

Study on the Key Factors of Violations of the 3-Nautical-Mile Trawling Limit by Fishermen

Yu-Teng Chang

Associate Professor, Department and Graduate Institute of Information Management, Yu Da University of Science and Technology, Taiwan

Hwang, Hsu-Hwei

Assistant Professor, Department of Applied Japanese Language, Yu Da University of Science and Technology

Wei-Che ,Chen

P.G, Department and Graduate Institute of Information Management, YuDa University of Science and Technology, Taiwan

Abstract- Article 44 of the Fisheries Act of the Closed Fishing Locations of Trawlers and Related Restrictions in Taiwan announced by the Council of Agriculture, Executive Yuan on November 24, 1999 stipulated relevant matters of “operation of trawlers under 50 tons within 3 nautical miles”. Taiwan government re-established this law to regulate, maintain and manage the Taiwan’s offshore fishery resources in order to maintain its sustainable utilization and development. Thus, with the enactment and promotion of the Taiwan government’s announcement standard, such law may help to improve offshore fishery resources and protect marine resource and conservation. However, from the perspective of fishery economy, in terms of quality, Taiwan fishermen believed that this law was not comprehensive and reasonable; in terms of quantification, the violation of trawling and unauthorized re-regulation of trawl operations ranked first among the violation list in the offshore fishery in the past years. In this regard, we can know the differences between Taiwan fishermen’s policy awareness, identity and government information and behavior. This study intends to explore the factors affecting fishermen’s violations of the 3-nautical-mile trawling policy. Taking fishermen in Hsinchu as the research subjects, this study adopts questionnaire survey method to discuss the individual factors, policy awareness, and policy recognition of fishermen’s violations of the 3-nautical-mile trawling policy. By relevant literature and the Modified Delphi Method, this study sums up the ideas of experts to analyze the influencing factors, and establish a hierarchical structure based on these factors. Using hierarchical analysis method, weights of the influencing factors of individual factors, policy awareness, and policy recognition of fishermen’s violations of the 3-nautical-mile trawling policy are obtained, and a weight system is established. For the results of this study, it can be seen that the hierarchical structure of factors influencing fishermen’s violations of the 3-nautical-mile trawling policy include individual factors, policy awareness, and policy recognition. However, the influential factors that are highly valued include four factors: economic pressure, personality traits, content understanding, and meaning understanding. The research results of this study are provided to relevant government authorities, and relevant supporting measures for fishermen’s economic pressure are proposed to reduce fishermen’s motivation and behavior of violations of the 3-nautical-mile trawling policy.

Keywords: Individual awareness, policy awareness, policy recognition, 3-nautical-mile trawling policy

I. INTRODUCTION

The development and course of Taiwan's marine resource conservation policy started from the "National Marine Conference" held from 1998. During the conference, Taiwan's national marine development and resource policy was developed. In 2001, the sustainable marine resource management was incorporated into Taiwan's "Marine White Paper". In 2006, the "Marine White Paper" was put forward with the vision of a prosperous marine country. In 2015, the "Marine Four Laws" were promulgated and formulated, one of which was the organization law of the marine conservation agency. In April 2018, the "Ocean Affairs Council" was established to be responsible for Taiwan's overall marine policy, sea area safety, coastal management, marine conservation and sustainable development. Over the past 20 years, Taiwan government authorities have been actively promoting marine conservation policies to solve normal issued plaguing Taiwan in terms of marine resources, including exploration of marine fishery resources, marine pollution and illegal fishery operations. Hence, Taiwan government authorities hope to formulate relevant marine conservation policies and rules to mitigate and improve these normal issues.

Based on the above reasons, this study attempts to understand the current plan of the three-nautical-mile trawling policy and explore the violation of the three-nautical-mile trawling policy by fishermen. Furthermore, through comparing the differences between fishermen's individual factors, policy awareness and policy recognition, this paper sums up the findings for analysis, and then puts forward relevant solutions and measures.

II. LITERATURE REVIEW

Based on the analysis and collection of relevant data on the three-nautical-mile trawling policy, the basic status of policies can be revealed. In 2016, fishery statistics annual report of the fishery department showed that Taiwan's fishery employees were divided into ocean fishing, offshore fishing, coastal fishing, inland fishing, sea-surface breeding and inland breeding. Among them, the number of coastal fishing and onshore personnel was 77,164, ranking the first, followed by 66,967 of inland fishing, 37,923 of offshore fishing and 13,133 of ocean fishing. Hence, it can be seen that most Taiwanese fishermen relied on coastal fishery for their operations and livelihood. Whether they understand and support the government's policy is a key factor for the success of the policy. It can also be seen from the above-mentioned literature that although the policy has been implemented, the violation has not decreased continuously, indicating that Taiwanese fishermen should make continuous improvement in their awareness and recognition of the three-nautical-mile trawling policy.

A. *Policy awareness*

From the viewpoints of scholars both at home and abroad, this study defines the policy awareness as follows: individuals understand certain matters through the information received and then based on personal knowledge, internal perception and judgment. As a result, different attitudes and behavioral changes will occur due to awareness of events.

B. Policy recognition

From the viewpoints of scholars both at home and abroad, this study defines recognition as the degree of personal subordination, values and emotional factors to certain matters through social consciousness patterns, and differences in behavior and attitudes due to different degree of recognition. The Agricultural Committee has carried out a three-nautical-mile limit on trawls for Taiwanese fishermen. The main reason is that the three-nautical-mile coastal waters are rich in natural resources and are the best breeding sea areas for marine life. To make the Taiwan region rich in marine resources, the Taiwan government continues to promote the three-nautical-mile limit on trawls. Fishermen's recognition of this policy plays an indispensable role. In this regard, strengthening the public's understanding of policies can help to change attitudes of individuals and further improve their satisfaction of the policy.

III. RESEARCH METHOD

This study aims to "explore factors for fishermen's violations of three-nautical-mile trawling policy". Based on the relevant purpose and motive, the study analyzes the relevant literature at home and abroad and summed up relevant findings in a questionnaire survey of "Modified Delphi Method" to construct the decision-making hierarchy of fishermen's three-nautical-mile trawling policy in this study. Finally, Analytic Hierarchy Process (AHP) is used to obtain the weights of various indexes, and the consistency is inspected and sequenced. This chapter will explain the "research procedure and framework" and "research subject" in sequence.

A. Questionnaire Survey of Delphi Method Experts

The Modified Delphi Method is conducted through a semi-open expert questionnaire survey. The process will enable experts to fully express and feedback their opinions anonymously. Through the convergence of two rounds of expert opinions, it aims to define the motivation factors of fishermen in their violation of the 3-nautical-mile trawling policy. In this study, 13 experts from all sectors will assist in providing advice, and the convergence factor is the possible factor for the lower error value. Dalkey(1969) pointed out that a group with more than 10 experts has the lowest error value and higher group credibility.

B. AHP questionnaire object

The research subject of this study is mainly fishermen who are actually engaged in fishing operations. The aim is to investigate the factors that determine fishermen's violation of the 3-nautical-mile trawling policy. The subjects of the survey are fishermen from Hsinchu area. They are randomly sampled by age and gender variables and fill in questionnaires one by one.

C. Creation of a hierarchy

Based on the Modified Delphi Method questionnaire and feedback from experts twice, the second layer has three facets, while the third layer's assessment criteria conform to the principle that each layer has less than seven factors suggested by Satty. Therefore, based on the results of the second round of the Modified Delphi Method questionnaire, this study is divided into three major facets. A total of 13 evaluation factors are used to study the motivation of fishermen's violation of the 3-nautical-mile trawling policy, as shown in figure 1.

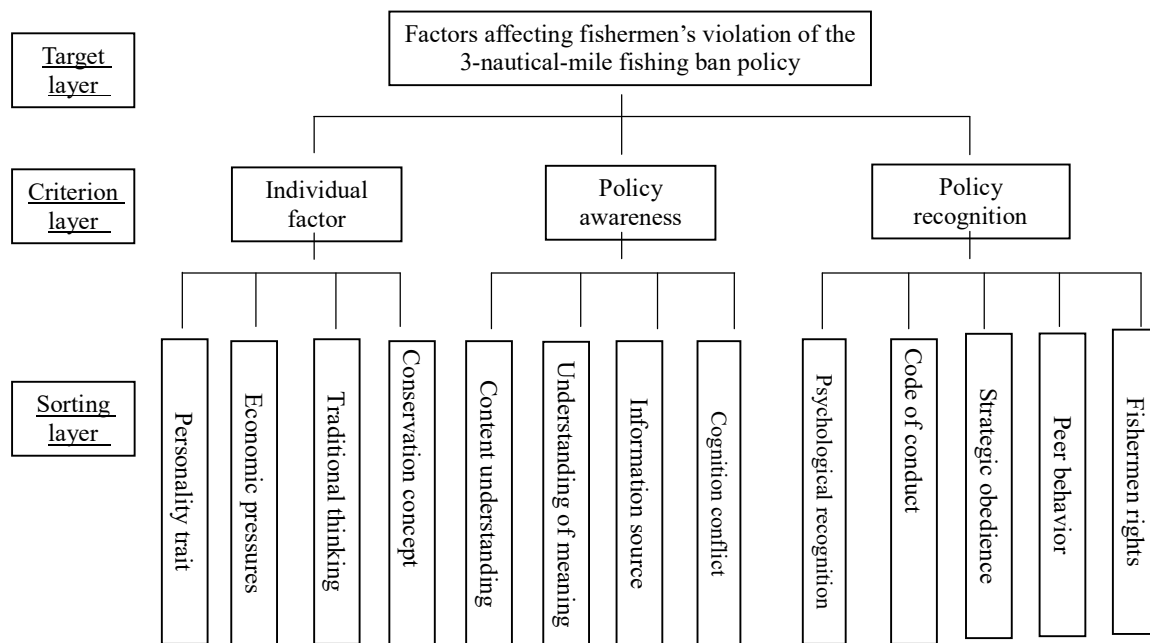


Figure 1. Thirteen evaluation factors to study motivation of fishermen's violation of the 3-Nautical-Mile Trawling Policy

D. AHP hierarchical questionnaire execution

This study is also a regional study. Snowball sampling method (also called chain-sampling strategy) is used to conduct research sampling. Fishery groups willing to assist this study are contacted by telephone and questionnaires are distributed through interpersonal networks. A total of 120 questionnaires were sent out in this study, and 100 were actually valid questionnaires.

IV. EMPIRICAL ANALYSIS

This study aims to explore the factors of fishermen's violation of the 3-nautical-mile trawling policy from the viewpoint of fishermen in Hsishcu region through Modified Delphi Method (Delphi Method) and AHP analysis, and to investigate, study, summarize and analyze the important influencing factors.

Table 1: Importance Analysis of Each Factor Affecting Fishermen's Violation of the 3-Nautical-Mile Trawling Policy

Criterion	Criterion weight	Minor criterion	Sub-criterion weight	Composite weight	Sorting
Individual factors	0.605	Personality traits	0.385	0.233	2
		Economic pressure	0.445	0.269	1
		Conservation concept	0.088	0.053	5
		Traditional thinking	0.082	0.050	6
Policy awareness	0.258	Content understanding	0.472	0.122	3
		Understanding of meaning	0.269	0.070	4
		Information source	0.139	0.036	8
		Cognition conflict	0.120	0.031	11
Policy	0.136	Code of conduct	0.335	0.046	7

recognition	Psychological recognition	0.104	0.014	12
	Strategic obedience	0.097	0.013	13
	Peer behavior	0.235	0.032	9
	Fishermen's rights	0.229	0.031	10

Based on the above calculation results, it shows that among the questionnaire, when considering the factors affecting fishermen's violation of 3-nautical-mile trawling policy, fishermen attach the most importance to individual factors, and the "individual factors" in the main criteria highlight its importance with a score of 0.605 as high as nearly 60%. When discussing a single factor, the most important factor in the basic analysis of personal factors is "economic pressure". In the basic analysis of policy awareness, "content understanding" is the most important. In the basic analysis of policy recognition, the most important one is "code of conduct".

The overall research results show that the influence of "individual factors" is extremely important, accounting for four of the top six minor criteria items. In addition, it can be seen from the table that attaching great importance to the four factors including economic pressure, personality traits, content understanding and meaning understanding are the most crucial motivations for fishermen's violation of the 3-nautical-mile trawling policy. Thus, it can be seen that the various illegal behaviors demonstrated by individuals have certain influence and predictive power, consistency and continuity, and will directly affect their decision-making mode, becoming the most important factor influencing fishermen's illegal motives.

V CONCLUSION AND SUGGESTIONS

A. Connotation of main factors affecting fishermen's violation of the 3-nautical-mile trawling policy

- (1) Economic pressure ranks first in terms of weight: The source of economic pressure is not entirely due to the lack of income and property. There are also economic difficulties and economic burdens, including unstable performance, loss of income, etc. Individuals have different economic pressures, and there are also differences in the degree of recognition of policies.
- (2) Personality traits: Different personality traits have different personal preferences, which are manifested in different degrees of policy recognition.
- (3) Content understanding: Individual understanding of the content of the 3-nautical-mile trawling policy, including access to information channels, policy content, legal norms, penalties for violations, etc., such as the location of closed fishing for trawlers and related restrictions.
- (4) Connotation understanding: Individual understanding of the purpose and target of the 3-nautical-mile limit on trawling includes the issue of rehabilitation of Taiwan's offshore fishery resources and depletion of marine resources.
- (5) Based on the above, the AHP questionnaire shows that fishermen attach great importance to their individual factors, policy awareness, and policy recognition among others facets and hierarchies. The influential factors that receive high attention are economic pressure, personality traits, content understanding and connotation understanding.

B. *Practical advice*

(6) Transform work type

When the world is facing the depletion of marine resources, fishermen could not harvest rich fish products like before. Providing opportunities for fishermen to change their work patterns and mitigating their own economic pressure through by work to effectively improve their income and reduce their exposure to illegal fishing operations due to livelihood problems.

(7) Improve fishing technology

The connotation of the main factors in economic pressure includes unstable performance and loss of income, which will enhance fishermen's motivation to violate regulations. Hence, if efforts can be made to effectively improve their fishing techniques outside the 3-nautical-mile and replace traditional fishing techniques with sophisticated fishing techniques, fishermen's desperate behavior due to unstable performance will be effectively improved.

(8) Control operation cost

Fishermen have to pay for fuel, equipment, and labor costs when going out to sea. When there is huge debt pressure and unstable performance, fishermen often violate the 3-nautical-mile trawling policy to reduce losses from going out to sea. Under the vicious circle, they are unable to make effective income, and will be invested by government authorities. Although government authorities have already subsidized fishermen's fuel cost to sea, if they can further assist fishermen in evaluating and analyzing the cost of reducing sea operations, they should be able to reduce fishermen's policy motive for violating the 3-nautical-mile trawling policy.

REFERENCES

- [1] Lin, S. P., Chang, S. H. 1991. Public Policy. Taipei: Wu Nan Books.
- [2] Lin, C. J. (1988). Management Psychology, Taipei: Wu Nan Books.
- [3] Hsu, P. C. (2004). Study on Employees' Awareness, Organizational Commitment and Job Satisfaction under Organizational Change-Taking Centralized Office in Taipei County as an Example. Unpublished, master's thesis, EMBA Program, Graduate Institute of Business Administration Da-Yeh University.
- [4] Chen, Y. C., Lin, Y. J. (2003). Choice Behavior of Tourists in Ecotourism Site. *Journal of Outdoor Recreation Study*, 16(3), 23-40.
- [5] Chen, C. K. (1996). Ways to Investigate and Study Regional Tourism Resources. *Geography and Territorial Research*, 4, 5-46.
- [6] Chang, C. H., Yang, K. S. (1989). Psychology. Taipei City: San-Min.
- [7] Yen, L. M., 2010. The Study on Cognitions and Satisfaction of Hurricane Disasters Prevention Literacy to Disasters Relief Policies - A Case on Wax Apple and Mango Farmers in Pingtung County. Master's thesis. Pingtung: Graduate Institute of Agribusiness Management. National Pingtung University of Science and Technology.
- [8] Hsu, C. M., Peng, M. L. (2010). Relationships among Policy Cognition, Policy Attitudes and Policy Satisfaction in Promotion of Student Swimming Programs: A Case Study of Parents of Elementary School Students in Miaoli County. *Journal of Taiwan Society for Sport Management*, 10(4), 1-24.
- [9] Ho, C. C., Lai, H. R., & Yao, Y.Y. (2009). The Relationship between Dietary Behavior and Cognition of School Dietary Policy and Environment among Technologic University Students. *Chinese Journal of School Health*, 55, 67-86.
- [10] Chen, S. J., Yen, T. M. (2013) Views of the People on Forest Function and Policy of Afforestation in the Slope Land and Lowland—A Case Study from Taichung. *Quarterly Journal of Forest Research*, 35 (2) : 103-112.
- [11] Chen, H. H., Huang, Y. Z. (2015.07). A Study on the Policy Cognition and Compliance in National Pension Insurance from the Female Insurants. *Journal of Contemporary Social Work*, 0 (7), 1-27.
- [12] Chang, M. K. (1997). On Several Issues of "Identity Politics". Yu, Y. L. (ed.), *Consolidation or Collapse of Democracy*, 91-116. Taipei: Yueh Tan Publishing.

- [13] Yang, Y. Y. (2011), A Study of Motivation, Commitment and Satisfaction on Volunteers in Nonprofit-Organization--Examples of Tzuchi in Hsinchu County, master's thesis, Graduate Institute of Business Administration, Minghsin University of Science and Technology Business Administration.
- [14] Hung, S. J. (2003) Study on the Relationship between Organizational Recognition, Leadership Style and Work Input of Expatriated Employees. PHD Thesis, Graduate Institute of International Business Management, Da-Yeh University.
- [15] Chu, C. P. 2009, Analytic Hierarchy Process Theory and Practice, Teaching Materials, Department of Business Administration, National Dong Hwa University.