

English for Fisheries Water Pollution Course: English for Fisheries and Aquatic Resources Management

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Abstract

The Service of Society (PkM) activity was carried out through an introduction to English for Fisheries and Aquatic Resources Management with the topic of Water Pollution. The activity aimed to improve participants' understanding of the concept of water pollution in English, identify types and sources of pollution, explain its impacts on fisheries and aquatic ecosystems, and discuss control solutions. The material covered the definition of water pollution and the importance of water quality for fish growth, aquaculture production, biodiversity, human health, and fisheries sustainability. The sources of pollution discussed included domestic waste, agricultural activities, industrial waste, and aquaculture activities. The material also connected water quality conditions with the seasonal calendar that includes rainfall, water temperature, fishing activities, cultivation activities, and changes in water quality. The implementation method used a contextual approach through material delivery, introduction of English vocabulary and concepts in the field of fisheries, identification of pollution sources, discussion of impacts, and discussion of control solutions. The results of the activity showed that the topic of Water Pollution provided a relevant learning context because participants were able to improve their English skills while understanding aquatic environmental problems. The material helped participants connect water pollution with fish growth, aquaculture productivity, biodiversity, human health, and the sustainability of fisheries resources. Thus, the English for Fisheries approach based on the Water Pollution issue is relevant for strengthening English communication skills as well as understanding the field of Aquatic Resources Management.

INTRODUCTION

English plays an important role in this community service activity, particularly in the fields of fisheries and aquatic resource management. Participants in these fields need English skills that are not only oriented toward general communication but are also related to terminology and issues within their fields of study. Therefore, the English for Fisheries and Aquatic Resources Management activity is designed to connect language skills with knowledge and real-world issues in the fisheries sector.

One of the important issues in aquatic resource management is water pollution (Dilani *et al.*, 2022). In the community service materials, *water pollution* is defined as the contamination of rivers, lakes, seas, and groundwater by harmful substances that reduce water quality and threaten aquatic life. Thus, water pollution is an issue that is directly related to the sustainability of aquatic resources (Drizo *et al.*, 2023). Water quality is highly important for the fisheries sector. Based on the community service materials, healthy aquatic environments are essential to support fish growth, aquaculture production, biodiversity, human health, and sustainable fisheries (Ding Jiafeng *et al.*, 2023). Conversely, poor water

quality can lead to decreased fish production, increased disease occurrence, and damage to aquatic ecosystems (Erish *et al.*,2022).

Water pollution can originate from various human activities. The materials presented during the community service activity identified five major sources: domestic waste, agricultural activities, industrial waste, aquaculture activities, and marine transportation. Domestic waste includes household wastewater, detergents, and solid waste (Hong *et al.*,2022). Agricultural activities can generate fertilizers, pesticides, and livestock waste. Meanwhile, industrial waste may include heavy metals, toxic chemicals, and factory wastewater (Goto Garrett *et al.*,2023).

Aquaculture activities can also become a source of pollution when they are not properly managed (GM Goto : 2023). Pollutants may originate from uneaten feed, fish waste, antibiotics, and chemicals. In addition, marine transportation can contribute to pollution through oil spills, fuel leakage, and waste generated by vessels.

The community service activity on *Water Pollution* in the English for Fisheries and Aquatic Resources Management course is important because the topic integrates English language skills with fisheries knowledge. Participants not only learn fisheries-related terminology in English but also develop an understanding of the relationship between water quality and fisheries activities.

Based on these conditions, this Community Service (PkM) activity adopted the theme “English for Fisheries Water Pollution.” The activity was designed to provide an understanding of water pollution using English while connecting the topic with fisheries and aquatic resource management.

Objectives of the Activity has several main objectives: (1) To understand the concept of *water pollution* in English; (2) To identify various types and sources of water pollution; (3) To explain the impacts of water pollution on fisheries and aquatic ecosystems; (4) To discuss various solutions for reducing water pollution; and (5) To connect English language learning with real-world issues in fisheries and aquatic resource management. These objectives directly refer to the *learning objectives* presented in the service of society materials.

METHOD

Partner Profile

The partner involved in this Service Society (PkM) activity is the Kurnia Baku People's **Business Group**, located in Tanralili District, Maros Regency, South Sulawesi Province. The group is a community-based organization engaged in business activities and involved in the local economic activities of the community. The involvement of the partner provides a real-world context for applying knowledge, skills, and experiences related to fisheries, aquatic environments, and the use of English for specific purposes.

The PkM activity involved 20 participants, consisting of members of the Kurnia Baku People's Business Group and students. The involvement of these two groups was designed to create an interactive, communicative, and contextual learning process. Participants were not only provided with knowledge by the implementation team but were also encouraged to share their experiences and knowledge regarding environmental conditions in their surroundings. Interaction between students and community members was expected to strengthen knowledge transfer while improving participants' ability to connect academic concepts with real-world problems in the community.

The selection of the Kurnia Baku People's Business Group as a partner was also relevant to the theme of the activity, namely *English for Fisheries Water Pollution*. Water pollution is an environmental issue closely related to the sustainability of aquatic resources and community activities. Therefore, the PkM activity was not only focused on improving English language skills but also on increasing participants' awareness of the importance of maintaining aquatic environmental quality.

Through this activity, the partner gained improved knowledge about the concept of *water pollution*, sources of pollution, impacts of pollution on aquatic environments and fisheries, and various pollution control solutions. In addition, participants were introduced to English terminology relevant to fisheries and aquatic resource management. Meanwhile, students gained experience in applying the concept of English for Specific Purposes (ESP) to real-world problems in the community.

Thus, the involvement of the partner was not limited to being a recipient of information but positioned the partner as an active participant in the learning process. This approach was expected to

produce a community service activity that was educational, practical, participatory, and relevant to community needs.

Form and Materials of the Activity

The community service activity was conducted in the form of training using the English for Specific Purposes (ESP) approach, particularly *English for Fisheries*. The ESP approach was selected because English learning was directed toward the specific needs and context of a particular field. In this activity, English was not taught as a general subject but was integrated with knowledge of fisheries, water quality, environmental pollution, and aquatic resource management.

The main topic was *Water Pollution*. This topic was selected because water pollution is an issue directly related to aquatic ecosystem conditions, fisheries productivity, human health, and the sustainability of aquatic resources. Through this topic, participants could learn English while simultaneously understanding environmental concepts and issues encountered in everyday life.

The materials were delivered using presentation media prepared by the implementation team. The first material discussed the basic concept of *water pollution*, namely the contamination of rivers, lakes, seas, and groundwater caused by the introduction of harmful substances that can reduce water quality and threaten aquatic life. Participants were introduced to the terms *water pollution* and *water quality* and their use in the fisheries context.

The next material discussed the Importance of Water Quality in Fisheries. Participants were provided with an understanding of the importance of water quality for *fish growth*, *aquaculture production*, *biodiversity*, *human health*, and *sustainable fisheries* (Arnupapboon : 2022). Participants were encouraged to understand that good water quality is an important factor supporting fish life and fisheries productivity. Conversely, declining water quality can cause impaired fish growth, increase the risk of disease, reduce production, and disrupt aquatic ecosystem balance.

The following material was Sources of Water Pollution. Participants were introduced to five major sources of water pollution: *domestic waste*, *agricultural activities*, *industrial waste*, *aquaculture activities*, and *marine transportation*. For *domestic waste*, participants learned terms such as *household sewage*, *detergents*, and *garbage*. Agricultural activities included *fertilizers*, *pesticides*, and *animal waste*. Meanwhile, industrial waste included *heavy metals*, *toxic chemicals*, and *factory wastewater*. Aquaculture activities were also discussed as potential sources of pollution when they are not properly managed. The terms introduced included *uneaten feed*, *fish waste*, *antibiotics*, and *chemicals*. In addition, marine transportation can contribute to pollution through *oil spills*, *fuel leakage*, and *ship waste*. These materials helped participants understand the relationship between human activities, the types of waste generated, and changes in aquatic environmental quality.

The materials also integrated a seasonal calendar. The seasonal calendar was used to connect changes in environmental conditions with fisheries activities. The aspects discussed included rainfall, water temperature, fishing activities, fish farming activities, and water quality conditions during January, February, and March. The integration of the seasonal calendar provided a contextual approach because participants could observe the relationship between environmental factors and fisheries activities during specific periods.

Implementation Methods and Stages

The implementation method used a training approach that was participatory, contextual, and practical. The participatory approach provided opportunities for participants to become directly involved in the learning process, while the contextual approach connected the materials with environmental conditions and real-world problems in the community. The practical approach was intended to enable participants to apply the knowledge and vocabulary they acquired in simple communication situations related to fisheries and aquatic environments.

The activity was implemented through several steps.

Step 1. Topic Introduction

The initial stage involved an introduction to the topic of *Water Pollution*. The implementation team explained the definition of water pollution, the importance of water quality, and the relationship between aquatic environmental quality and fisheries activities. Participants were given opportunities to share their initial experiences or knowledge regarding water pollution issues.

This stage aimed to establish participants' prior knowledge while connecting the English topic with their experiences and actual environmental conditions.

Step 2. English Vocabulary Training

The second stage consisted of vocabulary training. Participants were introduced to English vocabulary related to water pollution and fisheries, including *water pollution*, *water quality*, *fish growth*, *aquaculture production*, *biodiversity*, *sustainable fisheries*, *domestic waste*, *agricultural activities*, *industrial waste*, *heavy metals*, *toxic chemicals*, *uneaten feed*, *fish waste*, *oil spills*, and *ship waste*.

Participants were not only given the meanings of each term but were also encouraged to understand how the terms are used in sentences and fisheries-related contexts. Therefore, vocabulary activities were not limited to memorization but were directed toward understanding and communicative use.

Step 3. Problem Identification and Analysis

In the third stage, participants were actively involved in problem identification and analysis. They were guided to identify sources of water pollution based on human activities in their surroundings. Each source of pollution was analyzed according to the type of waste generated, the potential pathways through which pollutants enter aquatic environments, and their impacts on water quality and aquatic organisms.

This activity aimed to improve participants' critical thinking skills while practicing the use of English vocabulary that had been introduced.

Step 4. Group Discussion

The fourth stage involved group discussions. Participants were divided into several groups and given simple problems or cases related to water pollution. Each group discussed the sources of pollution, their impacts, and possible solutions.

The results of the discussions were then presented using simple English. Through this process, students and members of the Kurnia Baku People's Business Group were able to share their experiences, creating a two-way learning process.

Step 5. Communication Practice

The fifth stage was communication practice. Participants practiced using English through question-and-answer activities, expressing opinions, giving short presentations, and describing water pollution problems. Participants were encouraged to use the vocabulary they had learned to explain pollution sources, impacts on fish and ecosystems, and water quality conditions.

This activity aimed to improve participants' confidence in using English in the context of fisheries and aquatic resource management.

Step 6. Solution Development

The sixth stage was solution development. Participants were guided to formulate solutions based on the identified sources of pollution. Proposed solutions included reducing domestic waste, managing agricultural waste, controlling industrial and aquaculture waste, preventing oil spills, and increasing community awareness of the importance of maintaining water quality.

Participants were also encouraged to present their solutions using simple English so that language skills and problem-solving abilities could be developed simultaneously.

Step 7. Training Evaluation

The final stage was evaluation. Evaluation was conducted to determine participants' level of understanding after completing the training. Evaluation activities included oral questions, discussions, pollution-source identification tasks, group presentations, and a *post-test*.

The evaluation covered participants' understanding of the *water pollution* concept, mastery of fisheries-related English vocabulary, ability to identify pollution sources, ability to explain the impacts of pollution on fisheries and ecosystems, and ability to propose solutions.

Overall, the training method used in this community service activity was designed to integrate English language skills with knowledge of fisheries and aquatic resource management. The ESP approach enabled participants to learn English through relevant contexts, while the participatory approach provided opportunities for participants to interact, discuss, analyze problems, and develop solutions. Therefore, this activity is expected to improve English literacy in the fisheries field while strengthening participants' understanding of the importance of water quality and pollution control in supporting the sustainability of aquatic resources.

RESULTS AND DISCUSSION

Understanding the Concept of Water Pollution

The implementation of the activity provided participants with an understanding of the basic concept of *water pollution*. Participants were guided to understand that water pollution is not only related to the presence of garbage in water but also includes the introduction of various harmful substances that can reduce water quality and disrupt aquatic life.

This concept is important for students in the fisheries field because water quality is one of the key components determining the success of fisheries and aquaculture activities. By using English throughout the activity, participants had the opportunity to understand the concept as well as technical terms related to water pollution. This made the material more relevant to the characteristics of the English for Fisheries and Aquatic Resources Management course.



Picture 1; Explain the importance of Water Quality for Fisheries

Understanding the Importance of Water Quality for Fisheries

The activity materials demonstrated that water quality is closely related to the sustainability of fisheries activities. Healthy water is essential to support fish growth, aquaculture production, biodiversity, human health, and sustainable fisheries. Participants were able to understand that poor water quality can potentially cause problems in fisheries activities. Declining water quality can be associated with reduced fish production, increased disease risks, and disruption of aquatic ecosystems (Hong, et al: 2022). This discussion strengthened the understanding that English proficiency in the fisheries field cannot be separated from an understanding of the basic concepts of fisheries themselves.

Identification of Sources of Water Pollution

The results of this community service activity showed that participants gained an understanding of various sources of water pollution. (a) Domestic Waste includes *household sewage*, *detergents*, and *garbage*. These are sources of pollution originating from household activities; (b) Agricultural Activities can generate pollutants such as *fertilizers*, *pesticides*, and *animal waste*. Introducing these terms provided participants with additional English vocabulary relevant to aquatic environmental management; (c) Industrial Waste may include *heavy metals*, *toxic chemicals*, and *factory wastewater*. These terms are important for participants to understand because industrial activities can contribute to changes in water quality; (d) Aquaculture Activities, in aquaculture activities, pollution can be associated with *uneaten feed*, *fish waste*, *antibiotics*, and *chemicals*. This material provided an understanding that aquaculture management must also consider the quality of the aquatic environment; (e) Marine Transportation can become a source of pollution through *oil spills*, *fuel leakage*, and *ship waste*. This material broadened participants' understanding that pollution does not only occur in inland waters but can also originate from transportation activities at sea.



Picture 2; Practice the connecting cause and effect of water pollution

Integration of English and Fisheries Competencies

One of the important outcomes of the activity was the development of a connection between English language skills and fisheries knowledge. Participants did not simply learn vocabulary separately but used the terms in the context of water pollution issues.

For example, participants were able to connect the following terms: Water Pollution → Water Quality → Fish Growth → Aquaculture Production → Sustainable Fisheries.

This relationship made the learning activity more meaningful because English was used as a means of understanding phenomena directly related to the participants' field of study.

Discussion of the Seasonal Calendar and Water Quality

The Service of Society materials also introduced a *seasonal calendar* that connects seasonal conditions with fisheries activities. The calendar included five aspects: rainfall, water temperature, fishing activities, fish farming activities, and water quality.

In January, rainfall was high, water temperature was moderate, fishing activity was moderate, fish farming activities were in the preparation stage, and water quality was moderate. In February, rainfall remained high, water temperature was moderate, fishing activity was moderate, fish farming activities were in the stocking stage, and water quality was moderate. Meanwhile, in March, rainfall was moderate, water temperature was warm, fishing activity was high, fish farming activities were in the maintenance stage, and water quality was good.

The seasonal calendar provided additional context for the activity because participants could observe that aquatic conditions and fisheries activities can be monitored based on changes over time and across seasons.

The material also used intensity categories, namely very high, high, moderate, and low, while the terms *preparation*, *harvesting*, *stocking*, and *maintenance* were used to indicate different stages of fish farming activities.

In the context of this community service activity, the seasonal calendar can be used as a learning medium for describing aquatic conditions and fisheries activities using English sentences.

For example:

“In January, rainfall is high and water quality is moderate.”

“In February, fish farming is in the stocking stage.”

“In March, fishing activity is high and water quality is good.”

Thus, the seasonal calendar functioned not only as information about fisheries conditions but also as a contextual medium for English learning.

Discussion of Solutions for Reducing Water Pollution

The activity also aimed to encourage participants to discuss solutions for reducing water pollution. The discussion of solutions was conducted based on the sources of pollution that had been identified. Participants were encouraged to consider actions that could reduce the entry of domestic, agricultural, industrial, aquaculture, and marine transportation waste into water bodies.

In the fisheries context, the discussion of solutions also emphasized the importance of maintaining water quality as part of efforts to support fish growth, aquaculture production, biodiversity, human health, and sustainable fisheries.

Relevance of the Activity to Community Service

This activity was relevant to community service because it connected English language competencies with environmental issues closely related to the lives and activities of fisheries communities. The use of the *Water Pollution* topic enabled the activity to go beyond language learning and contribute to participants' understanding of the importance of maintaining aquatic environmental quality. The materials used in the activity can also be further developed into various sustainable community service activities, such as group discussions, presentations, environmental campaign posters in English, simple water quality report writing, and communication simulations between fisheries managers and community members.

Overall, the integration of English language learning with fisheries and environmental issues provided a contextual learning experience that could strengthen both participants' English communication skills and their understanding of aquatic resource management.

CONCLUSION

The Service of Society (PkM) activity with the theme “English for Fisheries Water Pollution”, conducted as part of the English for Fisheries and Aquatic Resources Management course, provided a community service approach that integrated English language skills with knowledge of fisheries and aquatic resource management. The activity materials covered the concept of *water pollution*, the importance of water quality for fisheries, and pollution sources originating from domestic waste, agricultural activities, industrial waste, aquaculture activities, and marine transportation. The materials also connected pollution and water quality with fish growth, aquaculture production, biodiversity, human health, and sustainable fisheries.

The integration of *Water Pollution* materials with English provided a relevant context for participants to understand and use technical terminology in the fisheries field. Participants also gained experience in connecting English language skills with real-world issues related to aquatic resource management. The use of a *seasonal calendar* further strengthened the contextual nature of the activity by enabling participants to relate rainfall, water temperature, fishing activities, fish farming activities, and water quality. Therefore, English for Fisheries Water Pollution can be used as a relevant community service-learning material to support the development of English language skills while simultaneously strengthening environmental literacy and competencies in Aquatic Resources Management.

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