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Coastal Aquaculture Management of Research and Development Coastal Aquaculture Center Region 3, Takhianthong Subdistrict, Kanchanadit District, Surat Thani Province, Thailand

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***Abstract*---**The objectives of this research were: 1) to study the management of coastal aquaculture at the Coastal Aquaculture Research and Development Center, Region 3, Surat Thani Province; 2) study problems and obstacles in aquaculture management. 3) Guidelines for the development of aquaculture management. This research used both qualitative and quantitative methods simultaneously. The sample consisted of 60 people, and a categorical randomization method was used. The qualitative method used a focus group and selected five key informants specifically. The research instruments used include questionnaires and semi-structured interviews. The Quantitative data analysis used statistics such as; mean, percentage and standard deviation. The results showed that the overall opinion on the management of coastal aquaculture Research and Development Center, Region 3 (Surat Thani) was at a high level with a mean of 4.03. The qualitative research method used in-depth interviews with the sample groups; it was found that coastal aquaculture management can be of two types: 1) The government sector co-ordinates with some agencies and organizations to seek the people's opinions in unity, which shows a direct collaboration with the government, hence opening room for mutual understanding. Both in terms of giving information, problem-solving, expression of opinion, and joint decision.

***Keywords*---**aquaculture center, coastal aquaculture, management, participation sector, research development.

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Introduction

Thailand has a coastal length of 2,667 kilometers covering 24 provinces from the Gulf of Thailand. From Trat province in the east along the coast to the southern part of Narathiwat Province with a length of 1,653 kilometers, and the Andaman coast. From Ranong Province to Satun Province on the border with Malaysia, it has a length of 1,014 kilometers. Many mangrove forest resources are densely distributed along the coast in various landscapes such as bays, estuaries, etc., making this area a breeding ground for many types of young aquatic animals. Such as shrimps, shellfish, crabs, and fish. Thus making this area abundant and rich in the most diverse marine ecosystems. It is also an important economic wetland of the economy, society, and culture. It is an important habitat for plants and rare or dangerous species (Nuh & Labduang, 2019). The aquaculture of Thailand today is still posed with a problem. As for the coastal aquaculture area, according to the Fisheries Statistics of Thailand, there is 51,262 rai, The number of households that are engaged in coastal aquaculture alone is approximately 35,000. Most of the problems encountered in many areas include high production costs, diseases, suitable area for aquaculture is limited. Environmental and resource quality problems damage farming areas and aquatic animal production, and another important problem is management, lack of academic knowledge, in both government and related agencies, including the people (Jarayabhand, 2017).

Coastal Aquaculture Research and Development Center, Region 3 (Surat Thani) is a unit under the Office of Coastal Fisheries Research and Development, Department of Fisheries, Ministry of Agriculture and Cooperatives, located at Village No. 4, Takhian Thong Subdistrict Kanchanadit District Surat Thani Province. On a total of 437 rai, consisting of aquaculture experimental ponds, breeding of aquaculture animals. There is also a conservation area of approximately 70 rai of mangrove forest as a coastal buffer and approximately 2,500 rai of marine space used for aquaculture research experiments. Furthermore, is a place where aquatic parent species are been preserved and taken care of such as; shellfish, cockle, sea crab, sea catfish, mullet, tiger fish, etc. Problems in the management of aquaculture farms, government, and related agencies did not give continuous support to the farmers (Suryani & Arya, 2017; Arnawa et al., 2017). The farmers lack management knowledge, lack of sustainability of aquaculture occupations, resource recovery, and development of coastal aquaculture. (Coastal Aquaculture Research and Development Center, Region 3, Surat Thani: 2017).

Coastal Aquaculture Research and Development Center 3 (Surat Thani) is responsible for Surat Thani Province. Its main functions are (1) Research and development of coastal aquaculture. and management of the coastal aquaculture system in connection with the Coastal Aquatic Health Research Institute. Marine Shrimp Farming Research Institute, Coastal Aquatic Food Research Institute, Coastal Aquatic Research Institute, and the Institute of Coastal Aquatic Health. Monitoring of produce from coastal fisheries, and the certification of coastal aquatic animal production processes to meet consumer and environmental safety standards. Production and breeding of endangered rare and endangered species (Holmen et al., 2018; Krause et al., 2015). Development of marine shrimp breeder production and management of the saltwater irrigation system for shrimp farming

(2) Office of Fisheries Technology Development and Transfer should promote and transfer fisheries technology, to increase the productivity of aquatic animals in water resources, and strengthen farmers, improvement of natural water resources, by dredging and weeding to increase the habitat of aquatic animals in natural water bodies. Development of personnel to have knowledge and skills suitable for working to increase operational efficiency. Development of fisheries database management for the promotion and transfer of fisheries technology (Lawanyawut et al., 2005).

From the above-mentioned, the researcher is thereby interested in researching Coastal Aquaculture Management of Coastal Aquaculture Research and Development Center Region 3 (Surat Thani) as a guideline for the management of coastal aquaculture for effective resource management as well as to develop a career in coastal aquaculture for a stable career, and increase the productivity of coastal fish to have an abundance of coastal resources.

Objectives

- To study the management of coastal aquaculture at the Coastal Aquaculture Research and Development Center, Region 3 (Suratthani).
- To study the problems and obstacles in Aquaculture Management of Coastal Aquaculture Research and Development Center Region 3 (Suratthani)
- To study the guidelines for the development of aquaculture management of the Coastal Aquaculture Research and Development Center, Region 3 (Surat Thani)

Literature Review

Management concept and theories

The terms "administration" and "management" have different origins in the development of knowledge. However, currently, both sides of the body of knowledge have been combined and applied to modern organizations. Therefore, these two words have the same meaning. and can be used interchangeably. Only the familiar popularity or linguistic concepts are somewhat different; they have different meanings in the following areas.

Regarding the types of organizations and agencies, "administration" is commonly used in public agencies or government agencies. As can be seen from the management position or executive (Administration) There is a term for this field of study that is "Public Administration", while the term management usually refers to the administration of private organizations. or businesses rather than public administration as will always be found that Important positions in NGOs use the term "manager" 2) regarding the level or scope of responsibility of the operation. The administration is sometimes a term that users refer to as acting at the policy level, that is the decision to provide guidelines and be responsible for the overall results. As for management focus on operations at the practical level (Policy Implementation), which is the second responsibility. or as a middle- or lower-ranking agency (Gulick & Lyndall, 1937; Altman et al., 2013).

Rungnapha Ta-in said that management is the process of working, activities that cause efficiency and effectiveness in the organization without doing it yourself, and Siripong Ladawan Na Ayudhya, said that management refers to activities related to Operations management to perform various activities occurring in the organization. This is to ensure the organization's work is accomplished according to its objectives. Jang et al. (2018), said that management refers to the art of getting things done until they are accomplished; that is, executives are not practitioners, but art users. In addition, Wisan Sri Mahawaro (2021); Intayot (2021), said that management sometimes refers to the operations, operations of any organization related to people, things and entities, by covering various subjects known as "Management process" or "factors that are important to management" called (PAMS-POSDCORB), including policy management, authority management, moral management, management related to society, planning, organizing Human resource management, administration, coordination, reporting, and budgeting.

Thus, Lyndall Urwick & Luther Gulick outlined seven administrative processes for executives :

P – Planning: Planning and structuring of work including planning to prepare to the planning of working together by different parties
O – Organising: organization, starting from defining the structure, position, authority, responsibility as well as assignments. Divide the work in an orderly manner.
S – Staffing: Management of personnel in the organization ranging from manpower, recruitment, placement, development, etc.
D – Directing: Administration, from the duty of making decisions, giving orders, giving orders to assigning missions to subordinates. as well as leadership.
Co – Co-ordinating: Coordination and activities to let the work achieve its goals well. including coordinating each part to be consistent as well to achieve the highest efficiency.
R – Reporting: Performance reporting from personal to corporate. To know the work of various departments and control to proceed according to the plans that have been set and can be inspected and evaluated
B – Budgeting: budget management, from the budget appraisal, accounting, financial audit to the most cost-effective use of the budget

From the preceding, it was concluded that the definition of management is a set of functions, that determines the direction of the efficient and effective use of resources, which is the ability of an individual or group of people responsible for planning, organizing, organizing people into work, ordering and controlling work for the organization's activities to be carried out following the objectives effectively based on management factors to achieve the goals of the organization and the operation was successful according to the plan set.

Coastal aquaculture concepts

Akber et al. (2020), gave the meaning of aquaculture that, aquaculture means "The art of increasing Aquaculture and aquatic plants" can be seen that may have a short meaning. Nevertheless, it covers the main objectives to increase the

productivity of aquatic animals, whether freshwater, brackish water, saltwater and aquatic plants under controlled or semi-controlled systems. Increase the number of aquatic animals and raise aquatic animals to sustain life Growth, increase in size and weight as goals under confinement or controlled environment conditions. Aquaculture is an art based on science. In operation, it is necessary to apply various sciences as elements to achieve the goal. Benchamasuthin (2007), describes coastal aquaculture as the propagation and reproduction of coastal aquaculture. Coastal aquatic species thrive in coastal areas, including Mangrove areas, mangrove forests, brackish water sources at the mouths of rivers and canals, and lakes, including the utilization of deteriorated mangrove forests in the uplands. Flooded coastal areas and shallow coastal waters include shrimp farming. Brackish fish farming, shellfish farming, crab and seaweed farming, etc.

From the above-mentioned, it was concluded that Aquaculture is the propagation of aquatic animals to increase the number of aquatic animals capable of living, growing, reaching their target size and weight or in conditions that can be controlled according to the environment, and in aquaculture, the scientific basis is required to operate freshwater, brackish, saltwater and aquatic plants under controlled or semi-controlled systems for coastal aquaculture. grows in coastal areas (Mohanty et al., 2018; Buck et al., 2004).

Research Methods

This study was carried out with a Mixed-Method Research approach using quantitative and qualitative research analytics. Research methods and qualitative operations were carried out by Focus Group. To determine the issues for asking questions in the questionnaire in Step 1, The qualitative study uses a specific group chat method, and samples were selected specifically, which include; director, skilled staff and operators. Discuss with them to build trust.

From group discussions through descriptive data analysis in both descriptive statistics analysis (Descriptive Statistic) and hypothesis testing with inferential statistics to seek appropriate policies or recommendations in the cooperation of the government and the people's sector in administration in the Management of coastal aquaculture of the Coastal Aquaculture Research and Development Center Region 3 (Suratthani) with the following steps:

- Specifically selected executives and skilled staff, totalling 5 people, namely 1) Director of the Coastal Aquaculture Research and Development Center, Region 3 (Surat Thani). 2) Aquaculture Raw Material Quality Inspection. Position; Fisheries Academician (skilled) 3) Aquaculture Production Department. Position; Fisheries Academician (skilled). 4) Farming Technician Position; Fisheries Academic Officer (Operator) 5) Administrative Officer (Operator).
- The group conversation was carried out 6 times. The information obtained from the group conversation will be the information used to identify issues for questioning in quantitative research. The researcher operates by himself in organizing group discussions, by observing, take notes and record the audio of the attendees. Analysis of the outcomes of group discussions based

on questions and openness to opinions as issues for quantitative research questions.

- Group discussion results analysis was done by the researcher according to the question. Then summarize the results on the management of coastal aquaculture at the Coastal Aquaculture Research and Development Center, Region 3 (Surat Thani). The researcher asked questions that cover all issues.

In step 2, quantitative research. The researcher determines the method of statistical data analysis by using the data from the testing tools. Arrange them according to the characteristics of the variables, i.e. questionnaires, and used a ready-made statistical computer program to analyze descriptive statistics and inferential statistics. The quantitative research tool includes; collected data from questionnaires, data analysis, such as; mean, percentage, and standard deviation (Brummett & Williams, 2000; Ndanga et al., 2013).

Research Results

The results of the analysis of opinions on coastal aquaculture management of the Coastal Aquaculture Research and Development Center Region 3 (Suratthani) can be summarised as follows.

Table 1
Research results

ISSUE	$\bar{x}$	S.D	Opinion Level
1. Expertise	4.04	0.73	a lot
2. Goal	4.05	0.74	a lot
3. Co-operation	4.00	0.80	a lot
4. Responsibility	4.01	0.79	a lot
Total	4.03	0.75	a lot

The summary of the management of coastal aquaculture of the Coastal Aquaculture Research and Development Center, Region 3 (Surat Thani) as a whole is at a high level. The mean value is 4.03 and when considering each issue can be arranged in descending order as follows: Goal ($\bar{x}$ = 4.05, SD = 0.74) Expertise ($\bar{x}$= 4.04, SD = 0.73) Responsibility ($\bar{x}$) = 4.01, SD = 0.79) and the least aspect is Cooperation ($\bar{x}$= 4.00, SD = 0.80)

Objective 1: To study the management of coastal aquaculture at the Coastal Aquaculture Research and Development Center, Region 3 (Surat Thani). It was in two forms 1) The government sector coordinates with some agencies and organizations to seek the people's opinions in unity, which shows a direct collaboration with the government, hence opening room for mutual understanding. Both in terms of giving information, problem-solving, expression of opinion, and joint decision. To serve as a benefit in terms of coordinating with the government and management of organization conducive for cooperation including joint 2) People's sector. For development and promotion to be successful, it must be supported by the cooperation of the people. To have the

opportunity to participate in decision-making, jointly think together to solve local problems; jointly formulate a plan as well as join in the action and lead to the benefit of the people together with the government (Primavera, 2006; Eng et al., 1989).

Objective 2 studies the problems and obstacles in aquaculture management at the Coastal Aquaculture Research and Development Center, Region 3 (Suratthani). It was found that the problems and obstacles were divided into five areas: 1) Lack of integration 2) Lack of listening to opinions 3) Inadequate public relations and mass communication 4) Lack of necessary basic facilities 5) Lack of adequate management. Therefore, good management in problem-solving should include participation, integration, and awareness-raising. and long-term planning together in terms of human resources, budget, time, and effective strategies.

Objective 3 is to study the guidelines for aquaculture management of the Coastal Aquaculture Research and Development Center, Region 3 (Surat Thani). It was found that there should be agencies and officers to research, develop, improve, continue to improve was is ben done. This makes the management smooth. There should be allocation of budget, recruit more personnel to work because the ones at hand are not enough. Set explicit goals and policies for efficient and effective work. And all personnel should work together, work as assigned in harmony to the best of their ability to achieve the objectives of the agency (Plyth & Craham, 2020; Arnawa et al., 2019).

Discussion of Research Result

- Coastal aquaculture management of the Coastal Aquaculture Research and Development Center, Region 3 (Surat Thani) found that the agency has the potential and prominence of coastal aquaculture. There is the integration of various sectors, including the public, private, and public, to have efficient and comprehensive management, consistent with Insai (2013); Tlopurin (2021). The administrative process for changing organizational culture that facilitates learning consists of; Leaders need to adjust to make what is available to them better in terms of personnel. Environment and management system and organizational structure. Factors that result in the integration of executive-driven management processes In which executives initiate their initiatives, especially leadership in intellectual, emotional, social, media vision and use participatory management. After that, deal with the environment and create a participating atmosphere for all members to participate in expressing their opinions. In the exchange of knowledge, applying knowledge, seeking to create knowledge. Manage people by appointing them as leaders to drive change. Provide personnel, moral, ethical, and democratic competence, and to set up a system and organizational structure to suit the manpower, modernize the database system for the benefit of systematic management.
- Guidelines for the development of aquaculture management of the Coastal Aquaculture Research and Development Center, Region 3 (Suratthani) found that agencies and officials should research, develop, improve what they have been doing to become better and integration of efficient and effective management by clearly assigning people to be responsible. Create

an action plan, set the priority of the action and participative Brainstorming. Therefore, management must rely on cooperation and participation that are integrated systems and aims to create the success of results-oriented management from the same standpoint. which corresponds to Chatakarn (2003); Wasuntara & Gnamsanit (2016); Sangaewut (2020), Said management affects success (1) Top management understands and supports achievement-oriented management, it is successful only when senior management understands and gives full support. That is Supported in the establishment of a performance measurement system. Using Performance Measurement Results, Data budget allocation, motivating the staff to work with the aim of achievement. This includes delegating decision-making powers in exchange for performance responsibility. Establishing a clear mission and strategic plan. The organization's executives must focus on and participate in the process of formulating missions and strategic plans. Objectives and goals to achieve results. Use of performance data in management must keep in mind that measurements do not make performance information that will help managers improve their performance benchmarks. Therefore, management must carefully analyze the information gathered to determine measures to improve performance. (2) Organization of performance information system: The preparation of the performance information system must always take into account that Information systems can show the degree of change in outcomes towards organizational goals. which must be prepared in addition to the original information system. Emphasis on inputs and activities to enable executives to have better information in decision-making. (3) Personnel and Organization Development: Managers at all levels play an important role in the implementation of projects to achieve goals under a results-driven management system. Therefore, it is necessary to develop managers in advance to be able to perform tasks that are responsible for the performance of the work. under conditions of flexibility and increased management power. All executives must know about strategic planning, performance measurement, including the use of performance data to make decisions in daily work. At the same time, there must be a system to develop and train operators to have more diverse expertise. To have the potential to switch roles in an age of rapid change and to understand the measurement and use of performance data in daily operations (Pharcharuen et al., 2021; Incio et al., 2021).

Recommendation

Policy recommendations should be supported by the government, NGOs, and the people as policymakers and practically practice as follows:

- The Coastal Aquaculture Research and Development Center Region 3 has to make changes to the organization to be an organization of learning and management that focuses on results. Including integrated problem solving, creating a vision for management to support learning processes and personnel development. Core Organizations for Integrated Participation and Sustainable Mutual Benefit.

- The Coastal Aquaculture Research and Development Center Region 3 must manage its services organization by creating and implementing organizational management processes following the principles of good governance in the organization.
- The Coastal Aquaculture Research and Development Center, Region 3 must implement Pock's Management Process (POCCC) apply to systematic work, including efficient and effective management.

Recommendation for policy implementation

- The Coastal Aquaculture Research and Development Center Region 3 should establish guidelines for Management in the use of information technology, strategies, visions to participate in the integration of all parties.
- The Coastal Aquaculture Research and Development Center Region 3 requires planning. Management that aims to achieve efficiency and effectiveness in terms of personnel, systems, and facilities.
- The Coastal Aquaculture Research and Development Center, Region 3 must use information technology used in management.

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