



**ANALYZING JAPAN'S POLICY COOPERATION FOR DISASTER
MANAGEMENT: A CASE STUDY OF THE GREEN MEKONG
INITIATIVES IN CYCLONE-PRONE COASTAL REGION IN
MYANMAR'S AYEYARWADY DELTA**

LINN LATT MAUNG

**MASTER OF ARTS
IN
INTERNATIONAL DEVELOPMENT**

**SCHOOL OF SOCIAL INNOVATION
MAE FAH LUANG UNIVERSITY**

2024

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**THIS THESIS IS A PARTIAL FULFILLMENT OF
THE REQUIREMENTS FOR THE DEGREE OF
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IN
INTERNATIONAL DEVELOPMENT**

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2024

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THESIS APPROVAL
MAE FAH LUANG UNIVERSITY
FOR
MASTER OF ARTS IN INTERNATIONAL DEVELOPMENT

Thesis Title: Analyzing Japan's Policy Cooperation for Disaster Management: A Case Study of the Green Mekong Initiatives in Cyclone-prone Coastal Region in Myanmar's Ayeyarwady Delta

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ACKNOWLEDGEMENTS

This research is the conquest of my industrious study during 2 years of academic years with all of my efforts to complete a Master's Degree in the International Development Program, School of Social Innovation, Mae Fah Luang University. First and foremost, I would like to express my deepest gratitude to Assistant Professor Dr. Wanwalee Inpin, my thesis supervisor, for her invaluable guidance, encouragement and energetic support throughout this research. She provided me with insights and her expertise to illustrate the way of shaping my research and until the success of it. Her patience, critical feedback and ideas have been an inspiration for my study journey.

Secondly, I would like to thankfully mention my academic advisor, Ajarn Dr. Yuki Miyake who also gave me her advice, and always welcomes to discuss academic ideas and innovative ways during her lecture times and in her free time as well. And, I am wholeheartedly thankful to Ajarn Dr. Thanikun Chandra and Ajarn Dr. Nichan Singhaputargun for teaching and sharing your knowledge and wisdom during lecture times that was useful to apply in my thesis. I am truly fortunate to have had these opportunities to learn from them. I am very grateful to all of the staff from the School of Social Innovation who helped me whenever I needed their help and they never hesitated for that. And special thanks to the Thailand International Cooperation Agency (TICA) which gave me a scholarship to study and get this degree in Thailand and Mae Fah Luang University for generously providing the thesis writing grant to be the smooth conduct for this thesis. My journey as a Master's student at Mae Fah Luang University has been a beautiful and memorable moment in my life together with them.

Last but not least, I also would like to extend my appreciation to my one and only family and friends who supported me directly or indirectly in the success of this work for their encouragement mentally and physically during my challenging moments and struggles. Their support has been a source of strength throughout this endeavor.

Linn Latt Maung

Thesis Title	Analyzing Japan's Policy Cooperation for Disaster Management: A Case Study of the Green Mekong Initiatives in Cyclone-prone Coastal Region in Myanmar's Ayeyarwady Delta
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Degree	Master of Arts (International Development)
Advisor	Assistant Professor Wanwalee Inpin, Ph. D.

ABSTRACT

Myanmar's Ayeyarwady Delta, with severe 2008 Cyclone Nargis evidence, is highly vulnerable to cyclones and storm surges disrupting regional sustainable development and human security, so it needs to be more resilient to disasters. Moreover, recurrent floods severely impact agriculture, human security and regional development. Disaster results from the convergence of hazardous conditions and vulnerabilities in the region. In this case, environmental well-being plays a crucial role in disaster risk reduction because it can trigger disasters and also protect communities.

Thus, this study analyzes disaster management of the "A Decade towards Green Mekong Initiative" using a qualitative method, secondary sources and thematic analysis to access resilience levels within the research region from the environmental dimension identifying key themes of collected data regarding disaster management efforts. Then, this study provides both the policy's effectiveness and necessary refinement for disaster risk reduction to leverage resources for enhancing environmental resilience in the Ayeyarwady Delta Region and similar contexts.

Keywords: Green Mekong Initiatives, Disaster Management, Disaster Resilience, Environmental Security and Myanmar

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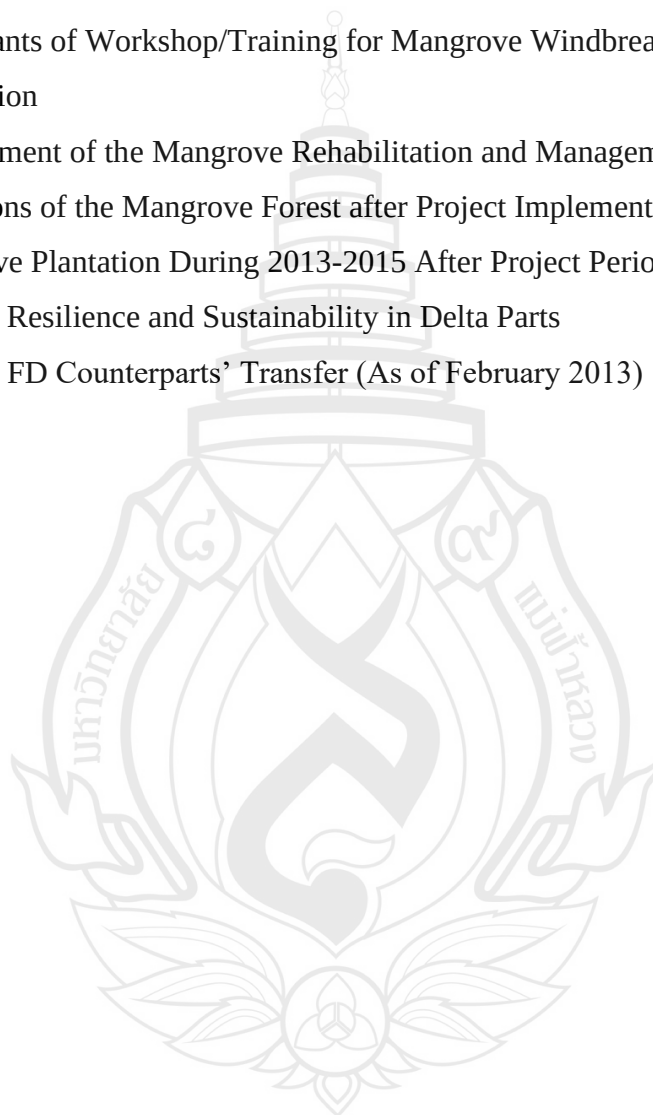
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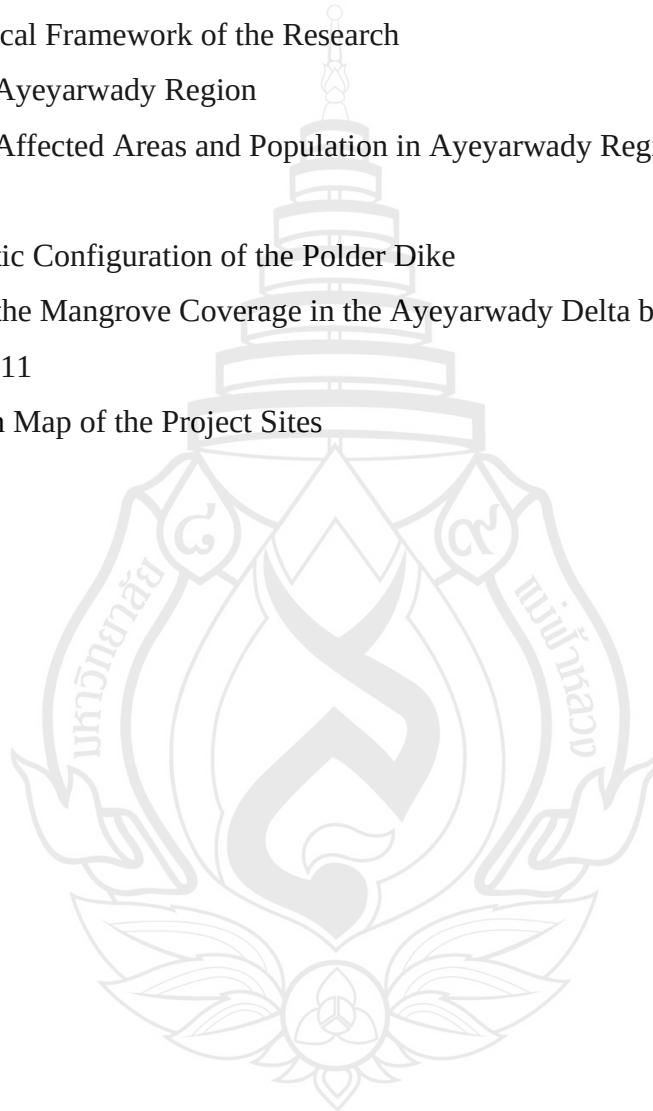
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ABBREVIATIONS AND SYMBOLS



AD	Assistant Director
ADB	Asian Development Bank
ARP	Action Research Plantation
ASEAN	Association of Southeast Asian Nations
CBDRM	Community-based Disaster Risk Management
CF	Community Forestry
CFUG	Community Forestry User Group
CIS	Commonwealth of Independent States
CLMV	Cambodia, Laos, Myanmar and Vietnam
DAP	Department of Agricultural Planning
DDG	Deputy Director General
DG	Director General
DMH	Department of Meteorology and Hydrology
DOA	Department of Agriculture
DP	Development Plan
EDA	Economic Development Administration
EM-DAT	The Emergency Events Database
EPA	Environmental Protection Agency
ERIA	Economic Research Institute for ASEAN and East Asia
FD	Forest Department
FPM	Field Project Manager
FY	Fiscal Year
GAD	General Administration Department
GIS	Geographic Information System
GMS	Greater Mekong Subregion

ABBREVIATIONS AND SYMBOLS



HRD	Human Resource Development
ID	Irrigation Department
IMMP	Integrated Mangrove Management Plan
IGNOU	Indira Gandhi National Open University
ILO	International Labour Organization
JCC	Joint Coordinating Committee
JICA	Japan International Cooperation Agency
JYP	Japanese Yen
MAS	Myanmar Agricultural Service
MCFTF	Mangrove Community Forestry Task Force
MI-CI	Mekong-Japan Economic and Industrial Cooperation Initiative
MIMU	Myanmar Information Management Unit
MJC	Mekong-Japan Cooperation
MJ-CI	Mekong-Japan Economic and Industrial Cooperation Initiative
MOAI	Ministry of Agriculture and Irrigation
MOFA	Ministry of Foreign Affairs
NFIO	CF-Natural Forest Improvement Operation
NSDRR	National Strategy on Disaster Risk Reduction
ODA	Official Development Assistance
OECD	Organization for Economic Co-operation and Development
PPP	Public-Private Partnerships
RCEP	Regional Comprehensive Economic Partnership
RF	Reserved Forest

ABBREVIATIONS AND SYMBOLS

RO	Range Officer
RRD	Relief and Resettlement Department
SDGs	Sustainable Development Goals
SEZs	Special Economic Zones
SO	Staff Officer
TOT	Training of Trainers
TPDC	Township Peace and Development Council
UN	United Nations
UNDRR	United Nations Disaster Risk Reduction
UNDP	United Nations Development Programme
UNEP	United Nations Environmental Programme
USAID	United States Agency for International Development
VPDC	Village Peace and Development Council
WWF	World Wildlife Fund
ha	hectares



CHAPTER 1

INTRODUCTION

1.1 Rationale of the Study

Natural disasters such as floods, storms, and earthquakes pose major threats worldwide, disrupting livelihoods and jeopardizing sustainable development and human security. Global climate change is increasing which is certain for disaster risks. According to the UN, it estimates that disasters affected more than 4.03 billion people worldwide from 2000-2019 (UNDRR, 2020). Developing countries are frequently hit hardest due to a weakness of resilient infrastructure and governance capacities. Besides, many countries are disaster-prone countries with their geographical conditions. The United Nations found out 44% of the world's population habitants around 150 km of coast without any other choice (Uitto & Shaw, 2016) since the coastal area is their origin of habitation. Resilience building in rural areas needs to be more concentrated than in urban areas as they lack resources, infrastructures, and awareness to be resilient to disasters or crises. For that, vulnerable coastal areas should be provided essential support for disaster resilience by respective authorities and organizations. According to the international database EM-DAT, nearly 194 million people were affected and the lives of 26,835 people were killed by 785 disasters only between 2019 and 2020 (Sen, 2021).

Myanmar is one of the most vulnerable countries in the world to the various hazards facing different disasters in all its regions including floods (most areas of Myanmar and the central parts of Ayeyarwady regions), droughts (Magway, Mandalay, and lower parts of Sagaing regions), earthquakes (middle parts of the country), cyclones (coastal regions and its related areas), extreme temperatures (almost throughout the countries), forest fires (Yangon, Mandalay, Ayeyarwady, Sagaing, and Bago regions),

storm surges (coastal areas), landslides (the western ranges and the eastern highlands), and also heavy rainfall events (Tun, 2020). As the past events, Myanmar experienced the very first cyclone called Nargis in 2008 which was utterly devastating (more than 140,000 deaths) (UNEP, 2009). Among them, Myanmar's Ayeyarwady Delta is highly vulnerable to devastating cyclones or storm surges with the evidence of Cyclone Nargis in 2008 which was highlighted as a severe disaster causing over 130,000 deaths (Webster, 2008). The Ayeyarwady Basin is home to 66% of Myanmar's population, it is also the agricultural heartlands of that people for their economic and social concerns. Ayeyarwady Basin is the most important source of inland fisheries, only with the Ayeyarwady Delta which represents 70% of all ponds in the country. One of the risks of the basin is that, although it is also the main paddy-producing region of the country's population, the climate change conditions of rainfall patterns lead to floodings, rising sea levels, and related cyclones. (WWF, 2018)

Disasters are regarded as events due to the fact that people, material and significant disruptions to community or societal activities in terms of environmental or economic impairments and unexpected progressive conditions. These incidents necessitate immediate intervention to stabilize the situation (Randolph, 2015). A disaster is defined as a sudden event caused by a mix of threats arising from exposure to hazards and vulnerabilities that are insufficient to prevent or cope with potentially harmful effects (Bethel, Foreman & Burke, 2011). Disaster impacts mortality, injuries, infections, physical damage, various harmful effects on psychological and social well-being, property damage, loss of services including social harm, economic disruption, and environmental degradation (Blaikie, Cannon, Davis & Wisner, 2014) and its dramatic increase and damages has become the vital role of national and international concern (Khan, Vasilescu & Khan, 2008) which all lead to human insecurity.

Human security is also one of the global concerns. It is essential to people in both rich and poor countries since various kinds of disasters hit all countries in different forms. From this perspective, natural disasters are regarded as one of the major threats to human security by the Human Development Report and the Commission on Human Security (Bacon & Hobson, 2014). Human security from natural disasters prioritizes threats that can impact humans by physical, economic, environmental and health emphasizing the importance of biological and sociological factors while they encounter

disasters (Bacon & Hobson, 2014). These natural disaster events have a nature to threaten human lives, realities, foods, incomes, pre-existing vulnerabilities, and the capacity of the community destroying their society and environment in various forms of devastations and leading to instabilities of their lives. The environment is recognized as having an important role in the disaster risk reduction approach because it can trigger disasters and also protect communities (UNEP, 2011) and environmental well-being is vital for human well-being since humans need to rely on environmental resources and natural disasters degrade the resilience of natural systems to disaster-related effects (DEWGA, 2008). Environmental security is also defined as the protection of the local and global biosphere which serves as the foundation on which humans rely for their enterprise (Trombetta, 2008). Thus, integrating environmental considerations into disaster risk reduction efforts can improve resilience and reduce the impacts of disasters on both human and natural systems because environmental security is crucial for long-term resilience and protecting ecosystems.

There are various preparatory measures to mitigate natural disaster impacts by disaster management; before a disaster strikes, to reduce its impacts or recover from its losses. These may be carried out during and after; including some programs and measures (Khan, Vasilescu & Khan, 2008). Disaster management is also defined by the United Nations Office for Disaster Risk Reduction (UNDRR) as the organization, planning, and implementation of disaster preparedness, response and recovery (ILO, 2020). Before a disaster: disaster prevention measures are implemented to reduce the loss of life and property caused by potential threats. For example, conducting awareness activities; improving their existing weak structures; and preparing for the disaster management plan at household and community levels. Risk reduction measures of this level are called mitigation and preparedness of disaster management. During a disaster: take actions to ensure that affected people's necessities and support are met and that suffering is minimized. Activities performed at this level are called emergency response activities. After a disaster: In the early aftermath of a disaster, there are required initiatives to respond to natural disasters and to promote recovery and rehabilitation. This phase is regarded as the response and recovery of the disaster management (Khan, Vasilescu & Khan, 2008).

Likewise, resilience building in cyclone-prone areas like Ayeyarwady Delta requires a comprehensive and integrated approach to capacity building for disaster management to enhance their resilience against disasters and to overcome shocks and stress with the collaboration of government agencies, non-governmental organizations, and other stakeholders since it is the closest region to cyclones and Tsunami with its coastal geography. Disaster resilience refers to a society's ability to endure disasters with minimal harm while maintaining the social, physical, and psychological capacity to jump back the pre-existing conditions (Sen, 2021) and it has been involved in disaster management sectors to advocate the communities to be more resilient to hazards by reducing them or by restoring their vulnerabilities of the region (Graveline & Germain, 2022). There has been emerged the notion that not only rebuilding communities after disasters but also improving their resilience to prevent future disasters or reduce their impact by the World Conference on Disaster Reduction in Hyogo (2005) (Coetzee, Niekerk & Raju, 2016).

Through such collaboration efforts, stakeholders at all levels, including governments, organizations, and also individuals need to work together to prioritize resilience building as one of the fundamental aspects of disaster management efforts for rural communities in the Ayeyarwady Delta region towards a safer, more sustainable and resilient future of the region. Recurrent floods also severely impact agricultural livelihoods, human security, regional development, and vulnerabilities. Therefore, these considerations point out the need to enhance disaster resilience through effective policies, action plans, and strategies which are crucial for successful disaster management (Sen, 2021).

Policy is a set of guidelines that direct decision-making, establish principles and outline future goals to be pursued by the governments and other relevant stakeholders. Thus, these guidelines are implemented through various administrations, programs, and projects aimed at achieving specific objectives and addressing societal concerns (Khan & Khandaker, 2016). However, at the implementation stage, while the adopted policies are translating into action for the targeted areas, some challenges can arise to take policy into action at the frontline through objectives, programs and legislation. And, this condition might lead to misinterpretation of the policies and objectives resulting in delayed execution (Jann & Wegrich, 2007). Thus, Khan and Khandaker (2016)

concluded that policy implementation requires clear goals and objectives, accurate planning, suitable job assignments, efficient monitoring and evaluation, and effective operating procedures and techniques to be able to define their responsibilities aligned with policy objectives.

Regarding disaster management, Japan has actively contributed to international cooperation efforts drawing on its extensive experience and deep understanding of the significance of disaster reduction in the development of the country (Japan International Cooperation Agency [JICA], 2007). Recognizing the essential role of development cooperation in enhancing international security, Japan has prioritized supporting fragile and conflict-affected countries (JICA, 2015) and Japan collaborates with the international community to mitigate the impacts of disasters and to support humanitarian aid and disaster relief efforts (Lertsithichai, 2015) by transferring policy objectives, structure, and content; policy tools or administrative techniques; institutions; ideology; ideas, attitudes, and conceptions; and negative lessons (Pacheco-Vega, 2021).

Policy transfer involves the adoption and adaptation of “government strategies, action plans, guidelines, goals, objectives, rules and regulations” from one country to another (Mokhtar & Rahman, 2020). This transfer process is conducted through action-oriented international activities which can be voluntary or coercive in policy practices. This concept refers to the copying or imitation of policies from one country to another (Mokhtar & Rahman, 2020) reflecting a form of cross-national learning and adoption. Concerning the climate issues in the environmental field, policy transfer occurs when countries adopt some strategies like mitigation and adaptation to the environmental changes from the international to the domestic scheme or national level to the local level (Pacheco-Vega, 2021).

Furthermore, Japan’s engagement with Mekong region countries highlights its commitment to international cooperation, recognizing that the development of these nations is also integral to strengthening collective security and fostering inter-state collaboration. Since 2009, Japan has actively pursued the development of the Mekong Region, as demonstrated by the Mekong-Japan Exchange Year 2009, with the endeavor aimed at fostering collaboration across a variety of fields with Mekong countries (Ministry of Foreign Affairs Japan [MOFA Japan], 2009d). Specifically in Myanmar,

Japan demonstrated its dedication by providing a range of emergency relief supplies, including tents, blankets, generators, and other vital aid as one of the multinational assistance to the Nargis cyclone, through international channels and alongside the deployment of Japan Disaster Relief medical teams to Myanmar (MOFA Japan, 2009c, March; Ehrenfeld & Aanenson, 2013) totaling approximately US\$ 266,000 to Myanmar Government (Embassy of Japan in Myanmar, 2008) and Japan also pledged 46 million dollars to assist in the aftermath of the cyclone, underlining its ongoing commitment to humanitarian efforts in the region (MOFA Japan, 2009c).

Following the devastating Nargis cyclone in 2008, the Government of Japan promptly dispatched the Japan Disaster Relief Medical Team in response to a request from the Government of Myanmar. The team was deployed to provide crucial medical assistance, focusing on their efforts to operate in the Labutta township of Ayeyarwady Delta Region for medical examination and to offer vital healthcare services to those affected by the disaster (MOFA Japan, 2008). This proactive intervention underscored Japan's commitment to providing timely and effective humanitarian aid to regions in need.

Then, as one of the regional cooperation for disaster management, Japan also initiated the Action Plan for “A Decade toward the Green Mekong” initiative in 2009 in order to promote regional cooperation on the environment including disaster management (MOFA Japan, 2010). Examining the gaps and analyzing the necessities of relevant policies and planning through documentary sources of the previous implementation support comprehensions for improving the integration of environmental dimensions into future disaster management policies and for successful disaster management. To understand this fact, this paper analyzes “A Decade towards Green Mekong Initiative Policy” and explores how disparities naturally can happen in formulation and implementation and what would be potential infills for the founded gaps. In this research, theories of human security, disaster management and policy implementation are used to analyze Japan's policy cooperation aimed at strengthening Myanmar's cyclone preparedness under this framework for the cyclone-prone region of the Ayeyarwady Delta of Myanmar to understand the vulnerabilities of that region and finding the gaps of their practices while implementing to be a more resilient area by improving the integration of environmental dimensions into future disaster

management policies by using qualitative approaches, secondary data, and descriptive method.

1.2 Research Questions

1.2.1 How does Japan implement the “A Decade towards Green Mekong Initiative Policy” in Myanmar in order to promote environmental resilience in the Ayeyarwady Delta area?

1.2.2 To what extent does Japan’s “A Decade towards Green Mekong Initiative Policy” promote environmental security in Myanmar?

1.3 Research Objectives

The study’s research objective is to analyze Japan’s policy cooperation for disaster management in Myanmar to promote environmental resilience in the Ayeyarwady Delta area under the Green Mekong Initiatives and to identify gaps between policy formulation and implementation for the Green Mekong Initiatives in Ayeyarwady Delta from the environmental dimension following an examination of the strengths and weaknesses of policy based on their practices.

1.4 Scope of the Study

This study analyzes Japan’s policy cooperation for disaster management within the context of the “A Decade towards Green Mekong Initiative Policy” since it was adopted in 2009. This study mainly focuses on its implementation processes under “A Decade towards Green Mekong Initiatives” through two projects namely “The Project for the Preservation of Farming Area for Urgent Rehabilitation of Agricultural Production and Rural Life in Areas Affected by Cyclone Nargis (2009-2011)” and “Integrated Mangrove Rehabilitation and Management Project through Community Participation in the Ayeyarwady Delta in Myanmar (2007-2013)” in the disaster risk

area, the Ayeyarwady Delta region for its environmental security as the disaster management measures. And impacts of these projects' implementation and sustainability were explored following the implemented period.

This assesses how this initiative contributes to resilience building from the environmental dimension following post-disaster events in this Delta Region, particularly in addressing flood risk reduction. Then, this study identifies the strengths and weaknesses of policy implementation and Japan's disaster management cooperation based on the related documented records of the governments and organizational sources to be able to provide recommendations for enhancing flood risk reduction in the Ayeyarwady Delta, Myanmar.

1.5 Research Outcomes

1.5.1 It will investigate how policy contributes to environmental resilience in Myanmar, the Ayeyarwady Delta. Based on the findings of the study related to the current disaster management strategies, it will provide the effectiveness of the “A Decade towards Green Mekong Initiative Policy” and also for the refinement of existing strategies for enhancing the integration of environmental dimensions into future disaster management policies.

1.5.2 The study will make recommendations for improving the integration of flood risk reduction strategies from the environmental dimension in the Ayeyarwady Delta region by exploring the strengths and weaknesses of the “A Decade towards Green Mekong Initiative Policy”. From that, it will also suggest some necessities for policy formulation and implementation by analyzing the gaps between them to be able to promote more sustainable practices. The study can also contribute to shaping international cooperation frameworks which are involved in disaster risk reduction to leverage resources for enhancing environmental resilience in the Ayeyarwady Delta Region.

CHAPTER 2

LITERATURE REVIEW

This chapter provides a review of literature relevant to the research objectives of analyzing policy cooperation for disaster management under the Green Mekong Initiatives towards the cyclone-prone coastal region of Myanmar, the Ayeyarwady Delta, to give the readers a clear understanding of each concept used in this research study. Besides, the respective theories such as the Human Security Theory, Disaster Management Theory, and Policy Implementation Theory are used to examine the aim of this research and create the conceptual framework with the respective concepts of this study.

2.1 Human Security Theory

The concept of human security originated in the 1990s as a response to the limitation of traditional security paradigms with the release of the Human Development Report (UNDP, 1994) of the United Nations Development Program (UNDP) (Paris, 2001). The human security approach was also initiated in the post-Cold War era with globalization discourse emphasizing the interconnection between nature and the consequences of human insecurities (Bacon & Hobson, 2014). The application of human security has been significant by the consensus that human security is an approach that will assist Member States in identifying and addressing their challenges to the survival, livelihood, and dignity of their citizens, with the adoption of General Assembly resolution 66/290 on the 10th September 2012 (UN, 2016). The traditional concern of the Security Council was mainly the military threat to regional and global order, but, the non-traditional security consists of health, environmental, and

poverty issues (Thomas, 2001) identifying “people as the primary referent for understanding security” (Bacon & Hobson, 2014).

According to the UNDP Report, it regarded that human security is a universal concern with the people-centered approach with seven components (Quinn, 2008), such as economic security, food security, health security, environmental security, personal security, community security, and political security, to embrace all kinds of securities to protect against sudden and hurtful disruptions in our daily lives (Bacon & Hobson, 2014). There are three pillars of human security theory: (i) Freedom from fear which focuses on the protection of individuals from violent threats such as conflicts, crime emphasizes the importance of ensuring personal safety and security for all individuals, (ii) Freedom from want which address the economic and social concerns, for example, such as poverty, hunger and lack of access to basic needs aiming to the individual to be able to have opportunities to live in proper life and, (iii) Freedom from indignity that focus on to protect human rights including political, economic, social, civil and cultural rights seeking to be able to uphold the dignity and worth of individuals (UN, 2016).

According to some scholars, “Human security calls for shifting attention from government-centered to human-centered attitudes in security approaches” (Seifi, Razmkhah & Pletnev, 2021). Human security refers to people’s rights to live in freedom, in dignity, and free of poverty and despair (Gwiazdon, 2020). Human security means is that “understanding new threats beyond traditional forms of violence”, “understanding new determinants of security” and “understanding the interrelationship between development, human rights, and security” (Seifi, Razmkhah & Pletnev, 2021).

Insecurity comes from worries about daily needs rather than fears of catastrophic world events, for example, income insecurity, health insecurity, and environmental insecurity create concern for human security around the world (Thomas, 2001). Both in developing and underdeveloped countries, income poverty and lack of humanity are under the threat of disasters in their regions, which are essential issues of human security and the fundamental need of human beings as non-tradition human security. Human security emphasizes the protection of individuals from stabilities (Paris, 2001), which are often threatened by natural disasters hindering to be able to access basic needs, sustainability, and development. Therefore, they should be prevented by the notion of human security (Mine, 2007), in the disaster management

sector, to be able to reduce the rate of casualties since natural disaster events cannot be entirely avoidable and they are also the root causes of human insecurities (UN, 2016).

Some scholars argued that human security should be defined more narrowly to be able to accrue greater analytical and policy value (Bacon & Hobson, 2014). Human security components have interconnected relationships and it is about a people-centered approach. Anthony Lake (2013) concluded that “nations are collections of human beings and it’s the security of those human beings that defines whether or not a nation is secure” (Anthony Lake, 2013 as cited in Bacon & Hobson, 2014). According to the Report on Human Development of 1994, “Human security is concerned with how people live and breathe in a society, how freely they exercise their many choices, how much access they have to market and social opportunities and whether they live in conflict or peace” (UNDP, 1994).

It is also considered as a way of prioritizing some kinds of threats, that destroy human well-being as physical violence, such as economic, environmental, health security, etc. A human security approach to natural disasters entails an understanding of how important biological and sociological elements are to determine how safe people are and what types of threats they are facing. (Bacon & Hobson, 2014)

2.1.1 Environmental Security

The environmental movement of the 1960s and 1970s influenced contemporary definitions of environment-security links (Matthew, 2014) when environmentalists noticed the relationship between human survival and environmental issues (Floyd, 2012). The idea is that there is a link between the well-being of the natural environment and the security of people, societies and the biosphere (Floyd & Matthew, 2012). Then, movements sparked a strong policy response in the United States, including the establishment of the Environmental Protection Agency (EPA), legislation and funding for the United Nations Environmental Program (UNEP) (Matthew, 2014). In the 1980s, environmental security gained traction due to global environmental issues such as global warming and then, ‘Our Common Future’ by the World Commission on Environment and Development (1987) brought ‘environmental security’ to the international debates (Trombetta, 2008) with the idea that the national security could depend on its environmental security (Floyd & Matthew, 2012).

Disasters Environmental Working Group for Asia (DEWGA, 2008) expressed that the environment was described in early studies as a dangerous one associated with the threat of danger and frequently appeared as the term 'environmental hazards or disasters'. However, it is important to recognize that the environment is also impacted by disasters when it is vulnerable to hazards (UNEP, 2011). According to the Millennium Project study for environmental security, they found out that environmental security was defined by various definitions but there is no consensus definition (Wenning et al., 2007; Glenn, Gordon & Florescu, 2012) among them. As one of them, it is defined as "the state of protection of vital interests of the individual, society, natural environment from threats resulting from ... natural impacts on the environment" by the Commonwealth of Independent States (CIS) (Glenn, Gordon, & Florescu, 2012). Environmental security is also defined as the protection of the local and global biosphere which serves as the foundation on which humans rely for their enterprise (Trombetta, 2008).

Likewise, Belluck et al. defined environmental security as the involvement of actions which protect from environmental degradation "to preserve or protect human, material, and natural resources at scales ranging from global to local" (Belluck et al., 2005 as cited in Wenning et al., 2007) and also involve protecting from the natural disaster impacts such as storms, earthquakes and others (Wenning et al., 2007). The environment is recognized as having an important role in the disaster risk reduction approach because it can trigger disasters and also protect communities (UNEP, 2011). Without environmental well-being, human well-being would be difficult to achieve since humans need to rely on environmental resources due to the reason that natural disasters degrade the resilience of natural systems to disaster-related effects (DEWGA, 2008). The significance of environmental security goes beyond concerns about man-made or natural disasters and also encompasses the issues of environmental degradation and sustainability (Sobhan, 2012).

According to the Millennium Ecosystem Assessment, human activities mainly agriculture and land use are identified as the primary causes of ecosystem change and degradation, in some cases, deforestation for timber has a purposeful impact on the environment (DEWGA, 2008). The Hyogo Framework also acknowledges that environmental degradation plays a significant role in contributing to disaster risk that

can occur when hazards interact with environmental vulnerability (UNEP, 2011), therefore, environmental security is vital for itself as disasters also change the environment (DEWGA, 2008) but also for the community to protect from the disaster risks. There is also substantial evidence that contributes to understanding that improving environmental management can significantly support disaster risk mitigation, post-disaster response and efforts toward environmental and humanitarian recovery as well (DEWGA, 2008).

Therefore, environmental degradation highly contributes to disaster vulnerabilities and the need for resilience-building measures. Thus, to address environmental security together with disaster risks, integrating environmental considerations into disaster risk reduction efforts can improve resilience and reduce the impacts of disasters on both human and natural systems because environmental security is crucial for long-term resilience and protecting ecosystems.

2.2 Disaster Management

The United Nations defines Disaster as the severe disruption of the functioning of a community or society through various human, material, economic, or environmental damages (Chondekar, 2018; Khan, Vasilescu & Khan, 2008), the disaster management is the method of organization and resources management to cope with these impacts of disaster for all humanitarian aspects of emergencies through preparedness, response, and recovery to reduce the disaster impacts (Chondekar, 2018; Sawalha, 2023) and defined as the dynamic process by many authors (Sawalha, 2023). The United Nations Development Program (UNDP) defined disaster management as “the body of policy and administrative decisions and operational activities which pertain to the various stages of a disaster at all levels” (USAID, 2011).

Disaster risk management is the systematic process of applying decisions of administration, operational skills, and capacities for the policies implementation and for the society and communities to be able to deal with or lessen the effects of natural hazards and other environmental and technological disasters (Chondekar, 2018), and it organized with both structural and non-structural measures to avoid or to mitigate

adverse effects of hazards (USAID, 2011). Therefore, “disaster management effort is geared towards disaster risk management” (Chondekar, 2018), in another way, it is “the application of disaster risk reduction” (USAID, 2011).

A disaster is caused by the combination of hazards, vulnerabilities, and insufficient capacity or risk-reduction measures (Khan, Vasilescu & Khan, 2008). Modh (2010) argued again that the disaster also creates opportunities to conduct development processes by changing society and its characteristics through housing construction and reforming of lands (Modh, 2010) to withstand the upcoming disaster impacts and, to adopt a new smarter framework based on the present disasters (Sawalha, 2023). Thus, Khan, Vasilescu & Khan (2008) assumed that developmental considerations are significant to mitigation and preparation efforts for disasters, but sometimes, improper or poor management of disaster can unfortunately exacerbate pre-existing vulnerabilities, affect victims, donors and relief agencies (Chondekar, 2018) and increase to be more vulnerable to the future hazards (Modh, 2010).

Moreover, disaster preparedness and prevention and mitigation processes need to welcome the participation of risk communities to increase the resilience of socio-economic systems (Modh, 2010) understating their experiences and nature, as the decentralized decision-making process (Modh, 2010). Not only evocating human resilience and reducing improper actions, preserving the ability of the ecosystem and enhancing physical adaptation to changes need to be performed to increase their resiliency to external stress in the environment like natural disasters as the prevention procedure of disaster management (Modh, 2010).

As the nature of the environment has continuously changed, the evidence of disaster events, with 428 disasters between 1994 and 1998 and 707 disasters between 1999 and 2003 respectively (Khan, Vasilescu & Khan, 2008), therefore, disaster management to handle natural changes are also developing over time. According to the literature, the earliest management of disaster started in 1803 with a Congressional Act of the US Federal Government as the very first disaster legislation to be able to provide financial assistance to a New Hampshire town that was destroyed by fire, (Sawalha, 2023), the Flood Control Act of 1917 was another significant piece of legislation due to the flood experiences on the Mississippi, Ohio and other rivers (Country, 2022).

In the late 1950s, 'civil defense' became the popular term for disaster management demonstrating higher levels of collaboration among different parties and levels of groups (Sawalha, 2023) and centralized to safeguard their citizens (Rajabi et al, 2021), but it focused only on the post-disaster response (Sawalha, 2023). Until the middle of the 20th century, modern disaster management did not emerge (Rajabi et al, 2021). In 1966, the General Assembly of the United Nations established the UNDP (United Nations Development Program) for the climate and disaster resilience building measures for disaster-prone areas. During the 1970s, a process-oriented approach to disaster management was conducted, later on, disasters were managed by applying the disaster management cycle practically by researchers and practitioners (Sawalha, 2023) to measure the accomplishment of the disaster management process and also to design or innovate their management plans based on the previous experiences.

At present time, the disaster management cycle is widely used and it is comprised of the Mitigation, Preparedness, Response, and Recovery phases in order to define the stages of disaster management. The disaster management cycle depicts the process of governments and civil society attempting to decrease the impact of disasters including the policies and strategies to transform the causes of disasters or mitigate consequences on individuals, property of people, and their infrastructures (Khan, Vasilescu & Khan, 2008). It can be specifically divided into three stages such as before, during, and after disaster strikes stages (Khan, Vasilescu & Khan, 2008; Chondekar, 2018; Sawalha, 2023) as the disaster management cycle.

1. Before disaster strikes - Activities are conducted to reduce the human and property losses due to disaster events as the mitigation and preparedness phases (Khan, Vasilescu & Khan, 2008).

2. During a disaster occurrence- The performed activities ensure to meet the needs of victims minimizing their losses and suffering, which are referred to as the emergency response phase (Khan, Vasilescu & Khan, 2008).

3. After a disaster- The affected communities are assisted in their rehabilitation and restoration by local governments and respective agencies to be able to bounce back their regular condition from social, physical, and economic damage and this phase is defined as the recovery phase (Chondekar, 2018).

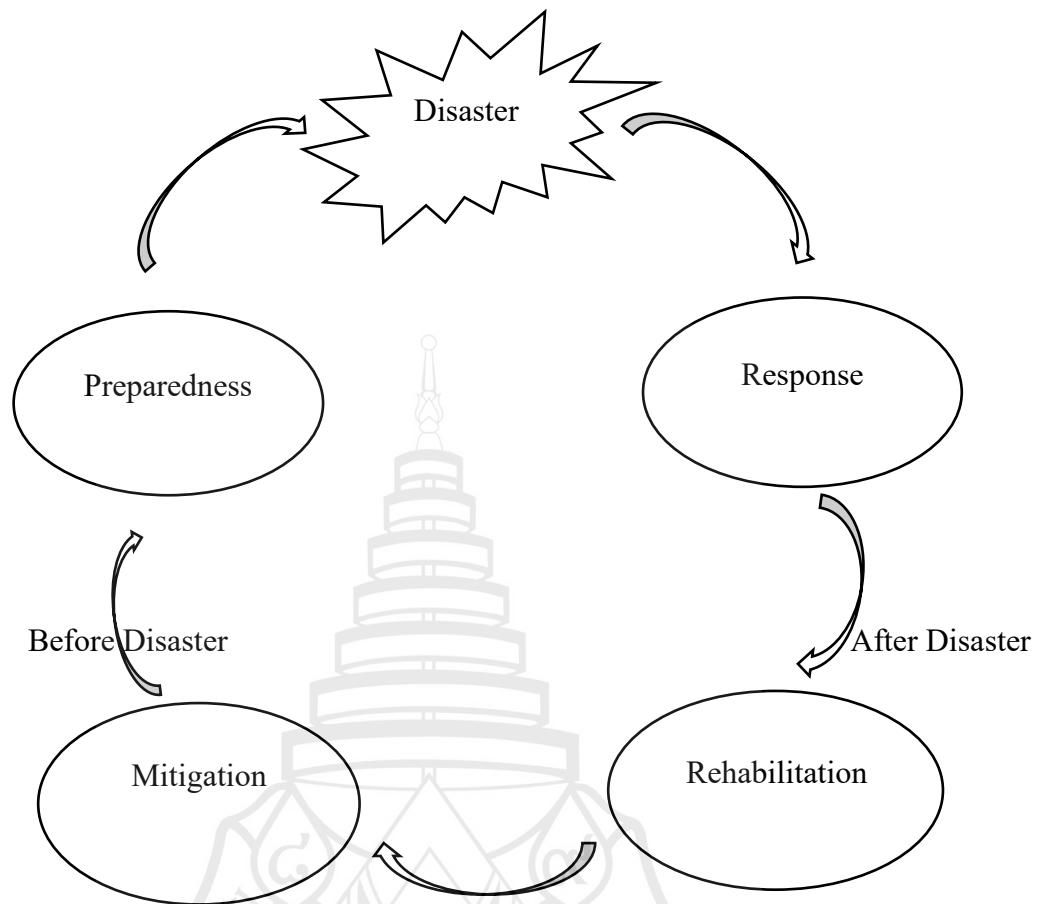


Figure 2.1 Disaster Management Cycle

Efficient disaster management planning must comprehensively address all activities and conditions that would occur before, during and after a disaster whereas emergency relief and rehabilitation are crucial components of this process (Indira Gandhi National Open University [IGNOU], 2017). All these stages are interconnected and activities across these stages can be performed simultaneously but the important thing is timely implementation of disaster management to minimize the risks (Bali, 2024).

Although this cycle is constructed according to its phases, in practice, these phases are not always in order and sometimes may overlap (Chondekar, 2018) or merge (Benson, 2008). Recovery action may also start in the phase of emergency response, for instance, a technical advisory team frequently starts to gather information as soon as after the disasters with the purpose of response and recovery initiatives (Carter, 2008). Castillo (2005) also argued that disaster preparedness involves developing and

maintaining plans for evacuation, operating emergency operations centers, and establishing disaster recovery plans.

Moreover, rehabilitation focusing on affected people is conducted to enable them to resume their normal lives and reconstruction needs to be integrated into long-term development plans to be able to reduce future disaster risks by incorporating appropriate measures (Bali, 2024) that can also be recurrently assumed as the mitigation and preparedness of the pre-disaster phase of the future one. Here, resource allocation at all stages is a significant challenge, which aims to optimize the effectiveness of risk reduction and minimize the impacts of disaster management efforts (IGNOU, 2017).

Tay et al. (2022) concluded that there are also some sources of risks through the phases of the disaster management cycle, that seems to resonate with practicing effective disaster management, such as operational (unanticipated changes i.e., product unavailability or lacking personnel) and infrastructure (information and transportation) risks that should be taken into account while providing the affected region to the rescue. Therefore, to prevent future disaster impacts, public policies should be adopted following these phases, then they can prevent future tragedies by disrupting the vicious cycle of cause and effect (IGNOU, 2017).

2.2.1 Disaster Resilience

As mentioned above, people are at risk of natural hazards for various reasons worldwide, building and/or strengthening resilience to disasters is an essential part of societies and their future. The rising costs of disasters have led to a need for more efficient disaster management and prevention methods, rather than simply responding to their adverse effects (Coetzee, Niekerk & Raju, 2016). The term resilience has been popular in many disciplines since the 19th century and resilience also can enhance responses to disaster risks (Combaz, 2014). Since before three decades, the concept of ‘resilience’ originated in the ecological field (Ranjan & Abenayake, 2014) by Holling (1973) (Shao, Soda & Xu, 2016) and has been a significant concept in the field of disaster risk management and climate change adaptation (Tiernan et al, 2019) also applied to social systems and human-environmental systems (Rodriguez-Nikl, 2015).

The definition of resilience given by Holling (1973) is “a buffer capacity or the ability of a system to absorb perturbation or the magnitude of the disturbance that can

be absorbed before a system changes its structure by changing the variables” (Holling et al., 1995 as cited in Ranjan & Abenayake, 2014). There are a few common attributes that are shared by scholars with words such as robustness, efficiency, redundancy, adaptability, and transformability (Shao, Soda & Xu, 2016), bouncing back or jumping back (Ranjan & Abenayake, 2014). Norris et al (2008, as cited in Tiernan et al., 2019) also found that there is not a single definition of resilience but it can be expressed as ‘perturbation’ and ‘recovery’ compared through various research. According to Bocchini et al. (2014), resilience is defined as resistance toward annual external shocks and the ability to quickly recover from catastrophes Bocchini et al. (2014 as cited in Rodriguez-Nikl, 2015). Maru (2010) considered that ‘resistance’ and ‘recovery’ are the main themes of this concept.

The concept of resilience has been demonstrated to be particularly useful with its capacity to capture systems' behavior (Tiernan et al., 2019). It has been involved in the disaster management sectors by many researches and practices both for post- and pre-disaster times aiming to advocate the communities to be more resilient to hazards by reducing them or by restoring their vulnerabilities of the region (Graveline & Germain, 2022). However, both academics and practitioners often confront challenges when they attempt to operate, quantify or identify the specific factors or indicators that can contribute to community resilience (Coetzee, Niekerk & Raju, 2016). Mayunga (2007) assumed that the redundant term of resilience could deplete the improvement of disaster risk reduction or policy formulation if there is no solid theoretical base on resilience. Maru (2010) observed that “most applications of the resilience concept on individual or social systems if not explicit have at least implicit a steady-state (an equilibrium) assumption that the entity has to hold onto or bounce back to after a perturbation”, meaning that the resilience involves both the ability of recovery and to return their stable or desired state after the disturbance.

After the devastating Indian Ocean Tsunami (2004) and the World Conference on Disaster Reduction in Hyogo, Japan (2005), the term ‘resilience’ became popular in disaster risk reduction discourse. The conference also underlined the importance of not only rebuilding communities after disasters but also improving their resilience to prevent future disasters or reduce their impact (Coetzee, Niekerk & Raju, 2016). The UN’s Hyogo Framework (2005-2015) also promoted to integration of disaster risk

reduction and climate change adaptation into a framework for building resilience (Combaz, 2014).

According to the Department for International Development (DFID), identifying the levels of resilience is also vital to understanding the concept and most of the resilience definitions constructed sharing its 'context', 'types of disturbances', and 'capacity' to respond and their 'reaction' after adverse events (DFID, 2011) and also provided a framework constructed with these four elements that can be applied to analyze disaster risk performances, building resilience, and adaptation to disturbances of the systems or the individuals.

Disaster resilience refers to a society's ability to endure disasters with minimal harm while maintaining social, physical, and psychological capacity to jump back the pre-existing conditions (Sen, 2021). It is also the "ability of a community to respond and recover from disaster impacts through an adaptive process that facilitates the ability of the social system to recognize, change and learn in response to a disaster" (Coetzee, Niekerk & Raju, 2016). Disaster resilience has been embedded in the disaster risk management history and it has been regarded as the essential capacity to overcome hazards under the disaster risk management topic learning from risk reduction, prevention, preparedness, mitigation, response, and recovery (Combaz, 2014).

The study of disaster and environmental issues should take into account measures for disaster resilience, which boost long-term outcomes by enhancing the ability to deal with major disasters. Disaster management including readiness, action, recovery, and prevention have an impact on resilience in emergency management. Therefore, it is necessary to research national catastrophe resilience policies to determine which actions are associated with resilience. It is necessary to investigate intervention strategies that can shift the greater cumulative risks and consequences during disasters toward more desirable resilience (Wenger, 2017). The government and concerned stakeholders could manage natural disasters and environmental problems by enforcing rules and standards to be implemented in-laws.

2.3 Policy Analysis

Public policy is a set of guidelines that guide decision-making, establish principles and outline the future goals which will be pursued by the governments and other relevant stakeholders. Then, these guidelines are translated into action through the implementation of various administrations, programs, and projects aimed at achieving specific objectives and addressing societal challenges (Khan & Khandaker, 2016). It is regarded as the “series or pattern of government activities or decision to remedy certain social problems”, therefore, the implementation of public policies has to achieve the intended goals for their citizens (Khan & Khandaker, 2016, p.539). While adopting public policy, policy analysis also plays a significant role within reform coalitions aimed at governance development and methods enhancing the effectiveness or identifying the cost of public policies (Jann & Wegrich, 2007).

2.3.1 Introduction to Policy Process

Since the early 1950s, the field of policy analysis has been closely associated with the idea of understanding the policy process as evolving through a series of distinct stages or phases (Jann & Wegrich, 2007). The policy process is termed as a system that transforms policy ideas into actual policies which are implemented and have a positive impact (Birkland, 2019). The first idea of the policy process model was developed by Harold Lasswell with the aim of establishing “a multidisciplinary and prescriptive policy science” (Jann & Wegrich, 2007). Lasswell’s model of the policy process comprises seven stages: (1) intelligence, (2) promotion, (3) prescription, (4) invocation, (5) application, (6) termination, (7) appraisal, served as a foundational framework to understand the dynamic policymaking and various typologies of the policy process with the expansion of policy studies between the 1960s and 1970s. (Jann & Wegrich, 2007)

Many scholars such as Brewer and deLeon, Anderson, Jenkin and others scholars modified the policy process, after that, the policy process was identified with sequential stages named agenda-setting, policy formulation, decision-making (policy adoption), implementation and evaluation. Here, each stage will only be expressed briefly. As the first stage, “Agenda-setting results in a selection between diverse problems and issues”

among various actor such as policymakers, the media, the public and other interest groups who are trying to get the attention and action of the government to solve their problems (Jann & Wegrich, 2007).

In the next phases, the defined problems and proposal will be transformed into the government plan then, they will be formulated and adopted for the specific objectives and alternative actions (Jann & Wegrich, 2007). There will be identifying the approaches to problems with specific policy tools. Policy formulation is an important stage of the policy process because it involves designing alternative policy options for decision-makers which has a direct impact on their final policy choice for the issues and allocation of power among social, political and economic interests (Sidney, 2007). Then, the final adoption of the proposed policy options will be conducted by policymakers to address societal needs or goals.

At the implementation stage, which is crucial, the adopted policies are finally translated into action for the targeted areas. Although this stage implements the policy decision, political and administrative actions at the frontline are difficult to control through objectives, programs and legislation. Then, this condition can lead to misinterpretation of the policies and objectives resulting in delayed execution (Jann & Wegrich, 2007). Therefore, many scholars have attempted to study policy implementation research to identify possible factors of policy success or failure in its implementation stage (Signé, 2017).

In the policy evaluation stage, the expected outcome of the adopted policy will be focused on examining to what extent the policy has effectiveness. This stage cannot be solely regarded as the last stage of the policy process because where either policy termination or redesigning based on a transformed perception of the problem and agenda-setting. (Jann & Wegrich, 2007)

2.3.2 Policy Implementation

Policy implementation is a vital setting of the policymaking process (Khan & Khandaker, 2016) where various stakeholders and organizations cooperate using techniques and procedures (Inpin, 2011), however, there is a lack of universally accepted theories that can provide clear direction and guidance to put policies into practice effectively (Khan & Khandaker, 2016).

The very first study of the policy implementation process was initiated between the late 1960s and the early 1970s (Inpin, 2011) and developed as the core field of policy studies in the 1970s and early 1980s (Jann & Wegrich, 2007). Before the Wildavsky and Pressman time, there was only a debate on the definition of implementation (Khan & Khandaker, 2016). The seminal work published in 1973, “Implementation: How Great Expectations in Washington are Dashed in Oakland” by Wildavsky and Pressman, is significantly regarded as one of the foundational studies in the field of policy implementation (Inpin, 2011; Khan & Khandaker, 2016 & Signé, 2017). This book provided a link between policy design and performance and its variable across time, policies, and government together with a case study of the challenges confronted by the Economic Development Administration (EDA) when they were trying to implement a job-creation program in Oakland, California, during the 1960s (Khan & Khandaker, 2016). In this first generation of implementation studies, there was no theoretical building for the implementation process although their works could identify the policy failure of the policy process (Jann & Wegrich, 2007; Khan & Khandaker, 2016).

Therefore, their finding was criticized for the absence of a specific theory-building. Later on, other scholars, as the second generation of implementation studies, explained the implementation process with two well-known approaches to be noticeable for the success or failure of the implementation stage (Khan & Khandaker, 2016). There was a significant model defined by some scholars such as Maznamin and Sabatier named the top-down model, which emphasizes the role of high-level authorities or central governments in driving the implementation process, it is based on identifying the tractable of the issues or problems (Signé, 2017) and the behavior and actions of top-level officials in practicing and enforcing the policy intended goals (Inpin, 2011).

After that, in the mid-1970s, the bottom-up approach was also developed as an alternative to the top-down approach (Inpin, 2011) because the top-down perspective has been criticized on analytical grounds identifying that implementation is not taking place as a linear process from central decision-making to field agency (Jann & Wegrich, 2007). Adversely to the top-down approach, the prominent scholar, Lipsky argued that the discretion of street-level bureaucrats (Signé, 2017), the frontline workers who

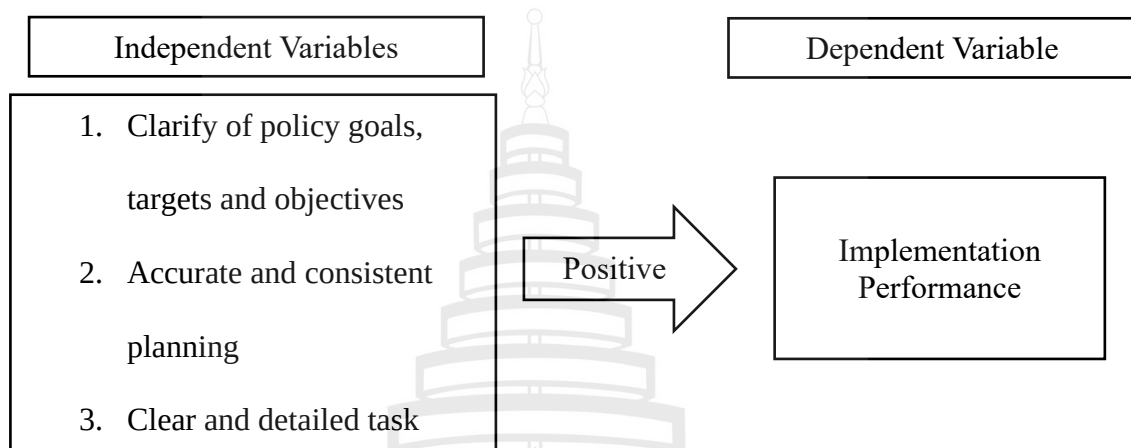
interact with citizens and deliver public services in the field and sometimes exercise based on their personal values, opinions and judgements (Inpin, 2011), is a crucial factor in the successful implementation of policies (Signé, 2017). The bottom-up theorists assumed that centralized decision-making overlooked the condition of a target area to create a flexible implementation process in the field (Signé, 2017), on the other hand, the implementers might transform the policy aim by trying to fit their implementation process with the conditions of the field (Inpin, 2011) based on various reasons such as pressure from the public side, inadequate resources (Inpin, 2011), a lack of professional and technical resources and sometimes due to the negative disposition among actors in the field (Khan & Khandaker, 2016).

In the field of implementation, many researchers have generally agreed that the process of implementation policies is too complex to be fully explained by any single theory (Seraw & Lu, 2020). For instance, scholars advocated for a multi-theoretical approach through their findings that draws on insights from various theoretical perspectives to provide a more comprehensive understanding of implementation (eg, Wildavsky and Pressman, Maznaman and Sabatier, Lipsky). Then, as a hybrid approach, the outcome of implementation has been identified by many factors both at the central level and local level (Khan & Khandaker, 2016). Therefore, the third generation of implementation research tries to combine the top-down and bottom-up models emphasizing their relative strengths and weaknesses for the implementation study (Seraw & Lu, 2020).

Thus, the researchers have attempted to relate their benefits to synthesis into one model (Seraw & Lu, 2020). Because the top-down and the bottom-up approaches highlighted the main factors (Inpin, 2011) of why the implementation failed (Najam, 1995), this generation has strengthened to understanding of complex variables, that can impact implementation outcomes, by modifying analytic models of the implementation process (Najam, 1995). In this generation, Khan and Khandaker (2016) created some models to guide successful implementation that are intended to expedite implementation performance by investigating the theoretical aspects of policy implementation and its performance issues (Seraw & Lu, 2020).

Khan and Khandaker (2016) advocated a rational model based on the theory of policy implementation, which is a more scientific model that embraces third-generation

thinking (Seraw & Lu, 2020). According to scholars, this model is mainly based on the assumption that policy implementation requires clear goals and objectives, accurate planning, suitable job assignments, efficient monitoring and evaluation, and effective operating procedures and techniques to be able to define their responsibilities aligned with policy objectives (Khan & Khandaker, 2016).



Source Khan and Khandaker (2016)

Figure 2.2 Rational Model by Khan and Khandaker

Regarding this model, scholars also formulated some hypotheses for each independent variable. They posited that “the clearer the goals, targets and objectives, the more chance that the policy will be successfully implemented”. Similarly, they hypothesized that accurate and consistent planning correlates with the greater possibility of successful implementation. Furthermore, they suggested that precise and detailed task assignments will contribute to better implementation performance. Then, they also hypothesized that accurate standardization will enhance the performance of successful implementation and the greater level of monitoring will augment the greater chance of successful implementation. (Khan & Khandaker, 2016)

This model can provide a clear understanding for researchers to analyze the policy implementation process and equip practitioners with some actionable guidelines to optimize implementation efforts and drive meaningful outcomes.

2.3.3 Policy Failure

The success of the adopted policy depends on the translation of policy objectives into concrete actions. If their actions are not effectively implemented, even the well-crafted policy can fail to achieve its intended goals (Khan & Khandaker, 2016) since the adopted or formulated actions and programs would not pursue the policymakers' expectations and objectives on the ground (Jann & Wegrich, 2007). The very first article, published in 1887, "The Study of Administration" by Woodrow Wilson, suggested that policy implementation should only be straightforward, following the directives laid out in the policy itself (Alberta, 1994). Until the early 1970s, the application of the policy into practice was only regarded as an unproblematic action in the field (Khan & Khandaker, 2016).

Over time, many scholars and practitioners realized the complexities and challenges of translating policy objectives into concrete actions in the field. Analyzing the case of implementation strategies of the Economic Development Administration (EDA) in Oakland by Pressman and Wildavsky, they found that policy failure can be encountered by unclear goals and objectives, faulty theory for the program, a lack of coordinated planning and the complexity of joint actions (Khan & Khandaker, 2016).

Decentralization should be in the context of central control (Signé, 2017) since front-line workers are the closet implementers and they well know the situation of the field. However, their discretionary decisions are another issue which can sidetrack the actual expectation of the policy intended by the central government (Signé, 2017). Therefore, Matland defined that "Flexibility and autonomy might be appropriate when the goals of the policy formulators and implementers are the same", if not, that may result in the poor performance of the policy goal (Signé, 2017), meaning that the implementation might not be successful.

Therefore, to mitigate the risks of policy failure, policymakers and implementers must not only pay careful attention to the design, planning, and execution of policy initiatives but also ensure adequate resources, and capacity not excluding collaboration, stakeholder engagement, and monitoring progress.

2.3.4 Policy Transfer

The concept of policy transfer has emerged as a significant area of study in public policy analysis and political studies, experiencing exponential growth from the late 1990s to the mid-2000s (Benson & Jordan, 2011). In the globalization context, the world economy has been developed and expanded through transnational corporations, exchanging their ideas and knowledge and there have been influences by global economic pressures among nations (Dolowitz & Marsh, 2000). The concept of policy transfer is widely utilized for analyzing the phenomenon of Europeanization, globalization, and policy innovation and is understood as the process of applying “knowledge of policies, administrative arrangements, institutions, and ideas” from one political system whether past or present, is applied “in the development of similar features in another” (Benson & Jordan, 2011). In 2019, researchers began expanding the discourse on the concept of policy transfer to encompass private sector practices in addition to the government policy sectors (Mokhtar & Rahman, 2020).

This concept did not originate on its own. According to Dolowitz and Marsh (1996), the emergence of this concept started from the critique of ‘policy diffusion’ regarding its ignorance of the multiplicity of the transfer process (Benson & Jordan, 2011) focusing more on geographical relations than policy transfer studies (Dolowitz & Marsh, 1996). Then, they coined the concept of ‘policy transfer’ to overcome the implicit assumptions of the ‘lesson drawing’ in which the drawing process was both rational and voluntary (Benson & Jordan, 2011) even though there were some scholars who argued that the process of policy transfer and lesson drawing are same (Dolowitz & Marsh, 1996). Dolowitz and Marsh (1996) termed policy transfer as embracing both voluntary and coercive transfer processes concluding that this process involves “free choices of political actors” and there is also the force by “one government or supra-national institution” to another to adopt a particular policy (Dolowitz & Marsh, 1996).

In the process of policy transfer, there are nine main categories of political participants such as “elected officials, political parties, bureaucrats/ civil servants, pressure groups, policy entrepreneurs and experts” (Dolowitz & Marsh, 1996), “transnational corporations, think tanks, supra-national governmental and nongovernmental institutions, and consultants” (Dolowitz & Marsh, 2000). Some scholars argued that, for example, intergovernmental and international organizations

such as the European Community and OECD promote comparison among countries to be aware of or copy the performances or competitions by the member states (especially developing countries) as the lesson drawing. On the other hand, Dolowitz and Marsh (1996) state that these international organizations are also concerned with coercive transfer, and lesson drawings do not proceed until policy adoption, and sometimes, they just learn not to pursue them. Diane Stone also conjoined with the condition of some international organizations like the World Bank where they try to impose their policies on the other actors (Benson & Jordan, 2011).

Expect from the case in which the countries do not follow or apply the policy of the others, in some cases where a country may transfer a specific program or policy which seems to be relevant for it. Then, the other countries may also perform the same transferring manners directly or via the former recipient country. Considering with the nature of this policy transfer process, Porto de Oliveira concluded that this can be identified as diffusion (Pacheco-Vega, 2021). However, some noted that this transfer process can lead to policy convergence among countries over time (Benson & Jordan, 2011; Pacheco-Vega, 2021). Concerning the climate issues in the environmental field, policy transfer occurs when countries adopt some strategies like mitigation and adaptation to the environmental changes from the international to the domestic scheme or national level to the local level (Pacheco-Vega, 2021).

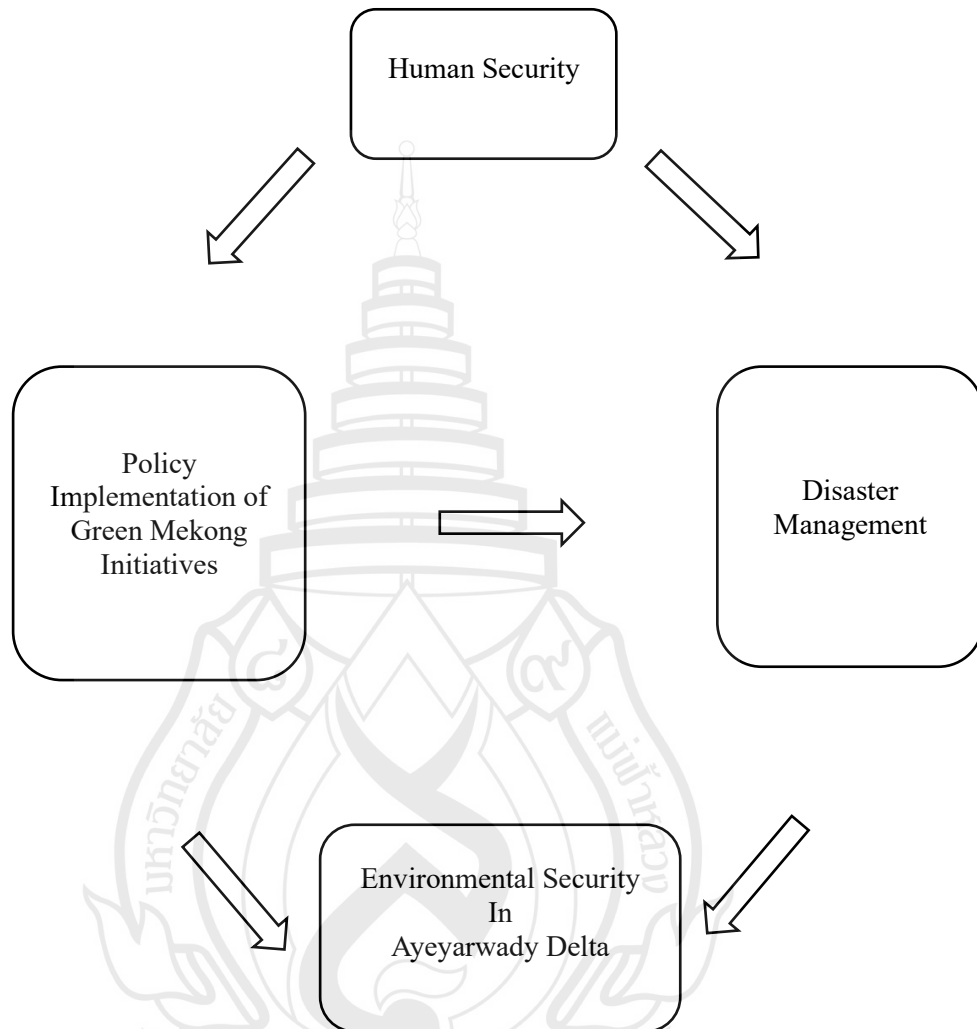
Some other scholars considered that policy transfer can also take place both within and across borders through horizontal and vertical participant networks, including regional and local governments which can also perform as essential agents, considering the process of globalization and devolution (Benson & Jordan, 2011). The countries transfer policy goals, structure, and content; policy instruments or administrative techniques; institutions; ideology; ideas, attitudes, and concepts; and negative lessons. Policy transfer seems to happen when there is high interest in others' policy instruments, plans, and ideas that are successful in their origin (Pacheco-Vega, 2021). Based on the empirical research, some scholars such as Wolman and Robertson found out that policy borrowers apply especially policy instruments or administrative techniques rather than changing policy direction (Dolowitz & Marsh, 1996). Dolowitz & Marsh (2000) argued based on their studies that not only the borrowers (the countries

who applied the ideas of others) exercise the lenders', but also the lenders learn lessons from the borrowers for some political systems.

Due to the complexity and its varied components, learners and policymakers would be confused with its concrete definition. Based on their research, Mokhtar & Rahman (2020) extracted that the policy transfer corresponds to "government strategies, action plans, guidelines, goals, and objectives, as well as rules and regulations" and is conducted through "action-oriented international activity" by the "voluntary or coercive policy practices". To clarify more, this concept focuses on the process in which the policy of one country is "copied or imitated" (Mokhtar & Rahman, 2020), "replicated or adopted" into another country (Pacheco-Vega, 2021), either within the same or between different political contexts (Mokhtar & Rahman, 2020) except the policy design or structure of its origin (Dolowitz & Marsh, 1996).

This concept has been widely used in literature such as social and welfare policy, development assistance, and environmental issues besides its state-centric studies. The concept has been accepted and debated by many scholars as a distinct concept due to the contextual clarifications and its value to be able to address policy failures and guide policy innovation (Benson & Jordan, 2011). Overall, the concept of policy transfer provides to understanding of the diffusion of ideas, practices, and institutions across borders and influences policy development and implementation in different political contexts.

2.4 Theoretical Framework



Source Own Compilation

Figure 2.3 Theoretical Framework of the Research

This theoretical framework is organized by the theories and concepts which are mentioned above. Understanding the theory of human security in line with three kinds of freedom (freedom from fear, freedom from want, and freedom from indignity) and seven components (especially focus on the environmental security in this study) of the theory, disaster management will be conducted by implementing the adopted policy (Green Mekong Initiatives) to reduce the impacts of disasters on both human and

natural systems in the cyclone-prone region named the Ayeyarwady Delta and to improve their resilience in terms of environmental security in that region.

From this, the policy will also be examined concerned with how the policy is implemented to tackle disaster crisis and disaster management under the Green Mekong Initiatives towards the disaster-prone regions for their sustainability and disaster resilience and how their performances in the implementation stage are being practiced (productively or not). Through this analysis, some obstacles or necessities will also emerge while exploring their performances during their policy implementation.



CHAPTER 3

RESEARCH METHODOLOGY

This chapter starts with an explanation of the research design used to carry out the research, followed by the research site and access to the field. Appropriate data collection and methods are also presented. The methods and the tools needed to analyze data and generate the results capable of answering the research questions are explained. Finally, limitations and challenges that may be encountered in this research are presented.

3.1 Research Design

Throughout this research, information about the policy cooperation of Japan for disaster management in Myanmar was collected from specific situations and specific sources through a qualitative approach. This research, therefore, primarily focused on qualitative methods to collect the necessary data. The study used the secondary data previously gathered through a statistical process, which was published (Claire Selltiz, 1962). The secondary data were used for this study, most of the common research design utilized in social science is the cross-sectional research design that was also applied in this study. Data were collected through relevant documents such as the publications of related foreign governments, reliable governmental documents of Myanmar/Japan, technical journals, reports, statistics data, public records, previous research and other related documents. These secondary data were provided to obtain the facts of both disaster risks of the region, resilience-building process, organizational cooperation, and administration sectors, then, they illustrated to understand Japan's policy cooperation for disaster management and its effect on the Ayeyarwady Delta region.

3.2 Research Site

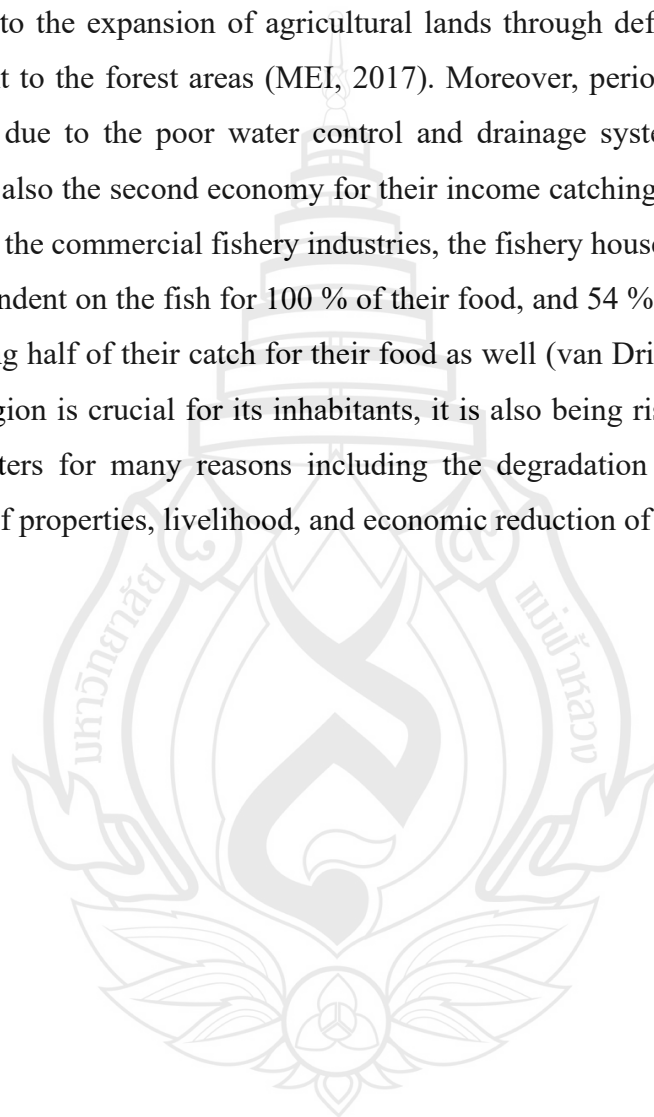
The Ayeyarwady Delta region, also known as the Irrawaddy Delta, was the research site to provide this study since it is one of the cyclone-prone coastal areas of Myanmar. It is located in the Bay of Bengal to the west and the Andaman Sea to the east as a coastal area as well. It connects with Rakhine, Bago, and Yangon. It is also the region with 88 percent of the population who are living in rural areas while 12 percent of the population living in urban areas (Myanmar Information Management Unit (MIMU), 2020).

It is composed of 6 districts: Patheingyi, Sagaing, Mandalay, Bhamo, Monywa, and Labutta districts with 39 cities, 273 quarters, 1919 village groups, and 11,907 villages. Famous relaxing spots of Myanmar are Ngazun and Chaung Mya Beaches which are also located on the West side of Ayeyarwady region. Both of these beaches are along the coastline of the Bay of Bengal (Mingalaya writer teams). The capital city of Ayeyarwady is Patheingyi and it is organized with 26 townships such as Ngazun, Labutta, Pyaw, Thabang, Bogalay, and Myawmya which are also the nearest townships to the basin and they are often affected by natural disasters, especially by cyclones (MIMU, 2020). It is also the region for 40 percent of the total population of Myanmar living in the delta relying on fishing, cultivation, and water-related economy for their livelihood (Zaw et al., 2011). In this research study, Labutta, Pyaw and Bogalay townships were mainly focused on where Japan implementations were conducted.

The Ayeyarwady Delta is one of the main rice and fish-producing areas of the country providing 35 % of the rice production (Green Growth Knowledge Partnership, 2020). For the agricultural sector, around 3.6 million acres out of 4 million acres are used for paddy fields and other crops such as coconut, banana, chilli, and onion cultivation (Myanmar Environment Institute [MEI], 2017). As the characteristic of the delta region, it can provide for human settlement and economic production with its prosperous ecosystems, however, this region has been addressing sustainability for human income and food security in its coastal areas (Seeger et al., 2023). Category 4 tropical cyclone Nargis struck the delta in 2008, which was a notable catastrophic event.

Following the Nargis cyclone, severe flooding resulted from the strong precipitated monsoon impacting over 1.6 million people and over 530,000 hectares of aquacultural and agricultural production areas (Seeger et al., 2023).

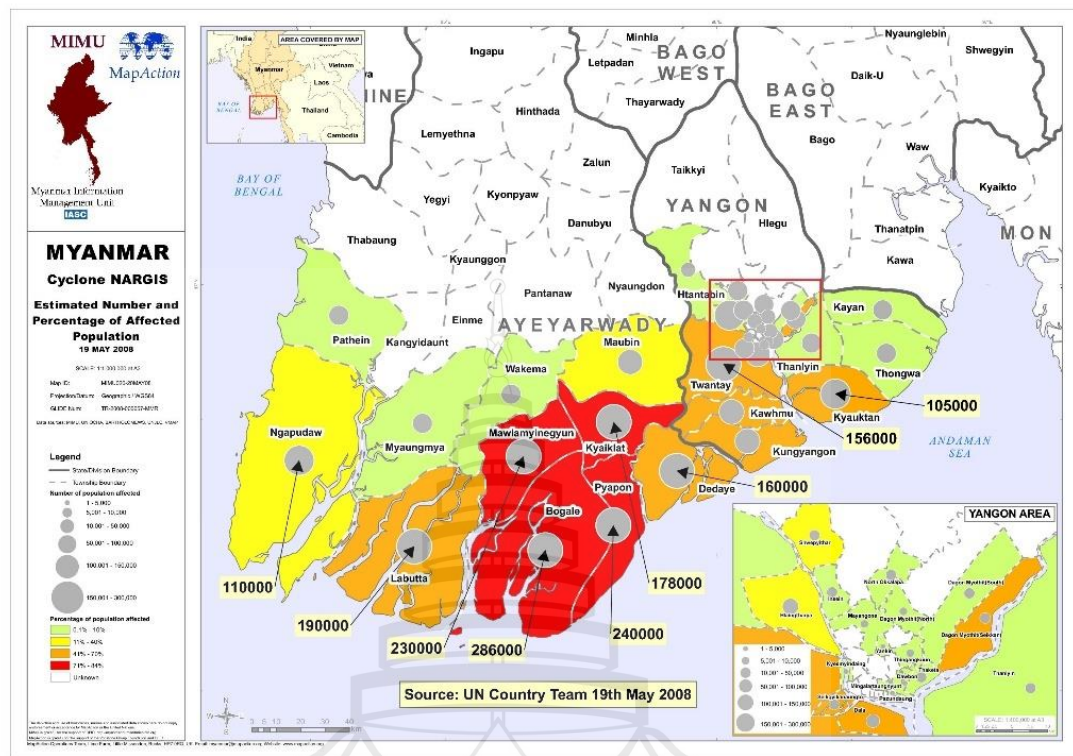
In the previous time, the Ayeyarwady Region possessed a wide range of mangroves but the forest areas continuously decreased from 8 % to 6 % between 2002 to 2014 due to the expansion of agricultural lands through deforestation and human encroachment to the forest areas (MEI, 2017). Moreover, periodic flooding and crop losses occur due to the poor water control and drainage systems in those regions. Fisheries are also the second economy for their income catching fish, prawn, crab and eel etc. From the commercial fishery industries, the fishery households in the Delta are entirely dependent on the fish for 100 % of their food, and 54 % of fishery households are consuming half of their catch for their food as well (van Driel & Nauta, 2014). As this Delta region is crucial for its inhabitants, it is also being risk of various kinds of natural disasters for many reasons including the degradation of mangroves which creates loss of properties, livelihood, and economic reduction of the people.





Source Reliefweb (2017)

Figure 3.1 Map of Ayeyarwady Region



Source Map Action (2016)

Figure 3.2 Map of Affected Areas and Population in Ayeyarwady Region by Nargis Cyclone

3.3 Data Collection

For this study, data were collected using qualitative methods to explore policy gaps for disaster management in Myanmar through a case study of the Ayeyarwady Delta region. This study mainly focuses on the Action plan for “A Decade towards the Green Mekong” Initiatives adopted by collaborating with Japan and Mekong countries to conserve the “Green Mekong” including biodiversity conservation and disaster management. Under this, Japan conducted disaster management measures for the Ayeyarwady Delta region of Myanmar by implementing two main projects for environmental security and other support.

In this study, the data on their cooperation and implementation process information were collected from more than forty sources of various publications of the reliable governmental documents of Japan and Myanmar, annual reports of

organizations, technical journals, statistics data, newspapers, previous studies of scholars and research workers, articles, etc., as the secondary sources to explore the environmental dimensions of the policy cooperation to promote sustainability in Delta region. Using the qualitative approach with these sources, all of the used secondary sources were justified with the facts discussed or studied on the cases of disaster management, resilience-building efforts, and their cooperation regarding the action plan and their implementation process and results after establishing the Green Mekong Initiatives.

3.4 Data Analysis

The study started data collection by doing documentary research from May to August 2024. The qualitative data collected through documentary sources were analyzed using a deep qualitative method. Throughout the data analysis process, the study interpreted gaps or integration of the policy cooperation by using tables and graphs. The analyzing pattern included structures and systems of disaster management, the improvement level of resilience in the region such as preparation, recovery, and disaster reduction plans, comparing with the facts and aims included in the action plan and adopted policy for it.

The data of this study were analyzed using thematic analysis techniques to identify prominent themes among observed data. With this analysis approach, the data were comparatively and intently reviewed to be able to recognize and develop themes based on the features of the data (Armstrong, 2021). The thematic analysis provided rich, detailed insights into respective stakeholders' lived experiences of their disaster management measures, challenges, and perspectives on improving the sustainability of the region. Results from the different sources were also analyzed comparatively to understand their different viewpoints and to identify gaps in the policy implementation phase. In this documentary research, the thematic analysis helped to uncover underlying patterns, themes, and meanings of the data within the documents that were being studied.

CHAPTER 4

RESEARCH FINDINGS

This chapter starts by explaining the cooperation of Japan and Mekong region countries and then continues to focus on Myanmar for disaster management through two projects and other supports of Japan, then ends up with the analysis of their implementation in the Ayeyarwady Delta region of this study. Japan provided various sectors for the development of the regions through cooperation between Japan and the Mekong countries. Under “A Decade Towards the Green Mekong” Initiatives, Japan implemented disaster management measures for Myanmar country from an environmental dimension, including dispatching advisors on cyclone forecasts and alerts and it implemented two projects for the disaster-prone Ayeyarwady Delta region. Through collaborative efforts with Myanmar, namely “Project for the Preservation of Farming Area for Urgent Rehabilitation of Agricultural Production and Rural Life in Areas Affected by Cyclone Nargis” and “Integrated Mangrove Rehabilitation and Management through Community Participation in the Ayeyarwady Delta” were implemented for its disaster resilience by enhancing the environmental ability. The findings about their cooperation performances including these projects are explored in the following sections.

4.1 Regional Cooperation between Japan and Mekong Countries

Japan has played a proactive role in international cooperation, recognizing the critical importance of development to assist in strengthening global security. Also, with a focus on supporting fragile and conflict-affected nations, Japan has prioritized initiatives to promote stability and resilience in these regions (Japan International Cooperation Agency [JICA], 2015). Former Prime Minister Shinzo Abe stated that a country’s peace is likely to depend “on the peace and stability of the international community” (Miyajima & Swenson-Wright, 2014). As a regional cooperation, Japan endeavors to contribute to the development of the Mekong Region, recognizing that

these initiatives benefit the ASEAN community and overall prosperity and stability in East Asia.

The Mekong-Japan Cooperation framework was initiated in 2007 (Duong, Hang & Thanh, 2020) with the Japan-Mekong Regional Partnership Program (Chheang, 2017). In January 2008, the very first Japan-Mekong Foreign Ministers' Meeting was held in Tokyo and during this meeting, Japan pledged to expand its Official Development Assistance (ODA) under the Japan-Mekong Region Partnership Program. Furthermore, commitments were made to enhance exchanges in different sectors such as politics, economics, culture, and tourism, as evidenced by the Mekong-Japan Exchange Year 2009. Then, a partnership between Japan and the Mekong Region has grown stronger for sustained cooperation and mutual development. (Ministry of Foreign Affairs Japan [MOFA Japan], 2009d)

Their cooperation framework covers various cooperation mechanisms for socioeconomic development, infrastructure construction, and environmental protection. Additionally, the adoption of the Tokyo Strategy at the 10th Mekong-Japan Summit Meeting in October 2018 highlights their milestones in regional cooperation which aimed at achieving the Sustainable Development Goals by 2030 (Duong, Hang & Thanh, 2020). By aligning with the 2030 Agenda of Tokyo Strategy, they forward cooperatively to tackle complex interrelated issues within their framework of addressing economic, social and environmental dimensions of development. Their cooperation with collective sectors fosters comprehensive regional development and ensures the region's progress which is aligned with the global standards of sustainability and inclusivity.

To fill the gap in the development sector, Japan and the Mekong region countries (Cambodia, Laos, Myanmar, Thailand and Vietnam) strengthened their cooperation by focusing on the Mekong-Japan Economic and Industrial Cooperation Initiative (MJ-CI). Japan agreed to conduct a training program on Special Economic Zones (SEZs) development for the CLMV countries (Cambodia, Laos, Myanmar, and Viet Nam) and to conduct feasibility studies for the development and improvement of hard infrastructure in the Mekong region as the promoting of sub-regional development (MOFA Japan, 2009b, November 7). The Mekong region countries (CLMTV) and Japan recognize that the Mekong region has geopolitical significance and economic

value for two reasons: (1) the region has been achieving dynamic economic development and, (2) the region is located at a juncture of the enormous emerging markets of Asia, such as China, India, and other ASEAN countries that this region has the potential to become a “global growth center” (MOFA Japan, 2015). With this consideration, the Mekong countries require cooperation mechanisms both for regional and individual economic and social transformation for inclusive and sustainable development (Duong, Hang & Thanh, 2020) that would provide the chief aim of Japan “from the development cooperation to the international security as the peace-building efforts” (JICA, 2015) through the regional development level.

In addition to that, in the case of Japan,

“ASEAN is an important partner for Japan in various domains. Narrowing the development gaps is vital to ASEAN community building and the less developed economies in ASEAN are located in the Mekong region”. (Chheang, 2017)

According to the above, thus, Japan's cooperation with Mekong countries has been conducted with the concept that the focused effort on the development of the Mekong region countries contributes to narrowing the development gap among the less developed countries of the ASEAN member countries for building the ASEAN Community. Therefore, Japan's approach to Mekong cooperation is also closely related to the broader regional strategy within ASEAN. By concentrating on these development initiatives, Japan is highlighting its collaborative efforts to promote regional cohesiveness, which cannot be fully achieved without addressing the development gap in regional development.

Along with Japan and Mekong countries' cooperation, thus, it exemplifies their strategic regional partnership which is aimed at fostering sustainable development, inclusive growth and regional stability. Their collaboration was found they emphasize achieving “quality growth”, which underscores the need for sustainable and inclusive economic development, aligning with global development goals that prioritize economic stability and reduce disparities among nations (MOFA Japan, 2015). In this context, Japan's involvement suggests a commitment to ensuring the Mekong countries achieve economic growth in an environmentally sustainable and socially equitable and Japan's experience in balancing industrial development with environmental preservation is shared and highlights it as a valuable partner to the Mekong countries.

Both the Mekong region countries and Japan sides agreed that maintaining regional stability is crucial for the development and prosperity of the region and, they reaffirmed the significance of the ‘consolidation of democracy and the rule of law’, giving respect for human rights, and peacebuilding in the region (MOFA Japan, 2015). This is crucial for internal stability within the region and for maintaining peaceful international relations with the region. Additionally, they recognize a vast infrastructure demand in the regional countries to achieve ‘quality growth’ strengthening connectivity with the surrounding regions, improving the environmental investment, and industrial sectors, building industrial human resources and understanding sustainable and environment-friendly development (MOFA Japan, 2015). Since the development gap within the Mekong region is a key factor in this cooperation, Japan’s role, particularly in providing technical, and financial support across the region ensures that all Mekong countries benefit from the development initiatives.

According to their cooperation in ‘hard’ and ‘soft’ efforts, it reflects a multi-layered strategy to achieve sustainable growth. They emphasize strengthening ‘institutional connectivity’ to support the development of the legal and intellectual property systems, and ‘economic connectivity’ through the Regional Comprehensive Economic Partnership (RCEP) (MOFA Japan, 2015). In addition to their cooperation, the establishment of the Japan-Mekong Parliamentary Friendship Association (2015) also solidified Japan’s active involvement in the Mekong region countries.

The third pillar of the Tokyo Strategy emphasizes sustainable development addressing disaster risk reduction, climate change, water resource management and conservation for the Green Mekong by improving environmental investment in their cooperative mechanisms integrating with economic development and regional stability (Chheang, 2017; MOFA Japan, 2018). By focusing on these areas, the cooperation between Japan and Mekong countries promotes economic development while ensuring the ecosystem of the region, which cannot be implemented without environmental health. By safeguarding natural resources, the strategy ensures that industries such as agriculture and fisheries can contribute to providing economic value while supporting the livelihoods in the region.

According to the Tokyo Strategy (2018), “ASEAN-Japan Environmental Cooperation Initiative” focused on the development of quality environmental

infrastructure, besides, they encouraged greater participation of the Mekong region's young generation in the Green Mekong Forum to exchange vision and perspective to realize the Green Mekong with the aim of sustainable development. The concept of the "Green Mekong" of the Tokyo Strategy aligns environmental security with sustainable development, therefore, Japan contributes to the resilience of Mekong region economies by addressing the challenges of natural disasters and reinforces the region's capacity to cope with the impacts of climate change and economic losses from the environmental hazards. Moreover, their focus on youth participation in the Green Mekong Forum is their forward-looking effort to strengthen the region's ability to maintain both environmental and economic stability for the future.

Moreover, as the collective efforts, they enhance the coordination between Mekong-Japan Cooperation and other development partners such as relevant NGOs for the Mekong region; respective international organizations and developmental financial organizations, such as the UN, the OECD, ADB which coordinates the Greater Mekong Subregion (GMS) Program; the World Bank; and the Economic Research Institute for ASEAN and East Asia (ERIA). (MOFA Japan, 2015)

Consequently, Japan's ongoing efforts to enhance the Mekong-Japan relationship including active high-level visits are recognized by the Mekong region countries and also appreciated for its constructive role in the region in such areas as peacebuilding, democratization, and national reconciliation, by the organization of the 'High-Level Seminar on Peacebuilding, National Reconciliation and Democratization in Asia' held in Tokyo in June 2015. Both sides concluded that the Mekong region countries' development is becoming increasingly significant in the context of reducing the development gaps within the region, intending to establish the ASEAN Community. Recognizing these challenges, the Mekong countries and Japan declared to implement Mekong-Japan Cooperation focusing on the four pillars, regarded as 'hard efforts' (industrial infrastructure development), 'soft efforts' (industrial human resource development), 'Sustainable development towards the realization of a Green Mekong' and 'Coordination with frameworks of the Mekong region countries', to generate regional stability and to achieve 'quality growth' in the Mekong region (MOFA Japan, 2015). Based on their multisector cooperative strategy, their cooperation movements

also align with ASEAN approaches in terms of addressing the development gap, implementing the SDGs, and promoting the 2030 Agenda for Sustainable Development.

Even as, the Mekong region countries valued cooperation projects are performed in the Mekong region under the collaboration between Mekong-Japan Cooperation and the ‘Lower Mekong Initiative’ and ‘Friends of the Lower Mekong’, with a wide range of topics from disaster prevention, recovery from disaster, and women’s empowerment. The Mekong region countries also expected to make a dialogue for peace and prosperity building in the Mekong region. To preserve peace, stability, and prosperity in and beyond the Mekong area, both the Mekong region countries and Japan sides assured to enhance their strong cooperation for regional and global issues as the common concerns (MOFA Japan, 2015). Japan’s leadership in adopting frameworks, strategies and policies for cooperation underscores its role as a development leader, providing technical assistance, financial and resource support and capacity building to the Mekong region countries.

4.1.1 Action Plan for “A Decade Towards the Green Mekong” Initiatives

According to the 1st Mekong-Japan Summit Meeting, “A Decade towards the Green Mekong” Initiatives action plan was adopted in 2009 to create “a Green Mekong’s rich in biodiversity, resilient to natural disasters, blessed with sustainable water and forest resources and achieving both environmental protection and economic growth” (MOFA Japan, 2010) through the Mekong- Japan initiative for SDGs towards 2030 (Duong, Hang & Thanh, 2020). At the 1st Summit Meeting, the former Prime Minister General Thein Sein of the Republic of the Union of Myanmar attended together with the other Prime Ministers of the Mekong region countries, Japan hosted and declared the aim of the Meeting and committed to holding the joint meeting to the ASEAN Summit in the future (MNA, 2011, November 11).

Then, the state leaders of member countries considered the challenges for Green Mekong, Japan and Mekong countries launched several projects and cooperative actions in the context of environment and climate change. In the 2nd Mekong-Japan Summit Meeting, Japan presented its plans to implement the respective assistance projects in the region such as forest conservation in Cambodia, Laos and Vietnam, water, management in the Mekong River, Japan’s low-carbon technologies and

products in Myanmar, Laos, Thailand and Viet Nam. Under “A Decade toward the Green Mekong” Initiative, their implementation plans cover six areas to advance the Green Mekong such as,

1. Sustainable Forest Management

This aims to promote the sustainable use and preservation of forest resources providing necessary hardware, data analysis and capacity building of government officials to prevent deforestation and promote a comprehensive forest management system enhancing the awareness of the local people on forest conservation. It encourages reforestation efforts and necessary measures for forest management to reduce Emissions from Deforestation and Forest Degradation (REDD+) in developing countries.

2. Water Resource Management

This area focuses on the cooperation for capacity building in policy-making and the institutional framework of water resource management against flood and drought and for the improvement of irrigation facilities in the region. It involves participatory irrigation management to achieve stable food supplies and poverty reduction.

3. Disaster Prevention and Response to Disasters

The focus is to strengthen the region’s resilience to natural disasters by improving hardware-oriented assistance such as riverbank reinforcement and prevention of erosion and disaster preparedness. It also emphasizes building capacity for administrative institutions and disaster response.

4. Improvement of Urban Environment

This seeks to enhance the disparities among Mekong countries for the development of sustainability of urban infrastructures including environmentally friendly transportation systems with the aim to create environment impact assessment systems in developing countries for cleaner, more livable cities while reducing the environmental impact of urbanization.

5. Conservation of Biodiversity

In this area, Japan and Mekong countries focus on the forest management of Mekong regions by cooperating for data collection and monitoring systems of the ongoing activities of biodiversity conservation, preservation of coastal mangrove ecosystems, protection for Mekong River Irrawaddy dolphins preserving the rich biodiversity of the Mekong region.

6. Controlling and Reducing Greenhouse Gas Emissions

The last area targets the reduction of greenhouse gas emissions through the promotion of renewable energy, infrastructure development and energy-efficient practices. It aims to mitigate the impact of climate change by encouraging low-carbon development strategies and by promoting capacity building for REDD+ related measures across the Mekong region.

At the 2nd Green Mekong Forum (Ministry of Foreign Affairs Thailand, 2013), the introduction of environmental technologies and efforts by the Japan International Cooperation Agency (JICA), Japanese local authorities and private sector representatives highlighted their multifaceted approach to sustainable development in the Mekong region. For example, their emphasis on public-private partnerships (PPPs) during the forum reflects their recognition that addressing environmental and climate change issues requires a multi-stakeholder approach. Besides, Japan's engagement through JICA and other agencies illustrates its commitment to facilitating such partnerships by acting as a bridge between the public and private sectors to implement the Action Plan effectively in various areas of the aims.

As one of the actions above regarding disaster prevention and response to disasters in each country, "hardware-oriented assistance will be provided for riverbank reinforcement and prevention of erosion, and prevention of floods in urban areas by developing sewage systems. Assistance will also be provided for capacity development such as observation and data-analysis systems as well as personal training for enhancing meteorological forecast and warning capacities. At the same time, efforts will be made for the development of related administrative institutions and the capacity of the community to respond to disasters".

Besides, water resource management will also be promoted by cooperation for "capacity building in policy making and development of institutional framework" to

“support countermeasures against flood and drought efficiently in the region”. Hardware-oriented assistance will also be provided to repair and improve the existing irrigation facilities and to develop new supports. Assistance for “capacity building to improve and develop human resources development and establish and manage irrigation cooperation” will also be provided for water resource management.

Another action for biodiversity conservation is “cooperation for developing data collection systems and monitoring systems for forest management” to continue “ongoing activities to conserve biodiversity” for the preservation of coastal mangrove ecosystems and to support the protection of Mekong River Irrawaddy dolphins to enhance more to conserve ecosystem and regional biodiversity. (MOFA Japan, 2010)

Conclusion

In conclusion, Japan’s cooperation with the Mekong region countries shows their multifaceted partnership with the aim of regional stability, economic growth and sustainable development. Japan’s cooperation for “hard” and “soft” efforts and “quality growth” reinforces the region’s capacity to address complex global challenges such as climate change and disaster risk reduction. Through their cooperation framework, Japan's commitment and support are found for addressing long-term development necessities in the region. By prioritizing capacity building, economic and infrastructure improvement and environmental sustainability, Japan’s efforts are found with the aims to narrow the development gaps of Mekong countries and then to the benefits of ASEAN nations promoting cohesion and contributing to the inclusive and resilient ASEAN community align with the objectives of global security and prosperity. These cooperation efforts reflect Japan’s dedication to fostering sustainable and inclusive development as a key partner in the Mekong countries and beyond.

Moreover, Japan’s “A Decade Towards the Green Mekong” initiative, represents a comprehensive and multi-dimensional approach to sustainable development and environmental resilience with specific emphasis on the six areas demonstrating the commitment and collaborative efforts in Japan’s provisions to support long-term sustainable development of the region. These cooperative efforts highlight Japan’s vision and proactive role for a resilient and environmentally secure “Green Mekong” region aligned with the Sustainable Development Goals (SDGs) taking into account the

environmental resilience and sustainability on the way to bridging the development gaps economically prosperous among the countries.

Therefore, Japan's role in supporting the Mekong region countries, particularly through this initiative, "A Decade towards the Green Mekong" showed that it has significantly strengthened regional stability, development and environmental resilience. Japan's cooperative efforts are found in addressing critical areas such as sustainable water and forest resources management across countries, disaster resilience, climate change mitigation and biodiversity conservation. By implementing these initiatives, Japan has not only contributed to regional economic growth but also reinforced environmental security, recognizing that sustainable development is central to both local and international stability.

4.2 Japan Policy Cooperation for the Disaster Management in Myanmar of the Mekong Region Countries

The Mekong region countries expect Japan's continuous support to contribute proactively to the stability and development of the region. This aligns with Japan's policy of "Proactive Contribution to Peace" which is grounded in the principle of international cooperation of Japan (MOFA Japan, 2015), recognizing that "development cooperation could also improve the conditions of international security by helping fragile and conflict-affected countries in their socio-economic development as well as their peace-building efforts" (JICA, 2015). Japan proactively contributes to international security by collaborating with the international community to participate in peacekeeping missions, humanitarian aid, and disaster relief efforts with the understanding of international policy coordination which is necessary to address complex challenges and safeguard its national interests (Lertsithichai, 2015). Through these concerted efforts, Japan believes that this would foster international solidarity and address global challenges for the development of all people.

The reaffirmation of Japan and Mekong region countries "to strengthen the response capacity and to work together to tackle climate change in this region, andthe inclusion of ecosystem-based disaster risk reduction can be effective and

sustainable in reducing disaster risk and climate change mitigation and adaptation” (MOFA Japan, 2018).

From this, their regional commitment to tackling climate change and strengthening disaster response capabilities reflects a proactive and integrated approach to environmental security. Through the implementation of ecosystem-based disaster risk reduction, Japan and Mekong region countries are moving forward to sustainable development that balances environmental protection and economic resilience aligned with the international agreement.

Besides, since 1954, Japan signed the Colombo Plan and as a commitment to it, it significantly expanded its Official Development Assistance (ODA) program, providing both financial and technical assistance to countries in need through the Ministry of Foreign Affairs of Japan. In Myanmar, Japan’s assistance takes various forms including technical cooperation, ODA loans, and Grant Aid through the Japan International Cooperation Agency (JICA) in various parts of the country. JICA Myanmar, established in 1981 as the technical cooperation section of the Embassy of Japan, has initiated its development projects across multiple sectors in Myanmar encompassing economic development, agricultural enhancement, healthcare, infrastructure, and many others focusing on human resource development (Phu, 2019).

According to Japanese Foreign Minister Takeaki Matsumoto, he proposed to ASEAN foreign ministers “further strengthening of cooperation in the area of disaster management between Japan and ASEAN in light of the current major earthquake, Japan’s foreign policy for ASEAN going forward” at the Special ASEAN-Japan Ministerial Meeting (2011) (MOFA Japan, 2011 as cited in Thuzar, 2013). This highlights Japan’s readiness to build a regional disaster management based on its expertise and best practices in disaster preparedness, response and recovery, that will collectively respond to natural disasters across ASEAN and the Mekong Region countries. The proposal also ties into Japan's ongoing cooperation with the Mekong region countries, where disaster risk reduction and climate change mitigation have been key pillars of their partnership.

Likewise, in Myanmar, one of the Mekong countries, Japan responded to humanitarian crises such as the Nargis cyclone in 2008 by sending the Japan Disaster Relief Medical Team to the Labutta township of the Ayeyarwady Delta Region to

provide crucial medical assistance, conduct medical examination and offer vital healthcare services to those affected by the disaster (Ministry of Foreign Affairs Japan, 2008; MNA, 2008 May 29). Furthermore, Japan has consistently strengthened its development efforts, including rehabilitation and disaster risk reduction initiatives (JICA et al, 2011; JICA et al, 2013) and renewed its ODA loan to Myanmar after the summit meeting between the Governments of Myanmar and Japan in 2012 (Phu, 2019).

At the Japan-Myanmar Summit Meeting (2012), Prime Minister Yoshihiko Noda announced that “the Government of Japan reviewed its assistance policy to support Myanmar’s efforts for reform in various areas towards its democratization and sustainable development focusing the improvement of people’s livelihood, capacity building, development of infrastructure and related systems such as disaster management, information and communication technology including bilateral investment between Japan and Myanmar” (Ministry of Foreign Affairs Japan [MOFA Japan], 2012 April 21). Prime Minister’s announcement underscores Japan’s commitment to supporting Myanmar’s reform efforts in which disaster management was included as one aspect of their cooperation to enhance Myanmar’s capacity to mitigate the impact of such disasters on its population and infrastructure. Japan’s assistance to Myanmar is likely to build a resilient system which can support both economic development and disaster preparedness. Sustainable development is also the core one ensuring inclusive growth with environment security to reduce the vulnerability of communities to natural disasters.

Along with their commitments, in 2012, Japan provided for the construction of 13 primary schools cum cyclone shelters in Labutta and Bogalay Townships of Ayeyarwady Region and also the recultivation of Mangroves forests in the affected area of Ayeyarwady Region (MOFA Japan, 2017; Government of the Union of Myanmar, 2015). Between the fiscal years 2011 and 2015, Japan assisted with loans, grants, and also for technical assistance (MOFA Japan, 2017). These actions have focused on livelihood development, capacity building, and institutional strengthening, contributing to Myanmar’s socio-economic advancement. Through various kinds of projects, Japan has been supporting Myanmar’s development in terms of large-scale and small-scale projects enduring partnerships for mutual benefits (Phu, 2019).

In 2010, Japan, along with the countries of the Mekong region, underscored the significance of environmental and climate change issues as critical factors for regional development. This collective effort led to the launch of “A Decade towards the Green Mekong” initiative at the 2nd Mekong-Japan Summit in 2010. The cooperation focused on environmental conservation, natural disaster resilience, and water resource management across the Mekong region countries. Furthermore, the countries committed to reducing greenhouse gas emissions in accordance with the principles of the United Nations Framework Convention on Climate Change (UNFCCC). (MOFA Japan, November 7)

According to Inpin (2021), Japan is one of the main countries providing various support to Myanmar for disaster prevention efforts in vulnerable areas providing development aids and assistance for training programs aimed at developing human resources to be able to respond to disaster impacts. In the context of Japan's assistance to Myanmar, Japan has conducted based on its own experience in dealing with the Hanshin earthquake sharing its knowledge to respond to the post-disaster. While it is carrying out its efforts, the government of Japan has been actively supported, through the Japan International Cooperation Agency (JICA), according to the requests from the Government of Myanmar regarding humanitarian aid, emergency relief supplies and rehabilitation programs by the Phase 4 of the Green Mekong Initiative. Japan has also cooperated with the Government of Myanmar to provide technical assistance and human resources to effectively prevent and mitigate the impacts of natural disasters in the Ayeyarwady Delta region.

4.2.1 Dispatch of the Advisor on Cyclone Forecast and Alert in Myanmar

Regarding the aftermath of the Nargis cyclone, Japan has supported Myanmar in various aspects of recovery activities and preparedness for future disaster events. With the request of the government of Myanmar, the Japan International Cooperation Agency (JICA) was conducted to dispatch advisors and experts in vulnerable areas to disasters to assist in the capacity enhancement of weather forecasts and warning issuance and community-based disaster management.

As one of Japan's approaches to the improvement of cyclone forecast and alert system in Myanmar, Japan improved the model of end-to-end early warning systems

in the Ayeyarwady Region and Rakhine State for natural disasters including the improvement of the early warning system, enhancing the capacity of the government officers, and capacity on community level disaster response targeting the respective department of Myanmar. It also focused on improving information distribution systems, disaster risk management activities, and collaboration between the Japan International Cooperation Agency (JICA) and local Myanmar authorities to improve disaster management.

According to a survey by the JICA expressed in JICA et al. (2017) after the 2008 Cyclone, information regarding the cyclone was not delivered to people. This is because of communication difficulties such as announcements of weather forecasts and lack of sufficient facilities to broadcast about storms. In response to this, JICA collaborated with the Relief and Resettlement Department (RRD), the Ministry of Social Welfare, Relief and Resettlement, the Department of Meteorology and Hydrology (DMH), the Ministry of Transport and Communication, and Local Disaster Management Committees at all levels to strengthen the early warning system operated efficiently (JICA et al., 2017; Aung, 2013). JICA provided essential communication equipment such as satellite communication devices, automatic tidal gauges, handy speakers, solar power systems, and generators including the enhancement of disaster broadcasting channels and radio for timely information (JICA et al., 2017). The Myanmar Government's report (2015) also expressed that the capacity of DMH has been enhanced by support from the Japan Government such as the installation of Doppler weather radar systems and high-quality weather stations improving the DMH's quality to monitor and respond to hazardous weather events. Then, these provided the organization regarding focusing on the impact of weather and hydrological extremes and improved the in-time early-warning system both at the headquarter and regional departments. (Government of the Union of Myanmar, 2015)

To JICA, the expert team also offered training on information transmission for timely warning systems and established working groups at each level as part of a Human Resource Development (HRD) program for government officials. Additionally, Community-based Disaster Risk Management (CBDRM) activities, including Training of Trainers (TOT) workshops, were conducted at the village level

to enhance the community's capacity to respond to natural disasters delivered by JICA experts based on Japan's disaster experience. (JICA et al., 2017)

Therefore, the collaboration between JICA and Myanmar in disaster management reflects a multi-level policy cooperation approach to the enhancement of Myanmar's capacity to respond to natural disaster impacts and, it is likely to cooperate grounded structure in the infrastructure and technology support, capacity building of officials to the community engagement. Here, JICA's focus on community-based disaster risk management ensures that their response is localized, sustainable and rooted in the specific needs and capabilities of local populations. This illustrates Japan's genuine commitment to supporting disaster management strategy from technical to human capacity.

These collaborative efforts significantly improved Myanmar's early warning system and established resilient infrastructure, alongside developing a skilled workforce capable of effectively managing and mitigating the impacts of natural disasters. The partnership between JICA and local Myanmar authorities set a strong foundation for continuous improvements in disaster preparedness and response, contributing significantly to the overall safety and resilience of, the high disaster-risk areas, such as the Ayeyarwady Delta region and also Rakhine state.

Else, Japan's assistance to Myanmar is found to focus on capacity building for disaster management including training government officials, enhancing institutional frameworks, and providing technical expertise for the improvement of their capacity to respond to natural disasters. Due to Japan's experience in disaster management and its advanced technological capabilities, it is a valuable partner in strengthening Myanmar's disaster response mechanisms. As one of the disaster management initiatives under the Action plan of "A Decade Toward the Green Mekong" Initiatives, Japan conducted the following projects for disaster risk management from the environmental dimension in Myanmar as shown in the following section.

Conclusion

In conclusion, Japan's policy idea of "Proactive Contribution to Peace" grounded in international cooperation, Tokyo Strategy further highlights its dedication to addressing challenges, fostering long-term regional partnerships and commitment to assisting fragile states in achieving socio-economic growth, thereby advancing global

security. And, in Myanmar, Japan's disaster response, including aid following Cyclone Nargis, as well as its investments in infrastructure and human resource development significantly demonstrate Japan's deep commitment to building resilience. Among them, initiatives such as the construction of cyclone shelters and mangrove replantation projects which provide not only protect local communities from immediate disaster impacts but also contribute to sustainable and inclusive growth of those areas. These provision of financial, technical and human resources through JICA's programs supports Myanmar's capacity for independent disaster management, infrastructure development and environmental preservation. Therefore, Japan's multi-dimensional approach exemplifies the enduring partnerships needed to bridge the development gap among countries ensuring that cooperative efforts are not only to the current necessities but also focused on creating resilient systems for future generations.

Moreover, the collaborative approach between JICA and Myanmar reflects a multi-level strategy focused on improving infrastructure, advancing technology and human capacity enhancement. JICA's focus on community-based disaster risk management ensures that disaster response systems are not only technologically advanced but also the capacity building of local communities. These combined efforts have significantly enhanced Myanmar's early warning capabilities and established resilient infrastructure and initiatives such as training workshops and human resource development programs state JICA's support to Myanmar disaster management sectors. So, as a valuable partner, Japan plays a crucial role in strengthening Myanmar's resilience with various projects under the "A Decade toward the Green Mekong" initiative. These actions demonstrate Japan's commitment and implementation to supporting Myanmar's disaster management efforts contributing to sustainable regional security and stability as one of the Mekong region countries.

4.3 Project for Preservation of Farming Area for Urgent Rehabilitation of Agricultural Production and Rural Life in Areas Affected by Cyclone Nargis

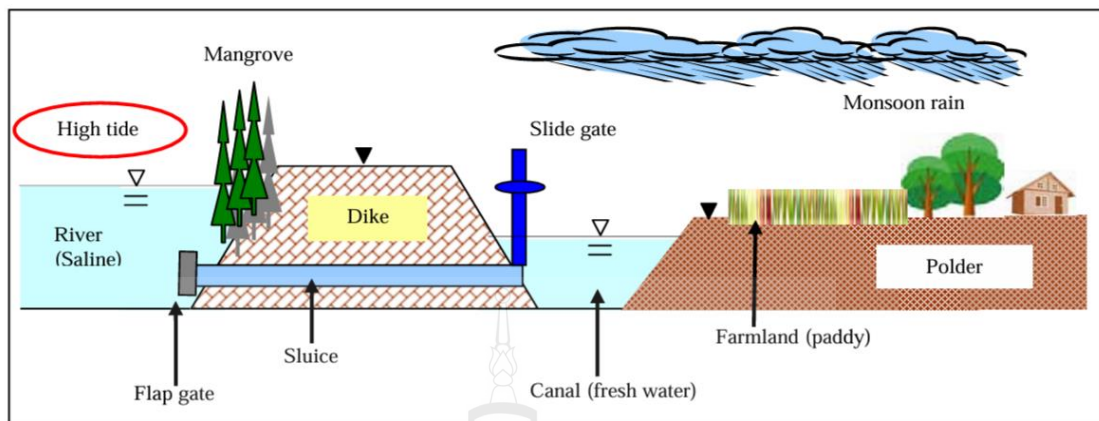
After the Nargis cyclone, which destroyed 770,000 hectares (ha) of paddy fields in the Ayeyarwady Delta, the Government of the Republic of the Union of Myanmar requested the Government of Japan to conduct a development plan study for the restoration of agricultural production and rural life through rehabilitation and preservation of the farming area due to the insufficient technology and budget, then, the government of Japan initiated this project under the Action Plan for “A Decade Toward the Green Mekong” Initiative intending to preserve farming areas for urgent rehabilitation of agricultural production and rural life affected by Cyclone Nargis and developing their capacity of counterparts for project implementation and technical skills and to rehabilitate agricultural production.

In implementation of the project, the Japan International Cooperation Agency (JICA) dispatched a Project Team to the Union of Myanmar. The project team carried out their study in collaboration with counterparts from the Ministry of Agriculture and Irrigation (MOAI) from December 2009 to September 2011 and formulated a Development Plan (DP) based on it. The project area is situated on the coast of the Ayeyarwady Delta and the project aims to address critical issues through two main priorities. The project focuses on 34 embankment areas of five Townships such as Labutta, Bogalay, Pyapon, Daydaye and Kyaiklatt that were seriously affected by cyclone Nargis in the Ayeyarwady Delta. The urgent rehabilitation process had been executed by the government of Myanmar before (Swe, 2008 June 3), however, the proper restoration system was not yet established for the local security as the disaster risk management in that area (JICA, 2009). Therefore, in response to this necessity, the JICA initiated their cooperation efforts to facilitate the proper restoration of polders to protect land, local communities, and agricultural sectors, along with providing other essential support.

Following the Nargis cyclone, the farming areas and paddy fields were seriously damaged because the stormwater destroyed all the farming lands, which are the main income sources for the villages in those townships, supporting rice farming, paddy cultivation, and fishery. After the losses of many properties of the farming industry, the lack of farming tools, draft animals, fertilizer, and access to agricultural finance led to the rehabilitation of agricultural production (JICA et al., 2011). The project primarily supported two key areas: (1) the rehabilitation of polder dikes, embankments, and sluices, as well as the establishment of mangrove windbreaks to preserve farming areas, and (2) the improvement of farming practices and income generation to rehabilitate crop production and enhance rural life. In this study, only the first one is focused on examining JICA's support for environmental security and disaster prevention in the Delta region. In this case, the JICA team initiated a pilot project to identify a suitable design and construction plan to be implemented in Myanmar from April 2010 to April 2011 (JICA et al., 2011).

4.3.1 Impacts of the Rehabilitation of Polder Dikes, Embankments and Sluices for the Water System and Mangrove Windbreaks for the Preservation of Farming Areas of the Delta Region

The construction of polder embankments, sluice gates and drainage systems are essential sectors for cultivation in the Delta region to prevent the intrusion of saline water into the paddy fields. Although there was already that kind of construction by the Irrigation Department (ID) of Myanmar in the early 1980s by the World Bank-financed project (Japan International Cooperation Agency [JICA], 2009), the heights of old embankments are designed to protect only a flood of 20 years recurrence period (JICA et al., 2011). These constructions had already lowered before the Nargis then, the poor water tightness of sluice gates and the overflowed high waves of Nargis cyclones caused great damage to the inside of the polder and impacted the farming activities. The destroyed paddy fields and polder dikes were renovated in collaboration with the ID of Myanmar, the JICA team, the local consultant and the respective contractor. Through the pilot project, they completed a test embankment construction and sluice rehabilitation for disaster prevention by the end of March 2011 (JICA et al., 2011).



Source JICA et al. (2011)

Figure 4.1 Schematic Configuration of the Polder Dike

From the above figure, it can be explained that the technical design implemented by JICA, featuring manual embankments and shifting alignments on the dike, effectively minimizes the resettlement of houses and impacts on structures, providing substantial environmental and social benefits (JICA et al., 2011). Additionally, the function of mangrove windbreaks is to prevent human life disasters or death and preserve farming areas from surges caused by cyclones or storms. In the pilot project, the JICA team assessed appropriate technology, maintenance, and operation systems outlined in the 2011 development plan (JICA et al., 2011) for reforesting mangrove trees along the polder dike to protect against cyclones that damage the embankments. In this region, mangroves act as a primary defense mechanism, shielding the embankment from direct tidal wave impact and protecting the agricultural areas. The JICA study team observed that Cyclone Nargis had impacted the mangrove windbreaks in 22 out of 34 polders. As the pilot project area, one village was selected for planting mangrove windbreak trees, mainly implemented by the local villagers under the management of a Myanmar local consultant contracted by the JICA Study Team.

According to the villager impact survey of JICA team, over 70% of respondents demonstrated an understanding of the technology transfer involved in mangrove windbreaks, while 80% recognized the role of these mangroves (JICA et al., 2011) as the essential environmental protection for their paddy field and social well-being. This indicates that the villagers are aware of the techniques and practices required to implement and maintain mangrove windbreaks for long-term preservation to prevent

disaster risk. Such understanding is crucial for the sustainability of the project as it suggests that the community is capable of continuing these practices independently. Likewise, 80 % of respondents reflect the community's awareness of how these mangroves contribute to the resilience to climate change and protect as a natural barrier against coastal erosion and storm surges. Additionally, 100% of respondents agreed that the mangrove windbreak initiative is beneficial for the local environment and provides security for their farming areas. This agreement highlights the community's strong approval of the project suggesting that it is perceived as not only environmentally beneficial but also crucial for protecting their livelihoods. Based on this finding, the project successfully engaged the community and positively impacted environmental and local agricultural practices.

In addition to the case of Nargis cyclone-impacted paddy production, through the Social Impact Monitoring (SIM) study by the World Bank (2015), paddy production after Cyclone Nargis showed a temporary recovery in their study time (2008-2013) due to soil contamination by seawater intrusion, increased production costs, subsequent climatic challenges, pest and crab infestations, recurrent floodings and lack of profitability (World Bank, 2015) became as the additional hindrance to rebuilding villagers' resilience for agricultural productivity. However, following the study period, the conditions of the polder embankment and their effectiveness on agricultural productivity were found as the following Table 4.1, as shown in the study by Htut (2019).

The hybrid circulation of the water system of dike embankment and sluice construction developed by the JICA team, along with support for mangrove recultivation, significantly enhanced the cropping yields of 34 polders.

Table 4.1 Improvement of the Paddy Yields in Delta's Townships After Rehabilitation

Township	Paddy Yield in basket/acre (Monsoon Season)			Paddy Yield in basket/acre (Summer Season)		
	2008	2010	2018	2008	2010	2018
Labutta	22	30	61	30	60	99
Bogalay	28	35	67	35	65	97
Pyapon	30	38	71	35	68	94
Daydaye	32	35	58	40	70	99
Kyaiklatt	35	55	62	45	85	106

Source Htut (2019)

According to the data from Htut (2019), Table 4.1 shows a significant increase in paddy yields across the five townships of 34 embankments between 2010 and 2018, not only in the monsoon season but also in summer. These data indicate the result of technical support developed by the JICA team and their effectiveness on paddy production in the region. The well-developed technical support on the polder embankment construction including the sluice and drainage system reduced the risk of saline water and flooding and mangrove windbreak planting led to higher crop yields where the Nargis seriously hit. Besides, the rehabilitation practices for removing saline water from ponds, initially implemented in the aftermath of Nargis, have been still utilized in subsequent disaster events (Government of the Union of Myanmar, 2015). The practice rehabilitated by this project helps protect freshwater resources by making them an essential component of disaster resilience strategies for upcoming disaster events as the long-term environmental management and resilience efforts.

Additionally, the informant interview with officials from the Department of Agriculture (DOA) and General Administration Department (GAD) in the Delta region, “the average cropping intensity increased to 168.18% in the JICA design polder regions” with crop production increasing by “more than 400% following the rehabilitation of the polder embankments” (Htut, 2019). These findings suggest that the technical support provided by JICA significantly enhanced crop production through improved environmental security, achieved by rehabilitating polder systems and

restoring mangrove windbreaks. Furthermore, the Social Impact Monitoring (SIM) study by the World Bank (2018) also observed these improvements in farming practices within the Nargis-affected areas of the Delta region especially through infrastructure improvements like embankment development and agricultural training on improved farming methods and quality seedlings by NGOs.

Alternatively, the improvement of paddy yields, as shown in the above, was gained from the various villages in 34 polders. The survey revealed that the “cropping yield of 2008 monsoon seasonhas been restored with support by rehabilitation and construction work of polder embankment” (Htut, 2019). Considering this, the polder rehabilitation conducted by the JICA team was only at Labutta North Polder as the pilot conduction (JICA et al., 2011), the development in all townships as shown in the above table could not only be the effort of JICA support but also the involvement of local government and their continuous efforts on the JICA support, sustainable maintenance and the successes of the pilot project on the technical skills and expertise developed during the JICA collaboration. In addition, according to a World Bank study (2018) which observed that villagers prioritized embankments as essential parts of their agriculture systems, as answered in their interviews (World Bank, 2018). Therefore, this finding additionally suggests that JICA’s focus on embankment construction effectively addressed a critical component of regional rehabilitation, aligning with local priorities for disaster management.

4.3.2 Organizational Structure and Roles for Project Implementation between Myanmar and JICA

That implementation was a genuine model as the master rehabilitation of sluice gates in terms of technology and construction by the ID in the future. In this case, around 45 to 70 ID engineers participated in part of the embankment construction as the training (JICA et al., 2011). According to the Survey on the Dike and Sluice Rehabilitation pilot project, 78 % of participants indicated that “the mechanical support of embankment and sluice rehabilitation was very effective for them” (JICA et al., 2011). However, it was found that the JICA team did not include in the study tour and workshop on the rehabilitation of the pilot project while the ID served as the implementing agency for the rehabilitation (JICA et al., 2012a).

Here, the JICA team acted as the supervisor for the local consultant and provided high-level support in terms of finances and operations, while the Forest Department (FD) handled the technical aspects (JICA et al., 2011). Local villagers, however, played the primary role in the actual field implementation. Then, according to the JICA et al (2011), the involvement of the JICA team was not found in training and workshop periods in which delivering and discussion made about methods of operations, expected results, potential issues, exchanging updated information of the activities throughout the implementation time and seem that they did not directly touch the field implementation. The majority of the training sessions and workshops were conducted by local authorities, departments from the Myanmar side, and local villagers, as shown in the table below.

Table 4.2 Participants of Workshop/Training for Mangrove Windbreak Cultivation

No	Workshop/ Training	Participants
(i)	Introductory Meeting	TPDC Chairman, FD officer, MAS, SLRD, ID
(ii)	1 st Workshop (Orientation)	VPDC Chairman, Villagers of Damin Chaungalay
(iii)	2 nd Workshop (Technical Training)	VPDC members, Villagers of Damin Chaungalay
(iv)	3 rd Workshop (Technical Training)	Villagers of Damin Chaungalay
(v)	4 th Workshop (Technical Training)	Villagers of Damin Chaungalay
(vi)	5 th Workshop (Technical Training)	Villagers of Damin Chaungalay
(vii)	Evaluation Workshop	Villagers of Damin Chaungalay

Source JICA et al. (2011)

According to Table 4.2, despite the JICA team's critical role in supporting the project, their lack of direct involvement in field implementation and training workshops may have limited their understanding of the ground realities and hindered their ability

to provide informed support. This gap suggests a disconnect between high-level oversight and the practical challenges faced in the field, potentially impacting the effectiveness of the policy cooperation, however, the fact that local authorities and departments from Myanmar conducted most of the training and workshops indicates strong local leadership and ownership of the project. The limited participation of the JICA team might have resulted in missed opportunities for deeper collaboration, knowledge exchange with villagers, and the development of refinement of policies that consider local insights and conditions. Participating in the training and field implementation would ensure the financial and operational support is closely aligned with the practical needs of the project, leading to better outcomes and more sustainable development.

Regarding JICA's role in the study, it appears to be the primary support, offering technical expertise, financial assistance, and guidance. Its involvement strengthens the capacity of the ID and other stakeholders, including villagers, enabling Myanmar to manage and implement the project effectively.

According to the Japan International Cooperation Agency (2009),

“the Directorate General of Irrigation Department will act as the counterpart agency to the study team and also act as a coordination body in relation with other governmental and non-governmental organizations” (JICA, 2009).

Therefore, there were found that the Directorate General of the ID conducted as the counterpart agency to the JICA study team serving as the central coordinating body that signifies the ID holds a critical leadership role in managing both the study and the collaboration with JICA. Its responsibilities facilitated communication, resources and sharing of expertise between the Myanmar government and JICA. Moreover, empowering local agencies to take on leadership roles aimed at building local capacity and ensuring that the knowledge and skills developed coupled with JICA's support during the study can be sustained and applied independently after the JICA's involvement.

During the project period from December 2009 to May 2011, technology transfer was conducted by the JICA project team to counterpart personnel from various sectors such as the Department of Agricultural Planning (DAP) which coordinated with the related organization for discussion about the project, Irrigation Department (ID),

and Myanmar Agricultural Service (MAS), as well as farmers and villagers, through both office-based and field-based activities. The technology transfer targeted (1) Central level officers for Counterparts, DAP, ID and MAS offices, (2) Site-level officers for ID, MAS, FD and Township Peace and Development Council (TPDC) offices and (3) Site-level farmers and villagers. Here, TPDC joined with ID and shared formation for various departments. At the village level, and, it acknowledged the selected village leader and assigned a clerk as the VPDC member for each village. Then, VPCD provided information from the township level to the villagers and gave them instructions.

“Technology transfer conducted during the Project was highly relevant to its technical level, implementation process and methodology. Technical / management capacities and understandings of the government officers and engineers involved in the Pilot Project for the preservation of farming area were sufficiently strengthened.” (JICA et al., 2011)

From the above, their improved understanding and capacities suggest that the technology transfer was successful for the necessary tools to preserve farming areas effectively through the government sides. The training provided by the JICA team sufficiently enhanced government officers' and engineers' abilities to manage and implement the pilot project which are crucial for the sustainability of the project by the local capacities and ensuring the independent work after the project completion and also for the future development plan.

Based on these, the overall impact of the technology transfer by the JICA team was positive, particularly in terms of building local capacity and strategic focus on training government officers and engineers, as well as the emphasis on a patient and repetitive approach to training farmers and landless people, demonstrates a comprehensive understanding of the different needs and learning paces of various stakeholders. It was well-conceived and ensured that the local personnel were equipped to carry forward the initiatives independently and effectively with significant impacts on the technical and management capacities of the Myanmar counterparts. The Japan side was able to provide technical support through insights from various aspects for the preservation of farming areas that are “socially acceptable for rehabilitation of

agricultural production and rural life and financially viable to the government of Myanmar and environmentally sound for the country” (JICA et al., 2011).

Conclusion

In conclusion, the rehabilitation of the agriculture infrastructure of the Ayeyarwady Delta, in the aftermath of Cyclone Nargis, Japan’s collaboration with Myanmar has been proven critical for disaster risk reduction through the construction and rehabilitation of polder embankments, sluice gates and mangrove replantation. And, the subsequent damage underscored the need for more resilient infrastructure and these necessities were filled by working with Myanmar’s ID, JICA and local consultants to complete a test embankment and introducing disaster-prevention improvements by 2011. In this rehabilitation, community involvement has been substantial with the results of the JICA survey such as 70% of villagers’ understanding of the technology transfer and 80% of participants recognizing the protective role of these mangroves for paddy fields and social welfare.

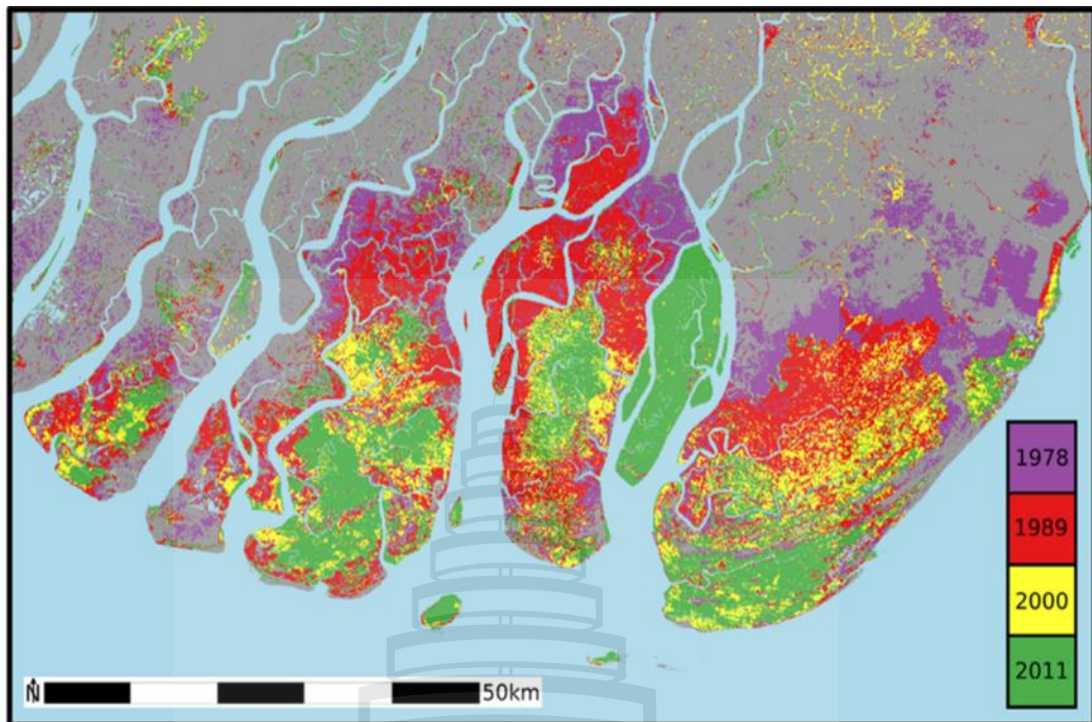
Besides, the fact that 100% of respondents support the mangrove windbreak initiative also highlights the community’s appreciation for these environmental interventions which reflects the project’s strong engagement and effective knowledge-sharing approach to the community. The benefits of these collaboration efforts are found as evident in increased crop yields rising by over 400 % in rehabilitated areas. And, the outcomes of increased cropping intensity of 168.18 % in JICA-designed polders are also a testament to the combined efforts of JICA, Myanmar’s local government, and community participation, underscoring the importance of sustainable practices and continuous local engagement in achieving long-term agricultural resilience and disaster preparedness. Then, the implemented technical design minimized environmental and social impacts incorporating community-based practices to shield agricultural areas from cyclone impacts.

However, JICA was found as a supervisory role, with local agencies like the Irrigation Department (ID) and Forest Department (FD) taking charge of direct implementation and training, their support empowered local entities and encouraged strong ownership of the projects. Although there were limitations of JICA’s direct involvement in field-based training, the local leadership demonstrated through workshops and training activities helped establish a foundation for sustainable disaster

management and agricultural resilience. The project outcomes highlight the importance of enduring, training and strong local agency involvement, underscoring Japan's commitment to fostering resilience through capacity building and strategic cooperation which will serve as a robust foundation for Myanmar's future disaster management and agricultural development.

4.4 Integrated Mangrove Rehabilitation and Management through Community Participation in the Ayeyarwady Delta

To address the critical environmental and socio-economic challenges in the Ayeyarwady Delta, a region profoundly affected by natural disasters, particularly cyclones, the project aims to ensure the sustainable coexistence of mangrove forests and local communities within the reserved forests where project activities were conducted. Mangrove coverage has changed in the Ayeyarwady Delta since 1978 as in Figure 4.2.1 and during the 1989-2000 period, 44% of the remaining mangrove area was lost (Webb et al., 2014). The Myanmar Government established RFs at the beginning of the 20th century and FD promoted Community Forestry (CF) practices to encourage forest management by local communities but there was continued deforestation of mangrove forests (Takimoto, 2015). Therefore, this project was designed to foster technical cooperation for the establishment of CF by collaborating with communities and officers of the Forest Department of Myanmar. The project sought to promote environmental sustainability and socio-economic development in the Ayeyarwady Delta by combining scientific expertise with local knowledge and active community participation.



Source Webb et al. (2014)

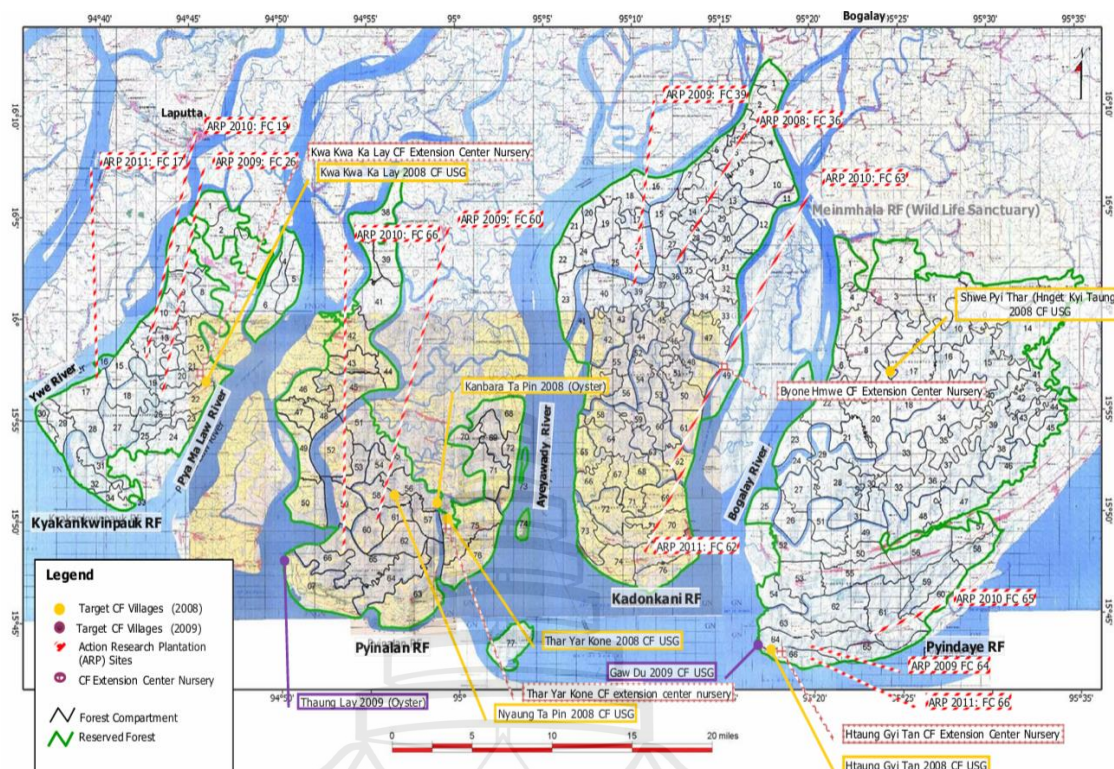
Figure 4.2 Map of the Mangrove Coverage in the Ayeyarwady Delta between 1978-2011

From the above figure, it can be seen that a year-by-year decline in mangrove coverage is shown in different colors. In 1978, mangroves were widespread throughout many areas of the Delta region. However, by 1989, just 11 years later, a noticeable reduction in mangrove forests was found with their coverage no longer expanding into parts of the Delta in the following years. By 2000, the degradation had intensified which highlighted the growing ecological loss. The green-colored part in the year 2011 shows further deforestation demonstrating the continual decline of environmental degradation and increasing the regional vulnerability to disaster impacts as mangroves play a crucial role in providing local ecosystems.

Following a three-year development study by the Japan International Cooperation Agency (JICA) (2002-2005), it formulated the “Integrated Mangrove Management Plan (IMMP)” for the sustainable co-existence between mangrove forests and local communities. Then, the Myanmar Government requested the Japanese a project for the capacity development of FD and local communities for managing and

reforestation of mangrove forests (Takimoto, 2015). This project was initiated to support technical assistance for Phase I of the IMMP after the Japan International Cooperation Agency (JICA) and the Myanmar government signed an agreement in September 2006 to implement this comprehensive project in the targeted Reserved Forest areas of six villages of Labutta, Bogalay, and Pyapon townships by collaborating with both sides of governments and local communities. In 2011, actually, due to the capacity and available resources of the Forest Department and JICA Expert Team, the targeted villages were reduced from thirteen to six villages for project implementation of the Community Forestry (CF). Kwin Thone Sint, Kanbala Ta Pin, Pein Kone, Thaung Lay, Ahpyin Pade Gaw, Gway Chaung Gyi and Daming Daung were deposited. But then, the project was implemented from 2007 to 2013 to address these regions' environmental and socio-economic challenges, promoting the conservation of mangrove ecosystems while supporting local populations' livelihoods. (JICA et al., 2013)

The figure below illustrates the locations of project implementations for mangrove rehabilitation in the Delta region. The areas of Target CF User Groups in 2008 are shown in yellow and 2009 CF villages are in purple. The four sites of CF Extension Centre Nurseries and Action Research Plantation (ARP) sites were also the implemented project sites in the Delta region during the project period of 2007 to 2013.



Source JICA et al. (2013)

Figure 4.3 Location Map of the Project Sites

The figure above illustrates the project sites where mangrove rehabilitation initiatives were implemented, encompassing various activities such as Community Forestry User Groups (CFUG) programs, Extension Center Nursery operations and Action Research Plantation (ARP) projects. These efforts were carried out in the villages of Labutta, Bogalay and Pyapon Townships including Kwa Kwa Ka lay, Thar Yar Kone, Nyaung Ta Bin, Shwe Pyi Thar and Htaung Gyi Tan and Gaw Du villages. These sites represent the focal points of rehabilitation activities aimed at restoring mangrove ecosystems, engaging local communities in sustainable forestry practices and contributing to environmental resilience and disaster preparedness in the region.

4.4.1 Impacts and Effectiveness of Implementation of Mangrove Rehabilitation on the Study Area

According to the project evaluation conducted in the fiscal year 2015, after the project implementation period (2007-2013), the project was highly relevant to Myanmar's development plans and needs, however, the effectiveness of the project implementation for the increment of CF communities co-existing with mangrove and their income levels through CF activities was fair (Takimoto, 2015). The evaluators found that

“Not all CFUGs had a prospect to gain profits from income generation activities and the profits were not yet earned.”, “Eight households had increases in their incomes, among them, six households are from Nyaung Ta Pin and a household each from Kwa Kwa Ka Lay and Thar Yar Kone villages”. (Takimoto, 2015)

The project did not uniformly succeed in creating income-generating activities for all Community Forestry User Groups (CFUGs) and the economic benefits of the project were not widely distributed. All these eight households are located in the Labutta Township, meaning that income generation after the project impacted one out of three townships. No other income increases in Bogalay and Pyapon were not found. This limitation suggested that the project did not achieve its goal in all targeted villages. This limited profitability of CFUGs and the confinement of these benefits to a single township showed the need for further refinement or support to enhance the project's impact. This observation of low limited income generation increases might be due to the short evaluation timeframe after the project was implemented, however, income generation should have significant improvement in all villages participating in the project, even if not uniformly.

Table 4.3 Achievement of the Mangrove Rehabilitation and Management

No	Project Implementation	Achievement of the Project (in Acre)
1	Current 6 CFUGs (reselected in 2011)	1,670
2.	Previous CFUGs	285
3.	Action Research Plantation	1,587
Total		3,542

Source JICA et al. (2013)

According to Table 4.3, which results from the Project Reports, CF Progress Reports and FD Reports (JICA et al., 2013), the mangrove forest coverage after the project implementation which was conducted on 3,542 acres for the target of 3,550 acres in the selected areas through the Community Forest Plantation, CF- Natural Forest Improvement Operation (NFIO) and Action Research Plantation (ARP) of the (ARP) of the project (JICA et al., 2013; Thu, 2021). The Action Research Plantation conducted, from 2007 to the end of the project, in twelve sites to be able to identify applicable silvicultural techniques and suitable species for rehabilitation and management of mangrove forests in the delta. (JICA et al., 2013)

These findings demonstrate the project's capability to execute large-scale reforestation initiatives by redeveloping mangrove forests as one of the international organizations for effective recovery efforts (Food and Agriculture Organization [FAO], 2009) by restoring community forest resources for livelihood rehabilitation (UNEP, 2009) in the Delta region. The project successfully executed its activities for mangrove rehabilitation and management from 2009 to 2013 as shown in Table 4.3.

Although the mangrove coverage could be implemented through the project as shown above, the disparity of the income rate of all villages might be attributed to some conditions impacting unsustainability and safety measures which were observed, by the 2016 project evaluation in six targeted villages as follows.

Table 4.4 Conditions of the Mangrove Forest After Project Implementation

No	Targeted Villages	Reserved Forest	Township	Acres of CF	Observation by the Evaluation in 2016
1	Kwa Kwa Ka Lay	Kyakankwinpauk	Labutta	202	“Mangrove forest coverage increased as plantation took place.”
2.	Nyaung Ta Pin	Pyinalan	Labutta	693	“CF condition worsened after the Project, but some patches improved its condition.”
3.	Thar Yar Kone	Pyinalan	Labutta	1051	“The forest condition did not change much from the time before the Project.”
4.	Shwe Pyi Thar	Pyindaye (North)	Bogalay	50	“CF condition was improved.”
5.	Gaw Du	Pyindaye(South)	Pyapon	50	“Some neighbouring community
6.	H t a u n g Gyi Tan	Pyindaye (South)	Pyapon	157	repeatedly encroached the CFs and cut mangroves for fuelscause degradation.”

Source Takimoto (2015)

According to Table 4.4, inconsistencies in the management and sustainability of the CFs were observed. Differing levels of community engagement, their practices and encroachment in two villages undermine conservation efforts and the potential of income generation for the villages and degradation highlighted the need for stronger enforcement of protective measures in the CF of the Reserved Forests areas since the mangrove forests across the Delta region have faced continuous degradation due to various reasons such as agricultural expansion (Myanmar Environmental Institute [MEI], 2017; Fee et al, 2017), human encroachment and the harvesting of wood for charcoal and firewood (Myanmar Environmental Institute [MEI], 2017). These mixed results in CF conditions suggest continuous support for local communities was still required to enhance the project's long-term success and also for the significance of income generation in all villages after the project period. Even though there were some unsustainability and safety measures in the targeted villages, the following table shows some developments in mangrove forests through the project activities.

Table 4.5 Mangrove Plantation During 2013-2015 After Project Period

No	Agencies of Mangrove Plantation	Year	Mangrove Plantation (in acres)
1	Forest Department	2013-2015	2,400
2.	JICA (Conducted by others project)	2013-2015	Approximately 2,851 (1,154 ha)

Source Takimoto (2015)

According to Table 4.5, it shows that the mangrove forest increased by approximately 5,251 acres after the project completion from 2013 to 2015. Therefore, although the impact of the project on income generation of the targeted area was not significantly observed, the rate of mangrove forest coverage was significant. In another way, the project could enhance the protection of Reserved Forest Areas and the environmental sustainability and resiliency of the climate impacts in the targeted villages of the Delta region.

Therefore, the project was concluded as “The project has achieved at a limited level”, “The effectiveness and impact of the project were fair”, “sustainability of the project effects was fair” and “The project was to be satisfactory” by the evaluators for the overall goal of the project “The mangrove forests are sustainably managed and poverty is alleviated among the communities in the Ayeyarwady Delta” (Takimoto, 2015). In 2019, the mangrove areas of the Labutta, Bogalay and Pyapon townships were planted around 2,800 acres by the Forest Department. In addition, the study by Green Growth Knowledge Partnership (GGKP) (2020) observed estimates from experienced mangrove restoration staff indicating that approximately 100 to 200 hectares of mangroves are planted annually in the three townships, on the other hand, there is still mangrove degradation due to many reasons such as illegal logging and unregulated management activities.

Based on these observations, if the mangrove coverage and plantation are further improved in the upcoming years, the project will likely enhance environmental security and increase income for the local communities. Since the mangrove coverage expanded due to the project implementation, it shows that the project could enhance environmental security as mangroves play a crucial role in coastal protection, reducing the impact of storm surges and protecting soil erosion for the stability of the environment. Through environmental security, this improved mangrove coverage can also enhance the resilience of local communities to natural disasters, particularly cyclones which frequently occur in the Ayeyarwady Delta. However, based on the resilience and vulnerability assessment findings of the Ayeyarwady Delta (2013), they predicted the resilience and sustainability situation of the Delta region was not at a satisfactory level through the environmental enhancements.

Table 4.6 Table of Resilience and Sustainability in Delta Parts

Current situation (2014)	Land and water use	Infrastructure	Natural resources	Governance	Overall resilience & sustainability indicator
Lower Delta	-	--	--	-	--
Middle Delta	-	--	--	-	--
Upper Delta	-	-	--	-	-
Urban Delta	-	-	-	-	-
Overall Delta	-	--	--	-	-

Note Resilience/vulnerability: ++ (very good), + (good), 0 (medium), - (low), -- (very low)

Source van Driel and Nauta (2014)

According to Table 4.6, the resilience and sustainability of the Lower and Middle Delta were still lower than the other Delta parts in 2014 and the vulnerability of coastal resources showed a very high level in the Lower part. These findings indicated that while there may have been localized improvements in mangrove coverage and management, the broader systemic issues and challenges continued to hinder significant progress in enhancing the region's overall resilience and sustainability. Therefore, implementation of the project was likely to achieve localized success in increasing mangrove coverage and rehabilitation activities through community participation, however, these improvements could not be sufficient for the overall resilience and sustainability of the lower and middle Delta regions.

Besides, the geography of the Lower Delta and its vulnerability indicate persistent threats such as coastal erosion, storm surges, and cyclones, including human encroachment problems that were not fully mitigated by this project in the Delta regions. Additionally, the result of the scorecard for the governance of the Delta as shown in Table 4.6 was at a low level (van Driel & Nauta, 2014) and the observation

of inconsistencies in the management and sustainability of the CFs observed by the 2015 evaluation of the project (Takimoto, 2015) indicated that the insufficiency of the project's success.

These low governance levels can affect various aspects of project implementation and sustainability leading to several challenges that hinder the achievement of project goals as expected. Insufficient resource allocation might contribute to the insufficiency of the project's success and achieving the long-term goals of environmental security and socio-economic development in the Delta. The FY 2015 Ex-Post Evaluation of the Project observed that:

“The annual plantation area was largest in 2013 and gradually decreased. This is because the budget and human resources also need to be allocated to maintain the planted forests and does not mean the total budget for mangrove reforestation and conservation was decreasing.” (Takimoto, 2015)

The annual plantation areas decreased from 1100-600-700 acres between the years 2013-2014-2015 by the Forest Department. This indicates a strategic shift in resource allocation. Because instead of continuing to expand the planted area, resources were being directed towards maintaining and ensuring the survival of the existing plantations. Since the plantation rate was decreasing due to the allocation of the budget for maintenance for the planted area as well, it shows that resource allocation needs to be balanced between new plantation and maintenance so as not to hinder both forest expansion and resilience of the existing forest areas, then, the overall resiliency and sustainability of that Delta regions would be higher and also enhance environmental and socio-economic benefits.

As the supplementary results of the project support the capacity of FD staff and local communities, the project likely provided valuable resources for the other related projects for mangrove rehabilitation in the Delta regions like “Mangrove Rehabilitation Plan for Enhancement of Disaster Prevention in the Ayeyarwady Delta” (JICA et al, 2012b). In the secondary Preparatory survey on the Mangrove Rehabilitation Plan for Enhancement of Disaster Prevention in the Ayeyarwady Delta (2012), it mentioned that,

“The FD Staff will participate in the training to be provided in collaboration with a training organization of the Ministry of Environmental Conservation and

Forestry..... to enable the FD Staff to manage the mangrove forest through community participation in cooperation with the technical cooperation project”, “FD staff, participating in the technical cooperation project shall also participate in this project to actively use the knowledge and expertise they have gained”. (JICA et al., 2012, January)

the experienced staff from the FD, who participated in the “Integrated Mangrove Rehabilitation and Management Project through Community Participation in the Ayeyarwady Delta” as the technical cooperation project, could leverage its implementation by applying the knowledge and skills gained from the technical project to support the effective implementation. The survey report indicates that government officers who participated in Cyclone Nargis training possess greater experiences in disaster management compared to other regional government officers (Relief and Resettlement Department of Myanmar, 2016). This finding showed that training in post-Nargis cyclone has enhanced their capacity not only for immediate actions but also for responding to effective disaster challenges and future disaster events. Besides, this project’s approach through community participation could help engage communities for other related projects foresting a sense of ownership and ensuring the active involvement of the community in the mangrove rehabilitation efforts. Based on Nargis's experiences, understanding the value of Community Forestry through this implementation, strengthening community disaster resilience based on the community forestry programs has been implemented in the Ayeyarwady Delta by decentralizing forest management as a part of the Myanmar National Framework for Community Disaster Resilience (National Disaster Management Committee, n.d). Therefore, by embedding forest management within the community, the project promoted a proactive approach to disaster resilience building in the community through environmental security that benefits mangrove forests.

Additionally, the increased awareness of the communities would also be beneficial for the following project as it helped to enhance that the local communities recognized the importance of mangrove rehabilitation for disaster risk reduction since 80% of CFUGs answered that Community Forestry (CF) is “Useful” in their survey (JICA et al., 2013). This community-based mangrove restoration for climate-resilient ecosystems and rural livelihoods was ranked “3” as one of the important projects for

reducing vulnerability to climate impacts by the Myanmar National Environment Conservation Committee (Department of Meteorology and Hydrology, 2012). This project also focused on formulating a mangrove forest management plan with discussions and deliberation between the FD personnel and local communities, then, this established plan was likely to be a foundation for other projects for further mangrove conservation and disaster prevention in the Delta regions.

4.4.2 Inconsistencies of the Project Members and Counterparts of Myanmar and JICA Sides throughout the Implementation

As discussed in previous sections, the project implementation had impacts to a certain extent on the target areas of the rehabilitation process. Additionally, some tendencies of the staff involved in the project were also observed during its field implementation highlighting the influence of these factors on the project's outcomes.

The report found that nearly all members of the Mangrove Community Forestry Task Force (MCFTF) were engaged in the project on a part-time basis. There was regular transfer of officers within the Department and Ministry which could impact the consistency of frequent staff transfers during the project implementation. This can significantly impact the implementation of the project and can lead to delays and inconsistencies in project execution, former staff members who are already familiar with the project's history, process and objectives were often replaced by individuals who might not have the same level of understanding of the project including the conditions of the local communities and fields.

When the new staff are transferred to the project field, new staff or officers might require time to acclimate to the project's specific requirements and dynamics and the learning curve associated with this transition can also reduce overall efficiency and productivity as new personnel must learn and be trained. On the other hand, the loss of experienced staff members results in the loss of institutional memories, valuable knowledge and insights gained through their experience throughout the project. Since the project implementation relies on strong collaboration and cohesion among the team members, these frequent staff changes might be one of the factors that hinder the effectiveness of the project. Thus, ensuring stability in staffing and fostering

consistent, project team members can enhance the project's overall effectiveness instead of addressing the challenges of frequent staff transfer.

During the Project Implementation, decision-making was conducted by the FD offices at the headquarters level through Joint Coordinating Committee (JCC) meetings, Project Implementation in collaboration with township FD offices and reserved forests offices was undertaken by the offices at the division and the district level and the Mangrove Community Forestry Task Force (MCFTF) of each level and its assigned staff were served as the implementers of the Project.

While the structure of the Project Organization from Headquarters to Field level was likely constructed systematically, inconsistencies in counterparts were observed throughout the implementation process. Moreover,

“FD formulated Mangrove CF Task Force (MCFTF) for commencement and implementation of the Project.....functions and roles of MCFTF were not always well understood by its members. Therefore, as a result, MCFTF was not fully functioning as an organization.” (JICA et al., 2013)

According to the FD's information on assignments of FD counterparts for the project from 2007 to 2012 (JICA et al., 2013), frequent transfer was more observed at the Township level as the following table.

Table 4.7 Table of FD Counterparts' Transfer (As of February 2013)

Position	Counterparts				
	April	September	March	October	February
	2007	2010	2012	2012	2013
1 Project Director (Director General: DG)	1	2	2	3	3
2 Deputy Project Director (Deputy Director General, DDG)	N. A	1	1	2	2
3 Project Manager (Director)	1	2	2	3	3

Table 4.7 (continued)

	Position	Counterparts				
		April 2007	September 2010	March 2012	October 2012	February 2013
4	Director Ayeyarwady Division	1	2	3	3	3
5	Project Coordinator	1	1	1		2
6	Assistant Project Coordinator (SO)		1	2		3
7	Assistant Project Coordinator (RO)			1	1	1+2
8	Field Project Manager (FPM/AD) Myaung Mya District	1	2 (I)	2 (I)	2 (I)	2 (I)
9	SO Myaung Mya FD/Assistant FPM	N. A	1	2		
10	SO Labutta Township FD	1	1	2	3	4
11	SO Bogalay Township FD	1 (I)	2 (II)	2 (II)	2 (II)	2 (II)
12	SO Pyapon Township FD	1	2 (III)	2 (III)	2 (III)	2 (III)
13	RO Labutta FD (Kyakankwinpauk RF)	1	2	3 (IV)	3 (IV)	3 (IV)

Table 4.7 (continued)

Position		Counterparts				
		April	September	March	October	February
		2007	2010	2012	2012	2013
14	RO Labutta FD (Pyinalan RF)	1	2 (IV)	3	4	4
15	RO Bogalay FD (Pyindaye RF North)	1	2			
16	RO Bogalay FD (Kadonkani RF)	1	2			
17	RO Pyapon FD (Pyindaye RF South)		1+1	2	2	2
18	GIS			1	1	1
19	GIS				1	1

Note (1) Counterpart Transfer: 1 (First person), 2 (Second person), 3 (Third person), 4 (Fourth person), 5 (Fifth person)

(2) Project engaged officers more than 2 years: I (First person), II (Second person), III (Third person), IV (Fourth person)

Source JICA et al. (2013)

From the above Table 4.7, the frequency of officer transfer was not stable throughout the project period with only four officers (I, II, III, IV) engaging in the project for more than two years out of approximately 40 officers. Frequent transfers were prevalent in the Labutta Township, occurring Four times, and this instability is suggested as a contributing factor to the observed mangrove forest in Labutta Township as shown in Table 4.4. Conversely, the condition of Community Forestry (CF) in Bogalay Township, was found to have “improved” as in Table 4.4 since there had fewer officer transfers. On the other hand, the CFs encroachment by the

neighbouring community occurred in the Pyapon despite there being no significant transfer situation.

Sustainable environmental projects require long-term commitment and stability in governance structures. Ensuring that key personnel remain in their positions for extended periods allows for the development of in-depth understanding and effective management practices. Building the capacity of officers and embedding them within the community can foster stronger ties and better project outcomes. Continuous training and professional development are essential to equip officers with the skills to address evolving challenges.

In Addition to the inconsistencies among the counterparts of the Forest Department, the project faced limitations and restrictions affecting the foreign experts from the JICA Teams. For example, every expert needed to apply for travelling outside of Yangon 2 weeks in advance “causing difficulties to respond to urgent needs and requests from the field”, taking a long time to get visa approval from the Myanmar side created difficulties for “timely dispatch new experts in accordance with the needs and requirements of the Project” and “changes of experts were mainly due to health issues” contributed to the project’s difficulties. Besides travel permission issues, transportation to and from the various project sites within the reserved forests located in different sites, presented logistical problems because the reliance on boats complicated adherence to the scheduled activities. (JICA et al., 2013)

The necessity for experts to apply for travel permissions severely limited their ability to address emergent issues and that might result in missed opportunities to respond to critical on-site problems, timely site visits and some interventions that not only affected the immediate implementation but also the overall efficiency and responsiveness of the project. As the project report of “changes of experts were mainly due to health issues”, these challenges likely resulted in interruption and a lack of consistency in project leadership and oversight, which are crucial for maintaining and achieving project goals. These challenges led to schedule disruptions and affected the efficiency and timeliness of project activities. Therefore, exploring alternative transportation methods, and enhancing communication and coordination among all stakeholders can improve implementation efficiency and effectiveness for future

projects contributing to the successful rehabilitation and conservation of mangrove forests.

Conclusion

In conclusion, Japan's mangrove rehabilitation project in the Ayeyarwady Delta was found as the achieved notable progress in enhancing mangrove coverage and laying a foundation for environmental protection and community engagement in conservation. This project's success in reforesting approximately 5,251 acres and implementing community-based forestry activities indicated its positive impact on environmental resilience and disaster preparedness. However, the project's income-generating potential for Community Forestry User Groups (CFUGs) remained limited, partly impacting the economic benefits of eight households in Labutta Townships and some further sustainable management issues still occurred in some target villages. This suggests the need for further refinement and targeted support to achieve balanced economic outcomes for all participating communities and sustainable measures.

Moreover, the findings of the evaluation of the sustainability and governance system of Delta revealed mixed results in resilience and sustainability, particularly in the Lower Delta region where governance scores and sustainability levels were inconsistent, although the lessons and technical capacity gained from this rehabilitation provided for further initiatives, such as the "Mangrove Rehabilitation Plan for Enhancement of Disaster Prevention". On the other hand, the Mangrove Community Forestry Task Force (MCFTF) largely comprised part-time members and frequent personnel changes, particularly at the township level hindered continuity as experienced staff were often replaced by new personnel who required additional training and acclimatization. So, as in Labutta Township with the most prevalent transfers, mangrove forest conditions showed limited progress, whereas Bogalay Township with fewer transfers demonstrated improvements in community forestry (CF). This contrast suggests that stable staffing positively impacts project outcomes by preserving institutional knowledge and continuity in project execution.

Local administrative and logistical barriers also constrained the foreign experts from the JICA teams. The need for travel permissions two weeks in advance restricted experts' capacity to respond promptly to field requests, impacting project responsiveness and efficiency. Furthermore, expert changes due to health issues

contributed to a part of inconsistent project implementation. These limitations underscored the importance of flexible administrative processes and reliable transport arrangements to support timely interventions and maintain project momentum. Ensuring stable staffing, streamlined logistics and effective cross-level coordination in future projects could significantly enhance project outcomes, particularly in sustainable environmental initiatives such as mangrove conservation, where continuity, local engagement and timely interventions are critical for long-term success.

4.5 Summary

In this chapter 4, Japan's participation in the cooperation with Mekong countries was found as the main role in their development initiatives in the region considering various sectors such as economic, social, environmental, and capacity building including consideration for disaster preparedness, response and recovery efforts of the region. Japan's cooperation with Mekong countries was observed based on the idea that regional development is fundamental in building peace and stability of the international community and global security. Besides, their cooperation in that regional progress was found to be aligned with international agreements such as SDGs, the 2030 Agenda and Tokyo Strategy by filling development gaps among developing countries in sustainable ways. Throughout the cooperation measures, while addressing gaps in the countries, they implement economic development by strengthening environmental security, disaster management and climate change impacts. The action plan for a Decade towards Green Mekong initiatives is a significant cooperation to conserve biodiversity and resources and to polish Green Mekong's rich as one of their development cooperation.

Not only to the Mekong region development, this initiative is also found as the benefits to the ASEAN community. Therefore, these cooperation and development measures are prosperous considering all sectors and showed that Japan's enthusiasm for environmental security and disaster management to be able to extend from Mekong cooperation to ASEAN-Japan by filling gaps of developing countries of Mekong and

ASEAN countries. As Japan committed, Japan's assistance was found in humanitarian aid, emergency relief supplies and dispatch experts for capacity enhancement from official to local community level through multi-level policy cooperation. In Myanmar, one of the Mekong countries, Japan's disaster response in the Ayeyarwady Delta's region was found together with the support for environmental security by providing such as dispatch expertise for preparedness of early-warning-systems, rehabilitation of mangrove forests through community participation and agricultural production by reconstruction of embankment, water systems and mangrove windbreak activities in the delta region.

Japan's role in the Mekong region exemplifies a strategic approach to regional cooperation that integrates environmental security and disaster management as the essential pillars of development initiatives. Here, environmental security highlights that safeguarding ecological stability is not only important to environmental health but also foundational to social and economic resilience which is also linked to human security as the interconnected components, particularly in areas vulnerable to climate change and natural disasters. Therefore, Japan's cooperation under this policy was found that align with the view that robust environmental security strengthens the broader goals of disaster preparedness, response, and recovery. By implementing projects to enhance the ecological stability of the Ayeyarwady Delta region, Japan's efforts support long-term resilience within the Mekong region's socio-economic and environmental structures focusing on biodiversity conservation and resource management.

Japan's provided disaster management of the region to be the effective preparedness and response which require preventive measures such as environmental conservation and rapid response infrastructure to mitigate impacts. During its disaster management process, it was found that the dynamic process of disaster management phases, some intervals such as countering new disaster events or structural challenges of the disaster management members and regional stability which depends on adaptive capacity to climate risks For instance, Japan provided the development of the Delta region for disaster management, but, there were some difficulties for logistical and inconsistencies of members and sustainability throughout their implementation

processes even though they could provide to a certain extent by their project implementation.

Those findings provided for further refinement of the adopted policy based on the experience and challenges of the field implementation. In the research, reducing the project's original targeted areas due to capacity insufficiency and the interrelationship between frequent transfer and decline in mangrove conditions in the mangrove rehabilitation project through community participation and JICA limited participation in field implementation level of embankment rehabilitation projects that conditions impact to be the successful implementation of the adopted policy. Therefore, the result of adopted policies cannot only rely on the aims and objectives, but, it essentially depends on the involved members, assigned tasks and accuracy of the implementation. If the policy implementation is a transferred process, the effectiveness also depends on the implemented recipient's condition are also observed. The findings of this research study revealed the difficulties and challenges of policy implementation, the nature of disaster management and tendencies while foreign expert teams implemented their aims at the field level by transferring and cooperating for the technical and policy support.

CHAPTER 5

CONCLUSION, DISCUSSION AND RECOMMENDATION

This chapter provides a comprehensive conclusion, discussion and policy recommendation based on the research findings of Japan's policy cooperation with the Mekong countries, especially focused on disaster management from the environmental security dimension of the Ayeyarwady Delta region of Myanmar through initiatives of "A Decade Towards the Green Mekong". This chapter begins with summarizing key projects like the rehabilitation of mangrove forests and the implementation of embankments and sluice rehabilitation in Ayeyarwady Delta highlighting both successes and challenges encountered during their implementation. Then, the chapter discusses the theoretical perspectives comparatively with the research findings and also provides some policy recommendations for strengthening sustainable development from different points of view. Finally, suggestions for further studies are described to expand and deepen understanding of the interplay between climate change, regional development and policy-making in the Mekong region.

5.1 Summary of Research Findings

The findings from this research centered on the policy cooperation between Japan and Mekong countries, particularly focusing on Japan's role and impacts in its implementation of disaster management from the environmental dimension through the "A Decade Towards the Green Mekong" initiative. Japan is seen as having the main role in development cooperation, its endeavor to contribute to regional development as one of the essential sectors in building peace and stability of the international community and its commitments to the implementation of development through various sectors. Their cooperation with collective sectors enhances comprehensive regional development and ensures regional progress through policies, strategies and aims

aligned with the global standards of sustainability and inclusivity such as Sustainable Development Goals (SDGs) and 2030 Agenda and the Tokyo Strategy. Japan understands the essential requirements for creating a peaceful community from the state to regional countries and then region to global stability with the idea that regional development cooperation is the fundamental essential to international security as the peacebuilding efforts. Recognizing the significance of the Mekong region as a geopolitical and economic value, Japan proactively collaborates with the countries in this area by providing technical and financial support. Besides, Japan improved end-to-end early warning systems in the coastal region of Myanmar, in Ayeyarwady and Rakhine State for disaster preparedness by enhancing the capacity of government officers and local community to be able to in time information distribution as the improvement of disaster management based on their needs. Therefore, not only multi-sector such as economic, social, environmental, disaster management and human capacity building but also multi-level cooperation from official to community level are found in its cooperation process with other countries. Through the adoption of necessary policies, Japan leads the implementation of these initiatives from various perspectives by supporting technical and financial necessities.

Among these initiatives, “A Decade Towards the Green Mekong” stands out as a significant effort, showcasing Japan's commitment to promoting resilience and sustainability in disaster management and other biodiversity conservation efforts, particularly in Myanmar, one of the Mekong region countries. And this research study also explored Japan's policy cooperation for disaster management in Myanmar intending to examine promoting environmental resilience in the Ayeyarwady Delta and identify gaps between the formulation and implementation of the Green Mekong initiatives through the environmental dimension of the Ayeyarwady Delta region. This initiative was adopted with a strong aim and extensive negotiations with the member countries, taking into account the environmental sector, which is aligned with the international agreements. The exchange of ideas between the donor country (Japan) and the recipient countries in the Mekong region is focused on achieving equal development by addressing existing gaps. Through this collaborative effort, Japan and the Mekong countries are striving to implement economic development by strengthening environmental security.

5.1.1 How Does Japan Implement “A Decade towards Green Mekong Initiative Policy” in Myanmar in Order to Promote Environmental Resilience in the Ayeyarwady Delta Area?

The key projects of Japan in the Ayeyarwady Delta region of Myanmar, as shown in the previous parts, are the rehabilitation of mangrove ecosystems in the Ayeyarwady Delta, and the rehabilitation of agricultural lands as the post-Cyclone Nargis recovery projects contributing to the improvement of socio-economic conditions and environmental security of the Delta region. Japan's assistance to disaster management of Myanmar, also the assistance to other countries, are found that it based on its own experiences and shares its knowledge to respond post-disaster, prevent and adapt to the disaster impacts. According to the Myanmar government's request, Japan implemented these projects aligned with the commitment of the Green Mekong Initiative. Japan supported sustainable forest management in the Delta region through mangrove rehabilitation for the disaster prevention and response to disasters impacts by replanting mangrove forests and promoting Community Forestry (CF), and water resource management to be able to enhance the quality of the local infrastructure of agricultural systems which protects the local farmlands and paddy production by rehabilitating the embankment quality and technical sectors, and improvement of the urban environment for the Delta region as prioritized in the action plan.

Japan implemented these projects at the field level through the Japan International Cooperation Agency (JICA). They collaboratively implemented these projects not only with the local government but also with the local community meaning that their focus is not only on the government, they also consider the local community's challenges and the aim of their implementation to be long-term success and be effective. The JICA team supported the rehabilitation of agricultural infrastructure by cooperating with Myanmar local officials and villagers for disaster risk reduction and agricultural productivity after the Nargis cyclone. They constructed and restored polder embankments, sluices gates including the replantation of mangrove forests to protect them from storm surge damage. This technical support effectively reduced impacts on the environment and social sectors and enhanced the quality of paddy yields by incorporating community-driven practices to be able to against cyclone impacts according to the findings.

And, also in the mangrove rehabilitation through community participation, JICA's implementation helped the progress in expanding mangrove forest coverage as the foundation for the environmental protection of the cyclone-prone delta region for its resiliency through community engagement in conservation efforts. The project's emphasis on mangrove forest management for sustainability, community awareness of the mangrove forest's value for the environment and also capacity-building efforts have strengthened against natural disasters impacts. However, while the policy was implemented through these projects, there were significant positive outcomes, several challenges and factors which have impacted the adopted policies to be successful. These challenges were found while implementing projects for environmental conservation, disaster management and sustainable development in that delta region.

5.1.2 To What Extent Does Japan's "A Decade towards Green Mekong Initiative Policy" Promote Environmental Security in Myanmar?

Firstly, (in the second project), the significance observed is the inconsistent involvement and coordination among stakeholders in the implementation period. The inconsistent involvement of key stakeholders, particularly the frequent transfer of local officials and the varying levels of engagement from local communities and authorities. In this case, the nature of the frequent rotation of staff within the Forest Department (FD) and other relevant agencies resulted in a lack of continuity and stability and the consistent impacts of the implemented projects. For instance, the integrated Mangrove Rehabilitation and Management project experienced challenges due to the lack of consistency among assigned local staff, officials, and project staff, which disrupted the flow of activities, the application of transferred practices, and the closed relationship between communities and project members. The lack of sustained leadership and expertise affected the ability to achieve long-term goals such as the restoration of mangrove forests and the sustainable management of natural resources.

Additionally, limitations for obtaining timely permissions and logistical challenges related to transportation were other complicated factors in the implementation period. JICA experts faced delays due to travel permission requirements which hindered their efforts to respond to urgent needs in the field. These constraints would hinder JICA support and limit the effectiveness of interventions.

Because, in some cases, critical opportunities for timely actions would be missed reducing the overall impact of the projects. Therefore, addressing these administrative and logistical barriers is essential for improving the efficiency and success of future initiatives. While mangrove rehabilitation and management were in progress, Cyclone Nargis struck the delta in May 2008, devastating approximately 14,000 (hectares) ha of mangroves. Consequently, the decision to extend the project period for the timely implementation of disaster management had been made and it demonstrated the project's flexibility and capacity for adaptive management.

As for the effectiveness of the implementation, it was limitedly observed in income generation for all Community Forestry User Groups (CFUGs) in eight households of one township among three townships although it was aimed to enhance generation through this. Income generation should have significantly improved in all villages. Regarding its sustainability, inconsistencies in forest management and different levels of long-term community engagement were also observed in the six implemented villages and, these facts are also interconnected with frequent transfer in the Labutta township. Another challenge was the reduction of the targeted areas due to insufficient resources. The mixed results in CF conditions of Table 4.4 on Page 69 also suggest enhancing local communities' ability to improve the project's long-term success. These limitations highlight the need for further refinement or support to enhance the project's impact.

The resilience and sustainability of the Lower and Middle Delta regions were still low showing localized improvement which cannot cover the overall resilience and sustainability of the Delta region yet. However, following the implementation, the mangrove forest coverage could be conducted in 3,542 acres of the selected areas and expanded by over 5,251 acres through various plans which demonstrated the capability of the implementation to a certain extent and could leverage the knowledge and skills of FD staff and community involvement for the future efforts. Since the mangrove coverage expanded due to the JICA implementation, this could enhance environmental security through mangrove rehabilitation as the crucial role of the Delta region for the resilience of local communities to natural disasters.

Secondly, the implementation of the embankment and sluice rehabilitation project in the Ayeyarwady Delta, under the guidance of the Japan International

Cooperation Agency (JICA), was also a critical component of efforts to restore agricultural productivity and enhance disaster resilience in the region. However, it was found that the limited direct involvement of JICA experts in the training and workshop, which are crucial parts for the successful execution and sustainability of these projects, as well as exploring the deeper collaborations and exchanging knowledge and nature of villagers during the implementation phase. The majority of these training activities were conducted by local authorities and departments such as the Irrigation Department, Department of Agricultural Planning, Forest Department and Myanmar Agricultural Service (MAS). Therefore, there would be a gap between high-level oversight and the practical challenges faced in the field, potentially impacting the effectiveness of rehabilitated structures and policy cooperation.

In this project, JICA conducted technical support to rehabilitate polder dikes, embankments and replantation of mangrove windbreaks for the preservation of affected farming areas and to prevent humans from disaster impacts. Its efforts could restore destroyed polder dikes and enhance the cropping yields of 34 polders in five townships with the finding of the improvement of agricultural productivity. The result of the improvement in paddy production is due to the well-developed technical support of the JICA team for the polder embankment construction and mangrove windbreak through improved environmental security which reduces the risk of saline water and flooding. The additional evidence of officials' answers indicated the effectiveness of JICA support on crop production in the cyclone-affected region.

Nevertheless, the JICA expert team executed their work primarily at Labutta North Polder. The development of all polders across the five townships, therefore, was not solely a result of JICA's support but also involved the local government's active participation and continuous efforts. The success of the pilot project in developing technical skills and expertise during the JICA collaboration, particularly in embankment construction, was evident as approximately 45 to 70 local engineers participated in the project. Additionally, it was found that the abilities of government officers and engineers were significantly enhanced through this collaboration. These efforts not only restored damaged farmlands by the Nargis cyclone but also equipped local government and communities with the necessary skills to sustain these improvements. Moreover, Japan's disaster management support, particularly in early

warning systems and disaster preparedness training, strengthened Myanmar's resilience to future natural disasters.

Based on these findings, the implementation of both projects has contributed to the broader development plan, enabling the government of Myanmar to continue advancing its goals for sustainable growth and resilience in disaster-risk areas. These implementations demonstrated a holistic approach by enhancing the government's capabilities and resources and fostering community involvement and empowerment. The findings from this research highlight the impacts of these two projects on the field and also the important areas for refining the adopted policy, taking into account these practical experiences and challenges encountered during field implementation. These findings also underscore the importance of refining disaster management policies to support stable staffing, sustained community involvement and smoother integration of technical expertise which are crucial for achieving long-term resilience and effective disaster response. By focusing on both governmental and community levels, the projects ensured that development efforts were not top-down but rather integrated into the fabric of local society, making them more sustainable and effective in the long term.

From this research findings, the research found that the effectiveness of adopted policies is not influenced by the aims and objectives, but depends on the member involvement, task assignments and accuracy of the implementation, in another way, influenced by the conditions of field implementation. Besides, another consideration to be the successful implementation is the recipient's condition which is found as the main role while the policy is transferred or cooperatively implemented between countries. This research study identified various difficulties and challenges which potentially be addressed in the policy implementation process highlighting the complex nature of disaster management and the gaps between adopted policy and its implementation at the field level by exploring the success of the two projects under the Green Mekong Initiative.

5.2 Theoretical Discussion

Throughout the research findings, different conditions and impacts were found in the field implementation of the adopted policy. The rational model of policy implementation by Khan and Khandaker (2016) claims that accurate planning is required for the positive impacts on the implementation performance of its objectives. While implementing the project “Integrated Mangrove Rehabilitation and Management through Community Participation”, the targeted areas were reduced from 13 to 6 villages due to the limited capacity and available resources of the Forest Department and JICA expert team, which highlights the inconsistent focus of the implementation process, and it did not fulfil the original aim and targets. Therefore, in my research study, it is agreed with the fact that inconsistencies and inaccurate planning can impact the successful implementation as Khan and Khandaker (2016) conclude.

The research findings reveal varied field conditions and impacts during the implementation of the adopted policy, underscoring the critical role of accurate planning in policy execution. A rational approach to policy implementation assumes that a well-defined plan, clear objectives and efficient resource allocation will yield desired outcomes. However, this research highlights the practical limitations that could arise at the field level such as resource constraints, institutional capacity and unforeseen logistical challenges that interfere with these theoretical assumptions. The reduction in targeted areas from 13 to 6 villages due to the limited capacity of the local Forest Department and JICA team demonstrates how resource limitations can lead to inconsistent application of project goals and outcomes.

These conditions not only dilute the project’s original aims but also point to a gap between the planning of the adopted policy and field realities. Additionally, the empirical evidence from this project indicated that adaptive planning where objectives can be revisited and modified according to capacity and local context could enhance to be successful outcomes. So, integrated adaptive elements into policy implementation frameworks may help to address inconsistencies and challenges as in this study for a more responsive and context-sensitive approach to achieving long-term policy goals.

According to the JICA, the team continuously implement or supports the target regions, however, the current condition of the local community and also the government officials are found as another considerable issue in the context. Changes in the composition of implementation members can also significantly impact the success as well. In this study, it was observed that almost all members of the Mangrove Community Forestry Task Force (MCFTF) were engaged part-time and frequent transfers of officers within the local government department led to delays and inconsistencies in project execution. Only 4 out of approximately 40 officers were engaged for over 2 years. Notably, the finding that Labutta Township experienced a decline in mangrove forest conditions, which coincided with 4 times more frequent transfers, in contrast, Bogalay Township showed “improved” with fewer transfers as shown in Table 4.7 on Page 76. This suggests that the already experienced staff were often replaced by those lacking the same understanding of the project’s history and local conditions can disrupt the continuity and effectiveness of project implementation.

The findings of this study highlight the critical interrelationship between the frequent transfer of implementation members and the effectiveness of the implementation in the targeted areas. They underscore the importance of clear, detailed task assignments and the need for stable staffing to ensure project consistency and success in the project outcomes (Khan & Khandaker, 2016). In this case, the study illustrates that effective policy implementation requires not only strategic planning but also a commitment to sign staff retention and consistency in team composition ensuring that institutional knowledge and field experiences are addressed throughout the project period. Another thing is that this frequent transfer is due to the operational nature of the local government organization where the policy is being implemented, so, the outcomes or the success of the policy is influenced by its consistency of the local condition of the implemented field.

Decentralization in the field implementation to prevent policy failure as Signé (2017) discussed also occurred throughout the study. For instance, as highlighted in Table 4.2 on Page 59 and Community Forestry User Groups activities, the collaboration of local government, organizations and villagers plays a central role in the implementation of mangrove cultivation. This decentralized approach allowed for greater adaptability and responsiveness to local needs and conditions and demonstrated

that decentralization in disaster management fosters a more integrated and inclusive process to strengthen the effectiveness of environmental rehabilitation efforts which is the aim of the adopted policy. This distribution promotes resilience by distributing responsibilities among multiple actors instead of dependence on a single central authority. Through community-driven measures, local government and JICA support, this distribution of responsibility decreases vulnerability to maintaining the project's momentum, and approach to effective disaster preparedness by preventing policy failure.

The rational model of policy implementation by Khan and Khandaker (2016) also claims that successful policy implementation requires clear goals and objectives to be achieved. They expect to lead to effective implementation by minimizing uncertainty and ensuring that all actors understand the desired goals. In the implementation of the mangrove rehabilitation through community participation, their aims and objectives were clear, however, they were not fully achieved in the targeted areas, for instance, economic benefits were not widely distributed and limited income generation of villages in the eight households of Labutta township and challenges in sustainability and safety measures after the implementation period as shown in Table 4.4 on Page 70. These findings show that the successful implementation was not wholly dependent on clear goals and aims for the desired outcomes and illustrate the limitations of this model in practice. This study points to the need for a more flexible consideration that could be integrated by adaptive strategies to address contextual variables such as resource limitations, local capacity and post-implementation sustainability. Through the findings of this study, local economic conditions, environmental factors and community-based engagement also play a significant role in shaping outcomes of the implementation. Therefore, while goal clarity is necessary, this study theoretically provides for the incorporating responsiveness to local conditions, and flexible strategies to achieve sustained policy success.

Jann and Wegrich (2007) said that the formulated actions or programs wouldn't pursue the policy objectives on the ground if their action were not effectively implemented. In this study, the implementation plans were fairly successful and, although they did not entirely meet all expectations, they did not fail to deliver on their intended goals. So, it can be concluded that it does not mean a failure just because it

was not completely effective, progress can still be made to a certain extent and the project can be developed further.

The significant increase in mangrove forest coverage assisted in protecting Reserved Forest Areas for the environmental security of local villages. Floyd and Matthew (2012) consider that environmental security links the well-being of the natural environment and the security of people, societies and the biosphere. In this study, mangrove rehabilitation supported income generation for the communities through sustainable management and utilization of forest resources of the Community Forests to obtain food supplies in some parts of the Delta region. Therefore, environmental security by mangrove rehabilitation also strengthens a sustainable link between food security, and income generation and fosters a resilient and self-sufficient community. By providing a stable source of food and income, mangrove rehabilitation could be able to promote both economic and ecological resilience contributing to a self-sufficient and disaster resilient community. Thus, mangrove rehabilitation exemplifies integrated support to environmental security where the ecosystem restoration directly supports local livelihoods, reinforcing the community's ability to withstand environmental shocks and disaster impacts and fostering the long-term sustainability of the region.

In the implementation of agricultural production and rural life rehabilitation, mangrove replantation plays a crucial role in restoring affected farming areas hindering direct tidal waves to the embankment as a primary defense. So there, however, the embankment and polders were constructed for rehabilitation, and the role of mangroves, in another way, was that the ability of natural sources could not be left behind for environmental security for all considerations. Thus, even as modern engineered techniques are established, the resilience of natural protection like mangroves remains a critical component of comprehensive environmental security strategies in the context.

The environment does not threaten human life but human behaviors such as encroachment, self-exploitation, charcoal production and expansion for cultivation decline environmental abilities, which are found throughout this study, at the same time, the risk of disasters has risen in that region. Based on these considerations, this study will contrary define the term “environmental hazards” of early studies (UNDP, 2011) with the term “environmental vulnerability” of the Hyogo Framework (UNDP, 2011)

because as the environmental qualities decline due to human actions, environment security has been risk to disasters for itself.

Wennning et al. (2007) and Glenn, Gordon and Florescu (2012) conclude that environmental security is not defined by concrete definition. In this study, environmental security is defined as a fundamental shield for human livelihood, economic stability, wealth and dignity providing the essential resources for their development and ensuring the protection necessary for people to securely conduct their daily lives, then, environmental security enhances national security as the claim of Floyd and Matthew (2012). Here, environmental security ensures the availability of essential resources that foster individual and community development while providing the protective resources to pursue secure and stable lives of people. After that, it will be able to protect the global biosphere as the foundation of development as Trombetta (2008) defined. This is because, in this study, Japan's support for this implementation is viewed as the foundational effort toward the security of the global community through regional cooperation. It highlights the role of regional actions in addressing global environmental concerns, indicating that local environmental security is deeply interconnected with the well-being of global security. And, national or regional efforts on this contribute to broader international security and environmental resilience demonstrating that regional cooperation is essential for cumulative global impact. However, this study agrees with Sobhan (2012) that this environmental security goes beyond disaster concerns encompassing the crucial issues of environmental degradation and sustainability. These findings and ideas expanded to addressing ecological health and resource management are essential for sustaining long-term resilience and stability at both regional and global levels.

Disaster management is traditionally conceptualized as organizing and managing resources to cope with disaster impacts, focusing on preparedness, response, and recovery to minimize damage (Chondekar, 2018; Sawalha, 2023). Bali (2024) considered that the stages of the disaster management cycle such as preparedness, response, rehabilitation and mitigation are interconnected and simultaneously performed with the timely implementation of disaster management to minimize the risks. Chondekar (2018) claimed that these phases are not always in order and sometimes overlap in practice. While mangrove rehabilitation and management were

in progress, Cyclone Nargis struck the delta in May 2008, devastating approximately 14,000 ha of mangroves. This disaster highlighted the need for adaptable disaster management, consequently, the implementation of mangrove rehabilitation expanded a year to include cyclone recovery activities recognizing the urgent need for recovery support.

In this study, the phases of the disaster management cycle did not happen in order and sometimes it might be a dynamic process as Sawalha (2023) mentioned in his study understanding that the disaster management cycle should be adaptable in order to address current needs and immediate recovery actions. The preparation efforts of the project and urgent recovery programs happened during the same period. Therefore, these phases of the disaster management cycle are merged as Benson (2008) considered and recovery action also started in the phase of emergency response (Carter, 2008) by gathering information on affected areas by the Nargis Cyclone to conduct recovery activities. In disaster management, additionally, adaptive management should be regarded as a crucial component given the dynamic nature of the disaster management process. Thus, the stage-by-stage nature of disaster management cyclones may limit responsiveness and this study supports to practice of adaptive disaster management since flexibility is crucial for effective risk reduction and resilience building in unpredictable environments.

The project completion report of mangrove rehabilitation through community participation (2013), the redesignation of the Community Forestry Extension Centre Nursery (CFECN) with cyclone-proof structures and the construction of four offices and a concrete jetty in Kwa Kwa Ka Lay, Thar Yar Kone, Byone Hmwe and Htaung Gyi Tan CFECNs were additional efforts after Nargis Cyclone. The FD effectively implemented seedling programs for CF and ARP, including departmental plantations, and utilized CFECNs as hubs for raising awareness of CF activities to recover from cyclone damage. These recovery efforts enhanced the development of the local communities providing proper infrastructure and necessitating the execution of FD for mangrove preservation. The rehabilitation of polder dikes and embankments from the Nargis cyclone provided for paddy production as in Table 4.1 on Page 57 and protected overflow of high waves of cyclones.

Therefore, this study agrees with the idea of Modh (2010) that disasters can also create opportunities for development by transforming society and its characteristics making communities more resilient to future impacts. By establishing CFECNs as hubs for community engagement and awareness, the FD and JICA team not only supported immediate recovery but also strengthened local capacity for future disaster resilience integrating sustainable forestry practices as the positive changes to rebuild more resilience in the region. The rebuilding efforts on the embankment and polder dikes became more than recovery because they facilitated improvement that directly contributed to food security and economic stability by safeguarding paddy production against future impacts. In this study, the issues of poor disaster management exacerbating existing vulnerabilities, negative effects on donors, relief agencies and future hazard vulnerability as Chondekar (2018) and Modh (2010) said were not observed except for the impacts of the inconsistencies of local officers as Tay et al (2022) concluded on the risk of disaster management cycle which could undermine the practice of effective disaster management. Therefore, this study will not engage with the ideas presented by Chondekar (2018) and Modh (2010).

The findings of the insufficient, low resilience level and sustainability of the Lower and Middle Delta parts, where the project sites are located, revealed that this implementation might achieve a localized disaster resilience level, nevertheless, it has not covered the whole Delta parts. On the other hand, the result of the rehabilitation of the embankment and establishment of mangrove windbreaks to protect farming areas, alongside improving paddy yields after rehabilitation, contributed significantly to local communities' recovery efforts. These measures enhanced their ability to withstand disaster impacts by maintaining their income levels and promoting social stability (Sen, 2021). The term resilience was defined in various forms (Shao, Soda & Xu, 2016; Ranjan & Abenayake, 2014; Norris et al., 2008; Bocchini et al., 2014). In the context of disaster management, resilience can be viewed as both a process and an outcome with measures like embankment rehabilitation and mangrove windbreak establishment directly enhancing the adaptive capacities of local communities, although the uneven impact across the delta region suggests that localized resilience measures may need broader structural and policy support to enhance regional sustainability.

In this study, resilience is defined as recovery abilities which build resistance to future disturbances as Maru (2010) and Coetzee, Niekerk and Raju (2016) considered. But it is not aligned with the concept of ‘perturbation’ as Norris et al. (2008) described, because resilience is the ability to withstand and endure disturbance effectively the effects of perturbation. The low-level governance of the Lower and Middle Delta of the scorecard result and the observed inconsistencies in the management and sustainability of the CFs indicated the insufficiency of the project’s success. Therefore, research on national disaster resilience policies is crucial for identifying effective actions, and intervention strategies that can mitigate cumulative risks and enhance resilience as suggested by Wenger (2017). However, this study also develops that emphasizing the sustainable management of mangrove forests by local communities will also be a key factor in achieving successful implementation and ensuring long-term environmental resilience against disaster events.

Japan has played a leading role in fostering regional stability and sustainable development in the Mekong region by sharing its policies on disaster risk management, environmental protection and infrastructure development. This study exemplifies how policy transfer operates in practice within regional frameworks and finds that the success of policy transfer depends on the receiving country’s ability and local conditions such as the operational structure of local government, limitations and restrictions on the foreign experts' travel permissions. For instance, the technical quality of the transferred policies (which is effective in the original country) may have difficulties in meeting the governance and logistical constraints within the receiving country. These barriers highlight a theoretical insight within policy transfer where imported policies should be possibly compatible with the existing socio-political and infrastructural frameworks to be effectively implemented. This study agrees with Monkhtar and Rahman's (2020) statement that policy transfer is an action-oriented international activity of government strategies through voluntary practices (Dolowitz & Marsh, 1996), with the findings that Japan initiated this regional cooperation for disaster management by supporting infrastructure and technical support in Mekong region countries.

As Benson and Jordan (2011) declared policy transfer has been a concept to address policy failures and innovation, this study provides insights into the gaps, and

tendencies by exploring the implementation stage of the policy cooperation of Japan and Mekong countries. Japan addressed local interferences such as logistical challenges, local soil composition, cultivation practices and environmental conditions while implementing its objectives in the Ayeyarwady Delta region of Myanmar. Consequently, JICA could learn valuable lessons from these experiences adapting its techniques for improved future performance as Dolowitz and Marsh (1996) argued lenders also learn from borrowers when adapting to diverse political and environmental systems.

In this study, JICA policy cooperation under the Green Mekong Initiatives did not exhibit coercive transfer, as suggested by Dolowitz and Marsh (1996) and Benson and Jordan (2011). Unlike coercive transfer, JICA cooperation in this study reflects a collaborative process, for instance, their cooperation was operated by collaborative negotiation at the national level prioritizing the operational structure of the recipient country such as organizational frameworks, field conditions and adaptable strategies. Rather than imposing policies, its cooperation focused on sharing techniques and ideas, ensuring that field implementation aligned with local needs and conditions. This can be assumed that strategic cooperation where policy transfer can be regarded as an opportunity for mutual learning and capacity-building, enabling the recipient to build resilience through learning. Japan supports Myanmar's capacity to independently manage disaster risks emphasizing sustainable development rather than short-term. Therefore, the policy cooperation of Japan and Myanmar for disaster management can be regarded as strategic cooperation or strategic partnership, rather than the other scholars' ideas such as Pacheco-Vega (2021), Benson and Jordan (2011) and Mokhtar and Rahman (2020) argue.

5.3 Policy Recommendation

Based on the findings, some policy recommendations are provided to enhance the effectiveness and sustainability of international development projects in the Mekong region:

5.3.1 Strengthening Local Capacity and Governance

Future initiatives should prioritize the capacity building of local institutions and governments to ensure the sustainability of project outcomes. This includes continuous training and professional development for local officials and community leaders to manage and maintain the project's success independently after the period of external support like JICA.

By strengthening these, local governments and community leaders will be better equipped to manage projects independently, this would enhance governance structures, and decision-making at the local level ensuring that strengthening the benefits of international cooperation and strong local governance to increase resilience to future disasters and challenges.

5.3.2 Enhancing Inclusivity in Development Projects

To address the disparities in socio-economic benefits, future projects should adopt a more inclusive approach and long-term monitoring that ensures equitable distribution of resources and opportunities to fill the gaps across all target communities. This could involve tailored interventions that account for the specific needs and conditions of each community.

By adopting a more inclusive approach to development projects, it would provide equitable distribution among target communities and tailored intervention would address the unique needs of each community reducing disparities and filling gaps in that areas to extend a more comprehensive and cohesive strategy that would enrich the benefits of implemented development projects.

5.3.3 Integrating Climate Change Adaptation into Development Planning

Since climate change risks have increased in the Mekong region, development projects should incorporate climate resilience into their planning and execution. Among them, ecosystem-based disaster risk reduction efforts such as mangrove restoration, promoting the preservation of mangrove forests at the coastal areas and sustainable agricultural practices are essential and eco-friendly development ways for the resilient to climate change conditions to be integrated for the development of the local population.

Therefore, this kind of integrated strategy would enhance the resilience of local populations to growing risks and adapt to the possible impacts of other developments. However, in this case, ecosystem-based disaster risk reduction, such as mangrove restoration, which can protect risk areas from disasters and create sustainable livelihoods for local communities, is important to prioritize.

5.3.4 Promoting Public-Private Partnerships

The success of Japan's public-private partnerships to a certain extent in the region highlights the potential for further collaboration between governments, NGOs and private entities. Such kinds of partnerships can leverage additional resources, innovation and expertise to scale up successful interventions and address broader regional challenges.

This would lead to the mobilization of additional resources and address larger regional challenges more effectively from different points of view. From that, this could strengthen infrastructure development such as finance and technology which would be a challenge for the government alone. The disaster management by partnering between them could enhance their capacity-building sectors through collaboration in resources and technical sharing to be more effective in disaster response and recovery efforts.

5.3.5 Improving Monitoring and Evaluation Mechanisms

However, to endure the long-term success of the implementation of the policy actions, there must be robust monitoring and evaluation frameworks that track the process of development projects beyond their initial implementation phase. Regular assessments should be focused both on the governmental organizations and public sides while identifying emerging challenges and hindrances to expand the effectiveness of the implemented action.

Performing comprehensive monitoring and evaluation measures would help to identify emerging challenges and some actions that need to be corrected in a timely manner for the long-term success of policy actions. This would also improve the action of implementation based on the monitoring to increase their effectiveness and impact in the future.

5.4 Recommendation for Further Studies

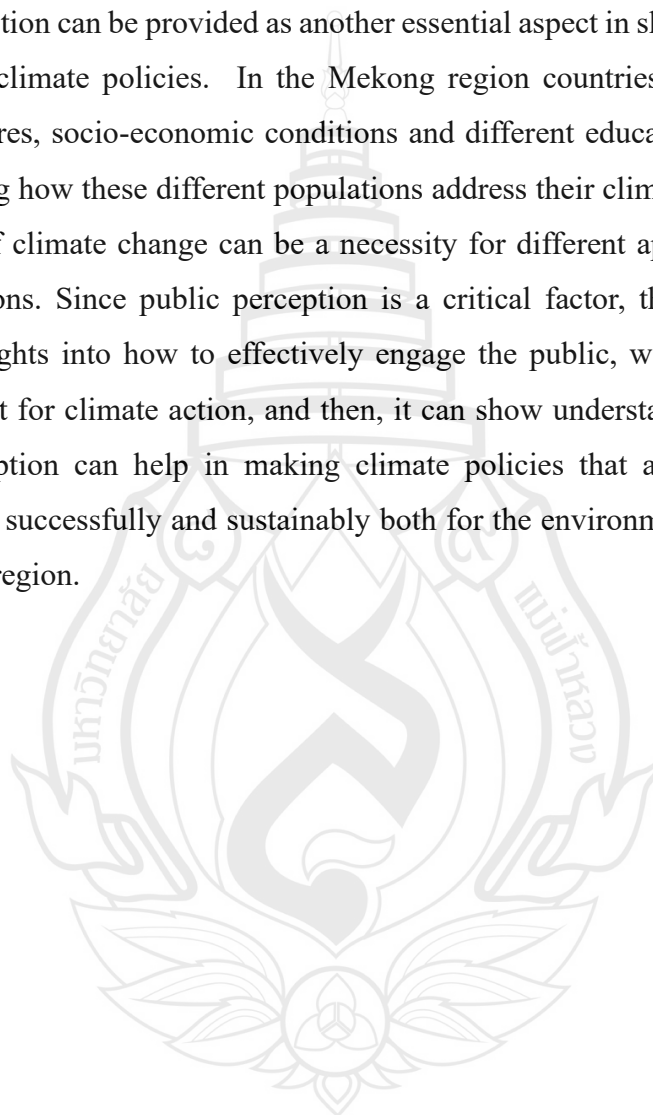
This research provides valuable insights into the cooperation between Japan and the Mekong countries, especially in Myanmar. However, the following are additional research studies developed to deepen understanding of the interplay between climate change and regional development in the Mekong region, which can contribute to policy-making, better adaptation strategies, and sustainable development outcomes.

Firstly, a comparative study of different international development models could provide a deeper understanding of the effectiveness of Japan's approach relative to other countries engaged in similar efforts in the Mekong region countries. This could include examining China's Belt and Road initiative and its regional development and cooperation implications. The BRI also represents another significant shift in global development cooperation, especially in the Mekong region. Therefore, by comparing Japan's approach to the Mekong-Japan cooperation framework with China's BRI, researchers would better understand the different strategies, methods and impacts of these two major powers in the same "Mekong Region". Through the comparative analysis, the study can identify different regional approaches which are more effective in achieving sustainable development goals and regional stability.

Secondly, climate change and its impacts on regional development could be conducted as a further research study to investigate the intersection of climate change and regional development in the Mekong region. This could include analyzing how climate-induced environmental changes affect agriculture, fisheries and livelihoods and how development interventions can be adopted to address these challenges. In this study, the researcher can assess how climate change influences agricultural productivity and the vulnerability and resilience of the Mekong region countries where most of the countries are mainly emphasized for their economic stability and food security in the agricultural industries. By understanding the impacts in the region, policies can be developed more to support climate-resilient measures at the community levels or state levels. Effective governance identifying the best practices can be provided to address the growing environmental challenges for policymakers, researchers and development

practitioners to safeguard peace and stability in the region and to reduce conflicts over resources, migration and transboundary issues due to environmental security.

Lastly, investigating how public perception of climate change influences policy-making and the implementation of climate adaptation and mitigation strategies in the Mekong region can be conducted as another research study. In this study, assessing public perception can be provided as another essential aspect in shaping the success and direction of climate policies. In the Mekong region countries, the regions possess diverse cultures, socio-economic conditions and different education levels, therefore, understanding how these different populations address their climate conflicts and their perception of climate change can be a necessity for different approaches in terms of their conditions. Since public perception is a critical factor, this study can provide valuable insights into how to effectively engage the public, with public perception-based support for climate action, and then, it can show understanding and addressing public perception can help in making climate policies that are more likely to be implemented successfully and sustainably both for the environment and the people of the Mekong region.



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