Handbook

Socioeconomic Data Collection

in Small-scale Fisheries

(Based on SEAFDEC Experiences)

Southeast Asian Fisheries Developement Center
Training Department

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Contents

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Acronyms and Abbreviations

KES Key Elements of Socioeconomic Data collection

IOC Index of item objective congruence

EC/IRB Ethics committee/Institutional Review Board

CPUE Catch Per Unit Effort

Glossary

Access and control: Access to and control over the resources and benefits of the men and women, to examine their participation level, and to analyze decision-making processes for their own lives and the development of their community.

Aging society: A population where the proportion of elderly people is increasing, typically due to longer lifespans and lower birth rates. This shift leads to challenges such as higher demand for healthcare, pensions, and changes in the workforce.

Catch Per Unit Effort (CPUE): A measure used in fisheries to assess the abundance of a fish population by calculating the number of fish caught relative to the effort expended, such as the time spent fishing, or the number of traps used. It serves as an indicator of fish stock health, with declining CPUE often suggesting overfishing or a decrease in fish population.

Data cleaning: It is the process of identifying and correcting errors, inconsistencies, and inaccuracies in a data set to improve its quality and reliability. It is essential to ensure that data analysis gives correct and reliable results, leading to valid conclusions.

Data validation: It is the process to ensure that data is correct, complete, and reliable before it is used for analysis. It involves checking data for errors, consistency, and correct formats to ensure its quality. Besides, it is important to involve the community that provided the data.

Decision-making: The cognitive process of selecting a course of action from multiple alternatives to achieve a desired outcome. It involves evaluating options, weighing risks and benefits, and making choices based on logic, intuition, or both, to solve problems or seize opportunities.

Division of labor or Activities Profile: to identify roles, responsibilities, experiences, knowledge, skills, problems, needs, interests, etc. in the target area.

Ethics committee/Institutional Review Board (EC/IRB): a committee established by an institution to review, approve, and monitor research involving human subjects, ensuring that the research is conducted ethically and in compliance with regulatory standards.

Gender: Refers to the relations between men and women and the socially constructed roles acceptable for each sex.

Gender equality: Gender equality is the concept that all human beings are free to develop their abilities and make choices without the limitations set by strict gender roles; and that the different behaviors, aspirations, and needs of women and men are considered, valued, and favored equality.

Index of item objective congruence (IOC): used to evaluate how well individual test items (questions, tasks, etc.) align with the objectives or criteria they are supposed to measure. It's a way to ensure that each item is relevant to the overall goals of the assessment.

Key element of socioeconomic (KES): factors within an economy and society that influence the living conditions and economic prospects of its members.

Microcredit: The provision of small loans to individuals, typically in low-income or underserved communities, to help them start or expand small businesses and improve their economic conditions. It aims to provide financial inclusion for those who lack access to traditional banking services, often empowering entrepreneurs, especially women, in developing countries.

Numerical: Refers to data that is expressed in numbers, such as age, income, or measurements. This type of data can be counted or measured and is often used in research and analysis.

Population characteristics: Provide a detailed description of the qualities or attributes of the individuals within the population. These can include factors such as age distribution, gender ratio, ethnicity, education level, occupation, income, health status, and cultural background.

Population structure: The composition or organization of the population. It typically involves the distribution of individuals across different

categories, such as age groups, sex, marital status, and geographic location. Population structure often focuses on the arrangement and proportions of these categories within the population, such as the proportion of children, working-age adults, and elderly people.

Primary data: It is original, first-hand information collected by the researcher specifically for a study. It is gathered through methods such as surveys, interviews, observations, experiments, questionnaires, and focus group discussions. This data is tailored to meet the study's objectives. Primary data is unique, directly sourced, controlled by the researcher, and up to date.

Productive roles: Activities that generate income or contribute economically, such as paid employment, farming, or business. These roles are typically valued more highly in society than unpaid reproductive work, as they directly contribute to economic growth and financial stability.

Program R: A powerful open-source programming language used for advanced statistical computing and data visualization.

Reproductive roles: Involve tasks related to household care and family maintenance, such as childbearing, caregiving, and domestic work, typically unpaid and traditionally assigned to women. Although essential for family well-being, these roles are often undervalued compared to paid productive work.

Resilience: Resilience is defined as the ability of a system to maintain key functions and processes in the face of stresses or pressures by resisting and then recovering from or adapting to change. It can be applied to both ecological systems and social systems (*e.g.*, human communities). It can also be applied to the systems that communities depend on, such as economic systems that sustain livelihoods, governance systems that undertake planning and management, or the built environment (*e.g.*, infrastructure and housing)

Secondary data: It is information that has already been collected, processed, and published by others, usually for a different purpose than the current research. It can be accessed through government reports, academic journals, etc. Secondary data is cost-effective, easily accessible, and provides a broad context for research. It is useful for background information, and comparative analysis. However, it may not always be as specific or current as primary data.

SPSS: A user-friendly tool for managing and analyzing complex datasets, especially for statistical analysis and hypothesis testing.

Supply Chain: The network of organizations, people, activities, information, and resources involved in producing and delivering a product or service, from raw materials to the final customer. It encompasses processes like sourcing, manufacturing, logistics, and distribution, ensuring an efficient flow of goods and services.

Survey team: A group of individuals, officers, or researchers responsible for gathering and analyzing data related to the social and economic aspects of small-scale fisheries.

Vulnerability: The susceptibility of individuals or groups to harm, often due to factors like poverty, social exclusion, or environmental risks. It highlights the inability to cope with, resist, or recover from adverse conditions, making certain populations more exposed to risks and hardships.

1. Executive Summary

The handbook "Socioeconomic Data Collection in Small-scale Fisheries" was developed based on SEAFDEC's experiences and contributions from resource persons at Kasetsart University, Prince of Songkla University, the Department of Fisheries, Thailand, and the Ministry of Marine Affairs and Fisheries, Indonesia. The objective of this handbook is to serve as a practical guide, providing examples of data sources and types of their key elements, for fisheries officers working in the field of small-scale capture fisheries on how to collect and analyze socioeconomic data. However, this handbook only provides instruments for interviewing small-scale fisheries.

By using this handbook, fisheries officers can better understand the methods for socioeconomic data collection and its key elements, such as income, employment, education, and access to resources, which significantly influence the success of fisheries management interventions. The handbook provides a step-by-step guide to the socioeconomic data collection process, including the following steps:

1. Defining goals and objectives
2. Constructing study design
3. Sampling design
4. Conducting data collection
5. Inputting and analyzing data
6. Reporting the results

The handbook aims to equip fisheries officers with the knowledge, tools, and examples needed to gather essential socioeconomic data that can inform policy and management decisions.

2. Introduction

Socioeconomic data collection on small-scale fisheries can provide baseline information and is essential for understanding the status and challenges faced by small-scale fisheries. Accurate and comprehensive data enables informed decision-making, ensuring that management actions or strategies meet the fishing community's particular needs. Without reliable data, it becomes difficult to develop an effective fisheries management plan and evaluate the success of interventions.

Socioeconomics refers to the interaction between social and economic indicators within a society. It encompasses the ways in which a person's economic status affects their social conditions and vice versa. There are various key elements of socioeconomic indicators such as income, education, occupation, family background, and access to resources, all of which influence an individual's or community's quality of life, opportunities, and overall well-being.

This handbook provides detailed information and specific instructions to collect socioeconomic data in small-scale fisheries focusing on capture fisheries (which can be applied to aquaculture) and some information on analysis at the site level. This handbook is provided for Southeast Asia due to similar characteristics of small-scale capture fisheries. It is useful for fisheries managers to assess, predict, and manage small-scall capture fisheries in a socioeconomic approach. It is also practical for scientists for socioeconomic data collecting because it offers a research design as well as a questionnaire sample. The limitation of this handbook is that it does not cover the possible specific socioeconomic data (*i.e.* it does not specifically discuss gender in a specific way).

An understanding of socioeconomic data collection methods and analysis is necessary for officers and policymakers. Community or individual behavior towards fisheries resources has considerable implications on the environment. The dynamics of socioeconomic conditions need to be aware of by the policy makers to determine some policies effectively. Therefore, the handbook aims to provide basic knowledge and guidance for fisheries officers working in the field of small-scale capture fisheries to select cost-effective and reliable socioeconomic data collection methodologies related to the objectives of their study, including contributing to the development of a more sustainable and resilient small-scale fisheries management plan.

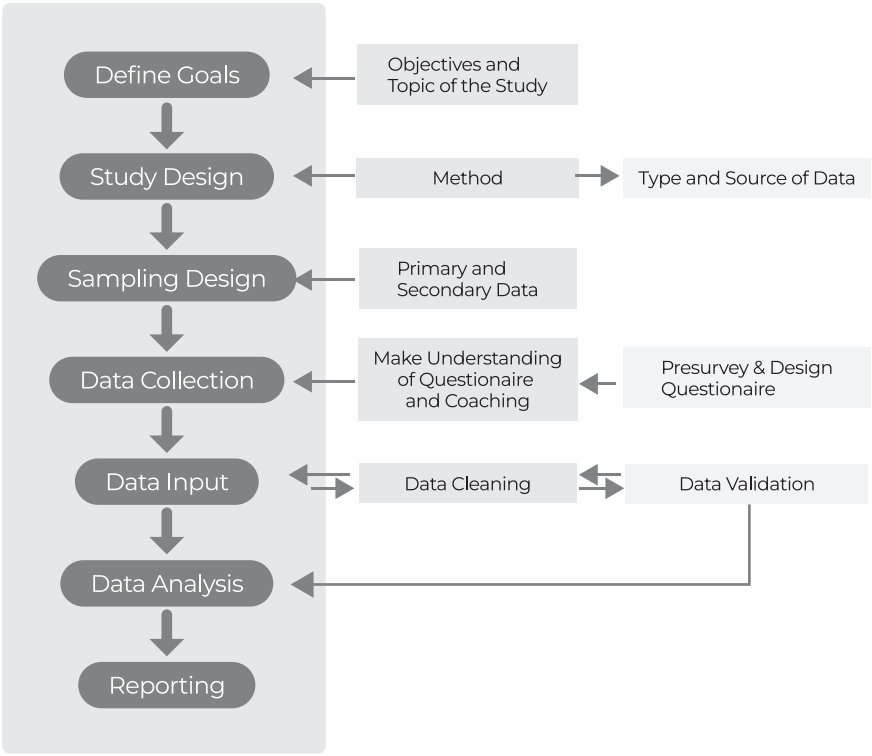

Figure 1. The process of data collection using questionnaire

3. Process of data collection using questionnaire

The process of data collection using a questionnaire involves several key steps to ensure accuracy, reliability, and validity. It begins with defining the study's goals, objectives, and research questions, followed by developing an appropriate study design and selecting the data collection method. The questionnaire is then designed, pre-tested, and validated to ensure clarity, relevance, and reliability, with any necessary improvements made based on feedback. Ethical approval is sought from relevant bodies, such as Institutional Review Boards (IRB), to ensure the study complies with ethical standards. A sampling design is developed to identify the target population and select the most suitable sampling method.

During the data collection phase, both primary and secondary data are gathered, with clear instructions and proper training provided to data collectors to maintain consistency and accuracy. The collected data is then proceeded, cleaned to address any errors or inconsistencies, and analyzed using appropriate statistical techniques. Finally, the findings are compiled into a comprehensive report that addresses the research objectives and provides meaningful insights and recommendations.

3.1 Defining goals and objectives

Firstly, the survey team needs to understand and define the goal and purpose of the study.

Goals and objectives identification: This is the process of defining what you want to achieve with your survey or study. Following is the example of the goal and objectives:

Goals: The goal is the main aim of your survey or research. It describes what you want to achieve in a simple and general way.

Objectives: Objectives are specific and should be directly related to the goal and clearly outline what you intend to achieve.

Topic of the study

The topic should be an interesting issue, clear and concise, and reflect the goal and align with the objectives of the study. The research objectives draw conclusions and provide actionable recommendations based on the study's results.

Box 1. Example of goal, objectives, and topic of the study

Goal	To improve the sustainability of small-scale fishers' livelihood
Objectives	1. Improve market access and fair trade, and 2. Increase income diversification
Topic	Assessing Strategies for Market Access in Small-scale Fisheries and Enhancing Income Diversification to Improve Livelihood Sustainability

3.2 Constructing study design

After defining and setting your objectives, you'll have a clear understanding of what you aim to achieve and what methods need to be used to achieve them. Therefore, it produces a conclusion that is expected and can be useful for the author or other parties related to the research being conducted. Research method is a primary way of working, to test basic hypotheses/assumptions using certain techniques and tools.

3.2.1 Type of data

Primary and secondary data

After establishing the methods you need to undertake to achieve your objectives, you'll have a clear understanding of what data needs to be collected. It's essential to review secondary data to gather information that will help in planning your sampling and questionnaire design. The secondary data should include:

- **Demographic information:** Useful for determining the sample size.
- **Research in the area:** Crucial if your data collection involves comparison.
- **Other relevant information:** Relevant to your objectives.

However, if you need specific and up-to-date information that is directly relevant to your study, you can collect the primary data through surveys, interviews, observations, and focus group discussions.

3.2.2 Source of data

A data source is any location people or community where you can find information, figures, or other relevant facts to support your study. This section determines how the data is collected. For example, whether this study will use a sample size of fisheries households or in-depth interviews with some key informants.

In fishing practices, generally in one location, there may be different types of boats, length of boat, gross tonnage, or even fishing gear utilized. It is necessary to look carefully at those different characteristics to produce a keen conclusion that is expected.

Box 2. Example of study design

Objectives	1. Improve market access and fair trade 2. Increase income diversification

Type of data	Source of data
Primary data	
- Market channel	- Fish monger, exporters
- Average income	- Fishers, house' wife
- Number of fish monger	- Head of villages
Secondary data	
- Market Channels	- Research papers, websites
- Number of : exporters, processing plants	- Statistical reports of relevant Departments, websites

3.2.3 Key elements and questionnaire design

The key elements of socioeconomic are composed of both economic and social conditions that influence the behavior, status, and opportunities of individuals or groups within a society. Some factors can be included as shown in Table 1.

Table 1. The key elements of socioeconomic and their characteristics

Category	Key Element of Socioeconomic	Indicate
1. Demographics	**Population and Household Characteristics:**	
	Age	- Population structure (age distribution, workforce composition) - Economic & social impacts: economic dependence, financial planning, social roles and status - Knowledge transfer and skill development - Health and well-being - Youth engagement in fisheries (regeneration of fishers) - Trend of community development
	Sex/genders	- Population structure & characteristic - Physical capabilities & roles - Reproductive roles and household responsibilities - Social dynamics & gender equality - Economic opportunities
	Ethicity	- Population structure - Community & social cohesion - Cultural values, traditional knowledge - Economic opportunities & livelihoods - Access to resources - Social inequities and power dynamics

Table 1. The key elements of socioeconomic and their characteristics (cont.)

Category	Key Element of Socioeconomic	Indicate
1. Demographics	**Population and Household Characteristics:**	
	Martial status	- Population structure and dependency - Household labor and economic contribution - Resource allocation and decision-making - Economic security and social support - Community and social networks - Gender roles and responsibilities - Vulnerability and resilience
	Social structure (religion)	- Population characteristic - Cultural practices and beliefs - Community cohesion and organization - Social support systems - Social dynamics
	Education	- Population characteristic - Skill development and knowledge - Ability to access to information and innovation - Resource management and conservation - Economic opportunities and diversification - Community development and leadership - Empowerment and social change
	Main and additional occupation	- Population characteristic - Income sources and diversification - Skills and knowledge - Economic and livelihood vulnerability - Workload and time management - Social and community dynamics - Resource dependency and management
	Household size and composition (children and elderly)	- Population characteristics &structure - Labor availability - Resource allocation - Economic pressure - Care needs and household duties - Educational investment - Economic resilience
	Individual income from fishing and other occupations (average, range)	- Welfare characteristic - Economic dependence - Livelihood security - Fishing practices and effort - Community dynamics and social structure - Sustainability and resource management
	Household income (average, range)	- Welfare characteristic - Livelihood security - Access to services - Investment in fishing activities - Income sources - Savings and financial security - Education and future opportunities - Vulnerability and resilience

Table 1. The key elements of socioeconomic and their characteristics (cont.)

Category	Key Element of Socioeconomic	Indicate
1. Demographics	**Population and Household Characteristics:**	
	Expenditure household (average, range)	- Welfare characteristic - Economic management or expenditure pattern (spending, saving, investment) - Livelihood and sustainability - Social and well-being - Economic pressure - Debt and financial stress
	Saving and loan (source of loan and accessibility)	- Welfare characteristic - Economic security - Investment in fishing operations and other business - Access to financial services - Risk and debt - Improving livelihoods - Microfinance and community lending - Financial resilience
	Asset ownership and household goods (land size, value of house, cars, motorcycles, etc.)	- Welfare characteristic - Living standards - Health and education - Economic stability and wealth - Fishing capacity - Diversification of income sources - Investment ability - Social status - Risk management - Emergency preparedness - Access to assets
	Household facilities (water supply, electricity, sanitation (toilet), etc.)	- Welfare characteristic - Access to clean water - Sanitation and disease prevention - Quality of life (lighting, cooking, etc.) - Education and information access - Time savings (especially for women) - Income diversification (i.e. facilitate processing) - Social equity - Gender equality (i.e. reduce time for domestic chores)
	Number of family members who are working on fisheries and non-fisheries	- Welfare characteristic - Labor dynamics - Economic resilience - Livelihood security - Fishing efficiency - Workload distribution - Skill development (from another non-fisheries member) - Gender roles - Youth involvement - Cultural continuity

Table 1. The key elements of socioeconomic and their characteristics (cont.)

Category	Key Element of Socioeconomic	Indicate
2. Livelihoods and Economy	**Fishery & its related:**	
	Fishing, aquaculture, and related activities (fish processing)	- Economic stability - Diversification of income - Access to resources - Gender roles and division of labor - Specialized Skills - Knowledge transfer - Environmental impact and sustainability
	Fishing operation (day/month, day/trip, etc.), gear, boat, catch species, fishing season, fishing areas	- Economic stability - Seasonality and income fluctuations - Economic investment - Access to resources and fishing grounds - Environmental impact - Market demand - Adaptation to climate change - Conflicts and competition - Stability and vulnerability of fishers' income
	Fishing status (owner or worker)	- Economic status and income - Access to credit and financial services - Control over operations - Social hierarchy - Labor relations and dependency - Livelihood security and risk - Community leadership and influence
	Cost & earnings from fishing (production/trip, price of fish, operational cost and fixed cost, depreciation, fish size/kg, etc.)	- CPUE - Income stability - Market access and dynamic - Profit margin - Capital investment - Stock health - Consumer preferences - Economic growth in the community
	Fish consumption (buying from the market or catch)	- Self-sufficiency - Market dependency - Food Security
	Payment system for market and labor	- Payment methods - Credit and advance payments - Cash flow and financial planning - Income sharing and profit distribution - Labor payment system - Access to credit and financial services

Table 1. The key elements of socioeconomic and their characteristics (cont.)

Category	Key Element of Socioeconomic	Indicate
2. Livelihoods and Economy	**Fishery & its related:**	
	Market channel (direct or middle persons)	- Market channels overview - Income distribution and profit - Market access - Bargaining power and price negotiation - Community cohesion and cooperation - Gender roles and participation - Supply chain (traceability)
	Labor (no. of labor employed, nationality, part-time or full-time, etc.)	- Labor characteristics overview - Social dynamics and community impact - Worker rights and labor conditions
	Working experience in fisheries	- Working experience in fisheries overview - Skill and knowledge of the fishery - Adaptability and innovation
	Fish handling onboard	- Quality of control - Handling techniques - Hygiene practices - Market opportunities (access to premium markets) and income - Reducing post-harvest losses
	Resource availability	- Accessibility and abundance of natural, financial, and infrastructural resources (fish stock, fishing ground, microcredit, microfinance, loans, fishing equipment, market infrastructure, facilities,) - Adaptation to environmental changes
3. Gender and Social	**Gender dynamics:**	
	Reproductive and productive roles	- Roles in family, community, fishing and related activities - Impact on household income - Time allocation and workload - Social and economic empowerment
	Time use	- Fishing activities - Household responsibilities - Community and social roles (Co-management, etc.) - Supplementary income activities - Economic productivity - Gender inequality - Work-life balance and well-being - Sustainability of fishing (fishing time and effort) - Adaptation to environmental changes

Table 1. The key elements of socioeconomic and their characteristics (cont.)

Category	Key Element of Socioeconomic	Indicate
3. Gender and Social	**Gender dynamics:**	
	Access and control (fishing activities, household, employment)	- Access: fishing activities, natural resources, household resources, employment opportunities, rights, technologies, management - Control: decision-making power (household and related fishing activities), resource management, income and assets, management - Economic inequality - Gender disparities (access for women, men control assets and decision-making) - Social cohesion and community dynamics
	Social factors:	
	Community groups and community network (position/status)	- Overview of community groups and community networks (fishing cooperatives, saving/credit group, women group, resource management group, social/trade/cultural networks) - Sharing resources - Resource management - Economic and trade opportunities (bargaining, market, etc.) - Social support, information sharing, collaboration, capital - Social conflict - Position/status provides significant influence over decision-making, access to information and tsupport) - Gender equality and empowerment - Resource management sustainability
	Participation in the decision-making process	- Decision-making bodies/level - Mechanisms of participation - Empowerment and social equity - Sustainable resource management - Decisions on fishing grounds, gears, other resources, and pricing impact economic opportunities and income - Social cohesion (building trust and cooperation) - Sustainable management (share responsibility, balancing interests)
	Involvement in management program (enhancement, etc.)	- Type of management programs - Levels of involvement - Economic, social, and community benefit - Environmental and sustainability outcomes - Community empowerment

Table 1. The key elements of socioeconomic and their characteristics (cont.)

Category	Key Element of Socioeconomic	Indicate
3. Gender and Social	**Social factors:**	
	Access to services (financial, insurance, social welfare programs, technology, etc.)	- Overview of Financial services, social welfare programs, technology - Economic growth - Social security and well-being - Community development
	Affordability of communication access	- Types of communication access - Effectively fishers and their communities can connect with markets, access information, education, capacity building, and participate in decision-making processes
	Challenges faced in these occupations	- Challenges/problems and addressing in occupations (economic instability, environmental degradation, social inequalities, technological barriers, and regulatory complexities)
	Conflict management (how to minimize the conflict?)	- Type of conflicts - Strategies for conflict management - Resources use and management - Participatory management
	The existence of community empowerment programs	- Types of community empowerment programs - Benefits of community empowerment programs (strengthening capacity, resilience, well-being)
4. Additional Considerations	**Special/Current issues:**	
	Safety at sea/inland	- Common risks and hazards - Safety measures and best practices - Sustainability and resilience of fishing operations - Ensuring the well-being of fishers and family
	Environmental & resource challenges:	
	Impacts of climate change and human activities	- Changes in fish stocks and distribution - Marine and freshwater ecosystem changes and their impact (i.e. pollution, coastal erosion, fishing ground, fishing seasons, fish migration, sedimentation, etc.) - Impact on fishing practices - Economic, social, and livelihood impacts - Adaptation and mitigation strategies
	Impacts of alien species (invasive species)	- Species and their impacts (fish stock, ecosystem, biodiversity loss, economic, social, and livelihood) - Management and mitigation strategies and their effectiveness

Table 1. The key elements of socioeconomic and their characteristics (cont.)

Category	Key Element of Socioeconomic	Indicate
4. Additional Considerations	**Environmental & resource challenges:**	
	Disaster preparedness (adaptation)	- How well a community is ready to prepare for, respond to, and recover from disasters - Community resilience - Economic stability in communities - Social cohesion - Access to resources and services
	Attitude & perceptions (management, etc.)	- Influence the success and sustainability of fishing practices and community management - Compliance with regulations (concerns and issues of fishers, understanding, and involvement of fishers in the process of establishing fisheries laws and regulations) - Environmental responsibility - Community engagement and participation - Willingness to change - Trust in government and institutions
	Beach access	- Livelihood viability - Equity and social inclusion - Community well-being - Economic activities - Environmental impact - Land ownership and use rights - Infrastructure development - Conflict and management

Box 3. Example of the KES used

Objectives

1. Improve market access and fair trade
2. Increase income diversification

The KES to respond to the objectives can be:

Objective 1) Improve market access and fair trade

1. Market channel (direct or middle persons)
2. Cost and earnings from fishing
3. Payment system for market and labor
4. Access to services (financial, insurance, social welfare programs, technology)
5. Community groups and community networks
6. Participation in decision-making process

Objective 2) Increase income diversification

1. Main and additional occupation
2. Fishing, aquaculture, and related activities
3. Household income
4. Savings and loan
5. Asset ownership and household goods
6. Household facilities

The KES highlights critical aspects of socioeconomic status, focusing on income diversification and ensuring fair trade and market access for communities involved in fishing activities. It could help identify strategies to achieve the goal and objectives.

Note: The KES factors, such as Age, Sex/Gender, Ethnicity, Marital status, Religion, and Education, should be collected to understand the population structure/characteristics, which are the basic information necessary for study or research.

Design Questionnaire:

These KES can be used to design the questionnaires which are based on the survey objectives. An Example of a questionnaire is in **Annex 1.** While developing a questionnaire, it is necessary to conduct IOC and EC/IRB. IOC can ensure that the questionnaire is scientifically valid and aligned with the research goals, while EC/IRB ensures that the research is conducted ethically and respects the rights and welfare of the interviewee. Both steps are essential for developing a trustworthy, high-quality questionnaire and conducting responsible research. However, IOC and EC/IRB are dependent on the study goals and objectives including the country's specific regulations.

Before creating the questionnaire, the "Dummy tables" should be created to ensure that the data to be collected can be presented in the predefined blank tables by designing a dummy table with fields or columns that match the questions in the survey, such as name, age, gender, and expected responses. The tables should only contain the table headings and indicate what each question is about and how the data should be displayed. After that, input simulated data into the table to test whether the information can be recorded accurately as intended by the survey team. This step also helps with quick analysis and presentation of the data.

Box 4. Example of "Dummy Table"

Table 1. Frequency, mean, and percentage of respondent's age

Age/Gender*	Frequency		Mean		Percentage	
	Male	Female	Male	Female	Male	Female
Below 17						
17-35						
35-60						
60 above						
Total						

*Age range depended on the objective/data collected

Table 2. Percentage of access and control to resources

Resources	Access		Ownership		Control	
	Male	Female	Male	Female	Male	Female
Land						
Social welfare						
Fishing inputs						
Education/Training						
Total						

3.3 Sampling design

Qualitative research is an approach focused on understanding social phenomena through the exploration of people's experiences, perceptions, and behaviors. Instead of relying on numerical data, qualitative research seeks to capture the richness and complexity of human interaction and context. is most appropriate when the goal is to explore complex social processes and gain a deep understanding of the context surrounding them. It is particularly useful when the research seeks to understand experiences, perceptions, or behaviors from the perspective of participants. Additionally, qualitative methods are essential in new or under-researched areas where building new theories is required, allowing insights to emerge from the data without relying on pre-existing frameworks.

Qualitative data collecting is different depending on the relationship and interaction between the data collector and the respondent or group of respondents (Thaweesak, 2005). There are three main standard methods for qualitative data collecting.

- In-depth interviews: One-on-one conversations to gain in-depth insights.
- Focus Groups: Group discussions to explore collective views.
- Observations: Watching and recording behaviors in natural settings.

Sample size determination for qualitative data collection for the research depends on Data saturation and Data sufficiency (Sutheewasinnon & Pasunon, 2016).

Quantitative research is a systematic approach that focuses on quantifying data and applying statistical, mathematical, or computational techniques to analyze it. It is primarily used to test hypotheses, identify patterns, measure variables, and generalize findings from a sample to a broader population (Creswell & Creswell, 2018).

3.3.1 Population

In research, a **population** refers to the complete set of individuals, objects, or entities that share specific characteristics and are of interest to the researcher. It is the group from which data is collected or to which the study results are intended to apply. The population may include people, animals, events, organizations, or objects, depending on the focus of the study (Creswell & Creswell, 2018).

Types of Populations

1. **Target Population**
   The group the researcher aims to study and make generalizations about. For example, "all women working in fisheries in Southeast Asia."

2. **Accessible Population**
   The portion of the target population that the researcher can realistically reach for data collection. For instance, "women in fisheries from three coastal provinces in Thailand."

3. **Finite vs. Infinite Population**
   - **Finite Population:** A population with a known, countable number of units (*e.g.*, registered voters in a city).
   - **Infinite Population:** A theoretical or very large population that is impractical to count (*e.g.*, all potential customers for a global product).

Importance of Defining a Population

- Clearly defining the population ensures that the research findings are relevant and applicable to the intended group.
- It helps determine the sampling method and the size required to achieve statistically valid results.

Examples of Populations

- **Demographic:** Students aged 18–25 enrolled in universities.
- **Geographic:** Residents of coastal regions in Southeast Asia.
- **Behavioral:** Consumers who purchase organic products.
- **Specific Characteristics:** Patients diagnosed with a particular medical condition.

Relation to Sampling

Since studying the entire population is often impractical due to time, cost, or logistical constraints, researchers select a **sample**, a smaller group representative of the population, to conclude (Kumar, 2019). Sample size determination for qualitative data collection for the research depends on Data saturation and Data sufficiency (Sutheewasinnon & Pasunon, 2016).

3.3.2 Sampling method

1) Nonprobability sampling

Nonprobability sampling is a sampling method where not all individuals in the population have a known or equal chance of being selected for the study. This approach is commonly employed in exploratory research, pilot studies, or when it is impractical or unnecessary to achieve a representative sample (Etikan *et al.*, 2016). Unlike probability sampling, it does not use random selection, which can lead to potential bias but allows for flexibility and efficiency in data collection.

Types of Nonprobability Sampling

1. **Convenience Sampling:** Participants are selected based on their availability or ease of access. For example, surveying students in a nearby classroom. While cost-effective and quick, it risks a lack of representativeness (Bornstein *et al.*, 2013).

2. **Purposive Sampling:** Researchers intentionally select participants who meet specific criteria or possess certain characteristics relevant to the study. This method is suitable for qualitative research or studies focusing on specific expertise (Palinkas *et al.*, 2015).
3. **Quota Sampling:** The population is divided into subgroups, and participants are selected to fill quotas representing those subgroups. For instance, ensuring equal numbers of men and women in the sample.
4. **Snowball Sampling:** Initial participants recruit others they know, creating a "chain" of respondents. This is often used for hard-to-reach populations, such as marginalized groups or individuals with rare characteristics (Naderifar *et al.*, 2017).

2) Probability sampling

Probability sampling is a method of selecting participants for a study where every member of the population has a known and equal chance of being included. This method is widely used in quantitative research because it ensures a representative sample, allowing researchers to generalize findings to the broader population with a known level of confidence (Taherdoost, 2016). It relies on random selection, minimizing selection bias and enhancing the validity of the study.

The key types of probability sampling include:

1. **Simple Random Sampling:** Each member of the population has an equal chance of selection, often achieved through random number generation or a lottery method.
2. **Systematic Sampling:** A starting point is randomly selected, and participants are chosen at regular intervals (*e.g.*, every 10th person on a list).
3. **Stratified Sampling:** The population is divided into subgroups (strata) based on shared characteristics (*e.g.*, age, gender), and samples are randomly drawn from each stratum to ensure representation.
4. **Cluster Sampling:** The population is divided into clusters, usually based on geography or institutions. Entire clusters are randomly selected, and all members or a subset of members within these clusters are studied (Lohr, 2010).

Probability sampling offers several advantages, including the ability to estimate sampling error and make statistical inferences. However, it can be resource-intensive and time-consuming, particularly for large or dispersed populations (Kumar, 2019).

Box 5. Example of sampling method on quantitative data collection in fishing practice

1. Simple random sampling: every fisher can be a participant regarding the type of boat or fishing gear utilized.
2. Stratified random sampling: fishermen are divided into types of fishing gear utilized. Fishermen are randomly chosen from 3 groups of fishing gear: 1) Gillnet; 2) Fish trap; and 3) Longlines.
3. Systematic random sampling: 40 Longline fishermen decided out of 200, then every 5th fisherman was selected based on their arrival in the fishing port. Start with the 1st fisher, then select the 6th, 11th, 16th, 21st, and so on, until they reach the desired sample size of 40 Longline fishermen.
4. Cluster random sampling: 10 fishing zones of Longline fisheries are clustered, then 3 out of 10 zones are randomly chosen to select Longline fishermen to be participants. All the Longline fishermen of selected zones should be participants.

3.3.3 Sample size

1) The population size is available

1.1) Using percentages if you know the total number of populations by

- The total number of populations in a hundred samples should be 25% at least.
- The total number of populations in a thousand samples should be 10% at least.
- The total number of populations in 10 thousand samples should be 5% at least.
- The total number of populations in 100 thousand samples should be 1% at least.

Example:

- The population is 460 people therefore sample size should be 115 samples.
- The population is 1,250 people therefore sample size should be 125 samples.
- The population is 20,500 people therefore sample size should be 1,025 samples.

- The population is 330,000 people therefore sample size should be 3,300 samples.

1.2) Using formula

- Taro Yamane' formula

Yamane is used for finding sample size with the number of total samples from 500 at 95% significant.

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

n = Sample size
N = Population size
e = Level of precision or sampling of error that can accept

Box 6. Example of Taro Yamane' formula, in case the population size is known

The population size is 560 and this data collection allows error at 0.05(e= 0.05), therefore, can calculate for sample size as below;

$$n = \frac{560}{1 + (560 \times (0.05)^2)}$$

$$= 233$$

Yamane table used for finding sample size with number of total samples from 500 at 95% significant.

Table 2. Sample size of Yamane of 95% significant at each error level

No. of Population	No. of Population					
	± 1%	± 2%	± 3%	± 4%	± 5%	± 10%
500	*	*	*	*	222	83
1,000	*	*	*	385	286	91
1,500	*	*	638	441	316	94
2,000	*	*	714	476	333	95
2,500	*	1,250	769	500	345	96
3,000	*	1,364	811	517	353	97
3,500	*	1,458	843	530	359	97
4,000	*	1,538	870	541	364	98
4,500	*	1,607	891	549	367	98
5,000	*	1,667	909	556	370	98
6,000	*	1,765	938	566	375	98
7,000	*	1,842	959	574	378	99
8,000	*	1,905	976	580	381	99
9,000	*	1,957	989	584	383	99
10,000	5,000	2,000	1,000	588	385	99
15,000	6,000	2,143	1,034	600	390	99
20,000	6,667	2,222	1,053	606	392	100
25,000	7,143	2,273	1,064	610	394	100
50,000	8,333	2,381	1,087	617	397	100
100,000	9,091	2,439	1,099	621	398	100
∞	10,000	2,500	1,111	625	400	100

*Mean number of population were assume as not normal distribution therefore number of sample cannot calculate

- **Krejcie & Morgan's formula**

Krejcie & Morgan's used for identifying sample size at 95% significance for number of samples from 10

$$n = \frac{X^2NP(1-p)}{e^2(N-1) + X^2p^{(1-p)}}$$

Where:

x^2 = The table value of chi-square for 1 degree of freedom at the desired confidence level (x^2 = 3.841)
n = Sample size
N = Population size
e = Level of precision or sampling of error that can accept
p = The population proportion that you are interested to study

Box 7. Example of Krejcie & Morgan's formula, in case the population size is known

Population size is 135, this data collection allows error at 0.05(e= 0.05) and the population proportion is 0.5, therefore, can calculate for sample size as below;

$$n = \frac{(0.05)^2 \times ((135-1) + 3.841 \times 0.5\ (1-0.5))}{3.841 \times (135 \times 0.5) \times (1-0.5)}$$

$$= 101$$

Krejcie & Morgan's table use for identifying sample size at 95% significant for number of samples from 10

Table 3. Sample size of Krejcie & Morgan of 95% significant

No. of Population	Sample size	No. of Population	Sample size	No. of Population	Sample size	No. of Population	Sample size	No. of Population	Sample size
10	10	100	80	280	162	800	260	2,800	338
15	14	110	86	290	165	850	265	3,000	341
20	19	120	92	300	169	900	269	3,500	346
25	24	130	97	320	175	950	274	4,000	351
30	28	140	103	340	181	1,000	278	4,500	354
35	32	150	108	360	186	1,100	285	5,000	357
40	36	160	113	380	191	1,200	291	6,000	361
45	40	170	118	400	196	1,300	297	7,000	364
50	44	180	123	420	201	1,400	302	8,000	367
55	48	190	127	440	205	1,500	306	9,000	368
60	52	200	132	460	210	1,600	310	10,000	370
65	56	210	136	480	214	1,700	313	15,000	375
70	59	220	140	500	217	1,800	317	20,000	377
75	63	230	144	550	226	1,900	320	30,000	379
80	66	240	148	600	234	2,000	322	40,000	380
85	70	250	152	650	242	2,200	327	50,000	381
90	73	260	155	700	248	2,400	331	75,000	382
95	76	270	159	750	254	2,600	335	100,000	384

**Depend on sampling design

2) The population size is not available

Cochran's formula was used to identify sampling size when you do not know the exact number of the population, but you know its high amount, hence, for estimate sampling size has two ways are;

- When you know the proportion of the population.

$$n = \frac{p(1-p)Z^2}{e^2}$$

- When you don't know the proportion of the population.

$$n = \frac{Z^2}{4e^2}$$

Where:

n = Sample size
e = Level of precision or sampling of error that can accept
p = the population proportion that you are interest to study
Z = standard normal distribution at your level of confidence significant
- if your level of confidence is 95% or significant is 0.05, Z = 1.96
- if your level of confidence is 99% or significant is 0.01, Z = 2.58

Box 8. Example of Cochran's formula, in case the population size is not available

This data collection allows error at 0.05 (e= 0.05)

First formula: the population proportion is 0.5

$$n = \frac{((0.5 \times (1-0.5)) \times (1.96^2)}{(0.05)^2}$$

$$= 384$$

Second formula:

$$n = \frac{(1.96)^2}{4 \times (0.05)^2}$$

$$= 384$$

3.4 Conducting Data Collection

3.4.1 Presurvey

A presurvey is typically used to gather initial information, demographic, social, fisheries statistics as a baseline data before the study or data collection. It helps to refine questions, understand participants' knowledge, and culture of the community in the selected site. The survey team can also get the information from discussions with local fisheries officer, head of village, and leader of fishers, and including local government offices.

Remarks: It is important for the survey team to understand the traditional, customary and culture of the community from the head of the village, including the common name of fishes and fishing gears used in the study site.

3.4.2 Data collection

The survey team should design the way to collect the data such as the method used (*e.g.*, online, face-to-face), how many days for data collection, and the responsibility of each enumerator. It is important to choose a suitable time and place convenient for the respondents.

Nowadays, digital data collection is often conducted using electronic devices such as tablets or smartphones during interviews. The software is commonly used for socioeconomic data collection such as "Kobo Toolbox" or "Google form" to support the data collection for researchers and professionals in many fields. This would help save time on data entry and improve overall efficiency.

Furthermore, it is important to coach or train the enumerators to understand questionnaires and how to design, distribute, and gather responses effectively to obtain accurate and actionable data. This includes training on creating clear and unbiased questions, selecting the right audience, and encouraging engagement to maximize response rates while ensuring data integrity.

The survey team also needed to design the number of interviewees per day per enumerator by dividing tasks to each enumerator equally.

Noted: coaching is needed to have an enumerator at the study site or from the partner

After each interview, the questionnaires should be reviewed and refined daily. All enumerators must evaluate the details they have recorded each day to prevent any data loss.

Remarks: Before starting the interview with the respondent, please introduce yourself and inform the objective of the survey. Begin the interview only after obtaining their agreement.

Figure 2. Discussion with local officers

Figure 3. Interviewing at fishing village

Box 9. SEAFDEC experience on data collection plan

From SEAFDEC experience, during the COVID-19 pandemic, we adapted our data collection approach by involving local community members as enumerators (data collectors). These local individuals were trained to understand the questionnaire correctly. Training was essential to ensure they could ask questions accurately and consistently, reducing errors during data collection. A key benefit of using community members as enumerators is that they are trusted by the data providers (respondents), which increases the likelihood of receiving accurate and honest information.

Additionally, since enumerators are part of the community, they can schedule interviews at times that are convenient for respondents, making the data collection process more flexible, cost-effective, and efficient. This approach also fosters community involvement, enhancing the overall success of the data collection effort.

3.4.3 Survey material

All questionnaire forms need to be prepared and sufficient copies provided to all enumerators. Besides, the consent form for interviewing needs to be prepared before interviewing. However, if the online questionnaire form and internet signal are needed, it needs to check the internet connection, and the battery of electronic devices is full of charts.

The survey team can also prepare stationary tools, recorder equipment, fish species book, fishing gear book, map, and souvenirs for respondents if necessary.

3.5 Inputting and Analyzing data

3.5.1 Inputting data

Data input is the process of transforming the data collected (raw data) during household interviews into a digital format for further analysis. For the Paper-Based Surveys, the interviewer conducted data collection using the questionnaire by paper forms, which needed to enter the data in a computer manually, the data entry worker would type the answers into a software program to store the information digitally. Microsoft Excel is often used to enter and organize data because it's simple and widely available, more advanced tools like SPSS and Program R are also commonly used, especially when dealing with large datasets or performing more complex data analysis. SPSS is designed for statistical analysis, and R is a powerful programming language used for data processing and advanced statistical modeling. However, it needs to

make cleaning the data before entering it into a system to ensure the data is accurate and coding data transforms varied answers into a structured format, well-prepared for analysis.

Figure 4. Data input process

For the survey by digital data collection using electronic devices and data collection software "Kobo Toolbox", this allows for direct entry of responses into digital forms during the interview process, reducing the need for manual data entry later. This method offers several benefits, such as reducing transcription errors by directly inputting responses into the device, eliminating the need for manual data transfer. It also speeds up data processing since the collected information is automatically stored and organized, allowing for quicker analysis. Additionally, digital tools can apply automated data validation in real time, ensuring accuracy by checking if responses fall within acceptable ranges or preventing incomplete entries. Overall, this approach enhances data quality, saves time, and supports faster, more reliable decision-making.

- **Data cleaning**

Data cleaning involves reviewing the collected data to ensure it's accurate, complete, and free from errors, it should identify and correct mistakes early, improve accuracy to reduce the risk of entering incorrect or incomplete information into the database, leading to more accurate analysis results. It is recommended to review all forms in the field after data collection to correct any missing information while there's still a chance to adjust.

- **Coding Data**

Coding refers to converting answers from surveys or interviews, especially non-numerical or open-ended into numeric or standardized categories so that statistical software can process and analyze data easily. When the survey questions have multiple choice answers or categories (*e.g.*, sex, marital status, education levels), each answer needs to be converted into numeric codes.

Box 10. Example of "Dummy Table"

Item	Code	Type	Format
Sex	1 = Male 2 = Female	Nominal (labeling variables without any quantitative value)	Numeric
Marital Status	1 = Single 2 = Married 3 = Widow 4 = Divorce	Nominal (labeling variables without any quantitative value)	Numeric
Education level	1 = Primary School 2 = Secondary School 3 = High School 4 = University	Ordinal (labeling involves order or ranking)	Numeric

- **Input data in software (spread sheet of Ms. Excel)**

After coding, the next step is to input the coded data into a spreadsheet in Microsoft Excel for further analysis.

1) Create a spreadsheet, set up a clear structure by labeling each column with the corresponding "variable names" or "questions" from the questionnaire. For example, column headings could include "Sex", "Age", "Religion" and "Education Level, etc.

2) Input the Coded Data, enter the coded responses under each corresponding column with the appropriate code (1, 2, or 3) in the respective row for each respondent. Continue this for all respondents, row by row, with each row representing a single respondent and each column representing a variable.

Box 11. Example for input coded data in software (raw data)

No.	Respondent Name	Sex	Age (years old)	Marital Status	Educational level
1	A	1	40	2	1
2	B	1	37	2	1
3	C	1	32	1	3
4	D	2	45	1	1
5	E	1	30	3	2

*These raw data for example the age, in order to report the structure of the population the data can be created code to present a range

- **Data Validation (Rechecking)**

After entering all the data, it is important to review the spreadsheet for errors or missing values to ensure the data accuracy. The data is entered in Excel, it can then be exported or analyzed using Excel's built-in tools or other statistical software, such as SPSS or Program R.

It would be better if the survey team could conduct the data validation with the community. Data validation can help to refine, improve the quality of the data, and correct errors in the data before it is analyzed. Besides, engaging the community in the data validation process builds trust, and they can see their input.

Suggestions:

1) Checked, Coded, and Input data should be done by the survey team/enumerators. Data input should preferably be done in the field (or at the field station) as soon as possible after the data has been collected. Due to this, it can be quickly found missing or unclear responses and correct them while still in the field, when it's easier to recheck with respondents.

2) All data should be saved and backed up carefully, using options such as external hard drives, Google Sheets or other secure storage locations. Enumerators can use voice recording during the interview (ask permission from the respondent).

3.5.2 Analyzing data

Analyzing data is the process of reviewing, organizing, and interpreting data to find useful information, make conclusions, and help with decision-making, help identify patterns, trends, and relationships from the information gathered from households or individuals. It aims to summarize the collected information to address the project's or research's objectives. Socioeconomic data could be analyzed by Qualitative and Quantitative Analysis.

Qualitative Analysis is a research method focused on understanding and interpreting insights about people's experiences, thoughts, and behaviors using non-numerical data, emphasizing depth, context, and meaning. It involves collecting data through in-depth interviews, focus groups, and observations, this method provides detailed insights and emphasizes the importance of context and individual perspectives.

Quantitative Analysis focuses on numerical data and employs statistical methods to analyze and interpret data. This type of analysis is particularly valuable in socioeconomic studies, where it is used to evaluate and understand various measurable factors. Quantitative analysis uses a range of statistics, including both descriptive and inferential methods, to summarize the primary data. To test hypotheses, several inferential statistical tools were used, including chi-square tests, t-tests, correlation analysis, and regression analysis.

This handbook focuses on using descriptive statistics to analyze socioeconomic data to describe and delineate the characteristics of the respondents. Descriptive statistics that can be used include frequency, percentages, measures of central tendency (*e.g.*, mean, median, and mode), and measure of variation (*e.g.*, range, interquartile range, and standard deviation). These calculations can be performed using computer software such as Microsoft Excel, utilizing the Sort and Filter functions after inputting the data into the spreadsheet. Descriptive analysis gives a simple overview of the key features without exploring relationships between variables.

Frequency and Percentage

To classify the data in groups or classes on the basic of common characteristics,

- Descriptive such as sex, religion, marital status, education, occupation, etc. or
- Numerical such as age, number of household member, income, expenditure, etc.

The result of Frequency and Percentage could present in term of tabulation, bar chart, and pie chart.

Box 12. Collect data from 80 respondents in the fishing community and summaries by classification into a table

1. Sex	Frequency	Percentage
Male	20	25.0
Female	60	75.0
Total	80	100.0

2. Marital Status	Frequency	Percentage
Single	32	40.0
Married	40	50.0
Widow	4	5.0
Divorce	4	5.0
Total	80	100.0

3. Education	Frequency	Percentage
Primary school	48	60.0
Secondary school	26	32.5
High school	4	5.0
University	2	2.5
Total	80	100.0

3.6 Reporting the results

The analyzed data should be reviewed to interpret the results, interpretation is the process of understanding and explaining the findings of a study that is related to the objective of the study. For example, researchers might identify income differences between groups or trends in education levels. Interpretation would reflect actionable insights that can inform decision-making or policy development.

The result of the socioeconomic survey could be presented to the target audience in a written form such as reports and papers. Writing the report is the final and most challenging step of the research process. The report will present the survey results, detailing what was done, what was discovered, and the conclusions drawn. It should be written in an academic style with formal language. However, the report can be in several formats depending on the target group for the report.

Box 13. Example of Report format

1. Title
2. Name of researcher and institution
3. Execcutive summary / Abstract
4. Abbreviation
5. Introduction
6. Objectives
7. Research design / Methodologies
8. Result and Discussion
9. Conclusion and Recommendations
10. References
11. Annexes / Appendix

References

Bornstein, M. H., Jager, J., & Putnick, D. L. (2013). Sampling in developmental science: Situations, shortcomings, solutions, and standards. *Developmental Review, 33(4)*, 357-370.

Creswell, J. W., & Creswell, J. D. (2018). *Research design: Qualitative, quantitative, and mixed methods approaches.* Sage publications.

Etikan, I., Musa, S. A., & Alkassim, R. S. (2016). Comparison of convenience sampling and purposive sampling. *American Journal of Theoretical and Applied Statistics,* 5(1), 1-4.

Kumar, R. (2019). Research methodology: A step-by-step guide for beginners. *SAGE Publications Limited*.

Leah Nunce and Bob Pomeroy. 2003. Socioeconomic Monitoring Guideline for Coastal Managers in Southeast Asia. 82 pp. https://reefresilience.org/pdf/SocMonMan_SEA.pdf.

Lohr, S. L. (2010). Sampling: Design and analysis. *Boston: Brooks/Cole Cengage Learning.*

Naderifar, M., Goli, H., & Ghaljaie, F. (2017). Snowball sampling: A purposeful method of sampling in qualitative research. *Strides in Development of Medical Education, 14(3).*

Palinkas, L. A., Horwitz, S. M., Green, C. A., Wisdom, J. P., Duan, N., & Hoagwood, K. (2015). Purposeful sampling for qualitative data collection and analysis in mixed method implementation research. *Administration and Policy in Mental Health and Mental Health Services Research, 42(5),* 533-544.

Sutheewasinnon, P., & Pasunon, P. (2016). *Sampling Strategies for Qualitative Research.* Pariyat Journal, 29(2), 32-48.

Taherdoost, H. (2016). Sampling methods in research methodology; How to choose a sampling technique for research. *International Journal of Academic Research in Management, 5(2),* 18-27.

Thaweesak Noppaket, (2005). Qualitative Methods: a field guide for Applied Research in Human/organization/Community and Social Development. Community Nurse Association of Thailand, page 248.

Annex 1

Questionnaire Number : .....
Date : .....
Interviewer : .....

Part I : Demographics

1. Name of respondent .....
2. Address .....
3. Sex ☐ Male ☐ Female
4. Ethnicity .....
5. Marital status
   ☐ Male ☐ Married
   ☐ Widow ☐ Divorce
6. Education
   ☐ None ☐ Primary School ☐ Junior high school
   ☐ Senior high school ☐ Bachelor's degree
   ☐ Other (specify) .....
7. Total members in family
   7.1 Adult ..... person
   7.2 Children (under 15 years old) ..... person
   7.3 Elderly (more than 60 years old) ..... person
8. Number of family member who are working on fisheries ..... person
9. Main occupation
   ☐ Fisheries ☐ Aquaculture ☐ Agriculture
   ☐ Labor ☐ Business ☐ Government
   ☐ Other (specify) .....
10. Additional occupation (multiple choices)
    ☐ Fisheries ☐ Aquaculture ☐ Agriculture
    ☐ Labor ☐ Business ☐ Government
    ☐ Other (specify) .....
11. Individual income from fishing (average monthly) .....
12. Individual income from additional occupation (average monthly) .....
13. Time spent for additional occupation (daily) .....
14. Household total income (including all household members' income, average monthly) .....
15. Household total expenditure (average monthly) .....
16. Do you have saving money? ☐ Male ☐ Female
17. Do you have any loan taken? ☐ Male ☐ Female
18. What are your purposes for the loan taken? .....
19. Do you own any property? .....
20. What basic utilities are available at your residence? (multiple choices)
    ☐ Fisheries ☐ Aquaculture ☐ Agriculture
    ☐ Labor ☐ Business ☐ Government
    ☐ Other (specify) .....
21. What educational facilities are available at your residence? (multiple choices)
    ☐ Fisheries ☐ Aquaculture ☐ Agriculture
    ☐ Labor ☐ Business ☐ Government
    ☐ Other (specify) .....

Part II : Livelihoods and Economy

1. How many years of experience do you have in the fisheries sector? ..... years
2. Fishing Status

☐ Owner ☐ Worker (please specify): skipper/crew/mechanic/ ....

3. Have you received any training or certification related to fisheries?

☐ No ☐ Yes (specify) .....

4. Fishing boat

Fishing boat (name of boat)	In/Out board motor	Engine Power (HP)	Length (meters)	Weight (gross ton)	Construction material (wood/FRP)	Price of boat when purchased (baht)	Licensed/ Unlicensed boat	No. of Crew (person)
1.								
2.								
3.								

5. Operating cost (Baht/trip)

Fishing boat (name of boat)	Operational costs (Baht)							Total Cost (baht)
	Fuel	Ice	Food	Labor	Bait	Other :	Other :	
1.								
2.								
3.								

6. Fishing Operation

Type of Fishing gear	No. of fishing gear	Fishing season (month)	No. of fishing day per trip	No. of fishing trip per month	Fishing hours a day	No. of haul per fishing trip	Fishing ground (see map)
1.							
2.							
3.							

7. Catch utilization and distribution (per trip)

1st Fishing gear

Fish species	Utilization (%)		Total Quantity (kg)	Size of fish (No. of fish/kg)	Price (baht/kg)	Catch Value (baht)
	Family Consumption	Sale				

2nd Fishing gear

Fish species	Utilization (%)		Total Quantity (kg)	Size of fish (No. of fish/kg)	Price (baht/kg)	Catch Value (baht)
	Family Consumption	Sale				

3rd Fishing gear

Fish species	Utilization (%)		Total Quantity (kg)	Size of fish (No. of fish/kg)	Price (baht/kg)	Catch Value (baht)
	Family Consumption	Sale				

8. How do you obtain the materials for your fishing activities? (multiple choices)

☐ Purchase ☐ Borrow

☐ Community sharing ☐ Other.....

9. If you purchase your fishing materials, how do you obtain the cash? (multiple choices)

☐ Own saving ☐ Fish monger/collector/middleman

☐ Formal loan ☐ Other.....

10. Do you or your labors record fishing activities (such as production, fuel needs, etc)?

☐ Yes ☐ No (specify).....

11. How many laborers do you currently employ?.....

12. What is the nationality of the laborers you employ?

☐ Thai.....person ☐ Cambodian.....person

☐ Myanmar.....person ☐ Other. (Specify) .....person

13. How do you hire labor? (multiple choices)

☐ Community ☐ Crew recommendation

☐ Job vacancy ☐ Other.....

14 . Are the laborers employed full-time or part-time? (multiple choices)

☐ Full-time.....% ☐ Part-time.....% ☐ Both

15 . How do you pay for labors cost? (multiple choices)

☐ Wages/salary

☐ Profit sharing (specify percentage).....

16 . What is the average monthly wage for your fulltime laborers?.....

17. What is the average daily wage for your part time laborers?.....

18. How do you pay your laborers or workers? (multiple choices)

☐ Cash ☐ Digital payment (mobile banking)

☐ Bank transfer ☐ Other.....

19. Do you provide any non-monetary benefits to your laborers?

☐ No ☐ Yes (specify).....

20. What procedures do you follow for handling fish onboard? (multiple choices)

☐ Immediate icing ☐ Cleaning and gutting

☐ Packaging ☐ Other.....

21. How do you store the catch onboard to maintain its quality? (multiple choices)

☐ Ice ☐ Salt

☐ Cooler machine ☐ Other.....

22. How long do you typically keep fish onboard before landing?.....

23. Have you received any training in fish handling techniques?

☐ No ☐ Yes (specify).....

24. How do you sell your catch? (multiple choices)

☐ Traditional market ☐ Retailer (modern market)

☐ Household consumers ☐ Fish monger/collector/middleman

☐ Auction place ☐ Processing plants/Exporter

☐ Restaurant ☐ Other.....

25. Do you have any selling contract with your buyer?

☐ No ☐ Yes, written contract ☐ Yes, unwritten contract

26. How often are you paid for your fish sales?

☐ Immediately ☐ Daily

☐ Weekly ☐ Monthly

27. How do you obtain fish for your household consumption?
    ☐ From my own catch ☐ Buying from the market ☐ Both
28. How do you assess the availability of fish stocks in your fishing area? (multiple choices)
    ☐ Personal observation ☐ Reports from local authorities
    ☐ Scientific assessments ☐ Other.....
29. How often do you experience shortages of resources e.g., fishing gear, financial support?
    ☐ Frequently ☐ Rarely
    ☐ Occasionally ☐ Never
30. Have you received any assistance or funding from the government?
    ☐ No ☐ Yes (specify) : cash/boat/fishing gear/.....
31. Are there any local organizations or cooperatives that assist you in resource acquisition?
    ☐ No ☐ Yes (specify) .....
32. Do you think there are sufficient resources available for sustainable fishing practices in your area?
    ☐ No ☐ Yes .....
33. Are you involved in any community group or cooperative activities related to fisheries?
    ☐ No ☐ Yes .....

Part III : Gender and Social Roles

1. What is your role in the family regarding reproductive responsibilities?
   - ☐ Primary caregiver for children
   - ☐ Supportive partner
   - ☐ Other.....
2. How do reproductive responsibilities affect your work in fisheries?
   - ☐ Limit working hours
   - ☐ Impact availability for fishing
   - ☐ Other.....
3. How many hours do you spend on fishing activities each week? .....
4. How many hours do you spend on household responsibilities each week? .....
5. Do you participate in community activities? If yes, how many hours do you dedicate to them per week?
   - ☐ No
   - ☐ Yes .....
6. How do you prioritize your time between fishing and household responsibilities?
   - ☐ Fishing first
   - ☐ Household first
   - ☐ Equal
7. What factors influence your time use in fishing and household activities? (multiple choices)
   - ☐ Family obligations
   - ☐ Financial needs
   - ☐ Personal preference
   - ☐ Other.....
8. How does your gender impact your time use in fisheries and household roles?
   - ☐ Yes, it affects significantly
   - ☐ Yes, it affects somewhat
   - ☐ No, it does not affect
9. Who primarily controls the fishing resources in your household?
   - ☐ Male
   - ☐ Female
   - ☐ Jointly
10. Are there any restrictions on your ability to participate in fishing
    - ☐ No
    - ☐ Yes specify : .....
11. How are decisions made regarding fishing activities in your household?
    - ☐ Male makes decisions
    - ☐ Female makes decisions
    - ☐ Jointly
12. Do you have equal access to employment opportunities in the fisheries sector?
    - ☐ No
    - ☐ Yes
13. What factors influence your ability to secure employment in fisheries? (multiple choices)
    - ☐ Gender discrimination
    - ☐ Lack of skills/training
    - ☐ Network connections
    - ☐ Other.....
14. Are you a member of any community groups?
    - ☐ No
    - ☐ Yes specify : .....
15. What is your role within the community group? (multiple choices)
    - ☐ Leader
    - ☐ Member
    - ☐ Volunteer
    - ☐ Other.....
16. How often do you participate in community group meetings or activities?
    - ☐ Weekly
    - ☐ Monthly
    - ☐ Occasionally
    - ☐ Rarely

Time use

The data collection focuses on understanding the daily routines of fishermen and Fisherwomen. This involves documenting their activities in detail, starting from their waking time in the morning, followed by a step-by-step account of each activity they engage in throughout the day, along with the time spent on each task, until they retire to bed at night.

Women (from wake up until sleep)

Activities	Time (O' clock)																							
	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	1	2
Wake up																								

Men (from wake up until sleep)

Activities	Time (O' clock)																							
	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	1	2
Wake up																								

17. Are you satisfy with your responsibility ?

☐ Yes ☐ No

18. Why you have to do those responsibilities ? .....

Access and control

Resources	Access (can use)			Ownership (can own formally or legally)			Control (can independently make decisions over (e.g., have rights to share/sell/ alienate, sell, consume, improve)			Notes / Comments
	Men	Women	Equal	Men	Women	Equal	Men	Women	Equal	
Land - Water (for HH use) - Water supply/Water rights - Water Points - Water for irrigation - Forest products NTFP, TP - Wetland (biodiversity) fisheries, amphibians, invertebrates, plants										
Borrowing Capital - Credit & loans (e.g. microcredit, community fund) - banking services - social welfare (health & life insurance)										
Labor (e.g. family relations), informal labor, hired labor)										
Fisheries inputs: - Fishing gear - Boats - Boat engines - Storage facilities										
Fishing license										
Agricultural production materials: - Seed - Machinery - Poultry - Water buffalo - Storage										
Livestock production requirements										
Raw materials for artisan and craft production										
Transportation (boats, trucks, other vehicles)										
Education/training Skill development, etc.										

Job Opportunity

1. Do you want to change to other job?
   - ☐ No, please explain .....
   - ☐ Yes, please explain .....
2. Do you need additional income?
   - ☐ Yes. ☐ No, Why? Please explain .....
3. How much you need additional income per month? .....
4. How many hours of free time per day? And from when to when of day? .....
5. What type of alternative job do you want?
   - ☐ Agriculture ☐ Trading ☐ Handcraft ☐ Aquaculture
   - ☐ Labor ☐ Other (specify).....
6. How often do you see job opportunities?
   - ☐ Less than 1 month ☐ 1-3 months
   - ☐ 4-6 months ☐ More than 6 months
7. What is your primary source of job information? (multiple choices)
   - ☐ Job websites ☐ Social media
   - ☐ Friends / colleagues ☐ Other, specify : .....
8. How confident are you in your ability to obtain your desired job?
   - ☐ Very confident ☐ confident
   - ☐ Not confident ☐ Very confident
9. How long would you get a new job?
   - ☐ Less than 1 month ☐ 1-3 months
   - ☐ 4-6 months ☐ More than 6 months
10. What do you consider the biggest barrier to finding a job? (multiple choices)
    - ☐ Lack of experience ☐ Intense competition
    - ☐ Lack of qualification ☐ Limited networking
    - ☐ Other, specify : .....

Part IV : Additional Considerations

Special / Current issues

Safety at Sea

1. Have you ever got an accident during fishing in the sea?
   ☐ Never ☐ 1 time/year ☐ 2-3 times / year
   ☐ More than 3 times / year
2. Which is an accident that you face during fishing?
   ☐ Natural disaster ☐ Damaged fishing vessel/gears
   ☐ Slip/fall from boat ☐ Lost in the sea
   ☐ Run out of fuel ☐ Other .....
3. How do you get information on safety at sea?
   ☐ Friends ☐ Community leader
   ☐ Officers ☐ Radio broadcast
   ☐ TV ☐ Other .....
4. What kind of equipment for safety at sea in your fishing boat?
   ☐ Life jacket ☐ Floating device
   ☐ Medicine / first aid kit ☐ Repair tools
   ☐ Other .....
5. Have you ever gained in formation/training on safety at sea?
   ☐ Never ☐ Yes, (from which organization / agency .....)

Impacts of COVID-19 pandemic on fisheries

1. Do you get affected by COVID-19 pandemic?
   ☐ No ☐ Yes ☐ Not sure
2. How Covid 19 had affected in your fishing operation? .....
3. How Covid 19 had affected in your job? (agriculture, aquaculture) .....
4. How Covid 19 had affected in your daily life/health? .....
5. How to adapt to affected of Covid 19? .....
6. Do you get any support to alleviate suffering from the impact of COVID-19 pandemic?
   ☐ No ☐ Yes (please specify) .....

Environmental & resource challenges

1. Have you observed any changes in the amount or fish species you catch over the last 5–10 years?
   ☐ No ☐ Yes
2. If yes, what specific changes have you noticed? (multiple choices)
   ☐ Decrease in fish catch
   ☐ Increase in fish catch
   ☐ Appearance of new fish species
   ☐ Disappearance of some fish species
   ☐ Fish are found in different areas or depths
   ☐ Other, (please specify) .....
3. What do you think is the main cause of these changes? (multiple choices)
   ☐ Climate change (e.g., sea temperature rise, storms)
   ☐ Overfishing in the area
   ☐ Habitat destruction (e.g., coral reefs, mangroves)
   ☐ Pollution (e.g., plastics, chemicals)
   ☐ Other, (please specify) .....
4. Are there any changes in the ecosystem that affect your fishing activities? (multiple choices)
   ☐ Pollution (e.g., plastic waste, chemical runoff)
   ☐ Coastal erosion
   ☐ Changes in fishing grounds (e.g., depth, area)
   ☐ Shifts in fishing seasons
   ☐ Changes in fish migration patterns
   ☐ Increased sedimentation
   ☐ Loss of habitat (e.g., mangroves, coral reefs)
   ☐ Other, (please specify) .....
5. How have changes in fish stocks and ecosystems impacted your income?
   ☐ Significant decrease ☐ Slight decrease ☐ No change
   ☐ Significant increase ☐ Slight increase
6. Have you experienced any changes in your household's cost of living due to these impacts?
   ☐ No ☐ Yes (please specify) .....
7. What support do you think is needed to help you and other fishers adapt to these changes? (multiple choices)
   ☐ Financial assistance
   ☐ Training on sustainable fishing methods
   ☐ Training on alternative livlihoods
   ☐ Better enforcement of fishing regulations
   ☐ Restoration of habitats (e.g., mangroves, coral reefs)
   ☐ Climate change education and awareness
   ☐ Other, (please specify) .....

Attitude & perceptions

1. How important do you think sustainable fishing practices are for the future of your community?
   - ☐ Very important ☐ Somewhat important
   - ☐ Not important
2. What factors do you think influence the success and sustainability of fishing practices? (multiple choices)
   - ☐ Effective management and regulations
   - ☐ Cooperation within the community
   - ☐ Availability of resources and technology
   - ☐ Environmental conditions
   - ☐ Other, (please specify) .....
3. Are you familiar with the fisheries regulations that apply to your area?
   - ☐ No ☐ Yes (please specify) .....
4. Do you feel fishers in your community comply with these regulations?
   - ☐ Always ☐ Sometimes ☐ Rarely
5. What challenges or concerns do you face regarding compliance with fisheries regulations? (multiple choices)
   - ☐ Lack of understanding of the regulations
   - ☐ Disagreement with the rules
   - ☐ Lack of enforcement
   - ☐ Financial or practical barriers to compliance
   - ☐ Other, (please specify) .....
6. Have you or your community been involved in the process of establishing fisheries laws and regulations?
   - ☐ No ☐ Yes
7. If yes, how were you involved?
   - ☐ Consulted during planning
   - ☐ Participated in discussions or meetings
   - ☐ Provided feedback through surveys or other means
   - ☐ Other, (please specify) .....
8. Are you involved in any community groups or initiatives related to fisheries management?
   - ☐ No ☐ Yes
9. If yes, what type of activities do you participate in? (multiple choices)
   - ☐ Resource management
   - ☐ Environmental restoration
   - ☐ Education and awareness campaigns
   - ☐ Conflict resolution
   - ☐ Other, (please specify) .....
10. How would you rate the level of community engagement in fisheries management in your area?
    - ☐ Very high ☐ Moderate ☐ Low ☐ None

Part V: Additional comment

Southeast Asian Fisheries Developement Center
Training Department