

Master's Research Report

An Explanatory Case Study on Japan's Overseas Development Assistance (ODA) Contribution to Papua New Guinea's Coastal Fisheries Development towards Food Security of Rabe Community

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CERTIFICATION

This Master's Research Report remains original and true from the initial development through to its completion. No copy of the manuscript or printed format was submitted to any organization including universities or educational institutions to gain any form of degree or diploma. Under the guidance and requirements that are critical to research within the requirements of Ritsumeikan Asia Pacific University, all sources of references and any form of publications are appropriately acknowledged.



Terence Kedamwana
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ABBREVIATIONS

ADB	Asian Development Bank
BRI	Belt and Road Initiative
DAC	Development Assistance Committee
DFMR	Department of Fisheries and Marine Resources
DWFN	Distant Water Fishing Nation
EEZ	Exclusive Economic Zone
EPA	Japanese Economic Planning Agency
EU	European Union
FAO	Food and Agriculture Organization
FFA	Pacific Islands Fisheries Forum Agency
FSP	PNG Fisheries Strategic Plan 2021-2030
JICA	Japanese International Cooperation Agency
METI	Japanese Ministry of Economic Trade and Industry
MOF	Japanese Ministry of Finance
MOFA	Japanese Ministry of Foreign Affairs
MoU	Memorandum of Understanding
MTDP-III	PNG Medium Term Development Plan III 2018-2022
NFA	National Fisheries Authority of Papua New Guinea
ODA	Official Development Assistance
OECD	Organization for Economic Co-operation and Development
OECF	Japanese Overseas Economic Cooperation Fund
OFCF	Overseas Fishery Cooperation Foundation of Japan
PNA	Parties to the Nauru Agreement
PNG	Papua New Guinea
SDGs	Sustainable Development Goals
SPC	Secretariat of the Pacific Community
UN	United Nations
UNDP	United Nations Development Programme
US\$	United States Dollar
US	United States of America
VDS	Vessel Day Scheme
WCPFC	Western and Central Pacific Commission

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ABSTRACT

Official Development Assistance (ODA) plays a major role in the development of the economic, social, and political conditions of many developing countries. Japan is one of the major donors of ODA to the Pacific Islands. Technical cooperation has been the larger part of Japan's ODA to many Pacific Island countries, including Papua New Guinea (PNG). A majority of PNG coastal and island communities depend heavily on coastal resources for their daily survival. Technical cooperation assistance in providing technical training, technical experts, and supplying equipment and materials have been key priorities. The focus of this study is on technical cooperation in Japan's ODA toward the development of coastal fisheries in PNG in addressing food security in the Rabe community.

The results of this study confirms that technical cooperation as a modality under Japan's ODA is a better form and contributes towards coastal fisheries development of PNG. The case study of trap net project introduction in Rabe shows that the community members, have gained adequate technical knowledge from the trainings, advice and guidance from Japanese fisheries experts and the procurement of technical equipment to sustainably manage the operations and income gained from the project. The key features of managing trap net fishing in PNG are the critical contributions to the overall understanding and management of coastal fisheries in PNG. This includes the experience in mobilizing community groups to manage the project, incorporates important guidelines and action plans for the sustainable operations of the project, and encourages continuous data collection for future decision-making for sustainable operations of the project. Additionally, the trap net in Rabe demonstrates that it can self-finance its operation while providing incentives for other community development projects. There is also a contribution as savings for future project development.

Based on the four main food security pillars including Availability, Accessibility, Unitization, and Stability, this study confirms that the introduction of the trap net project in the Rabe community satisfies addressing food security. It illustrates that the project under the technical cooperation assistance provided by the Japanese ODA, can provide and sustain the livelihoods of the Rabe community, and the long-term sustainability of this fishing project is seemingly successful.

The results provide vital information to decision-makers for future implementation of ODA projects targeting coastal fisheries development in PNG, and they can be applied to other Pacific Island countries as well. Also, the study implies a stronger bilateral relation between Japan and PNG. The study satisfies an effective utilization of technical cooperation from Japan to PNG that serves interest of both Japan and PNG. This relationship can be an encouraging example for the wider Pacific Island countries.

CHAPTER 1: INTRODUCTION

This chapter elaborates on the overall research aim, objectives, and the significant contribution of this study. The main emphasis of this study is based on the technical cooperation assistance under the Japanese Overseas Development Assistance (ODA) contributing towards the development of Papua New Guinea's coastal fisheries.

1.1 Research Background

The motivation for this study stems from the introduction of a new fishing technology in Papua New Guinea (PNG) in 2012. The National Fisheries Authority (NFA) of Papua New Guinea and Overseas Fishery Cooperation Foundation of Japan (OFCF) signed a Memorandum of Understanding (MoU) for a collaborative partnership in introducing the trap net or set net fishing technology in Papua New Guinea.

The project reflects the existing bilateral relationship that was signed in 2006 between the government of Japan and PNG. A key emphasis of this bilateral relationship is based on mutual cooperation toward the development and management of fisheries resources. Since 2001, the National Fisheries Authority (NFA) of Papua New Guinea was mandated by the government of PNG under the Fisheries Management Act 1998 to sustainably manage all fisheries and marine resources in the country (Kuk and Tioti, 2012). Conversely, the Overseas Fishery Cooperation Foundation of Japan (OFCF) is a specialized non-profit organization under the Japanese Fisheries Agency of the Japanese Ministry of Agriculture, Forestry, and Fisheries. OFCF was created in 1973 and is responsible for providing technical assistance under the Japanese ODA towards the development and management of fisheries resources in many countries around the world, including the Pacific Islands. The emphasis of the assistance

provided by OFCF is based on maintaining close bilateral relations with Japan in the fisheries sector (Tarte, 1998). In this context, Japan extends its ODA through OFCF in partnership with the development of coastal fisheries in PNG.

The economy of the 22 countries and territories in the Pacific depends heavily on the revenue gained from tuna resources. However, there are varying levels of development challenges faced by the island countries based on the landmass, population, economy, and available resources. According to the United Nations Food and Agriculture Organization (FAO, 2018), the current major challenges for many of the Pacific Island countries include, limited land mass, fragile natural environments, a lack of arable land; limited resource bases, and heavy reliance on ocean resources; high vulnerability to climate change, external economic shocks, and natural disasters; high reliance on food imports; reliance on a small number of economic sectors; remoteness and distance from global markets; and high energy, transportation, and communication costs. Regarding food security, these challenges lead to a lack of fresh, healthy food and access to it. Also, concerning health, diseases including, obesity, diabetes, and heart disease, as well as vitamin and mineral shortages and food-borne illnesses, are now common in the Pacific. It poses a tremendous threat to the economic productivity and growth in the region (SPC, 2010).

For PNG, like other Pacific Island countries, the vast coastal fisheries resources support the livelihood of the majority of the communities living near the coast and the isolated islands. Major challenges faced by the PNG government include low fisheries infrastructure development, high cost of fishing, and low fisheries production to sustain the livelihoods of the people, to name a few (National Fisheries Authority, 2017). As such, one of the key objectives of the project is aimed at addressing food security.

Regarding Japan, access to the rich tuna resources within the Exclusive Economic Zones (EEZ) of the Pacific Islands is among its key objectives for diplomacy and cooperation with the island states. This forms the connection for Japan's extension of its ODA towards the Pacific Islands and thus PNG. According to OECD's creditor reporting system (2022), Japan's total bilateral assistance to PNG amounts to USD126. 687 million. The total ODA towards fisheries in PNG stands at US\$ 0.528 million. The fisheries sector ODA from Japan is the highest among other donors' countries like Australia and Taiwan at USD 0.327 million each. Also, Japan's assistance is mainly based on fishery development, amounting to USD 0.528 million. Australia and Taiwan are mainly focused on fishery policy and administrative management (OECD, 2022).

The trap net fishing technology is a traditional fishing gear in Japan. Since early 2000 it has gained remarkable recognition as one of the most sustainable coastal fishing gears in Japan. PNG has opted for the introduction of this fishing gear in line with its domestic aspiration towards sustainable coastal fisheries development. Since 2017, NFA requested OFCF for further extension of the MoU for the introduction and management of small-scale trap net as trial research for future potential expansion to other coastal communities in PNG. This study adopts the case of the Rabe trap net project. The study, therefore, uses primary data collected from the Rabe trap net since 2019 to explain how Japan's ODA contributes to coastal fisheries development and food security of the Rabe Community.

1.2 Research Focus

Trap net is a traditional fishing gear used in Japan for over 400 years. This fishing technology was declared recently in 2002 as one of the most sustainable coastal fishing methods in Japan. Japan has taken the initiative under specialized organizations including JICA

(Japan International Cooperation Agency) and the OFCF (Overseas Fishery Cooperation Foundation) to expand the knowledge and culture of Japan to support the aspiration of sustainable coastal fisheries development in other countries through collaborative partnership in the introduction and implementation of this fishing gear.

Since 2013, Japan's ODA under OFCF provided technical cooperation assistance in the introduction and implementation of the trap net project targeting the development of coastal fisheries in PNG. It is still an ongoing project with the main emphasis on contribution toward resource management, food security, and sustainable livelihood. This research, therefore, focuses on explaining, using empirical data collected from the Rabe project site how the utilization of Japan's ODA by OFCF contributes to food security in the Rabe community.

1.3 Research Questions

Main Research Question:

How has technical cooperation assistance under Japan's Overseas Development Assistance (ODA) been implemented in coastal fisheries development project in Papua New Guinea?

Sub-questions:

How has Japan's Overseas Development Assistance (ODA) contributed to addressing food security in Rabe Community in Papua New Guinea?

Why does Japan extend ODA to the Pacific?

How is Japan's ODA applied in the Pacific?

1.4 Research Aim and Objectives

The overall aim of this study is to explain using primary data how the introduction of the trap net technology under Japan's ODA contributes to coastal fisheries development to attain food security for the Rabe Community in PNG. To fully explain the aim of this research, the following objectives will be followed;

1. Undertake a literature review to provide an insight into why Japan gives ODA to the Pacific and thus towards the development of PNG's coastal fisheries.
2. Conduct a literature review to understand how Japanese ODA has applied to the Pacific Islands and thus PNG.
3. Critically evaluate and analyze the empirical data to establish how technical cooperation under Japan's ODA contributes to food security in PNG
4. Explain the findings and discuss outcomes from the analysis of the data relating to food security.

1.5 Value of the Research

This study is based on an ongoing coastal fisheries development project in PNG. Since the introduction and implementation of the project in 2013, it is the first time this study has documented the undertaking of the partnership between OFCF and NFA towards coastal fisheries development of PNG. First, this research contributes to the understanding of why and how Japan's ODA is used in contribution towards the coastal fisheries development in PNG. Second, in using the case of the Rabe trap net, the data that is analyzed in this research contributes to the additional understanding of the contribution of Japan's ODA towards achieving food security in PNG. Third, understanding the introduction, implementation, and management of the project in this research gives a better understanding of future ODA and

coastal fisheries project implementation. Finally, relative to the findings of this study, further information and opportunities can be identified and can be used to make informed decisions in case there are intentions for the trap net project to be duplicated for other coastal communities in PNG and other Pacific Island countries.

CHAPTER 2: LITERATURE REVIEW

The following chapter aims to give an insight into why ODA is given to the Pacific and thus towards the development of PNG's coastal fisheries. Also, it aims to discuss how technical cooperation under Japan's ODA is applied to the Pacific Islands.

2.1 What is Official Development Assistance (ODA)?

According to the Ministry of Foreign Affairs of Japan (1994), in the late 1960s, there was increasing international concern over lagging in the development of many developing countries based on the quality of aid. Following this, the Development Assistance Committee (DAC) under the Organization of Economic Co-operation and Development (OECD) introduced the concept of Official Development Assistance (ODA) in 1969. The aim was that, under this concept, a better understanding of channeling aid between donor countries to the developing countries can be attained. It became the means of measuring assistance of developed countries towards developing countries, i.e., how much a donor country can provide to developing countries based on its Gross National Product (GNP). Further, in 1970 the United Nations General Assembly proposed that donor countries allocate 0.7% GNP as the benchmark. The Development Assistance Committee (DAC) under OECD adopted the 0.7% Gross National Product benchmark for ODA towards developing countries from donor countries. This development of ODA measurement was also vital for assessing the conditionalities of ODA which signified the quality of the ODA provided. Key components such as concessionality or grant elements become a great concern towards effective ODA utilization by donor countries towards developing countries. The 0.7 % of GNP later was changed to 0.7% of Gross National Income (GNI) by 1993 together with the ODA grant-equivalent method. Concessionality measures the benefit provided to a borrower when compared with financing available at the

full market rates. The Grant element of a loan measures how soft the conditions of the loan in terms of interest rate and grace period as a percentage. This method saw fit that donor countries on average can provide up to 0.31 of their GNI as ODA (OECD, 2021).

According to DAC, ODA is defined as ‘*government aid that promotes and specifically targets the economic development and welfare of developing countries*’ (OECD, 2021). ODA is considered a form of development aid. It constitutes the flow of financial contributions by donor government agencies towards the developing countries as bilateral ODA or towards multilateral institutions.

Zimmerman (2007) and JICA (1998), show that ODA is received from bilateral donor countries or multilateral institutions. Also, the key elements to qualify aid flows as ODA must be that the finance is official, it promotes economic development and welfare, targets developing countries, must be concessional in character and has grant element of at least 25% (JICA, 1998). Donor countries under the DAC provide ODA flows to eligible receiving countries categorized under Part I. The four categories include: 1) least developed countries, 2) other low-income countries (per capita GNI less or equal to \$1, 045.00 in 2020), 3) lower middle-income countries (per capita GNI \$1, 046.00 to \$4, 095.00 in 2020) and 4) upper middle-income countries (per capita GNI \$4, 096.00 to \$12, 695 in 2020). Other countries including those in the Part II listing are considered high earning countries (OECD, 2022).

2.2 Why donor countries give ODA to the Pacific Islands?

In this current interdependent world, foreign aid is used as a tool by developed countries under their foreign policy as a means to promote their interest and relationship with developing countries. Developed countries give foreign aid to developing countries (Winham, 1970). In

this sense, Thapa (2020), defines foreign aid as the voluntary movement of resources including money, services or goods from developed countries to developing countries.

Developed countries including Australia, New Zealand, Japan, United States, China and France give aid to the Pacific Islands. International organizations such as Asian Development Bank (ADB), European Union (EU) and other specialized organizations such as the United Nations Development Programme (UNDP) also provide aid to the Pacific Islands. The purpose of providing aid to the Pacific is mainly to solve the North-South problems of the world. Foreign aid to the Pacific Islands is mainly for humanitarian and poverty alleviation (Edo, 1986). Overall, recipients of the aid in the Pacific aims to promote their industry, social wellbeing and overall economic development. Such is attained by providing direct financial support, supply of materials, improved infrastructure, technology transfer and manpower development. It is therefore expected the assistance gained by the developing countries can help achieve economic independence and reduce the gap between the North and South.

Australia, New Zealand and France have a long and strong political relation with the Pacific Islands. The biggest contributor of foreign assistance to the Pacific is Australia. Australia refers to the Pacific as countries at its doorsteps. Since 1974, Australia have been providing aid to the Pacific Islands. After several developments, Australia have decreased its aid to other regions of the world but maintains its focus in the Pacific region. The Australian aid comes under the banner of Australian Agency for International Development (AusAID) since 1995. It is a central agency merged with the Ministry of Foreign Affairs and Trade that is responsible for the overall management and disbursement of aid from Australia. PNG gets the biggest share among other Pacific Island countries due to close political and economic ties with Australia (Australian Department of Foreign Affairs, (n.d). The total Australian ODA estimate outcome for 2018 to 2019 was \$AU 1.3 billion. The bilateral aid program disbursements between 2018 and 2019 shows that PNG received the highest with \$AU 572.2 million, then Solomon Islands

with \$AU 187 million, Vanuatu at \$AU 62.3 million and Fiji with \$AU 58.1 million. Other Pacific Islands that also received bilateral programs include Samoa, Tonga, Kiribati, Nauru and others (Australian Department of Foreign Affairs, (n.d). For Australia, aid is provided mainly for regional stability and economic development. Australia plays the role of regional leader in the Pacific region and a key member of many regional organizations including the Pacific Islands Forum (PIF). A diverse range of project aid and economic support is provided towards the Pacific Island countries targeting environment, social wellbeing, human resource development and climate change programs.

On the other hand, the United State was a major donor country to the Pacific Islands in the 1970s. By 1990s, aid from the United States decreased dramatically until closure of the United States aid office in Fiji in the early 1990s. However, the United States still maintains its relationship with the Pacific through regional forums such as the Pacific Island Fisheries Forum Agency (FFA). The United States participation in the Pacific is mainly concerned with regional security and economic development. The South Pacific Tuna Treaty is a multilateral agreement that reflects the United States connection with the Pacific Islands. This multilateral agreement emphasizes on security and stability in the region. Since the initial signing in 1978, the United States maintains a strong connection with the island countries up until today. The main focus of the multilateral agreement was based on the threat of inroads by the Soviet Union into the Pacific in the late 1970s. Since then, the United States gave greater concern to the Pacific with providing US Aid as an economic support for government budget for the island countries. Until the 1990s, aid from the United Stated decreased and the multilateral agreement promoted cooperation and development through fisheries. Under this multilateral agreement the United States provided 16 Pacific Island countries an initial US\$ 12 million per year for five years from 1988 to 1993. Over the years, this amount increased as well with period changing from five years to ten years. By 2015, the amount reached US\$ 90 million for 10 years. The purpose

of this payment is to allow United States vessels to fish in the Pacific EEZ as well as maintaining security in the region. According to Tarai (2015), 85 percent of the payment is allocated to countries that United States' vessels access to do fishing. Other countries receive 15 percent of the payment regardless of any fishing activity in their EEZs. The main disbursement method is through project aid and technical assistance.

According to Pryke (2020), China, since 2006, has become an increasing influence for aid towards the Pacific Islands. The emphasis for China is based on bilateral relations towards infrastructure and economic development under their Belt and Road Initiative (BRI). The Pacific Ocean in this recent time pose a great concern among traditional powers in the region including Australia and the United States over China's involvement in the Pacific. Due to lack of basic infrastructure, weak economies, climate change challenges including high dependency of aid among many of the Pacific Island states, China has become a strong influence in their aid delivery towards the island states. Between 2006 and 2017, China provided close to US\$ 1.5 billion as foreign aid to the Pacific Islands. Solomon Island's for example has already reached a 46% of trade with China. As of 2017, China stand's as third largest aid donor in the Pacific region with 8% of total foreign aid mainly through grants and loans (Pryke, 2020). However, large infrastructure development is provided under projects that are funded by concessional loans. The Chinese state-owned enterprises are therefore invited into the region for delivery of these development projects under the agreements (Pryke, 2020).

For Japan, the main reason for Japan's relationship with the Pacific Islands is based on regional stability and humanitarian reasons. Japan is a dominant fishing nation in the Pacific since the 1920s. The Japanese fishing vessels gain access to the EEZs of Pacific Island states to harvest the vast tuna resources. The Japanese aid diplomacy towards the Pacific Islands became more pronounced following the adoption of the EEZ by many Pacific Island States. Japan maintains bilateral relations with many of the island states. The Japanese aid to the

Pacific Islands favors more the development of the fisheries sector. Japan extends grants, loans and technical assistance. JICA and other specialized organizations such as the OFCF are key implementing agencies for Japan's assistance towards the Pacific. The fisheries grant aid towards the Pacific Island remains the dominant kind of assistance from Japan. Technical cooperation for fisheries development forms the key disbursement of aid from Japan. Technical cooperation from Japan includes providing technical training, providing technical experts and providing technical equipment and materials. According to Numata (1990), Japan's aid disbursement mainly emphasizes economic cooperation. In global comparisons, Japanese ODA to the Pacific Islands is between 1 to 2 percent but steadily increasing since the 1980s. Between 1984 and 1988, Japan's bilateral ODA increased by 3.7 times reaching US\$ 93.07 million. The emphasis of increase in aid targets economic cooperation with priorities on infrastructure, primary industry such as fisheries, basic human needs and others like transportation, education, communication, health, social and cultural developments. Currently, Japan maintains in its White Paper Policy that recognizes close cooperation with the Pacific Islands to encourage fishing access to the Pacific's EEZ. In doing so continues to provide Japan's ODA towards the development aspirations for the Pacific Island states (Ministry of Agriculture, Forestry and Fisheries of Japan, 2021).

2.3 Japanese ODA Diplomacy

Japan's ODA remains an active and reliable diplomatic tool for Japan. It plays a major role in the relations of Japan and how it relates to the international community. The following outlines the development of Japan's ODA, types of Japanese ODA and mechanism of its aid delivery.

2.3.1 The Development of Japan's ODA

According to the Ministry of Foreign Affairs of Japan (1994), Japan's interest in economic cooperation between government-to-government prompted Japan to join the Colombo Plan in 1954. The members of this agreement were from the British Commonwealth of nations of which many were developing nations. Japan at that time was growing economically with having great interest to participate in trade and economic development among the comity of nations. In the same year, Japan began its reparation program. This program facilitated Japan's assistance towards damages of assets during World War 2. However, the technical cooperation of Japan's ODA was instrumental in the Colombo agreement and by 1958 the first yen development loan was extended to India. This reinforced economic cooperation towards trade relations via industry and infrastructure development with Japan. The use of Japan's yen loan was intended to promote a sturdier and longer-term economic relationship. It was seen to have greatly supported relationship with other Southeast Asian countries as well.

Further, MOFA (1994), pointed out that by the late 1960s, Japan's economy grew stronger with improved its international status. The foreign aid from Japan extended in scale and form with increased reach towards emerging economies of Southeast Asia. As Japan interests grew in the region, so did Japan's ODA loans to the developing countries in the region. The developing countries utilized this opportunity to develop much of their infrastructure, industry and trade relations with Japan. Specific to this relationship is the associated financing and mixed credit facilities used by Japan's ODA. The yen development loan accessibility was easily driven towards industry development and trade became stronger between recipient countries and Japan. It served the purpose of Japan's economic interest and development of the recipient countries in the region.

First, the focus and interest of Japan was on increased economic relationships. That signified Japan's interest in increasing its ODA and focus towards geographical locations expanding towards the Middle East, Africa, Latin America, the Pacific Region including Southeast Asia. The critical aid sectors were also diversified and included Basic Human Needs, Human Resource Development and Economic Infrastructure.

Second, by 1978, Japan redefined philosophies and objectives of its ODA based Japan's economic cooperation prioritized mainly security and trade. It states that by assisting developing countries, Japan contributes to peace and stability of the world. Also, it is essential for Japan to maintain a strong trade relationship with developing countries for a prosperous economic growth.

Third, the focus on increased economic cooperation demanded Japan to be clear of motives of their expansion and diversified ODA. By 1980, MOFA made clear the motives and stance of increase ODA by Japan stating two critical motives, the first being for humanitarian and moral consideration and the second, recognizes and stresses the need for relationship between Japan and developing countries as they are interdependent and covers aid philosophies of Japan. Japan's ODA contributed towards an international environment that secures a comprehensive security for Japan.

Fourth, by 1991 the Government of Japan had announced guidelines for the development assistance to developing countries. The creation of the guidelines was influenced by the development after the Cold War. Japan's ODA was therefore devoted to having no involvement in the war. Significantly, the guidelines outlined no support to developing countries and discouraged the use of Japan's ODA for any military expenses, production or participations in weapons of mass destruction, and export or import of arms. The final point in the four guidelines stipulated Japan interests in the ODA being granted permission for use regarding

promoting democratization and introduction to market-oriented economy and securing of basic human rights and freedom.

Fifth, the cabinet of Japan's Government adopted the Official Development Assistance Charter (ODA Charter) in June 30th 1992. It formed the basic principles or philosophies of Japan's ODA currently. The four basic philosophies of Japan's ODA include, human considerations, recognizes interdependence among different countries in the international community, consideration for the environment and supporting self-efforts of developing countries. Together with the four guidelines mentioned, forms the current principles of Japan's ODA relationship with developing countries worldwide.

2.3.2 Types of Japan's ODA and Delivery Mechanisms

According to MOFA (1994), Japan's ODA is in the form of grant aid, development loans, technical cooperation and associate financing and mixed credit facilities. Grant aid and technical cooperation are mainly utilized as a diplomatic tool towards Japan's bilateral relationship with developing countries in conducting various trainings, providing of experts, building of infrastructure and provide development projects. The development loans reflect Japan's interests in bilateral and multilateral relationships. It focusses on infrastructure and industry development. It also promotes trade between Japan and the recipient countries. The associate financing and mixed credit facilities are specialized aid by Japan to recipient countries that focus mainly on industry development and infrastructure. This form of aid to developing countries maximizes opportunities to attain necessary priorities of the recipient states at the domestic front. It complements the development loans and promotes trade as main attention is given to settling differences in exchange rates of the aid with effective and efficient delivery or supply of technical equipment supplied by Japan as per the aid agreement.

The delivery of aid mechanism of Japan's ODA is based on existing administrative apparatus of Japan's bureaucratic structure. Japan's ODA is not centralized to one agency for decision making or overall delivery. The management and decision making are based on a collective interest from an array of government institutions with direct involvement based on what Japan's interests best suits its aid utilization. It is unlike the United States, British, Australia or Canada which have a centralized aid delivery agency to focus on their aid.

Rudner (1989), provide the roles of some government institutions that have critical roles in Japan's ODA delivery including: The Ministry for Foreign Affairs and Trade (MOFA)- Administers the grants and components of aid contribution to recipient countries with Japan's Ministry of Finance. Japan International Cooperation Agency (JICA)- Works under MOFA and specialized in delivery of Japan's technical cooperation ODA. JICA also provide grant aid for projects involving technical assistance, training and equipment supply to recipient countries. Japanese Economic Planning Agency (EPA)- Manages Japan's ODA at the policy level. The responsibility is in making policy decisions on types of ODA loans, interest rates and repayment periods. They work closely with MOFA, MOF and METI. Overseas Economic Cooperation Fund (OECF)- They are a specialized institution managed by EPA that executes ODA loans based on approved policy decisions. They are specifically responsible for managing project appraisals and implementation of policies including disbursement of ODA loans and the repayments. Also, they manage ODA loans intended to cover differences in foreign exchange costs and the development projects. The Ministry of Finance (MOF)- This ministry works closely with the other ministries and organizations to accommodate budgeting for Japan's ODA based on approved decisions towards the annual financial year. The Ministry of Economy, Trade and Industry (METI)- This ministry involves in decision making regarding trade and industry development on the utilization of Japan's ODA. It works closely with MOF, MOFA and other doing development projects.

There are also small delivery mechanisms created by Japan for specific purpose of Japan's ODA effective and efficient delivery. These small group of delivery mechanisms are specialized in developmental activities and connected to important ministries of the Japanese government. Their main purpose is to address specific interests of Japan based on economic and technical cooperation or for specialized components of Japan's ODA towards the recipient countries. Some of these organizations include the following; Japan Overseas Development Cooperation, Overseas Fishery Industry Cooperation Foundation, The Metal Mining Agency of Japan, The Japan Petroleum Development Corporation, The Institute of Developing Economics, Japan External Trade Organization and The Japan Foundation.

Rix (2005) and Tarte (1998) mentioned that Japanese International Cooperation Agency (JICA) is the main implementing agency for Japanese aid under the Ministry of Foreign Affairs. By 1992, Japanese cabinet adopted the Japanese ODA Charter with four key principles including humanitarian considerations, recognition of interdependence among nations of the international community, environmental considerations and support for self-efforts of recipient countries. These basic principles form the guideline for disbursement of aid towards developing countries (JICA, 2021).

Other specialized organization such as Overseas Fishery Cooperation (OFCF) of Japan also disburse aid from Japan mainly for development of fisheries. These specialized organizations form a critical component for bilateral relations with the Japanese government and others including the Pacific Island countries in terms of their fisheries relations. The loans, grants and technical assistance provided are mainly fisheries related. For the Pacific Islands the connection with such specialized organizations are critical considering management and development of coastal fisheries resources supports the majority of its populations. Japan providing aid in that manner promotes cooperation and stronger bilateral relations.

2.4 Japanese ODA in the Pacific Islands

2.4.1 The Pacific Islands

The Pacific Islands are countries comprising isolated continental islands and small atolls in the vast Pacific Ocean. Much of what is understood about the Pacific Islands is their cultural connection to the ocean and dependence on fisheries resources as a means to their subsistence livelihood. The three major cultural groups of people in the Pacific include the Micronesians, Polynesians and the Melanesians. In terms of development, there is vast differences between small atoll islands like Tuvalu, a Polynesian State and Papua a New Guinea (PNG), a Melanesian state. The difference is based on level of available resources including landmass and natural resources. Kiribati and Tuvalu are examples of atolls that lack large land and natural resources. PNG, Solomon Islands and Vanuatu are continental islands with vast land area and natural resources. These continental islands have great opportunity for development. Such examples directly relate to the economic condition of the Pacific Islands. Small atoll sates have small economies with limited resources while the continental islands have a bigger economy in the region with many natural resources at their disposal. Also, a main difference among the Pacific Islands is the presence of industries that supports the country's economy. Fiji and PNG currently benefit more from industries of their natural resources. Fiji is known for the sugar industry and PNG for natural minerals including oil and gas exports. However, due to factors such as isolation and lack of technology, human development and infrastructure still lacks in nearly all pacific island states. Such disparities are examples that make foreign aid important for the development for the island states. Currently, fisheries resources are the main trading commodity for the island states. Coastal fisheries support the majority of the subsistence livelihood of the island states. Tuna resources are the key income gained from the Distant Water Fishing Nations (DWFN) that contributes largely towards many of the island state's economy.

However, the small atolls have shown quite a large part of dependence on aid from former colonial powers to date.

2.4.2 Japan's foreign policy in the Pacific

Japan's foreign policy in Oceania covers relationship with the Pacific Island countries including Australia, New Zealand and the United States as long-time traditional partners in the Pacific region. According to Rix (1989), Japan's participation in the Pacific was a reflection of its economic prowess and leadership as a key player in international aid politics. Japan's focus was to further its interest in trade and economic development on the basis of political stability. The 1987 Kuranari Doctrine proposed under Prime Minister Takeshita reflects Japan's foreign policy in the Pacific. Named after Japan's former foreign minister, the philosophy was adopted from the experience of Japan's relationship with the Southeast Asian countries with greater emphasis on aid flows to the Pacific Island countries. During that time, aid from traditional partners like Australia and the United States in the region was declining. Japan saw it necessary as a responsible economic power to assist the least developing countries in the Pacific. Domestically, there was also political instability in many Pacific Island countries as many were newly independent nations. Further, Rix (1989) explains that another reason for Japan's interest in the Pacific was a political strategy to halt further inroads of the Soviet in the region as they had already been expanding towards the Pacific.

Forming alliance with traditional powers in the region through aid giving was a more appropriate action for Japan at that time. By 1988 Prime Minister Takeshita and the Australian counterpart successfully set up the aid platform to the Pacific Island countries. Japan's foreign aid to the Pacific Island countries increased every year since then. Japan's foreign policy is implied through stronger cooperation with the Pacific island countries through the Pacific

Island Forum (PIF). This forum includes all eighteen (18) members of the Pacific Island countries including Australia and New Zealand. For further partnership and cooperation enhancement, Japan began hosting the Pacific Island Leaders Meeting (PALM) since 1997 (Tarte, 1998). The meetings happened every three years since then. Japan recognizes the importance of diplomatic relations through cooperation with the Pacific Island countries as long-standing partners to address common challenges while sharing the Pacific Ocean. The cooperation relationship for Japan and the Pacific Islands covers critical areas of security, trade and investment, environment, education and human resources development, and health and hygiene.

2.4.3 Japanese ODA and the Pacific Islands

Edo (1986), stated that Japan's ODA to the Pacific ranges between 1 to 2 percent to that of the total among other regions. In 1975, Japan began its ODA disbursement in assisting least developed countries in the Pacific Islands. The initial amount reached a total of US\$ 5 million. Then, the total amount increased yearly and by 1987 the total Japanese ODA to the Pacific reached US\$ 68 million. The main recipients during that time included Papua New Guinea, the Trust American Territories, Fiji and Western Samoa. At that time Papua New Guinea received substantial loan aid at the recipient's request by preferring untied loan aid to that of tied grant.

Rix (1989), mentioned that there was a difference between Japan's ODA approach to that of the Southeast Asian countries and the Pacific region. Japan's aid flow to the Pacific was dominant of ODA grants and technical assistance more than loans. The Asian countries received more loans for the development of industries and infrastructure. For the Pacific region, grant aid for fisheries development constituted nearly half of the total grants. By 1986 Japan was ranked fourth in total ODA to the region behind French, Australia and the United States at

that time. The reason behind tremendous utilization of grant aid and technical assistance as compared to loans was a tailored approach to the least developed countries in the Pacific. Japan realized the limitations especially for the small island countries. The small island nations had low aid absorption capacity due to small economies they have. Demands for infrastructure was low and the capacity to service loans was low as well. Also, the island nations already had relatively high per capita income from the given ODA. Another key factor was a risk for Japan in that there was absence of strong economic planning for the small island states.

The push behind Japan's expansion of ODA into the Pacific according to Rix (1989), was to assume leadership role as a dominant aid giver with greater potential of huge aid quantity, trade influence and support by Japanese private investments. Tarter (1998) and Rix (1989) both agreed that Japan also had the desire as a strong supporter to the United States political regime to counter the Soviet presence in the region as well.

Today, Japan's ODA expands further from its strong emphasis on fisheries diplomacy to include climate change effects in the Pacific under environment responses affecting the livelihood of the small island nations. Also, a strong cooperation initiative in food security, poverty alleviation and human development is provided via Japanese ODA to the region.

2.4.4 Characteristics of Japanese ODA in the Pacific

The traditional aid givers to the Pacific Islands include Britain, Australia, New Zealand France and the United States. These countries have long political and historical relationship with many of the Pacific Islands. Micronesia is the only exception. Japan had a strong connection with Micronesia in the pre-war period. Japan settled in Micronesia and promoted economic and industrial development in this part of the Pacific.

Japan's ODA, extended to the Pacific Islands became important for Japan following the adoption of the Exclusive Economic Zone (EEZ) in 1982. The Pacific Island at that time was not suited to the Japanese aid criteria as compared to large disbursement of Japanese aid towards the Southeast Asian countries. Regarding the conditions of the Pacific Islands in terms of Japan's security, the island states had insufficient market large enough to cater for large investment of Japanese private sector as a main aid criterion for Japan. For the economic interest, the island states were unable to provide natural resources needed by Japan except fish and other minor resources. Japanese aid towards the Pacific Islands at that time was limited and infrequent. Earliest record for Japanese aid was in 1972 with only US\$ 230, 000 or 0.04% of total Japanese aid (Edo, 1986).

Japanese aid to the Pacific Island after adoption of the EEZ began increasing. By 1982, Japan's ODA was US\$ 22.63 million or 1.0% of total Japanese ODA. Also, the total bilateral ODA in the region saw Japan increasing to US\$ 19.42 million at 2.1% among other donors in the region and ranked 6th place over Germany. The biggest recipient of Japanese aid was PNG with US\$ 3.69 million or 16.3% of total Japanese ODA in the Pacific region. Others include Western Samoa (US\$ 3.48 million or 15.3%), Fiji (US\$ 3.21 million or 14.1%), Solomon Islands (US\$ 3.16 million or 13.9%), Kiribati (US\$ 1.92 million or 8.4%) and Trust Territories of the Pacific Islands (US\$ 4.28 million or 18.9%) (Edo, 1986).

The North-South issue around the world also contributed to the driving factor for the increased Japanese aid into the Pacific. Regarding the type of aid, Japan only extended loan to PNG. The main aid provided to many other Pacific Islands were grant aid. The main aid for the Pacific islands were fisheries grants. By March 1984, there were 55 grant aid projects in the region. In order, fisheries grant aid constituted 20 of the 55 or 36% of the total aid projects. Next was the general grant aid for medical care, public health, education, agriculture, communication, and

transport with 17 projects or 30% of the total. Others included aid for cultural activities (10-18%), disaster relief aid (5.4%), aid for increased food production (5.4%) and food aid (3.6%).

Technical cooperation was also extended to the Pacific Islands. In 1982, the total share of technical cooperation was about 30% of the aid and amounted to US\$ 6.85 million. Compared to other regions of the world, the Pacific Islands have the higher proportion of technical cooperation. Edo (1986), claims that this shows Japan's eagerness towards the development of manpower among the Pacific Island states.

However, the characteristics of Japanese ODA towards Pacific Islands states is still small compared to other regions of the world. Also, the main focus is on fisheries projects.

2.4.5 The relationship between Japan and the Pacific Islands in Fisheries

Fisheries is the main interest of Japan's relationship with the Pacific Island countries. Shimura (1999) and Tarte (1997) expressed that Japan is one of the leading fishing nations in the world and has significant experience with advanced fishing techniques. The rich fishing grounds in the Pacific are among the top priority for Japan's fishing ventures since the 1920s.

All Pacific Island countries depend heavily on the resources provided by their surrounding sea territories. Kuk and Tioti (2012), pointed out particularly that the coastal fisheries resources sustain more than 80% of livelihood of the Pacific Island communities. The resources from coastal fisheries have significant connection with the lives of the Pacific Island countries in areas of culture and socio-economic aspects. However, the Pacific tuna resources in the rich fishing grounds around the Pacific have particularly given much significance in political and economic benefits towards relationship with Japan. Other countries including the United States, China, Taiwan, South Korean and Philippines have joined in on fishing tuna

resources in the Pacific but Japan maintains a long and strong fishing relationship with the island countries.

Since the late 1970s, the relationship between Japan and the Pacific Island countries have become more stronger based on the fact that Japan's ODA have become a diplomatic tool promoting the development of many developing states in the Pacific. During that time many of the countries in the Pacific have become newly independent states from former colonial powers and aspired in charting their individual political and economic development pathways. In regards to fisheries, the establishment of the 200-mile jurisdiction by coastal states and the payment of access fees from Distant Fishing Water Nations (DWFN) were key elements for economic development in allowing access to the rich fishing grounds in the Pacific.

According to Numata (1990), the Japanese approach to promote its interest and economic cooperation with priority including fishing relationship with the Pacific Islands saw an increased ODA to the region 3.7 times from US\$25.10 million in 1984 to US\$93.07 million in 1988. Although, the Pacific Islands receive between 1 to 2 percent of the total regional ODA from Japan, the significant part of this total ODA is the fisheries grants and technical cooperation towards development of fisheries in the Pacific. The fisheries grant promotes infrastructure development and technical cooperation assists in development projects including human resources development in the region. According to Tarte (1997), JICA under the Ministry of Foreign Affairs (MOFA) is the main implementing agency for majority of Japanese ODA. OFCF under the Ministry of Agriculture, Forestry and Fisheries (Fisheries Agency of Japan) also plays a key role as a specialist agency in implementing Japanese ODA specific to the importance in bilateral relationship regarding fisheries development between Japan and individual Pacific Island countries.

Tarte (1997) and Tarai (2015), claims that there has been a shift of negotiating power supporting the Pacific Island states. Since the implementation of the Vessel Day Scheme (VDS), the Pacific Island states have shown a stronger collective diplomatic relation among the island countries against DWFNs regarding access negotiations in the Pacific. This shift has given leverage in negotiations where the Pacific Island states determine the price for fishing days. A model developed internally by the Pacific Island states allegedly to promote management of resources and greater economic benefits for the island countries. Japan's interest however is based on the continuous fishing access and resource management. The VDS model have shifted competition among the DWFNs including Japan. The VDS is based on access fees per day by the DWFNs. Japan continues its relations with the pacific region utilizing ODA as a key diplomatic tool towards the regional bodies targeting sustainable resource management and greater emphasis on bilateral agreements to maintain access to the rich fishing grounds.

Regarding the Fisheries Policy White Paper (2021), under the bilateral relations, the Japanese government still recognize that fishing grounds within the Exclusive Economic Zones (EEZ) of Pacific Islands remain vital for many Japanese fishing offshore tuna vessels. However, the increasing access fees by the island states with establishment of marine protected areas have been an ongoing negotiating agenda for Japan. Nonetheless, under the overseas fishery cooperation, the Japan government continue to the utilization of its fisheries grants and technical cooperation under Japanese ODA towards developing countries. This reflects a mutual cooperative purpose in the relationship between Japan and developing countries. As such, relationship between Japan and the Pacific Island countries in fisheries maintains a greater part for more cooperation providing stability in Japanese vessel access and resource management, and promoting fisheries development towards the island countries.

According to the Japanese Fiscal Year on the 2021 fisheries policy under Overseas Fishery Cooperation, the Ministry of Agriculture, Forestry and Fisheries of Japan considers two important points (MAFF, 2021).

Firstly, the Japanese government emphasized on promoting fisheries industry especially in resource management efforts. Then, connects that with its aid initiatives specifying grant aid towards building of fisheries facilities and technical aid for the dispatch of experts. Importantly, these aid elements are for countries with important fishing grounds to Japan. At this point, it promotes relations for access of Japanese fishing vessels but maintaining sustainable use of marine resources.

Secondly, the Japanese government aims for stability for Japanese fishing vessels within the territories of the Pacific Islands. As such, the government of Japan supports private organizations cooperation aimed at rehabilitating fisheries facilities and providing fisheries technologies to the Pacific Islands.

2.5 Japanese ODA in PNG

2.5.1 About Papua New Guinea

Papua New Guinea constitute the eastern part of the island on New Guinea in the Western Pacific Ocean. PNG has a population of about 8.6 million people and land mass of about 462 840 square kilometers. Compared to other Pacific Island countries, PNG is the largest in population and landmass. PNG borders by land with the Indonesian province of Irian Jaya, and sea borders with Australia, New Caledonia, Solomon Islands and Federated States of Micronesia. The total coastline of PNG is about 20 197 square kilometers and Exclusive Economic Zone (EEZ) of about 3.12 million square kilometers. PNG has a long

coastline and its EEZ ranks third largest in the region behind French Polynesia with 4.8 million square kilometers, and Kiribati with 3.6 million square kilometers (FAO, 2019).

The resources from both land and sea are vast. Industrial scale fisheries for tuna and associated species in PNG have operated since the 1950s, and in certain years, around 10% of the global catch of the main market species of tuna has been taken within the PNG EEZ. The tuna fishery is the largest of PNG's fisheries exports and represents a balance of both domestic industry development and foreign distant water fishing nations (DWFN) access arrangements (NFA, 2021).

Minerals, oil and gas currently contributes the majority of the country's economy. Renewable resources from agriculture, forestry and fisheries are considered to be critical for the long-term food security, income generation, export revenue and job creation for the country. PNG's Gross Domestic Product (GDP) stands at US\$ 2 829. Currently, fisheries contribute about 2.7 percent of the national GDP (NFA, 2021).

2.5.2 Relationship in Fisheries

Japan has been fishing in PNG since the 1920s. Up until the 1950s, the first agreement between PNG and Japan was during the time when Australia was colonizing PNG. The colonial administration of Australia signed an agreement with Japan on behalf of PNG to allow Japanese vessels to fish in PNG waters with the understanding of creating joint ventures with foreign investors towards the development of the tuna industry. Japan considered PNG as an important fishing ground for its investment in fisheries. At that time the estimated optimum yield in PNG waters was calculated at 150,000 metric tons of which total annual catch amounts was between 20,000 to 40,000 tons (Sonu, 1979). By early 1970's, Japanese companies have already established fishing joint ventures in PNG. This includes the fisheries joint venture of Gollin

Kyokuyo Niugini Pty. Ltd with Japanese partner, Kyokuyo based in Kavieng, established in 1970, and New Guinea Marine Products Pty. Ltd and Japanese partners, Hokoku Suisan, Nihon suisan and Itochu Shoji in Madang, established in 1971. Both target bait fishing for the development of skip jack fishery (Matsuda, et. al., 1990).

In 1975, PNG gained independence from Australia. Japan was the first country to achieve bilateral agreement with PNG in the same year. Among other countries in the Pacific, Japan saw PNG as a reasonably good opportunity for its private investment. The natural resources in PNG attracted Japan's interest. Also, the position at which PNG was at in terms of political affiliations and diplomacy, was conducive for Japan to engage a friendly relation with PNG. PNG became a member of the United Nations and a member of the Commonwealth of Nations. PNG's foreign policy at that time was simple but quite vague according to some observers. PNG declared itself a country that is '*friends to all and enemy to none*'.

After PNG gained independence, the fishing arrangements remained relatively same but with increasing international pressure for the adoption of the 200 mile Declared Fishing Zone (DFZ). Fisheries in PNG at that time was managed under the Department of Primary Industry. There was very little understanding and development of fisheries at that time. However, PNG maintained fisheries relations with Japan in a relatively minimal policy requirement as there was no establishment of a permanent licensing procedure. Under the provisional agreement signed in 1978, allowed fishing efforts from 1st May 1978 to 31st January 1979. It was the only agreement in that period which allowed for Japanese vessels to operate in PNG's 200-mile fishing zone. There were no restrictions on catches or number of vessels. PNG encouraged foreign interests to operate with long term policy aimed at harvesting the fishery resources in the country with a national flag up to ten years. The focus was to train locals to fish tuna in the joint venture arrangement. Other plans for the PNG government at that time was to gain support from Asia Development Bank (ADB) and World Bank (WB) to

venture into commercial fishing and for building necessary processing plants in New Ireland and East New Britain Provinces (Sonu, 1979).

The adoption of the Exclusive Economic Zone (EEZ) fast became a common trend of concern among coastal nations like PNG at the end of the 1970s. This was due to increasing concerns from the coastal states towards managing their offshore fisheries resources for maximum economic gain via access agreements. In 1982, under the United Nations Convention of the Laws of the Sea (UNCLOS), many of the coastal countries adopted the 200 nautical mile EEZ. This international agreement incorporated the interpretation of the International Law in its application towards extension of the 200-mile territorial jurisdiction of coastal states. Also, this international agreement gave attention towards the ownership and management of resources within the EEZ supporting the coastal states. However, it was not adequate enough in explaining the management of resources including straddling and migrating species like tuna, that have the tendency to cross boundaries during their life cycle and migrating patterns. In 1995, another extension was attained under the Straddling and Migrating Stock Agreement to settle this oversight aimed at gaining an understanding among fishing states and coastal states towards the management of these resources. It was maintained that there is a shared responsibility between nations managing the resources and ones harvesting the resources. Much emphasis was based on regional interventions and sub-regional bodies to develop resource management frameworks that govern sustainable resource management based on sound scientific estimates and interpretations.

The adoption of the EEZ, was seen as an added value for economic gains in fisheries management by PNG. By that time PNG was also well established in its regional affiliations including the Western and Central Pacific Fisheries Commission (WCPFC) and Secretariat of the Pacific Community (SPC), as well as sub-regional bodies such as the Parties to the Nauru Agreement (PNA) and the Pacific Islands Forum Fisheries Agency (FFA). Also, during that

period Japan has established its Japanese International Cooperation Agency (JICA) office in PNG and Overseas Fishery Cooperation Foundation of Japan (OFCF) office in Fiji. The purpose of these organizations was to provide Japanese aid to the Pacific. The adoption of the EEZ by the Pacific Islands was a great motivation for Japan to increase aid towards the island nations. The connection for this advancement by Japan was primarily due to interest in the fisheries resources, especially tuna. Many island nations were still developing their tuna industry and Japan was the dominant fishing nation at that time. The adoption of the EEZ made Japanese vessels impossible to gain access to the rich fishing grounds in the Pacific Islands. Seeing that there was need for economic development from access to fisheries resources was reason enough for the island countries to gain bilateral relations with Japan. For Japan, through JICA and OFCF, technical assistance under Japanese ODA is provided for fisheries development of the Pacific Islands fisheries sector.

According to Kuk and Jerome (1997), the adoption of the EEZ created competition among fishing nations to fish in the Pacific. For Japan, to gain favor from the island nations against other competitors, the increase in extension of Japanese aid became an effective instrument for fishing access negotiations. Japan's ODA to the Pacific Islands was at US\$ 4.64 million or 0.3% in 1978 and in 1982, increased to US\$ 22.63 million or 1.0% of total Japanese ODA. PNG was the biggest recipient of this bilateral aid with US\$ 3.69 million or 16.3% of the overall total (Edo, 1986). At that time also, Japan demonstrated its aid policy in increasing aid to deter further inroads of the Soviet Union in the Pacific. Japan demonstrated its support for its allies, especially the United States in this regard.

For the United States of America, the greater concern was in the expansion of the Soviet Union in the Pacific. A multilateral agreement was signed with the Pacific Island countries in 1988. In the most part, this agreement was based on security of the Pacific Islands but also included fisheries access in the Pacific. In comparison to Japan, the United States

provided a lump sum payment of 12 million per year for five years. This was paid by the United States government towards the Pacific Islands that allowed fishing vessels from the United States to access fishing ground in the Pacific. This has increased ever since and now stands at US\$ 90 million as of 2015. Japan on the other hand utilized aid towards the Pacific Islands in promoting fisheries development for the Pacific Islands in return for Japan's fishing industry to access the Pacific Island's EEZ. There is no government funding for private fishing companies to gain access like what the United States is using.

In 1987, PNG rejected Japanese continuation of skip jack fishery joint-ventures as well as Japan's access fees. According to Matsuda et. al. (1990), fisheries policy of PNG in the 1980s was unclear. Domestically, there was unclear responsibility regarding management of fisheries between provincial and national governments. With the help of the United Nations Development Programme (UNDP) an understanding was achieved for the management of tuna resources in the country. The fisheries policies for PNG were then prioritized on domestic fisheries targeting mainly capacity building for local fisheries development and institutional reform. However, losing the skip jack fishery and access fees from Japan was a great loss for the PNG economy. PNG lost an export industry of 2% Gross National Product, foreign exchange earnings amounting to 20, 200 000 Kina or 3% of total export earnings, tax revenues of 2-3 million Kina, bait royalties of 440 000 Kina, local employment of 1, 257 people and related purchase of about 10 million Kina (Matsuda et. al., 1990). Japan also lost a huge investment at the time. The main reason for these losses was that PNG wanting to gain more from the fisheries access from Japan, requested a change of international shipping arrangements from the usual 5 percent of Freight on Board (FOB) value of the catch to Cost, Insurance and Freight (CIF) arrangement, which the Japanese fishing industry did not accept. PNG and Japan had limited engagement in fishing until 2006. However, the bilateral relation

between both countries was maintained but Japan focused its ODA on other sectors especially in infrastructure development, agriculture, forestry, health and education.

In regional development, PNG played a key role in the formation of sub-regional arrangements for tuna resource management. This reflected the development of and implementation of the Vessel Day Scheme (VDS) under the PNA. According to Tarai (2015), VDS is a model developed internally by the Pacific Island states in response to promoting sustainable management of the tuna resources and to gain greater economic benefits for the island countries. The VDS controls fishing efforts by DWFNs by limiting access to fish and access fees are paid per day by the DWFNs. The VDS model have shifted competition among the DFWNs including Japan. As such, the Pacific Island states have shown a stronger collective diplomatic relation among the island countries against DWFNs regarding access negotiations in the Pacific.

For Japan, there is a shared responsibility for the sustainable management of the tuna resources in the Pacific due to being a dominant fishing nation with well-known fish-eating culture. In this regard, Japan continues its relations with the Pacific region. Japan utilizing its ODA as a key diplomatic tool towards the regional bodies targeting sustainable resource management as well as gaining support for international fora such as in the United Nations (UN) in regards to addressing world issues. Under bilateral agreements, Japan emphasizes in maintain access of fishing vessels from Japan to the rich fishing grounds of the Pacific (Tarai, 2015).

By 2001, PNG again transitioned from the DFMR structure to National Fisheries Authority (NFA). The transition was guided was by the Fisheries Management Act 1998 as a means for national mandate for the NFA to have overall control of tuna fisheries management. According to Kuk and Titoti (1997), this transition was mainly focused on the development

and management of tuna resources towards industrial commercialization domestically. Before attaining this status, the DFMR during the 1990s had gained assistance from the European Union (EU) for the development of domestic coastal fisheries. The EU provided assistance to PNG in promoting small to medium scale fisheries development. The EU program was rolled out with the main aim to increase fisheries product supply by local producers to centralized buying stations. This program was not seen to be effective and eventually discontinued its operations. Following this, another program supported by SPC was rolled out in providing technical training to local fisheries to increase fish supply. Local fishers were trained in using a new fishing method for deep water fishing but again was not effective. Kuk and Tioti (1997), explained that there was lacking capacity in the overall and long-term management of these interventions.

In 2006, the governments of PNG and Japan regained relationship and signed a bilateral agreement for fisheries. The motivation of this agreement followed from the 2004 implementation of the VDS in the Pacific. For PNG, more focus was based on tuna management, but there was critical need for the coastal fisheries development. The Japanese fisheries policy at that time emphasized on application of Japanese technical cooperation assistance towards development of fisheries of the Pacific Islands. Japan maintained its presence in the Pacific as a dominant aid donor with the arrangement and participation of the Pacific Islands Leadership Meeting (PALM) since 1997. This meeting occurs every three years where focus of the needs of the Pacific Island can be discussed. The last PALM-9 Meeting was held in July 2021. The main objective of PALM Meetings is to attain commitment in strengthening partnership between Japan and the Pacific Islands with mutual trust and respect regarding shared values of freedom, democracy and respect for human rights and the environment. Japan emphasizes on rule of law and cooperation, and provides assistance in this regard by understanding the needs of the Pacific Islands. In return, a key emphasis is to gain

support from the Pacific Island states towards Japan's support in international forums such as the United Nations. Policy developments from the PALM Meetings towards fisheries expresses mainly partnership in management and development of the marine resources in the Pacific. In connection to bilateral relationship with PNG, Japan provides assistance towards the coastal fisheries development. The reflection to such arrangements encourages regional policy developments towards sustainable fisheries management. For the country level, bilateral agreements with Japan provides the avenue to realize the policy from regional framework to country level.

Papua New Guinea have gained such initiative with the introduction and implementation of the trap net project. A Memorandum of Understanding was achieved in 2013 between Overseas Fishery Cooperation of Japan and National Fisheries Authority of Papua New Guinea. This reflected the cooperative assistance between Japan and PNG in terms of fisheries development in PNG. For PNG much emphasis was based on the coastal fisheries development. Based on the current Roadmap for coastal fisheries and aquaculture development and in line with regional coastal fisheries framework, Japan provides aid under this banner to support PNG. As such, technical cooperation is provided under OFCF towards PNG. The main emphasis as is in the commitment of the PALM-9 Meeting priority of cooperation agenda 2 reflects among others, the sustainable use of fisheries resources in the Pacific such as through mutually beneficial fishing arrangements. This follows from the PALM-8 Meeting for coastal fisheries development towards food security and livelihoods for coastal peoples. The OFCF and NFA now have an ongoing partnership since 2013 and have worked together in implementing the trap net project to seven communities in PNG. Trap net project is a trial research project for the introduction and sustainable management of the introduced fishing technology in PNG. OFCF represents the government of Japan in providing Japan's ODA to PNG. PNG on the

other hand, represents the government of PNG in partnership with OFCF for this particular project.

2.6 Justification for Research Questions

1.6.1 Background

The focus on coastal fisheries development in PNG has been a priority since the development of the Fisheries Act 1984. According to Kuk and Tioti (2012), the department of fisheries initiated a program targeting fish buying from local communities. Supply of fishing gear and materials was provided to local fishers and fish buying stations were created as means to increase production of local fish products. This project ended soon after due to lack of monitoring and overall management of the project. Also, capacity development for local fishers towards increase in production was very little with no future plan for the project. Immediately after, the fisheries department realized that there was need for skill development of local fishers to increase fish production. Together with Secretariate of the Pacific Community (SPC), a new project was initiated where introduction of coastal deep water fishing gear was introduced where local fishers gained skills to provide fish to local markets. This follow up of this program was not adequate as there was still lagging of required infrastructure and project management. The program again ended with little progress (Kuk and Tioti, 2012).

According to report by Asian Development Bank (2009), the focus on coastal fisheries development in PNG was mainly focused on institutional infrastructure development, community-based fisheries management and introduction of fish aggregating device (FAD). This forms as part of the aspirations of the current adopted Fisheries Management Act 1998. Since then, this approach became a key factor towards promotion of coastal fisheries development in the country.

This study emphasizes an approach from the bilateral relations and assistance by Japan to PNG focusing on coastal fisheries development. The technical cooperation under the Japanese ODA translates towards partnership with PNG and accommodates domestic plans to facilitate addressing development needs for PNG. The report presented here, provides key understand of how Japan's technical assistance is utilized to promote coastal fisheries development in PNG. Although, the experience of other donors has given light into the need for coastal fisheries in PNG. The specific analysis for this report is based on current ongoing research project of introducing the trap net project as a new fishing technology from Japan that accommodates specific needs including, community mobilization, project management, and community development targeting food security in Rabe community. This approach forms a different perspective since it depicts the bilateral status of PNG and Japan, translating down to community level shows a new path that before was not seen possible, and utilization of these method brings more initiative for more stronger emphasis on cooperation with Japan and PNG in the field of fisheries management.

2.6.2 Technical Assistance towards Fisheries

Through bilateral relations, the technical cooperation assistance towards fisheries is the main ODA provided to the Pacific Island states by Japan. The main purpose of this assistance is to support the development aspirations of the island states towards nation-building. According to JICA (2014), the technical cooperation assistance involves Japan providing the know-how and experience to developing countries to promote socio-economic development. Essentially, such assistance promotes the improvement of technologies of recipient states as well as contributes to setting up institutional frameworks and organizations for development purposes to achieve economic growth. Through bilateral relations, collaboration is an important

factor in technical cooperation between Japan and the recipient country. In doing such, Japan provides technical cooperation assistance constituting dispatch of experts, excepting training participants to study in Japan, provision of necessary technical equipment, and implementing studies aimed at developing key policies and planning for overall development for the recipient states (JICA, 2014).

PNG is the biggest recipient of technical assistance under Japan's ODA in the Pacific Islands. According to the former managing director of the PNG National Fisheries Authority, Kasu (2018), a total of US\$19,910,000 grant aid was delivered through various projects and training through JICA and OFCF as the implementing agencies of the Japan ODA between 2008 and 2016. According to OECD (2022), Japan's overall bilateral assistance to PNG fisheries development amounted to USD126. 687 million. The current total ODA towards fisheries sector in PNG stands at US\$ 0.545 million. The fisheries sector ODA from Japan is the highest among other donors. Japan's assistance in PNG fisheries is mainly based on technical cooperation for fishery development, amounting to USD 0.528 million, and USD 0.016 million towards fishing policy and administration management. Other donors such as Australia and Taiwan are mainly focused on fishery policy and administrative management (OECD, 2022). Important to this study is the focus of the introduction and implementation of the trap net project in PNG as per technical assistance from Japan under OFCF. The above characteristics have been closely applied to PNG for analysis in this study.

Pinstrup-Andersen and Cohen (n.d), outline that the link between the role of ODA towards food security emphasizes the recipient country's government as the key to setting priorities for its development. The authors emphasized that the developing countries know best their problems and should put better policies in place that can guide the effective utilization of aid provided by donor states (Pinstrup-Andersen and Cohen, n.d). According to MOFA (2015), the Development Cooperation Charter, as a revised policy document following the 1992 and

2003 Japan's Official Development Assistance Charter, Japan recognizes international cooperation as a means to address pressing world challenges towards securing peace, stability, and prosperity. Japan emphasizes its ODA as an equal partner with the developing countries for joint efforts to address challenges facing the international community (MOFA, 2015). Technical cooperation assistance provided to PNG for fisheries development under this revised ODA policy reflects basic policy (C), '*Cooperation aimed at self-reliant development through assistance for self-help efforts as well as dialogue and collaboration based on Japan's experience and expertise*'. As such, Japan's assistance in this regard is provided to assist countries with policies that are aimed at addressing development challenges common to the international community. Further, food security was mentioned in Priority Policies, (C) *Building a sustainable and resilient international community through efforts to address global challenges*. This highlights food security among others as a challenge for developing countries as part of the international community (MOFA, 2015).

The PNG Medium-Term Development Plan III 2018-2022 (MTDP-III) provides the framework for overall national development plans. Under the *key result area 1: increased revenue and wealth creation*, the fisheries sector is identified to play a key role in achieving this key result area. Four (4) out of the seven (7) goals under the key result area 1, the fisheries sector is directly involved, especially in the goals of *increasing revenue, increasing export, employment creation, and economic opportunities*, and *promoting SME growth and foreign direct investment*. Coastal fisheries development falls under this development plan and among others, addressing food security is prioritized (Department of National Planning and Monitoring of Papua New Guinea, 2018). The recently adopted PNG Fisheries Strategic Plan 2021-2030 (FSP) under NFA, follows the MTDP III and focuses on improving socio-economic growth and providing food security as a key component of its vision for national development.

Under point 7 of the key results areas of the FSP, livelihood programs in rural communities directly apply to address food security (National Fisheries Authority, 2021).

The Papua New Guinea National Food Security Policy 2016-2025 was adopted in 2015. It also reflects the development plan following the MTDP-III specific to addressing food security. It follows the Food and Agriculture Organization of the United Nations (FAO) as the custodian agency regarding food security reflecting the United Nations Sustainable Development Goals (SDGs), the primary objective of Goal 2, *to end hunger, achieve food security and improved nutrition, and promote sustainable agriculture* (FAO, 2018). As per the policy, it emphasizes the four key dimensions of food security: *1) Availability (sufficient quantities of appropriate quality food, through domestic production or imports and their cost-effective distribution to consumers); 2) Access (of individuals to adequate resources for acquiring appropriate foods for a healthy diet); 3) Utilization (through adequate diet, clean water, sanitation, health care and nutritional awareness to reach a state of nutritional well-being); and 4) Stability (the ability to maintain the above three factors during sudden shocks or cyclical events)*. In focus of the five priority strategic action areas, fisheries is directly applicable to three, including; *Strategic Action Area 1. Productivity and farm output growth of the main food staples, horticulture, small livestock and fish farming and increasing efficiencies along the entire food value chain; Strategic Action Area 2. Building stability and resilience into food production and supply systems; and Strategic Action Area 5. Strengthened governance, coordination, monitoring and communication*. Also, fisheries is incorporated in this framework as a key component in enhancing the livelihood and production of local communities in line with the current Fisheries Management Act 1998 and related policies such as the FSP, Roadmap for coastal fisheries and marine aquaculture for Papua New Guinea: 2017–2026 and Trial Fishing Policies (Department of Agriculture and Livestock, 2015). A study conducted by Solofa, et. al. (n.d), outlines the overview of the Pacific Island using the

four pillars of food security as indicating the need for food security based on agriculture and the threats of climate change to the island states. The outcome has demanded more data to be analyzed however, addresses the immediate need for addressing food security in the Pacific Island countries. These four pillars are indicators adopted for analysis of this study using data from the trap net project in response to reflect addressing food security as the contribution of Japan's technical cooperation towards coastal fisheries development in PNG.

CHAPTER 3: RESEARCH METHOD

3.1 Introduction

This study employs qualitative and quantitative research approach. In incorporating both research approaches, key objectives of the study will be carefully examined and explained. Also, the case study of Rabe trap net is included to provide information on how trap net is managed by Rabe community.

Combining these methods will explain the contribution of Japanese ODA towards coastal fisheries development targeting food security of Rabe Community in PNG.

3.2 Research Strategy

3.2.1 Qualitative Research Method

The qualitative research method used in this study aims to gain key information from review of relevant literature on foreign aid. The main focus of this literature review aims to explain why developed states give ODA to developing countries. Much emphasis will be based on foreign aid decision-making. Also, important information focusing on key aspects of Japanese ODA in the Pacific Islands will be gained.

In utilizing this method of analysis narrows down to explaining the reason why Japan extends technical cooperation toward assisting the development of coastal fisheries in PNG. It essentially establishes the relationship in understanding the necessary contribution of Japan's ODA towards PNG and her aspirations towards coastal fisheries development.

3.2.2 Quantitative Research Method

Using this research method in this study aims to analysis a two-year data set collected from case study area between May 2019 to March 2022. The data was collected from the trial fishing of trap net in Rabe Community as the focus of this case study.

The outcome of the analysis aims to explain the contribution of Japan's technical assistance towards coastal fisheries development in PNG as case study of Rabe trap net fishing project. The key analysis aims to generate key information towards supporting the aim of this study focusing on the contribution of Japan's ODA towards food security of Rabe Community.

These data were collected by trained local fishers and verified by project stakeholders during periodic project stakeholders' meetings over the period of two years.

3.2.3 Case Study Method

Information provided by the case study aims to give the background of Japan's ODA towards the introduction and implementation of the trap net fishing project in Rabe Community. It establishes how the project is managed focusing on addressing food security of Rabe Community.

Also, the case study aims to establish the relationship between Japan's ODA towards coastal fisheries development in PNG. Further, the case study aims to explain key management features of the introduced and implemented trap net fishing technology in Rabe Community.

3.3 Framework for Data Analysis

Firstly, key information gained from review of literature will build into components including defining foreign aid, exploring reasons why foreign aid is given to developing countries by donor countries, examining Japanese ODA, explaining why Japan's ODA is necessary for the Pacific Islands with emphasis on technical cooperation in fisheries given to the Pacific Islands. Then, explaining Japan's ODA towards PNG. In completing this part, it will address the answers towards objectives of explaining Japan's ODA contribution towards coastal fisheries development of Papua New Guinea.

Secondly, the data analysis will use summary statistics in Microsoft Excel. The input data comprise of the key information including total catch, total sales, total expenses and savings gained from the project. The summary data looks into gaining key information to explain the contribution of Japan's ODA towards food security of Rabe Community in relation to operating and management of the introduced trap net fishing technology. The analysis will include explaining contribution of the trap net on the four pillars of food security provided under FAO towards addressing food security. This will form the main basis of contribution of Japan's ODA to coastal fisheries development in PNG

Thirdly, the case study provides key information in regards to answering questions of how the introduced trap net fishing technology is operated and managed by Rabe Community. Key management features will be highlighted to provide information towards how the project was managed and the individual participation of key project stakeholders. It gives important information for project management for future coastal fisheries projects.

3.4 Limitations

The following are considerations for the limitation of this study;

- Some official data from respective agencies that this study aims to generate sometimes may not be easily accessible due to official restrictions based on the information confidentiality policy of the respective organizations or delays caused by bureaucratic processes.
- This study anticipates limitations in the participation of government officials or local personnel in providing important and adequate information during the interview process for the research due to the sensitivity of issues during discussions.
- An unexpected disturbance due to the upsurge of the Covid virus in Japan and PNG may disrupt or delay the flow of information and data collection for this study.
- Trap net project implementation is chosen as a case study for this research as it relates to the scope of this study among other JICA projects in PNG. This is because the trap net project facilitates cooperation between OFCF and NFA working with local coastal communities in PNG.

CHAPTER 4: CASE STUDY- RABE TRAP NET PROJECT

This chapter provides information on the case of the trap net fishing technology in Rabe Community as a coastal development project. Information about trap net fishing technology, background of the project, description of Rabe Community, the implementation of the project and key features on management of the introduced fishing technology is discussed below.

4.1 Background

4.1.1 About trap net fishing technology

Trap net or set net, is a coastal fishing gear that is fixed by anchors in a specific location in a bay. It targets migrating pelagic fishes as well as the coastal semi-pelagic or demersal fishes. The design is made up of three common parts. First is the leader net, which guides the fishes towards the playground. Second is the playground, which contains the fishes that swim around until they find their way into the bag net. The third is the bag net, which contains the fish until they are harvested, mostly alive.

This type of fishery can be classified as a “defensive” or “wait-and-see” fishery. The key attributes of this fishery are that it uses fish behavior and provides 24-hour fishing. Particularly due to its characteristic in using fish behavior, it has been considered recently as an environmentally friendly and resource management fishing gear.

Trap net or set net fishery has been existing since 16th -17th Century and is a traditional coastal fishing gear in Japan. The trap net fishery has attracted tremendous attention in the world following the decline of pelagic fishery after the establishment of the EEZ and the drastic rise of the price of fuel.

Over the years, the trap net design has been developed to suit sustainable and modernized coastal fishery practices. Trap net fishery has therefore become an important part of community-based management fishery (CBFM). In Japan, trap net fishery is one of most successful coastal fisheries.

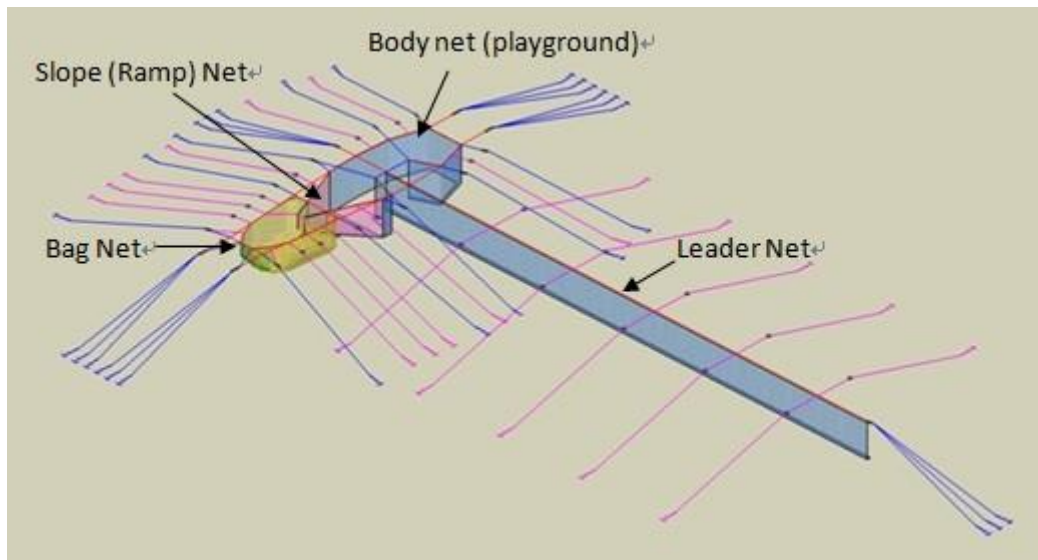


Figure 1: Showing trap net configuration

Source: National Fisheries Authority, (2021). Trap Net Fishery Training Manual: A Guide for Leading Fishers

4.1.2 Introduction of trap net in PNG

Himi city, located in the North-west of Japan, has a long and prosperous history of trap net fishing technology. In the year 2000, Himi city started the promotion of “Trap net Training Program” targeting countries in the world for a variety of international exchange and local revitalization efforts through the introduction of trap net fishing. Through this program, local fishers from Costa Rica and China were invited and trained in Japan. Also, Japanese Trap net

leading fishers were dispatched to these countries, in order to introduce trap net fishery and trained them in their respective countries.

In the same year, “The International Trap Net Fishery Summit” was held in Himi city. A total of 34 countries participated. The program was then extended to Thailand (2005~2008) and Indonesia (2007~2010) under the JICA Grassroots technical cooperation project. Through these activities, the trap net fishery has received worldwide attention as an environmentally friendly and sustainable resource management fishing technology.

In 2007, the PNG National Fisheries Authority (NFA) became aware of trap net fishing technology through the Frabelle Fishing Company of the Philippines. The NFA Managing Director pursued NFA interest through the TAIYO A & F Company which acted as a connection center between PNG and Japan. In 2009, Managing Director of NFA had an opportunity to observe trap net fishing in Japan and Nitto Seimo Co. Ltd in Himi city. In 2012, 11 participants from PNG were invited by Nitto Seimo Co. Ltd to observe the small and large-scale trap net fishing operations and the trap net construction factory in Japan.

By 2013, preparations for the operation of the first trap net started in both PNG and Japan. In August of the same year, the first trap net was deployed in Meni Bay, Wewak, East Sepik Province, PNG. It was coordinated by NFA, OFCF and Nitto Seimo Co Ltd in collaboration with local fishers in Wewak. That signified the beginning of the trap net operation in PNG. The project was introduced as trial fisheries under NFA. From observing the potential for more coastal fisheries development in PNG, NFA signed an MOU with OFCF and continued expansion by introducing one more trap net in Cape Wom in Wewak (2014) and Labumiti in Lae (2015).

Between 2016 and 2017, NFA worked closely with local stakeholders including the provincial fisheries and local communities to develop the trap net management guideline. The

aim was to sustainably manage the trap net and make it an entity where its operations and financial management is sustainable and easily managed by local community members involved in the project.

Due to local training needs and potential expansion of the project, NFA decided to introduce small-scale trap nets in PNG. Based on this decision, small-scale Masu-ami was introduced to Labutale and Busamang, Lae, Morobe Province, in 2018. Further to trialling small-scale trap nets, Milne Bay Province was selected and works began including consultation and collaboration with the Division of Fisheries and Marine Resources (DFMR) of Milne Bay Province. The research surveys for suitable fishing grounds in Milne Bay Province concluded in 2018 and NFA decided to introduce trap net at Stringer Bay in Rabe Community.

By May 2019, trap net project was introduced to Rabe Community, Milne Bay Province. The Rabe trap net was aimed to model the project for future operations of small-scale trap nets. The trap net project under NFA in collaboration with OFCF continues to work with local stakeholders to ensure it becomes one of the most sustainable and resource management coastal fishery in PNG.

4.1.3 Information on Rabe Community

Rabe is a coastal community on the main land of Milne Bay Province. Milne Bay Province is located at the easternmost tip of Papua New Guinea comprising 600 islands and atolls of about 110, 000 square kilometers (Kinch and Bagita, 2003). Rabe is under the Huhu Local Level Government. According to 2011 available population data by PNG National Statistics Office (2011), Rabe Community comprise of 249 households with a total population of 1 340 persons which 658 are males and 682 are females. Culturally, Rabe Community practices matrilineal clan membership and territorial rights where inheritance of land and resources are

passed down from the mother's family line. This is a common cultural trait among other island and coastal communities in the province.

Rabe is considered a rural village but its location is at least 15 minutes from the provincial capital, Alotau town. The majority of the population of the community live a subsistence and artisanal lifestyle. Only a minority gain formal employment in Alotau town, especially in the supermarkets, tourism, and hotel industry. The average household income for the province, including Rabe is US\$ 130 (Kinch and Bagita, 2003).

In terms of fishing, it was recorded in the initial consultation with the local fishers before the introduction of trap net project that between 40 to 50 people are actively in fishing. Their catch is mostly for subsistence consumption while only a few are sold at the local Bitu market. The main type of fishing done in the area includes hand line, drift line, trolling and spear fishing. These are done using canoes in which both males and females participate.

4.2 The Trap Net Project

4.2.1 About the Project

Under the current MoU between OFCF and NFA, the name of the project is titled, *'The Trial Research Project for Trap Net Fishing Operation in Papua New Guinea'*. The initial negotiations to introduce the trap net project in PNG were between 2007-2008. In 2012, a team consisting of provincial fisheries advisors and key members of various fisheries cooperative associations in PNG traveled to Japan to learn the fishing technology in Himi City, Toyama Prefecture. OFCF and a private Japanese company, Nitto Seimo Co. Ltd were key organizations facilitating this training. The events leading to this outcome were tremendously supported by the Japanese Overseas Purse Seine Fishing Association (Kaimaki). As per the

training in Himi City, the first trap net was constructed, shipped to PNG, and deployed in Wewak, East Sepik Province.

By 2013, OFCF and NFA signed the initial Memorandum of Understanding (MoU) for the introduction and implementation of the trap net project in PNG. As the trap net technology was a new fishing method for PNG, this agreement encouraged cooperative understanding and effort towards the development and implementation of the project. OFCF and NFA remain as the key implementing agencies of this project to date.

The MoU with OFCF is for one year and is subject to extension depending on the importance of the project, reflecting the essence of partnership and bilateral relations that is significant to cooperation with Japan. PNG requests further extension annually for the cooperation with OFCF regarding trap net project. Since then, there have been annual extension of the MoU up until now. As part of cooperation, NFA provides an annual budget of up to K2 million. According to National Fisheries Authority (2017), the brief for the PALM ministerial interim meeting shows that OFCF spent a total of US\$105,184 between 2012 to 2017 providing technical assistance to PNG. For the trap net project, OFCF provided JPY17,079,000 in 2020 (OFCF, 2021).

The project was extended to Lae, Morobe Province in 2015. By 2016, a project evaluation was conducted by OFCF and NFA and recommendations supported the extension of small-scale trap net designs in PNG coastal communities. The key emphasis was to promote sustainable operations and management of the project towards a self-financing one for the long term, contributing towards coastal fisheries development and food security. Currently, seven communities in PNG are operating and managing trap net fishing gear. Three communities are operating the Otonshi-ami design, two have small scale Masu-ami design, and the other two with small-scale Choko-ami design.

4.2.2 The Project Stakeholders and Responsibilities

The trap net project stems from the bilateral relationship between PNG and Japan. The NFA and OFCF are representative organizations of each government as key implementing agencies. As the project is focused on coastal fisheries development, it includes local stakeholders for the introduction and implementation of the project. The following outlines the stakeholders in the project and their roles.

i. The National Fisheries Authority of Papua New Guinea

The NFA is a statutory organization that represents the government of Papua New Guinea in the implementation of the trap net project. The NFA develops a work plan for the project in line with OFCF activities based on annual activities according to the existing MoU. The main input of NFA includes providing annual project capital for the project, providing necessary technical equipment and net materials, providing necessary technical training in collaboration with OFCF, providing guidance and advice on proper management and sustainability of the trap net fishing operations, conducting routine monitoring of the project, collect necessary data from operations and management of the project, conduct fishing ground surveys for the establishment of trap net project new sites, facilitate and gather key stakeholders to collaborate in introducing, implementing and developing the project, coordinate proper consultation and awareness for introduction and implementation of trap net project in selected new sites.

ii. Overseas Fishery Cooperation Foundation of Japan (OFCF)

The OFCF of Japan, as the representative of the Japanese government towards the project are responsible to provide guidance and technical advice for sustainable management of the project operations and management, provide necessary support technical equipment and materials, provide necessary technical trainings to NFA counterparts and local technical fishers, provide fisheries experts to conduct trainings, monitoring of the project and necessary technical advice, conduct monitoring of the project operations and management in collaboration with NFA, conduct fishing ground surveys for new project sites with NFA and local stakeholders.

iii. Local Government Stakeholders

The Division of Fisheries and Marine Resources (DFMR) and the Huhu Local Level Government are two key representatives of the Provincial Government and District Government respectively. Both are considered local government stakeholders of the project as their roles concern the local interest of the province.

The Division of Fisheries and Marine Resources (DFMR) represents the Milne Bay Provincial Administration. Huhu Local Level Government represents the Rabe Ward which the project site is located. For the NFA, much emphasis and responsibilities are required from the DFMR as a close contact organization with NFA and OFCF. However, both are expected to collaborate at the local government level to work with NFA and OFCF. They are not part of the MoU signed between NFA and OFCF but play a key role towards the introduction and implementation of the project. The responsibilities of the two includes, assisting NFA and OFCF conduct fishing ground survey for potential trap net sites, assisting NFA and OFCF

conduct community awareness for the introduction and implementation of the project, and coordinate and assist Rabe community in providing guidance and advice on sustainable management of technical operations for the project, coordinate and assist in providing technical support training for the project, assisting NFA and OFCF collect necessary data from fish catches and sales at various markets, assisting Rabe community in term of market arrangements, and provide care and management of all technical equipment and net materials including all assets provided by NFA and OFCF for trap net project. Also, DFMR provides a project officer to oversee the project management in the province.

iv. Rabe Community

Rabe community is the target recipient community of the trap net project. The community and its members are the key focus of the overall success of this project. As the roll out of the project begins, much of the outcome of the project depends heavily on the acceptance and cooperation of the community leaders and its members.

The responsibilities of the community are focused mainly on, approving in writing under customary arrangement among major customary clans for the use of the fishing ground and acceptance for introduction and implementation of the project, providing necessary manpower as working group members for the daily operations and management of the project, manage daily operations of the project, attend training provided by NFA, OFCF, and DFMR, cooperate with stakeholders involved and sustainably operate the trap net project, collect all necessary data for the project under the supervision of NFA and DFMR project officers.

4.3 Project Implementation

4.3.1 Research for suitable fishing ground

Before the introduction of the trap net project in a new site, important information is gathered for a suitable selection of the fishing ground. Selecting a suitable fishing ground is the most important component to guarantee the start of the project. Without a suitable fishing ground, the operations and management of the project cannot be applied. Figure 1 below shows the requirement for selecting a suitable fishing ground.

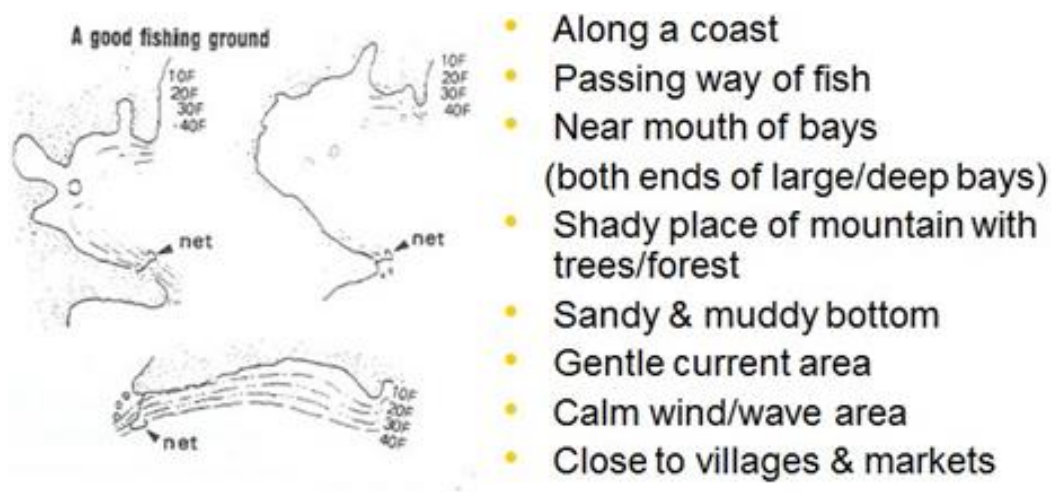


Figure 2: Selection of a suitable fishing ground

Source: National Fisheries Authority, (2021). Trap Net Fishery Training Manual: A Guide for Leading Fishers

An echo-sounder is used during the survey for the selection of appropriate fishing ground. The data gathered by the echo-sounder is recorded and analyzed. The main components of the analysis outline that the appropriate fishing ground should have a gradual slope, being far from nursery grounds, and must be sandy or muddy seafloor. Also, the depth for the operation of the small-scale trap net is up to 15 meters. Other supporting information includes

market access and operation condition. Regarding market accessibility, the information should provide that the fishing ground can be easily accessed and fish caught from the trap can easily reach the market. In terms of operation conditions, the community must be willing and available to participate in the project. Once this information is satisfied, then the project is ready to begin. Figure 2 below demonstrates the outline of selecting an appropriate fishing ground.

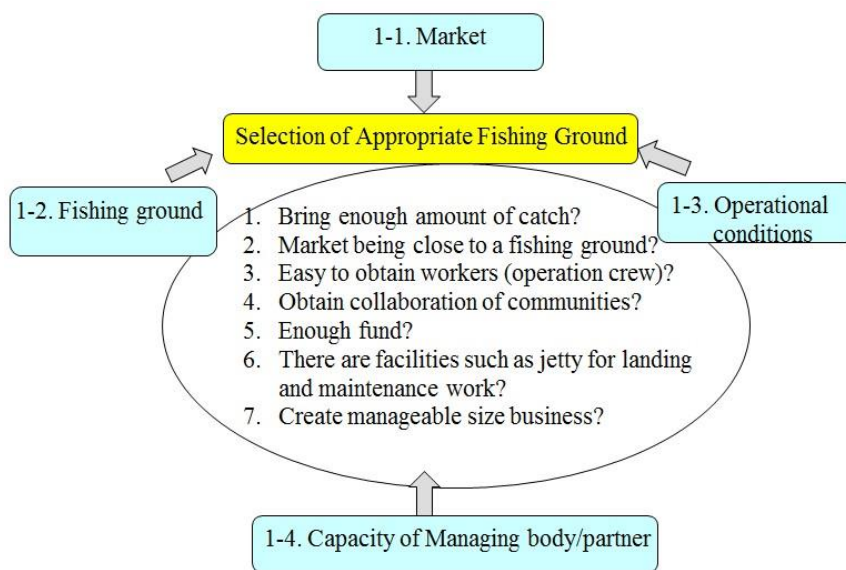


Figure 3: Selection of an appropriate project site or fishing ground

Source: National Fisheries Authority, (2021). Trap Net Fishery Training Manual: A Guide for Leading Fishers

4.3.2 Equipment and Materials

The key emphasis of equipment and materials are on providing small-scale trap net gear for community members of Rabe community to utilize and learn the necessary skills in sustainably operating and managing the new fishing technology. NFA and OFCF are the main agencies providing all required technical equipment and materials. Under the existing

agreement between NFA and OFCF, the responsibility is shared between the two organizations. For OFCF, the responsibility is to locate and supply the required support technical equipment and materials from Japan to PNG. Also, OFCF makes sure the technical equipment provided is adequate and appropriate for PNG. In doing so, OFCF supplies materials from Japanese companies such as Nitto Seimo Co. Ltd. For NFA, all domestic charges including agreed technical equipment is purchased and supplied from Japan and from domestic suppliers.

The equipment and materials for small-scale operation in Rabe includes the Choko-ami small-scale design net and related fishing materials such as operation boats, frame ropes, buoys, and sand bags as anchors, including harvesting and fish processing materials.

4.3.3 Key Features of Managing the Trap Net Project

The following are key management aspects for sustainable management of trap net project practiced by the Rabe trap net working group.

a) Selection of Working Group Members

Selecting the working group members are necessary to attain the workforce of the project. The selection of the working group members is left to the discretion of the community elders and clan leaders of the community. NFA and OFCF only provide the required number of local fishers for the daily operations and monthly net maintenance.

The selected individuals perform all necessary work for the project. It is part of the requirements for the working group to learn about the new fishing technology through training and guidance by experts from OFCF and NFA counterparts. Their activities begin with the construction and deployment of the trap net. They learn the daily operations of harvesting,

selling of fish caught from the trap net, and financial management of income from the fish sales. At the end of the month, they are required to conduct the net cleaning exercise as well.

These individuals are selected by the community elders and clan leaders to perform the responsibilities of the project. They become the group representing the community in this project. In Rabe Community, since the net design is small, only a few are selected. In the beginning, there were 19 members of the working group. Now, the number of working group members has decreased to 12.

Additionally, 5 community leaders are being part of the working group members as a way of providing guidance and support to the working group members.

b) Action Plan Development

The action plan development of the project provides the forecast of activities towards sustainable management of the project. The key areas of focus are on project management, operation management, training, asset management, management of sales and income, and data management. With this overall focus include sub-activities under each, persons in charge to make sure the activities are done and monthly expected deadlines per activity. The completion of this purposely guides the overall project operation and management in achieving continuous and sustainable development of this project.

The emphasis by NFA and OFCF is sustainable project management following the action plan.

c) Management Guidelines for Working Group Members

The working group management guidelines of the project are developed by input of all stakeholders of the project. It is developed from guidance by OFCF and is formed during the first stakeholder consultation meeting. It is updated periodically upon need basis in considering stakeholder participation and opinions towards sustainable management of the project. The main emphasis of the working group management guidelines includes, rules and regulation to operate and manage the project, the management of the operation fund, replacement fund and community fund, selection and roles of the committee members towards the overall management of the project.

d) The operation fund, replacement fund and community fund

The idea of operation fund, replacement fund and community fund are gained from the experience of trap net project from previous trap net sites before Rabe. This concept was first introduced and encouraged by fisheries expert from OFCF. In adopting this concept, it accounts for the sustainability of the project in terms of financial management. The income from fish catch is the main and currently only income source of the project. Much attention is put forward for the sustainability. Upon acceptance by all stakeholders the three accounts have been the most important feature supporting the sustainability of the project.

The operation fund gets 90% of the income from fish sales daily. This fund is utilized for all daily expanses of the next day fishing.

The replacement fund gets 5% of the total daily income. The purpose of this fund is for savings for when in future should any equipment is damaged then it shall be used to purchase needed technical equipment and required fishing materials.

The community fund is purposely for the support of other community projects. It is managed by the community elders and used when necessary, regarding community needs. It takes 5% of the total daily income.

The operation fund is the responsibility of the working group members to manage. The replacement fund is managed by both the working group representative and the assigned provincial fisheries offer. This is because all assets still belong to the state.

The working group committee in collaboration with the provincial fisheries open three separate accounts for each fund to be stored in the commercial bank at the local town.

e) Data Collection

The NFA and OFCF put great emphasis on data collection. The main concern is on resource management of coastal fisheries. Important data from the project is collected from the initial consultation with key stakeholders, the fishing ground survey, and the introduction and implementation of the project. A greater emphasis in regards to sustainability of the project is on the daily total catch in kilograms, sales and income, and expenses from trap net. Only selected working group member/s are trained specifically to collect the data in regards to daily operations of the project. The initial consultation, fishing ground survey is performed by NFA and OFCF with provincial fisheries.

NFA provides data forms and training to collect data regarding daily fish harvest, sales and income of the operation. These include, fish identification, total amount of catch per species, total mass of catch, total number of each species, average length (in centimeter) of each species, total sales and income, daily expenses and daily weather information.

OFCF provided a summary data template to gain monthly totals of required figures to observe monthly performance. It summarizes the key information from the above data collection form by NFA to give better understanding for informed decisions based on monthly totals. It includes the total monthly catch, total monthly sales and income, and total monthly expenses. From these data the average sales per month, average expenditure per month and average fish price per month is calculated and included in the form. Further, this template also includes total operation fund, replacement fund and community fund. It gives an overall indication of the project management based on data collected from the operations and management of the project.

f) Technical Trainings

OFCF expands tremendous effort on technical training. Since trap net is an introduced fishing gear, Rabe Community working group members lack the know-how, both in the operations and management of trap net. The effort by OFCF is expanded towards upskilling the local fishers as well as the counterparts of NFA. These trainings are tailored towards sustainable operations and management of trap net fishing.

The training begins from the initial stages of fishing ground survey, net and frame construction and deployment of trap net. However, much emphasis is based on the daily operation and monthly maintenance of trap net. OFCF develops a yearly plan for activities towards monitoring and providing technical training of the local fishers and the NFA counterparts.

During the construction and deployment of trap net, OFCF provide technical training in understanding the design and particular skills in net joining and rope works. After the deployment, OFCF emphasis training of safety of fishing including key aspects of harvesting

and net maintenance. Net maintenance is done once every month and takes at least 5 days. OFCF key emphasis on maintenance, is for the longevity of the net. It is strongly recommended that consistency in performing the monthly maintenance of the nets and frames is key for long time operation of trap net fishing.

The extended part of training is the OFCF technical training in Japan. OFCF offers invitation for key local fishers and one NFA counterpart to attend training in Japan for two weeks. This training requires the trainees to learn from the experience of Japanese trap net fishermen. This training is offered every Japanese fiscal year since 2014. Currently, there are 11 local trap net fishers with experience from Japan including one provincial fisheries officer. The next batch for the training is set for this year 2022 and will include 2 Rabe trap net fishers and provincial fisheries officer in Alotau.

An important point regarding training is the utilization of locally trained leading fishers' participation in imparting skills and knowledge to the new local fishers in the new trap net sites. During the introduction of the Rabe trap net, 4 leading fishers from previous sites including, Wewak and Lae, accompanied OFCF and NFA in the net construction, deployment practice, daily harvest and monthly net maintenance. It was seen to be very effective as local to local understanding and knowledge transfer seems quite reliable. The local leading fishers from the other sites gained knowledge from Japan and through continuous operations in their own respective projects. They were regarded highly by other fishers in their own project as fishing coordinators or trap net leading fishers. Their skills have developed over time and have translated positively towards extending their experience and knowledge to the new sites as seen in Rabe.

g) Monitoring and Stakeholder Consultation

The stakeholder consultation meeting gives the opportunity for all stakeholders to meet and discuss relevant issues of the project. NFA and OFCF collaborate during monitoring to assess progress of the project as well as conducting the stakeholder meeting. Annual work plans provide that at least NFA and OFCF conduct monitoring a minimum of three to four times in one year.

During any one time of the routine monitoring activities, one or two OFCF fisheries expert travels to PNG. Two PNG counterparts join with the OFCF experts and travel to each project site. In gaining first hand observations and discussions with local trap net fishers, important adjustments and management measures are considered. The new concepts or ideas gained from monitoring are discussed during the stakeholder's consultation meeting and if favorable, adopted into the management of the project management and operations.

CHAPTER 5: RESULTS AND DISCUSSION

The following chapter outlines the findings and discussions of the research. The discussion is based on the key findings of this research regarding contribution of Japan's ODA towards food security of Rabe community. Key emphasis of the discussion is based on the four dimensions in regards to food security; Availability, Access, Utilization and Stability.

5.1 Findings and Analysis

Food security is reflected under Goal 2 and Goal 14 of the United Nations Sustainable Development Goals (SDGs). Food and Agriculture Organization of the United Nations (FAO) is the custodian agency regarding food security. The primary objective of Goal 2 is *to end hunger, achieve food security and improved nutrition, and promote sustainable agriculture*. Goal 14 focuses on conservation and sustainable use of oceans, seas, and marine resources. Developing the metadata to monitor the progress of these goals remains a challenge for most countries. Some of the reasons are, that either data is not available or the capacity to adapt the methodology is lacking. However, as the year 2030 approaches, member countries are urged to consider and take into account the importance of securing food sources for people, especially vulnerable populations.

This chapter presents the findings that support this study's arguments and aims. The data was collected on the spot for the project and is not yet accessible for general use. The database is kept by the Papua New Guinea National Fisheries Authority for the sake of data security and upkeep as the data is collected on a daily basis. It's a tool that gives NFA, partners and communities dependable and precise data and plenty of time to assess and solve problems that threaten the trap net project's long-term viability. In addition, the data may be used as a standard for developing appropriate policies and making informed decisions in the long term.

For ease of reference and clear linkage to this research's focus, the presented results will be categorized based on the four key dimensions of food security, namely, availability, accessibility, stability and utilization, presented in the chart below.

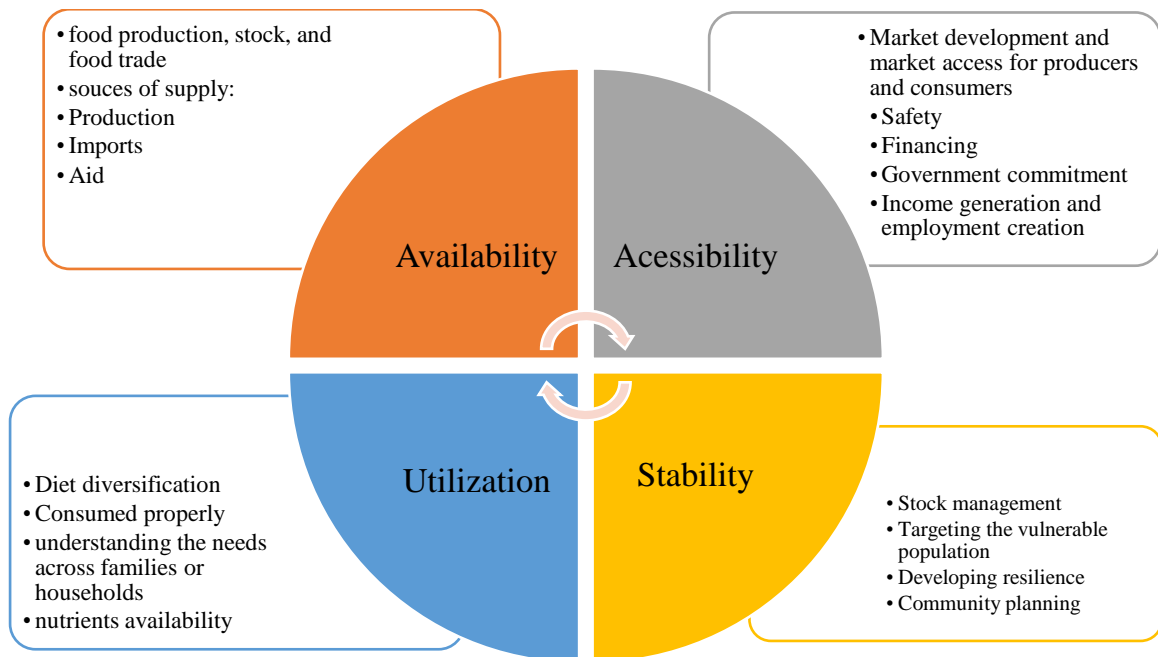


Figure 4: Dimensions of Food security

Source: FAO <https://www.fao.org/publications/sofi/2021/en/>

The analysis as per the four main pillars is based on available data corresponding to a key emphasis of each of the pillar. It provides an indication of how Japan’s ODA contributes to food security by the introduction and implementation of trap net project in Rabe community. Some of the indicators of the pillars are not applicable as they do not relate directly to the project. The analysis below constitutes indication to reason that the project is beneficial for the local community for sustainable food security.

5.1.1 Availability

The trap net project in Rabe community began in May of 2019. Through the cooperative agreement between NFA and OFCF the fishing technology was made available for Rabe community. The partnership between OFCF and NFA reflects the bilateral agreement between the government of Japan and PNG. Trap net is a fishing technology that provides avenue for the community members to part take in fishing daily. The result of this make fish available for consumption for the community.

Referring to Table 1 below, there were a total of 35 months of active fishing. A total of 875 days were reported fishing days from May 2019 to March 2022. From this, a total of 37,984.47 tons of fish was caught, traded and consumed. On average, data shows that 1,085.27 Kg of fish is caught which constitutes 43.41Kg of fish that is available for the community per day since the project started.

Table 1: Showing effort in fishing and total catch

Year	2019	2020	2021	2022	
Months	May-Dec	Jan-Dec	Jan-Dec	Jan-Mar	Total
Total harvest days	197.00	310.00	289.00	79.00	875.00
Total catch (Kg)	16,533.99	11,061.78	8,678.90	1,709.80	37,984.47
Number of months harvesting	8.00	12.00	12.00	3.00	35.00
Average catch per day (Kg/day)	83.93	36.33	356.27	21.64	43.41
Average catch per month (Kg/month)	2,066.75	921.82	723.24	569.93	1,085.27

Source: Rabe community trap net project 2022 data source

As per this data, there is fluctuation in the number of days fishing per year, month and day. Also, there is fluctuation in the total catches as well. These variations are a typical reflection of coastal fishing in regards to availability of participation and resources. For participation the

data clearly demonstrates that the community continues fishing everyday as according to the agreed management guidelines and action plan. For resources, the selection of the fishing shows that resources are available for the project to continue. As this trap net is a small scale and set at depth of about 8-15 meters, the catches show promising future for the project's continuity.

5.1.2 Accessibility

The trap net project contributes in providing freshly caught fish towards the diet of the people of Rabe community, the neighboring villages and when catches more, it is also supplied to the town market as well. The catch is done at a daily basis and three available market can be easily reached, the beach market, Bitu Market and the town market. Fish quality and freshness is maintained as the buyers are available soon after the harvest is done. Also, the fishing ground is near the community, accessibility of technical equipment is provided by the funding agencies, the technical training and advice is provided for the working group members. The working group members mainly conduct their sale of fish at the beachfront of the project site. After important data regarding the catch is recorded, each species caught by the trap net is weighed, packed and sold per kilogram. The emphasis regarding accessibility is discussed regarding sale of fish and wages gained from this project.

According to Table 2, in the 875 days of active fishing from May 2019 to March 2022, the working group members made a total of PGK 238, 126.10. In a month, the working group members made on average, PGK 6, 803.60 which constitutes a daily income from fish sales at PGK 272.14. These monies have been generated from the trap net fishing activities without any other income from other sources. Also, on average, the working group members maintain a fish price per kilogram at PGK 6.27. Compared to other suppliers this average price is lower

as others sell according to fish size rather than in kilograms. Rabe trap net fishers therefore constantly make income every day and sell to their local community members at an affordable rate at the community level.

Table 2: Showing Rabe trap net sales, wages and fish price data

Year	2019	2020	2021	2022	
Months	May to Dec	Jan to Dec	Jan to Dec	Jan to Mar	Total
Total harvest days per year	197.00	310.00	289.00	79.00	875.00
Total fish sales per month (PGK)	85,647.50	74,878.60	63,291.00	14,309.00	238,126.10
Average sales per month (PGK)	10,705.94	6,239.88	5,274.25	4,769.67	6,803.60
Average sales per day (PGK)	434.76	254.44	2,607.04	181.13	272.14
Wages (PGK)	12,135.00	29,213.90	25,391.50	6,043.00	72,783.40
Operation Fund (PGK)	77,082.75	67,390.74	56,961.90	12,878.10	214,313.49
Average fish price per kilogram (PGK)	5.18	6.77	7.29	8.37	6.27

Source: Rabe community trap net project 2022 data source

Further, through the trap net fishing method, local trap net fishers gain income from the project. Currently, there are selected 12 local fishers harvesting fish from the trap net and conducting monthly maintenance activities. The time taken for fishing is about 20 to 40 minutes. After that, data collection and fish sales are done. This takes at least 20 to 30 minutes when catch is small (about 10 to 15 kilograms) or an hour or more if the catch is more (about 20 kilograms or more). The most time and effort for trap is spent during net maintenance. This takes at least 4 to 5 days at the end of every month. As such, the working group members are paid a minimum wage agreed upon by their own liking as a weekly or fortnightly income. As seen in Table 2, since the project started, a total of PGK 72, 783.40 has been spent for the wages for the trap net fishers. On average PGK 2, 079.50 is spent on wages per month. This is

an additional benefit from the project apart from providing fresh fish to the community in which employment for a few of the community members is achieved. Due to the small scale of the net design only a few is selected to work with the project. The wages are gained from the fishing activity and paid to the fishers.

5.1.3 Utilization

The discussion on utilization emphasizes the sales and expense for the project with including operation fund and community fund. The income from the project is mainly from the sale of fish from the trap net. The main expenses for trap net operation include wages, fuel, plastic, ice, market fees and transportation. The income and expense depend on the amount of catch. Daily catches from trap net are not consistent as do other coastal fishing gears. As such, there is differences seen in the income and expenditure per month or year. However, as seen in Table 3, it is important to note that Rabe trap net has gained consistency in having income higher than expenses. This reflects that the operation continues to make sustainable income for Rabe trap net. For the 35 months of fishing a total of PGK 238, 126.10 income was made and expenses of PGK 111, 331.82. The Rabe trap net working group have utilized this fishing gear to make sustainable income for the Rabe community.

Table 3: Showing Rabe trap net sales, expenditure, operation fund and community fund

Year	May to Dec 2019	Jan to Dec 2020	Jan to Dec 2021	Jan to Mar 2022	Total
Months	8	12	12	3	35
Total fish sales (PGK)	85,647.50	74,878.60	63,291.00	14,309.00	238,126.10
Total expenditure (PGK)	20,579.40	40,836.20	41,989.30	7,926.90	111,331.80
Operation Fund (90%)	77,082.75	67,390.75	56,961.90	12,878.10	214,313.50

Community Fund (5%)	4,282.40	3,743.90	3,164.55	715.45	11,906.30
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Source: Rabe community trap net project 2022 data source

On the other hand, 90% of the income generated from Rabe trap net is reinvested into the operations of the project as the operation fund. According to Table 3 above, PGK 214, 313.50 was generated by the project and spent on its operations between May 2019 and March 2022. The operation fund covers all expenses for the operations of the project. This initiative reflects trap net project in PNG a sustainable one. Trap net generates its own income and funds its own operations at the community level making it self-sustaining fishing project for Rabe community.

Further, in utilizing the opportunities provided for self-sustaining operations of the project, an added initiative is the creation of the community fund. This fund was agreed upon by the stakeholders for 5 percent of total income from fish sales as incentive for the community. The purpose of the community fund serves as an incentive for use of customary fishing ground and as incentive to support other community development project initiatives by community leaders of Rabe community. As pe Table 3, The community fund for Rabe community after 35 months of active fishing stands at PGK 11, 906 30. As it forms the 5% total income from fishing, the fluctuation is mainly depended on the catch variations daily.

5.1.4 Stability

The initial implementing of the trap net project in Rabe was challenging. Several consultation meetings were conducted with local stakeholders including local government and customary land owners of the projects site to gain consent for the use of traditional

fishing grounds and understanding of key responsibilities towards the management of the project. It was through close collaboration and consultations that consent and understanding was attained and the project was successfully initiated.

Stability was a key aim for the project’s long existence at the community level. Stability includes measure of stock management, targeting the vulnerable population, developing resilience, and community planning. In the time of writing this report, data concerning resource management is still being processed by the NFA. This data is collected by trained local fishers and include key information such as species identification, information on resource biomass and weather data. All these contribute to making informed decisions on stock management regarding the management of trap net in PNG. The emphasis for this part will be based on developing resilience and community planning. The data presented here relates to data available on the replacement fund.

Table 4: Showing data on Replacement fund of Rabe trap net

Year	2019	2020	2021	2022	
Months	May to Dec	Jan to Dec	Jan to Dec	Jan to Mar	Total
Total harvest days	197.00	310.00	289.00	79.00	875.00
Total weight (Kg)	16,533.99	11,061.78	8,678.90	1,709.80	37,984.47
Total fish sales (PGK)	85,647.50	74,878.60	63,291.00	14,309.00	238,126.10
Replacement Fund (5% in PGK)	4,282.40	3,743.90	3,164.55	715.45	11,906.30

The emphasis on harvest days, total weight and fish sales in Table 4, signify a continuous fishing effort provided by the introduction and implementation of trap net fishing technology in Rabe. As discussed in the previous heading, 90% of fish income reinvested into the operation of the project makes it self-sustaining and the sales being

higher than the expenses shows positive signs of sustainable income. In this part, future planning of this project is also important for long term management of trap net. As trap net being a newly introduced fishing method, it is agreed that a replacement fund is created to sustain future operation of the project. As such, the replacement fund is agreed by the project stakeholders towards saving 5% of the total income from fish sales. The purpose of this savings is to make sure it grows overtime to cater for replacement of technical equipment and materials for the community members. Table 4 shows that a total of PGK 11,906.30 was generated from the 875 days of active fishing by the Rabe trap net working group. The fluctuation among the different months and year is due to the fact that catches are varies at different days as do other fishing methods.

The replacement fund in this case exemplifies an initiative for future planning of the community as is the community fund mentioned above. In the case of developing resilience, such initiatives help in promoting food security among communities such as Rabe. The project having guidelines and formed initiatives as such makes Rabe quite resilient.

CHAPTER 6: CONCLUSION

From this research, reflecting Japan's Overseas Development Assistance (ODA) contribution to Papua New Guinea's coastal fisheries development towards Food Security of Rabe Community, the author concludes in connection to answering the research questions as follows;

6.1 How technical cooperation assistance under Japan's Overseas Development Assistance (ODA) been implemented in coastal fisheries development project in Papua New Guinea, 6.2 How Japan's Overseas Development Assistance (ODA) contributed to addressing food security in Rabe Community in Papua New Guinea, and 6.3 The contributions of the study.

6.1 How technical cooperation assistance under Japan's Overseas Development Assistance (ODA) been implemented in coastal fisheries development project in Papua New Guinea

From the review of literature, Official Development Assistance (ODA) is aid provided by donor countries and international agencies to support the development aspirations of developing countries. Developed countries and international organizations provide ODA in the form of grants, loans, and technical cooperation to strengthen the economic, social, and political conditions of the developing countries. There are critical arguments regarding ODA towards developing countries. First, the priority of ODA is pre-decided by the donor countries and reflects their self-interests. Developed countries provide ODA as a means to gain friendly relations and access to raw materials from developing countries. Also, in the case of small island countries in the Pacific Islands, they have small economies with low industry development and are seen to heavily rely on ODA. As such, ODA comprises a larger part of the national economy of small island nations in the Pacific. A high dependency on ODA and a

low capacity to facilitate loan repayments from ODA is a worry for many island countries as well as for other developing countries.

This research report explained a case study of Japan's Overseas Development Assistance (ODA) for its contribution to Papua New Guinea's coastal fisheries development toward food security in the Rabe community. Particularly, the study explained how technical cooperation assistance under Japan's ODA contributes to coastal fisheries development in PNG as per the introduction and implementation of the Rabe trap net project. Second, the report also showed how Japan's ODA, through the implementation of the trap net project, has contributed to food security in the Rabe community as per the four pillars of food security; "Availability, Accessibility, Utilization, and Stability" (FAO, 2018 and Department of Agriculture and Livestock, 2015).

Japan is a dominant fishing nation in the Pacific and maintains a strong position in promoting cooperative relationships in trade and gaining support for international forums with the Pacific Islands including PNG. Through Japan's bilateral relations with individual island states, Japan provides ODA towards assisting the development of many Pacific Island countries. Technical cooperation assistance from Japan's ODA falls under this arrangement and targets mainly the development of fisheries in the Pacific region. Technical cooperation assistance in fisheries is the biggest component in the Pacific Islands among other regions. According to OECD (2022), Japan's overall bilateral assistance to PNG fisheries development amounted to USD126. 687 million. Japan's assistance in PNG fisheries is mainly based on technical cooperation for fishery development, amounting to USD 0.528 million, and USD 0.016 million towards fishing policy and administration management. The fisheries sector ODA from Japan is the highest among other donors (OECD, 2022).

Under Japan's revised Development Cooperation Charter, technical cooperation assistance from Japan provides mutual cooperative efforts towards the Pacific Islands including PNG. Through technical cooperation, the expertise and experience from Japan are transferred to developing countries to facilitate and promote economic development. Specialized training, expert knowledge, and procurement of technical equipment are key characteristics that emphasize close cooperation between Japan and recipient countries.

Regarding the introduction of the trap net project in PNG, this study finds that technical cooperation assistance from Japan proves to be useful and contributes to the improvement of sustainable coastal fisheries development in PNG. It complements the overall aim of Japan's technical assistance toward developing countries. Trap net as an introduced fishing gear, it promotes cooperation between Japan and PNG in fisheries development. Through the implementation of this project, necessary training, technology, and experience from Japan is being transferred to PNG. Also, the trap net as a traditional fishing gear in Japan promotes efforts towards sustainable coastal fishing. As such, fisheries experts provided by OFCF have been critical in imparting the necessary technical skills and knowledge to sustainably operate this fishing gear. PNG has been able to expand the project to seven project sites in total.

Further, critical to the sustainability of the project, this study finds that the management of the project provides a key emphasis on the overall sustainability of coastal fisheries. As compared to other previous projects, the trap net project offers key management features of how to manage the fishing gear to alleviate global challenges such as food security. It promotes understanding and experience in mobilizing community groups to manage the project, incorporates important guidelines and action plans for the sustainable operations of the project, and encourages continuous data collection for future decision-making for sustainable operations of the project. Additionally, the trap net in PNG demonstrates that it can self-finance

its operation while providing incentives for other community development projects. There is also a contribution as savings for future project development.

These key features of the project reflect Japan's Development Cooperation Charter in terms of technical cooperation between Japan and PNG. PNG aims to promote its coastal fisheries development with the assistance provided by Japan and shows self-reliant development through assistance for self-help efforts. Such outcomes can be adopted into future domestic policies for coastal fisheries development and experience shared with other developing countries.

6.2 How Japan's Overseas Development Assistance (ODA) contributed to addressing Food Security in Rabe Community in Papua New Guinea

The cooperative effort between Japan and PNG, presented in the case study of this report reflects the relationship between donor and recipient country addressing food security as a world challenge. From literature, the domestic policies in PNG such as the MTDP- III, Fisheries Strategic Plan, the trial fishing policy, and the Road map for coastal fisheries development in PNG prioritize and guide an effective utilization of Japan's technical cooperation assistance towards addressing pressing issues like food security in coastal communities in PNG.

Through technical cooperation assistance Japan provided necessary technical equipment and materials, experts, and training. This report finds that through OFCF's supply of technical equipment, the Rabe community now has an opportunity to participate in a sustainable coastal fishing method. The experts provided by OFCF made sure that technical understanding and skills are being transferred from Japan to PNG local counterparts and

working group members. Continuous training and monitoring provided a more consistent application of sustainable operations. These form the basis for input by OFCF towards the food security of the Rabe community.

The report finds that the Rabe community now has a management working group that can manage the project. Also, they have learned the necessary skills and knowledge to sustainably operate the fishing gear. More emphasis is being put on the training for net maintenance and financial management as the long-term operation and future sustainability of the project are key for food security.

Further, based on the four pillars of food security, the results indicate that the trap net project being introduced to the Rabe community under availability constitutes increased food production as per the catches provided by the project, there is income generation and employment creation reflecting accessibility, there is the creation of community wealth reflecting utilization, and developing resilience and community planning reflecting stability. Based on these key indicators, it can be said that the introduction of the trap net project in the Rabe community reflects efforts in positively addressing food security.

6.3 The Contributions of this study

The Pacific Islands, including PNG depend heavily on coastal fisheries resources. The use of the resources and challenges are similar among many of the island states. For PNG, since the 1990's, much effort have been put towards increasing production of coastal fisheries and increasing the livelihood of coastal communities. The management aspect for long term sustainability for coastal fisheries development have been lacking. In this study, the emphasis on the key management features of the case study of trap net project introduction and

implementation in PNG provides a good experience and ideas on how coastal fisheries can be sustainably managed to improve livelihood of the coastal communities and addressing global challenges such as food security. In this sense, the experience of trap net project management in PNG can be adopted to another coastal fisheries project domestically. Also, it can be adopted towards coastal fisheries development of other Pacific Islands.

Also, there is opportunity for a future study to compare how Australia and Taiwan disburse their assistance towards PNG in the field of fisheries compared to Japan. A huge bulk of Japan's ODA in fisheries is towards fishery development while only a small portion goes towards fishing policy and administration management. Australia and Taiwan also have bilateral agreement with PNG and their assistance in fisheries are mainly towards fishing policy and administration management. A comparative study for this case can be assessed for future studies to give light of development assistance towards fisheries development.

Finally, this study proves that technical cooperation assistance towards sector specific field like fisheries is more appropriate and is a better form of ODA from Japan. For PNG, the technical cooperation with Japan addresses the need for its coastal fisheries development. Through this this project, the Rabe community now have gained a new fishing method with adequate knowledge and skills to manage the project and its finances sustainably. For Japan, it serves Japan's interest in providing aid towards developing countries while supporting the domestic economy in PNG to be self-reliant. Also, technical cooperation as Japan's ODA modality towards PNG encourages cooperation between Japan and PNG. As such, this study confirms the strong bilateral relationship between Japan and PNG in emphasizing an effective utilization of technical cooperation assistance from Japan to PNG. This relationship can be part of an example for the broader Pacific region as well to promote strong cooperation between donor and recipient countries.

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