Chapter 6
Sustainable Fisheries Under Net-Zero Emissions: A Case Study of the Taiwan Fishery Administration

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Abstract This study focuses on the marine fishing industry, takes Taiwan's fishery authorities as the subject of discussion, collects and compiles documents related to international trends and policy implementation in various countries, incorporates the implemented or planned policies and measures by Taiwan fishery authorities to conduct a comparative analysis on fishery policies in Taiwan and other developed countries, and determines the green policy strategies and opportunities for a low-carbon economy in the context of net-zero emissions. The comparative analysis results were used to examine the gap between the current situation and the future policy goals through the goal, reality, options, and will (GROW) evaluation method. Possible implementation directions to address the gap are discussed. Finally, policy issues within short-, medium-, and long-term plans and possible opportunities are determined through Global Reporting Initiative (GRI) standards materiality analysis and the priority research direction determination method. Priority stakeholders to be considered or involved in each policy stage are identified using the boundary identification method.

Keywords Carbon neutrality · Carbon reduction · Carbon sink · Fishery · Low-carbon economy · Net-zero carbon emissions

6.1 Introduction

Since 1980, the global climate hazards caused by human-made greenhouse gas (GHG) emissions have been confirmed in numerous studies, and after 1990, their threats and impacts on human society have gradually intensified. In 1992, to reduce the possible impact of GHG emissions, the United Nations issued the "United Nations

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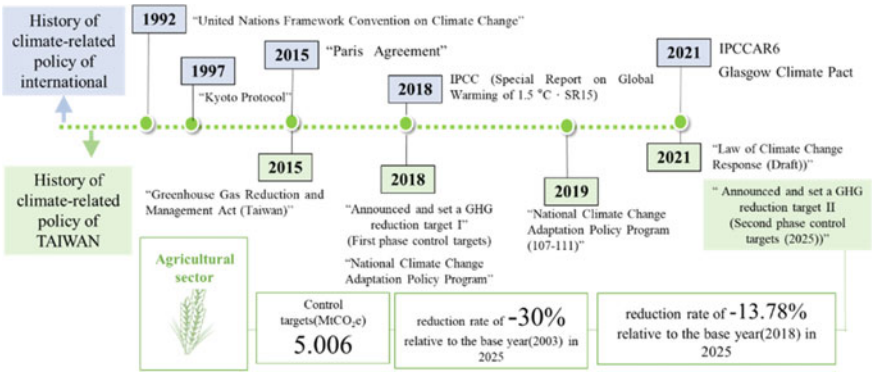

Fig. 6.1 Policy development history of international and Taiwanese agricultural departments in response to climate change and greenhouse gas emissions. *Source* Authors complied from the release of Executive Yuan (Council of Agriculture, Executive Yuan 2021; Ministry of Economic Affairs 2020)

Framework Convention on Climate Change (UNFCCC)". In 1997, the UNFCCC Convention's Third Conference of States Parties passed the Kyoto Protocol to the United Nations Framework Convention on Climate Change, which restricted and negotiated GHG emissions to mitigate the possible damage and impact of GHG emissions (Fig. 6.1) (United Nations 1992).

In response to the international trends and goals of coping with climate change and reducing GHG emissions, the Central Government of Taiwan delegated the Executive Yuan to establish the National Sustainable Development Council in 1997 as well as the Kyoto Protocol Group on Climate Change and the Energy Conservation, Carbon Reduction and Climate Change Group. In 2010, the National Development Council of Taiwan established the "Planning and Promoting Climate Change Adaptation Policy Program and Action Plan" task force and promulgated the "National Climate Change Adaptation Policy Program" in 2012. In 2014, the National Development Council approved the "National Climate Change Adaptation Action Plan (2013–2017)" (Environmental Protection Administration, Executive Yuan 2015a).

The United Nations Framework Convention on Climate (UNFCCC) adopted the Paris Agreement in 1995, which calls on all countries to propose specific reduction and adaptation management measures to address climate change and GHG emissions (United Nation 2015). Taiwan's Central Government appointed the Executive Yuan to take charge of environmental protection. The Environmental Protection Administration of the Executive Yuan issued the "Greenhouse Gas Reduction and Management Act" (Fig. 6.1) (Environmental Protection Administration, Executive Yuan 2015b), which also incorporated climate change adjustments into laws and regulations, laid the legal foundation for Taiwan's response to climate change, and clarified the 2050 long-term reduction targets and related adjustment mechanisms as well as the overall mitigation and adjustment actions required to address climate change (Fig. 6.1) (Environmental Protection Administration, Executive Yuan 2021).

Additionally, the Taiwanese government established a GHG reduction target (relative to the base year 2005), which was divided into four major implementation phases for gradual implementation, i.e., Phase I (from 2016 to 2020), with an annual reduction rate of 2% relative to the base year; Phase II (from 2021 to 2025), with an annual reduction rate of 10% relative to the base year; Phase III (from 2026 to 2030), with an annual reduction rate of 20% relative to the base year; and Phase VI (from 2031 to 2050), striving for an annual reduction rate of 25–30% relative to the base year, to achieve the GHG reduction target set in the "Paris Agreement" (Fig. 6.1) (Environmental Protection Administration, Executive Yuan 2022).

In 2017, the Environmental Protection Administration provisioned and issued the "National Action Plan for Climate Change" in accordance with Item 1 of Article 9 of the Greenhouse Gas Reduction and Management Act to ensure sustainable social, economic, and environmental development through mitigation and adjustment policies (Environmental Protection Administration, Executive Yuan 2021). On October 21, 2021, the Environmental Protection Administration of the Executive Yuan announced that the "Greenhouse Gas Reduction and Management Act" had been amended to the "Law of Climate Change Response (Draft)", which stipulates that the long-term GHG reduction goal for 2050 is net-zero emissions, raises the management level of climate control, and provides future development direction and work items by adding a dedicated chapter on climate change adaptation (Fig. 6.1) (Environmental Protection Administration, Executive Yuan 2021). The draft also incorporates the "carbon tax" levy system, which concerns all walks of life; in the future, carbon fees will be levied on domestic emission sources and imported products with high carbon content (Environmental Protection Administration, Executive Yuan 2021). The Office of Energy and Carbon Reduction of the Executive Yuan also formulated the second phase control targets for six major sectors; i.e., the GHG emissions of the agricultural sector (including agriculture, forestry, animal husbandry, and fishery) must be reduced by 5.006 $MtCO_2e$ by 2025 (by 30% relative to emissions in the base year (2014) and by 13.78% relative to those in 2018) (Environmental Protection Administration, Executive Yuan 2022), of which the fishery industry has a carbon reduction liability quota of 252 $MtCO_2e$ by 2025 (Fisheries Agency of the Council of Agriculture, Executive Yuan 2021).

Net-zero emissions, climate change, GHG emissions, carbon neutrality, and low-carbon economies have increasingly attracted the attention of countries around the world. In order to comply with the overall goal of international net-zero emissions policies (Intergovernmental Panel on Climate Change 2022), in addition to GHG reduction measures that are already in place in fishery entities, it is necessary to continue to include more specific and feasible issues and potential adjustments in the future and strive to achieve the designated reduction target in 2030 as a part of the net-zero and carbon–neutral targets of 2050 in line with international trends.

Regarding coping with climate change and GHG emissions policy planning and adaptation policy development, countries around the world are divided into developed countries, developing countries, and undeveloped countries based on the degree of national development. The degree of national development may affect the feasibility

of policy implementation and adaptation options in a particular region (Intergovernmental Panel on Climate Change 2022). However, most countries in the world that have explicitly included net-zero emissions, climate change, GHG emissions, and carbon neutrality in their fishery policy plans are developed countries (e.g., the United States, United Kingdom, the European Union) (European Commission 2020; Climate Watch 2021; Stephenson and Johnson 2021; Ministry of Agriculture 2022). However, relevant information and studies for developing countries are still lacking or are still in the planning stage. Therefore, this study selects Taiwan, which is categorized as a country that is between the developed and developing stages, as the subject of study and analysis, hoping that the results of this study will provide a reference for countries with development levels similar to that of Taiwan.

The specific objectives of this study are as follows:

(1) Introduce the actions of Taiwan's fisheries authorities related to GHG reduction policies and the benefits of actual policy implementation.
(2) Introduce policy plans or regulations formulated by developed countries for fisheries, such as the United States, Japan, the European Union, Germany, and the United Kingdom, and compare those policies with Taiwan's current policies.
(3) Determine feasible future operational issues, priority research directions (PRDs), and sustainable development opportunities for the industry surrounding this issue.

6.2 The Policy Planning and Potential Opportunity of Taiwan's Fishery Administration to Develop a Low-Carbon Economy

6.2.1 Policy Evaluation Framework and Process

The research object of this study is the "fisheries industry". It formulates the "Net-zero Emissions policy for fishery industry" main assessment framework, referring to the "Rolling Amendment to Risk Management Processes in Response to Climate Change" proposed by the Organization for Economic Co-operation and Development (OECD) in 2013 as the main assessment framework, method, and process for this plan through three steps: step 1—define the evaluation objectives and assess the current situation; step 2—identify policies and international integration; and step 3—explore potential policy opportunities. In addition, based on common practice, we categorize the policy implementation path into two modes of operation: "top-down" and "bottom-up" (Fig. 6.2).

Step 1: Define evaluation objectives and assess the current situation

In step 1, a bottom-up issue identification method is adopted. The issue of concern is mainly the industry's views of the issue and how to maintain production in

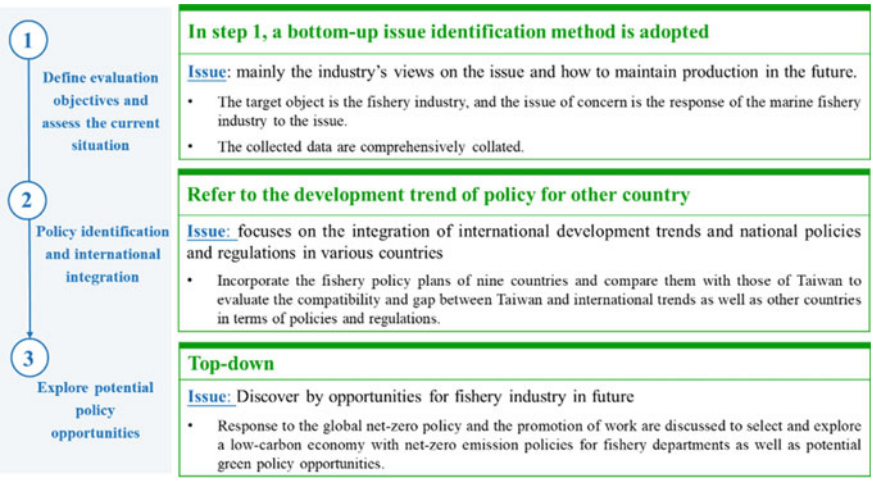

Fig. 6.2 Evaluation framework and process of the marine fishing industry in response to net-zero emission policies

the future. The target object is the fishery industry, and the issue of concern is the response of the marine fishery industry to the issue; the collected data are comprehensively collated (Fig. 6.2).

Step 2: Policy identification and international integration

This step focuses on the integration of international development trends and national policies and regulations in various countries. In this step, we incorporate the fishery policy plans of nine countries and compare them with those of Taiwan to evaluate the compatibility and gap between Taiwan and international trends in terms of policies and regulations (Fig. 6.2).

Step 3: Explore potential policy opportunities

Based on the overall integration and analysis results for steps 1 and 2, the future development trends for the marine fishery industry in response to the global net-zero policy and the promotion of work are discussed to select and explore a low-carbon economy with net-zero emission policies for fishery departments as well as potential green policy opportunities.

6.2.2 Methods of Policy Evaluation

To complete steps 1–3 described above, various methods, such as document analysis, materiality and topic boundary assessments of the Global Reporting Initiative (GRI) standards, and qualitative comparative analysis, are used.

(1) Document analysis

This research project addresses Objectives 1 and 2 by identifying the issues and collecting the results of studies in China and abroad on net-zero policies or national policies for the marine fishery industry to understand the current policy and regulatory situation at the legal level in countries around the world. It also summarizes and comparatively analyzes the gaps between current policy planning by Taiwan's fishery administration units and policies in other countries to formulate specific development goals for future technological, regulatory, and administrative tools.

(2) Materiality and topic boundary assessment of the GRI standards

To address Objective 2, the standards issued by the GRI are used as a framework to establish a process for identifying major topics for the development of Taiwan's fishery authorities and for identifying potential major issues. We also comparatively analyze the policies or governance practices implemented by Taiwan's fishery management units relative to current planning policies or the legal directions of various countries in the world for the results of document analysis.

(3) Evaluate future policy implementation goals

When implementing net-zero emission policies and scientific studies in the future, fishery authorities will face potential issues regarding target gaps, target discrepancies, current situation analysis, existing resources, feasibility planning, and specific and feasible action plans. In this context, we refer to the four elements of reflection of the "GROW" communication and dialogue model proposed (i.e., goal, reality, options, and will) to evaluate future policy implementation goals in the Taiwan Fisheries Agency (John 1992).

(4) Boundary identification and evaluation of PRDs and stakeholders

To address Objective 3, this study uses PRDs to make recommendations on technological development issues necessary for future policies and uses the stakeholder boundary identification and evaluation method to determine the short-term (within 3–5 years) and medium- and long-term (6–10 years) priorities and the recommended internal boundary (including other central-level and local-level units) of participants and external boundary of stakeholders (including fishery operators and communities) to be considered and incorporated when formulating policies.

6.2.3 Overview of GHG Reduction Policies of the Taiwan Fisheries Agency

The fisheries authorities of Taiwan (i.e., the Fisheries Agency of the Agricultural Council of the Executive Yuan) are subordinate to the agricultural department (i.e., the Agricultural Council of the Executive Yuan) based on the administrative powers and responsibilities of the administrative department. In terms of business scope, it is divided into two categories: marine capture fisheries and aquaculture fisheries. In

terms of legal classification standards for the operating sea area, marine fishing can be divided into three subcategories: coastal fisheries, offshore fisheries, and pelagic fisheries.

Based on the current adjustment strategy framework of Taiwan's agricultural sector in response to climate change, net-zero policies are divided into five categories: "adjustment measures", "agricultural green energy", "agricultural carbon sinks", "recycling agriculture", and "reduction measures". The policy planning paths can be subdivided into three sub-issues, i.e., "Conservation", "Ecology", and "Industry," based on the presence or absence of issues related to agricultural (fishing) industry operations (Council of Agriculture, Executive Yuan 2021). This study focuses on "agricultural (fishery) operation issues" and "industry" and selects "reduction measures" as the main research topic for subsequent exploration.

In response to the international trend of reducing GHG emissions, the current policies of the Taiwan Fisheries Agency are aimed at reducing the amount of fuel burned during fishery production, processing, transportation, and marketing. Specific administrative actions have also been adopted with respect to four directions, i.e., "fishing vessel fuel reduction", "energy-saving equipment", "reward for a fishing moratorium", and "fishing vessel (raft) buy-out", to achieve low-carbon economy goals by reducing carbon emissions through GHG reducing measures while maintaining fishery economic activities (Fisheries Agency of the Council of Agriculture, Executive Yuan 2021).

From 1990 to 2018, among CO_2 emissions from combustion in the energy sector in Taiwan, those from fuel combustion in the first-tier industries of agriculture, forestry, fishery, and animal husbandry accounted for approximately 16.27% (approximately 4000 thousand metric tons (CO_2 equivalent)). The items included in the calculation included connection tools, pump fuel combustion, and other uses of fuel for agriculture, forestry, fishery, and animal husbandry. To achieve the 252,000 metric ton CO_2 target of the fishery sector's carbon reduction liability quota in 2025 (Fisheries Agency of the Council of Agriculture, Executive Yuan 2021), relevant carbon reduction measures and practices have been implemented since 2002 (Environmental Protection Administration, Executive Yuan 2021). The following are the carbon reduction measures and the implementation effects of the measures for the marine fishing industry:

(1) Buy-out of fishing vessels (rafts) and reduction in fishing vessel fuel use

The primary aim of this policy is to reduce CO_2 emissions during fishery operations through the buy-out of fishing vessels (rafts) to reduce fuel and energy use while easing the pressure on fishery resources caused by fishery operations. Since 2000, Taiwan's fishery administration units have begun to implement a plan to decrease the number of fishing vessels; since 2007, they have begun to encourage fishery operators to install voyage recorders [Voyage Data Recorder (VDR) and Vessel Monitoring System (VMS)] to conduct fuel calculations for operations; and from 2016 to 2020, a total of eight fishing vessels and 166 fishing rafts have been bought out, resulting in a total carbon reduction of 21.33 thousand metric tons of CO_2. It is estimated that 200 fishing vessels will be bought

out from 2023 to 2025, with an expected carbon reduction of 45.7 thousand metric tons of CO_2 by 2025 (EQUATION: Emissions (kg/CO_2) = the amount of fuel consumed by each fishing vessel and raft type between the activities of the fishing operation (in megajoules, MJ) × Emission Factor for each fishery type ($kg\ CO_2/MJ$) (Intergovernmental Panel on Climate Change 2022) (Figs. 6.3 and 6.4) (Fisheries Agency of the Council of Agriculture, Executive Yuan 2021).

(2) Reward for a fishing moratorium

In 2018, the Taiwan Fisheries Agency revised Article 59-1 of the Fisheries Law and established the "Voluntary Fishing Moratorium Incentive Measures" to increase the incentives for fishing moratoriums and the willingness of Taiwan's production fisheries (including coastal and offshore fisheries) to cease fishing. This policy measure relies on owners of fishing vessels (rafts) voluntarily adjusting the number of operating days at sea and the number of days of berth in harbors, actions that will not only reduce fuel consumption but also allow fishery resources more time to grow and regenerate. For example, in 2020, CO_2 emissions were reduced by 80.4 thousand metric tons through fishing moratorium incentives in coastal fisheries, and this decrease will be maintained every year through 2025. Regarding fishing moratoriums and taking the net fishing industry as an example, which accounts for the highest proportion of Taiwan's coastal fishery production, if the current fishing moratorium is maintained, CO_2 emissions will be reduced by 3.674 thousand metric tons each year, and the total annual reduction in CO_2 emissions through fishing moratorium incentives will be 84.074 thousand metric tons of CO_2 (EQUATION: Emissions (kg/CO_2) = the amount of fuel consumed by each fishing vessel and raft type between the

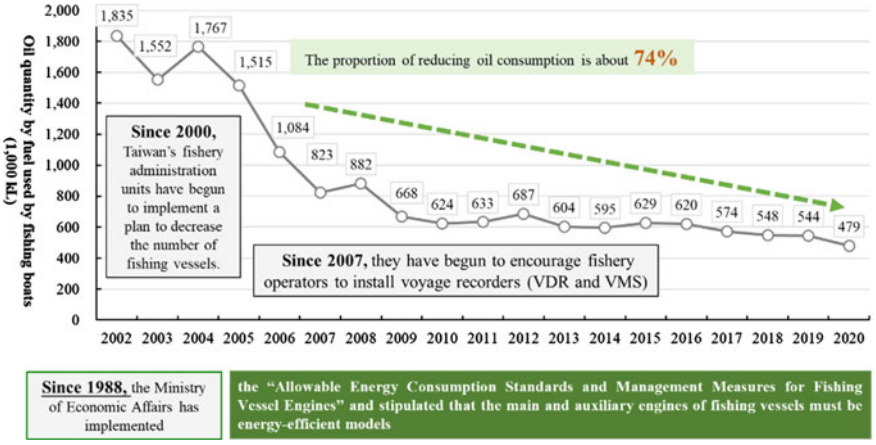

Fig. 6.3 Effectiveness of Taiwan's fishery administration units in implementing fishing vessel (rafts) buy-outs and reducing fuel used by fishing boats for reducing carbon emissions. *Source* Authors complied from the release of Executive Yuan (Council of Agriculture, Executive Yuan 2021)

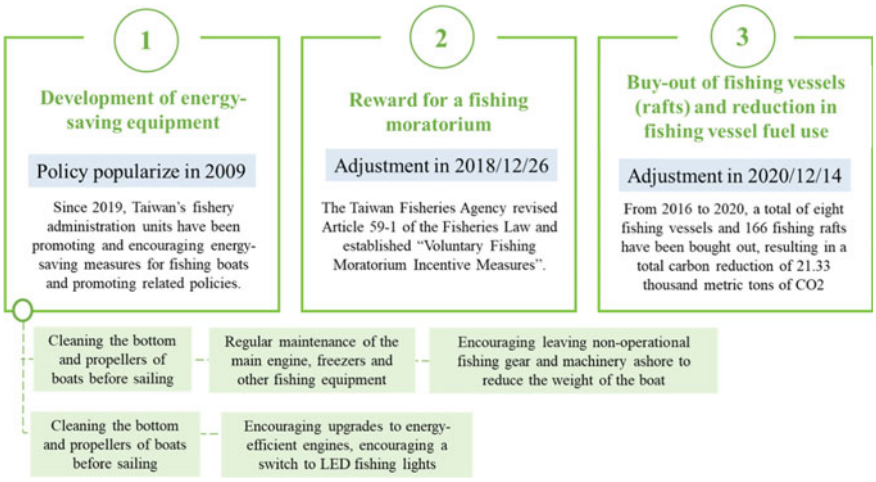

Fig. 6.4 Effectiveness of Taiwan's fishery administration units in implementing policy measures by fishery industries for other low-carbon economies for reducing carbon emissions. *Source* Authors complied from the release of Executive Yuan (Fisheries Agency of the Council of Agriculture, Executive Yuan 2021)

activities of the fishing operation (megajoules, MJ) × Emission Factor for of each fishery type (kg CO_2/MJ) (Intergovernmental Panel on Climate Change 2022) (Fig. 6.4) (Council of Agriculture, Executive Yuan 2021).

(3) Development of energy-saving equipment

Since 1988, the Ministry of Economic Affairs has implemented the "Allowable Energy Consumption Standards and Management Measures for Fishing Vessel Engines" and stipulated that the main and auxiliary engines of fishing vessels must be energy-efficient models (Ministry of Economic Affairs 1988). Since 2019, Taiwan's fishery administration units have been promoting and encouraging energy-saving measures for fishing boats and promoting related policies. The main implementation projects include encouraging upgrades to energy-efficient engines; encouraging a switch to LED fishing lights; counseling for low-interest loan applications; cleaning the bottom and propellers of boats before sailing; regular maintenance of the main engine, freezers, and other fishing equipment; and encouraging leaving non-operational fishing gear and machinery ashore to reduce the weight of boats (Fig. 6.4) (Fisheries Agency of the Council of Agriculture, Executive Yuan 2021).

6.2.4 *Comparative Analysis of Implementation Policies of Taiwan's Fishery Administration Units and Reduction Policies of Other Countries*

To cope with the impact of climate change on the industry and to achieve the global net-zero goal by 2050, Taiwan's fishery administration units have implemented relevant policies or administrative measures to reduce carbon emissions while maintaining the economic activities of its fishery industry (Fig. 6.5). However, in addition to the implemented policies and measures, to achieve the overall policy planning goals of Taiwan's agricultural sector, it is still necessary to identify potential issues regarding fishery production, the environment, the community, and the economy.

In this regard, this study uses the standards issued by the GRI as a framework to construct a process for identifying major issues related to the development of Taiwan's fisheries and compares the implementation direction of current plans of various countries with Taiwan's implemented or planned policies to identify the potential issues of the net-zero emission reduction path. The following major issues were identified:

(1) With respect to the environment and production, the main planning topics include applying fishery machinery, electrifying fishing vessels, introducing hydrogen fuel cells, adopting low-carbon fishery practices, developing smart agriculture (fisheries), introducing smart fisheries technology, developing data-driven smart supply chains, developing aquatic products with low GHG emissions, and improving fishery production equipment. The main countries for

	Major issues	Countries of have used or planned to relevant policy	Policy path	Taiwan
Environment and production	Planning topics of the applying fishery machinery	UK, Canada, France, Germany, Denmark	Carbon reduction	V
	Planning topics of the applying fishery machinery and electrifying fishing vessels	Japan	Carbon reduction	V
	Introducing hydrogen fuel cells	Japan	Carbon reduction	-
	Adopting low-carbon fishery practices	Japan, U.S.A.	Carbon reduction	V
	Developing smart agriculture (fisheries)	South Korea	Carbon reduction	V
	Developing data-driven smart supply chains	Japan	Carbon reduction	-
	Developing aquatic products with low GHG emissions	Japan, New Zealand, Germany	Carbon reduction	V
	Improving fishery production equipment	Japan, UK	Carbon reduction	V
Community and the economy	Establishing energy systems for local producing and consuming	Japan	Carbon reduction	V
	Innovating material recycling industries	Japan	Carbon reduction	V
	Introducing recycling economy models	Japan	Carbon reduction	V
	Establishing a global growth scenario ratio conversion system	Denmark	Carbon reduction	-
	Establishing a mechanism for offsetting emission quotas	Denmark	Carbon reduction	-

Fig. 6.5 Results regarding the major policy planning issues for developed countries and Taiwan's fishery authorities. *Source* European Commission (2020), Climate Watch (2021), Stephenson and Johnson (2021), Ministry of Agriculture (2022), Ho (2021)

comparative analysis are the United Kingdom, Canada, South Korea, Germany, Denmark, the United States, Japan, the European Union, etc. (Fig. 6.5) (European Commission 2020; Climate Watch 2021; Stephenson and Johnson 2021; Ministry of Agriculture 2022).

Regarding the abovementioned important international carbon reduction policy issues, those applicable to the policies implemented by Taiwan's fisheries authorities include improving feed formulation, applying fishery machinery, adopting low-carbon aquaculture operations, developing smart agriculture (fishery), introducing smart fisheries technologies, using feed additives, developing a data-driven intelligent supply chain, developing aquatic products with low GHG emissions, and improving fishery production equipment (Fig. 6.5) (Council of Agriculture, Executive Yuan 2021).

(2) With respect to the community and the economy, the main planning topics of the reduction policy include establishing energy systems for local producing and consuming fishing villages, innovating material recycling industries, introducing recycling economy models, establishing a global growth scenario ratio conversion system, and establishing a mechanism for offsetting emission quotas. The countries for comparative analysis are Japan and Denmark (Fig. 6.5) (Climate Watch 2021; Ministry of Agriculture 2022).

Regarding the abovementioned important international carbon reduction policy issues, those applicable to Taiwan's fisheries authorities include establishing energy systems for local producing and consuming fishing villages, innovating material recycling industries, and introducing recycling economy models (Fig. 6.5) (Council of Agriculture, Executive Yuan 2021).

6.2.5 Gaps and Specific Action Plans of Carbon–Neutral Targets of Fishery Policy Implementation in the Future

The core goal of the 2050 international net-zero policy and the overall goal of establishing a policy strategy and path in line with the characteristics of Taiwan's marine fishing industry will be achieved from the perspective of the current policy objectives and state of the policy implementation of Taiwan's fishery administration units. The gap between national policy objectives and fisheries authorities is mainly due to six major issues: (1) insufficient relevant information (primary reason); (2) prioritization of technological development needs; (3) applicability of policy issues to the industry; (4) lack of supporting administrative tools and regulations; (5) lack of a specific assessment methodology for Taiwan; and (6) integrating the policy tools used by other countries into international trends (Fig. 6.6).

Based on the existing resources of the fishery administration units and the results regarding the key topics of target audiences, the communication channels between experts and scholars, the collection and collation of relevant literature, and the construction of a fishery policy evaluation framework, it is necessary to focus on

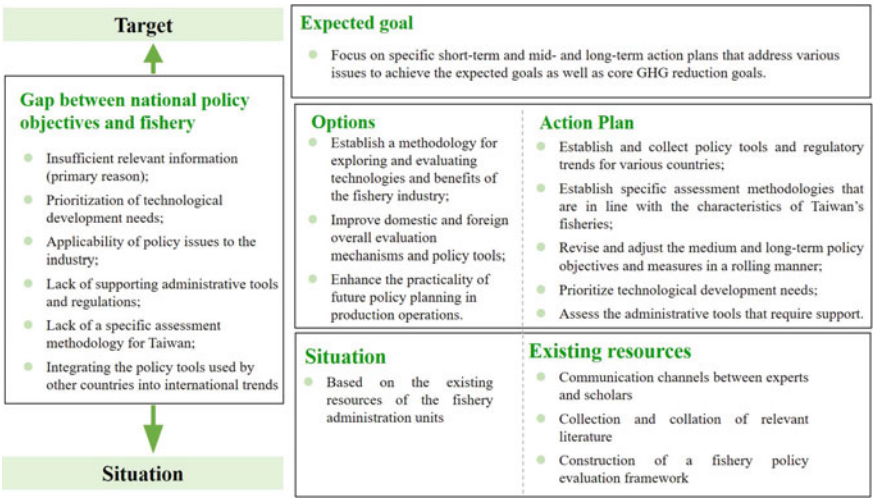

Fig. 6.6 Gap and specific action plan analysis of carbon–neutral and low-carbon economic policy goals implemented by Taiwan's fishery authorities

specific short-, medium-, and long-term action plans that address various issues to achieve the expected goals as well as core GHG reduction goals. The plans include the following: (1) establish a methodology for exploring and evaluating technologies and benefits of the fishery industry; (2) improve domestic and foreign overall evaluation mechanisms and policy tools; and (3) enhance the practicality of future policy planning in production operations (Fig. 6.5).

To implement these core goals, specific objectives, and action plans, the following tasks need to be accomplished: (1) establish and collect policy tools and regulatory trends from various countries; (2) establish specific assessment methodologies that are in line with the characteristics of fisheries industry; (3) revise and adjust the medium- and long-term policy objectives and measures in a rolling manner; (4) prioritize technological development needs; and (5) assess the administrative tools that require support (Fig. 6.6).

6.3 Conclusion and Policy Recommendations

To focus on future ocean carbon sinks to facilitate subsequent investigations, shorten the research period, and effectively promote studies, PRD recommendations are provided regarding the issues of implementing a "low-carbon economic policy" and of development opportunities for Taiwan's fishery authorities based on GROW model results and the identification of stakeholder boundaries. The priority stakeholders to

be included in joint participation and discussions must be determined when implementing sub-policy issues or emissions reduction measures to improve the compatibility between the implementation of fishery policies and "the fishery industry" and the applicability of these policies in the industry. The priority recommendations for major issues or specific action issues are divided into short-term immediate priority issues (3–5 years) and medium- and long-term governance (6–10 years) policy issues. The specific content is described below.

Short term (3–5 years): Policy planning recommendations for prioritizing the implementation of short-term policy measures include establishing specific evaluation methodologies for Taiwan's marine fishing industry, collecting and collating policy tools of and regulatory trends for various countries, evaluating the prioritization of technological development needs, establishing a cooperative participation mechanism for the industry and stakeholders, facilitating continuous communication and discussion among ministries and councils, and establishing policy strategies and paths in line with the characteristics of Taiwan's marine fishery industry. In the implementation process, priority should be given to external industry stakeholders, including front-line personnel in the industry, such as fishery operators, fishing village communities, suppliers, and sellers (Fig. 6.7).

Medium and long term (6–10 years): Policy planning recommendations for implementing medium- and long-term policy measures include revising and adjusting medium- and long-term policy objectives and measures in a rolling manner, evaluating administrative tools that require support, facilitating continuous communication

Priority research directions (PRDs)	Recommendations for prioritizing		Internal stakeholders		External industry stakeholders	
	Short-term	Mid- and long-term	other central ministries	local fishery administration units	Fishery operators	Fishing village communities
Establishing specific evaluation methodologies for Taiwan's marine fishing industry;	V	-	-	-	V	-
Collecting and collating policy tools of and regulatory trends for various countries;	V	-	-	-	-	-
Evaluating the prioritization of technological development needs	V	-	V	-	V	-
Establishing a cooperative participation mechanism for the industry and stakeholders;	V	-	-	-	V	V
Revising and adjusting mid- and long-term policy objectives and measures in a rolling manner;	-	V	V	-	-	-
Evaluating administrative tools that require support;	-	V	-	V	-	-
Facilitating continuous communication and discussion among ministries and councils;	V	V	V	V	-	-
Revising and adjusting policies in a rolling manner;	-	V	V	-	-	-
Establishing policy strategies and paths in line with the characteristics of Taiwan's marine fishery industry.	V	-	V	-	V	-
Achieve the expected goals as well as core GHG reduction goals	-	-	V	V	V	V

Fig. 6.7 Low-carbon economic policy implementation PRD recommendations for Taiwan's fishery authorities and stakeholder boundary identification and evaluation

and discussion among ministries and councils, and revising and adjusting policies in a rolling manner. In the implementation process, priority should be given to external industry stakeholders (e.g., fishery operators) and internal stakeholders (e.g., other central ministries and local fishery administration units) (Fig. 6.7).

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