and environment. The statistical significance is 0.05 on the subjects of benefits gained, and in follow up, and evaluation.

The results show that ‘searching of causes and problems’, planning and decision making, follow up and evaluation, there are no differences (statistical significance of 0.05).

Table 4 reveals that gender, age, occupation, and time period of stay in the research area (Don Ruak Subdistrict) are significant at the 0.05 level. Two variables, level of education and monthly income, are not significant.

Table 4 Hypotheses Tests

Hypothesis Tests	Independent variable	
	Significance	Non-Significance
Genders	✓	
Age	✓	
Education		✓
Occupation	✓	
Income		✓
Stay period in locations	✓	

6. Discussion and Conclusion

The data shows that public participation in the management of natural resources and environment is given importance by people in the community, and this finding correlates well with the study of Chaisongkram and Leelakitpaisarn (2017, Page 92). Their work focused on citizen participation in environmental discussions of Sampran Town Municipality, Nakhon Pathom Province.

The processes in which there was the highest level of participation were implementation, benefits to be gained, follow up and evaluation, search for cause and problem, and planning and decision-making, respectively.

According to a study by Jariya Mahapian (Mahapian, 2016, Page 134) the management of natural resources does not require everyone to be involved in every detail. This would restrict both the planning and management of natural resources and conservation of the environment at both national and local levels.

On the matter of searching for information as a requisite for decision making, the work by Sukpan (2013, Page 66) is interesting. The researcher studied the management of natural resources by a community in Khok Muang Subdistrict, Khlong Hoi Khong District, Songkhla Province. That community participated in the process of implementation by consolidating their influence and power that resulted in the building

of Krasop Dam to store water from Khlong Cham Rai. The community also was active in reforestation, and releasing fish, for example.

Similarly, the study by Roabpromraj (Roabpromraj, 2018, Page 71) in which a community participated in the managing of natural resources and community environment project. It was an integrated local development planning Royal initiative in Phetchabun province. The project included three levels of participation: decision-making, operations, and in evaluation.

With respect to analyzing individual factors and the level and degree of participation in the management of natural resources and environment in Don Ruak Subdistrict, this present project learned that factors such as gender, age, career, and stay period are set differently; whereas different education and monthly income levels are ‘indifferent’ to participation levels in the management of natural resources and environment.

Pattaraphokinpiban and Ongkasingh (2021, Page 95) studied what they named ‘ecofemenism and environmental conservation’. The researchers argued that female leadership in environmental conservation would be beneficial in that women had a stronger level of motivation to care about the environment because it affected the future of the nations’ families. The researchers seemed to have the opinion that women understood and perceived the importance of the natural environment better than men. They, therefore, had stronger reasons to become involved in conserving the natural environment.

Bamrungsuk (Bamrungsuk, 2012, pp. 76-77) identified factors that affect environmental management. The case study of Mae Klong river basin, Muang district, Samut Songkhram Province, showed that factors such as age and career are associated with different approaches to environmental management. They found that different education levels did not appear to influence the interest levels in environmental management.

The Department of Environmental Quality Promotion (2015, Page 8), suggested that individual interest in environmental management can differ depending on external factors such the particular situation, social conditions, and individual factors, such as thoughts, feelings, values, beliefs, and experiences (gender, age, and financial status).

7. Suggestions for Further Research

7.1 Citizens in Don Ruak Subdistrict, Don Tum district, Nakhon Pathom province, has expanded their participation in the management of natural resources and environment by starting various groups such as Save the Soil, Save the Water, and Community Power for Environmental Conservation. It is recommended that these expanded efforts be studied to understand how these groups got started, and what have been the results with respect to accomplishing their objectives and thereby prevent further deterioration of the environment.

7.2 A more detailed study of the involvement of the private sector such as industrial plant in contributing to the deterioration of natural resources and environment is recommended. Specifically, the private sector involvement in such activities as

releasing waste water, pollution, and disposal of chemical substances. Also are these industries meeting the standards which are set out in ISO 14001. This is the statute which sets out in detail how such organizations can cooperate in environmental management including conservation, and pollution prevention, for example.

7.3 It is recommended that a study be made of the role of local officials such as officers in the District Administrative Organization, Community Leaders, Village Headmen, and Subdistrict Headmen. All of these officers have some authority to help protect natural resources and the community environment. The study could examine their attitudes toward such matters as the use of natural resources, conservation, and the rehabilitation of natural resources and the environment. Also, what is the role of governmental agencies at the national level, such as the Ministry of Natural Resources and Environment? And, what is the opinion of local officers regarding the size of the budget for projects which are aimed at creating knowledge and understanding among the citizens regarding the management of natural resources and environment, for example?

7.4 Finally, it is recommended that there be a study to evaluate the relationship of the people's use of natural resources and its impact on the health of community? Are there any instances where traditional farming methods are being replaced by more environmentally friendly methods?

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