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Unveiling Gendered Dynamics in Myanmar's Small-Scale Aquaculture: Opportunities for Change

Realiti Gender dalam Akuakultur Berskala Kecil di Myanmar: Peluang Untuk Perubahan

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ABSTRACT

The security situation and other crises within Myanmar since 2021 have affected the lives and livelihoods of people in rural communities. As a result of these impacts, people are struggling to recover and improve their lives. Within this context, small-scale aquaculture has the potential to contribute towards poverty alleviation and food and nutrition security, mitigating the impact of the crises. However, gender dynamics within small-scale aquaculture-dependent communities in Myanmar prevent equal access to and benefits from their engagement in the sector. Therefore, this article analyzes gender dynamics in households dependent on small-scale aquaculture in rural Myanmar. A study was conducted to explore how gender norms and relations influence the ability of people to participate in and benefit from aquaculture activities. We interviewed 24 women and men from two different communities in Ayeyarwady and analysed their interview transcripts using QSR's Nvivo12 software. Key findings include that access to productive resources varies across households, with less marked differences within households as they believe that their families' common resources are accessible to all. Although women and men reported that their tasks were not gender-specific, women were found to take on more productive tasks in addition to household responsibilities, especially when their spouses has no income due to factors such as alcoholism and gambling addiction. To achieve the desired sustainable changes and results, we have made several recommendations for future programmes in this context.

Keywords: Myanmar; small-scale aquaculture; women; gender relations; gender roles

ABSTRAK

Situasi keselamatan serta krisis lain di Myanmar sejak tahun 2021 telah menjejaskan kehidupan dan mata pencarian masyarakat kawasan luar bandar di negara tersebut. Akibat daripada kesan ini, masyarakat tersebut menghadapi kesukaran untuk memperbaiki kehidupan mereka serta pulih sepenuhnya dari keadaan tersebut. Dalam konteks ini, akuakultur yang berskala kecil berpotensi untuk menyumbang ke arah pengurangan kemiskinan serta keselamatan makanan dan nutrisi. Namun demikian, dinamik gender dalam komuniti yang bergantung kepada akuakultur berskala kecil di Myanmar menyebabkan ketidaksamaan dalam akses dan maanfaat yang diterima daripada penglibatan lelaki dan wanita dalam sektor ini. Oleh yang demikian, satu kajian telah dijalankan untuk meneroka bagaimana norma dan hubungan gender mempengaruhi keupayaan ahli komuniti untuk mengambil bahagian serta mendapat manfaat dari aktiviti akuakultur. Seramai 24 orang wanita dan lelaki dari dua komuniti yang berbeza di Ayeyarwady telah ditemu bual dan transkrip temu bual mereka dianalisis menggunakan perisian Nvivo12. Antara penemuan utama kajian ini adalah akses kepada sumber produktif berbeza antara isi rumah. Namun perbezaan dalam isi rumah dilihat kurang ketara disebabkan oleh kepercayaan bahawa sumber bersama keluarga boleh diakses oleh semua. Lelaki dan wanita juga didapati boleh mengambil alih tugas masing-masing walaupun wanita lebih banyak memikul tanggungjawab terhadap tugas produktif, terutamanya apabila pasangan mereka tidak dapat menjana pendapatan akibat masalah seperti ketagihan alkohol dan perjudian. Bagi mencapai perubahan yang lestari yang diinginkan, kajian ini telah memberikan beberapa cadangan untuk program-program pada masa hadapan dalam konteks ini.

Kata kunci: Myanmar; akuakultur; wanita; hubungan gender; peranan gender

INTRODUCTION

Aquaculture has expanded rapidly over the past few decades and now produces aquatic animals nearly as much as capture fisheries and contributes to global food and nutrition security (FAO, 2022; Garlock et al., 2022). The small-scale form of aquaculture has been a focus for pro-poor development as the adopters are often poor. Small-scale aquaculture at the household and community levels has the potential to contribute to poverty alleviation and food and nutrition security by increasing household income and meeting protein demand directly or indirectly (Karim et al., 2020; Rashid et al., 2019; Sarker et al., 2017). It can also increase the domestic consumption of fish, lower the amount of income spent on the purchase of fish, and increase its availability throughout the year, which would help lower prices for those who do not engage in fishing. However, these are contingent upon the farmer's ability to increase their existing technical efficiency in fish production (Belton, 2013).

Fish is also an important component of the food system in Myanmar, serving as a primary source of animal protein and providing essential micronutrients that play an important role in growth and development, especially for children (Belton et al., 2015). It is derived from marine fisheries, freshwater fisheries and aquaculture. Most of the country's freshwater aquaculture production takes place in the Ayeyarwady Delta (Maung Soe et al., 2020). Although most aquaculture ponds in the region were reported to be medium to large in size initially, a study later found that the number of small and medium commercial farms is higher than generally believed because many farmers circumvent laws to convert rice land into fish ponds due to the high yields (Belton et al., 2015). Given their reliance on small-scale aquaculture, farmers face numerous challenges to sustain and benefit from their engagement in the sector, which includes heavy rainfall that often leads to flooding (Thant et al., 2022) and gender dynamics.

Gender dynamics, referring to the complex interactions between and among people based on gender (EIGE, 2016), are an important component of aquaculture and fisheries systems and a determinant of their outcomes (Rajaratnam et al., 2020). Women play an important role in aquaculture production, such as seeding and feeding, as well as marketing and processing (FAO & NACA, 2003). Their participation in decision-making within the household is reported to be associated with increased technical efficiency (Aung et al., 2021). However, due to norms that favor the participation of men over women in social networks, woman-headed households have lower technical efficiency than man-headed households (Aung et al., 2021). Moreover, normative factors such as inheritance systems, customary laws and traditions including those related to marriage can also shape the ownership rights of women and men. A survey conducted in the Ayeyarwady Delta highlighted that, while the majority of house (91.1%) and land (92.6%) holdings were owned jointly by men and women, men tended to dominate single ownership over women (Shein et al., 2014). Additionally, even though property accumulated during marriage is jointly owned by women, only a small proportion (1.5%) of women had sole house ownership. In the case of land ownership, including ponds, except in a few households, land was exclusively owned by male members of the households (Shein et al., 2014).

Gender norms also play an important role in influencing and shaping decision-making processes in rural Myanmar (Carnegie et al., 2020; Lambrecht & Mahrt, 2019). Community members in Ayeyarwady Delta believe men are usually the ultimate decision-makers for agricultural activities (Shein et al., 2014). Although women and men in the Delta discuss the selection and use of agricultural products together, the final decision on products is usually made by men. Most households (71.3%) also followed men's decisions when selecting aquaculture practices (Shein et al., 2014). The study concluded that women in the Ayeyarwady Delta are not

able to make independent decisions about agricultural and aquaculture activities, unless the male members agree with their decisions.

Past studies have also underscored the influence of gender on women's engagement in and benefits from aquaculture (Morgan et al., 2016; St. Louis & Oliveira, 2022). Studies on gender in small-scale aquaculture are needed to uncover and analyze influences that affect the 'productivity and the availability of fish, the capacity of certain groups to access employment and income to enable better access to food and/or if and how fish is utilized and by whom' (Morgan et al., 2016, p. 6). According to Kruijssen et al. (2018), studies are also needed to find practical ways to increase women's participation in and returns from aquaculture value chains by removing formal and informal barriers to women's control over assets, including through shifting underlying gender norms and relations towards equality. In order to achieve this, data gaps need to be addressed. One reason why women are invisible in aquaculture policy is the lack of comprehensive and up-to-date data on women in aquaculture (Brugere & Williams, 2017). Therefore, this study aims to analyze gender dynamics in small-scale aquaculture households in rural Myanmar, focusing on access to key resources, roles and responsibilities, decision-making processes and other constraints faced by women and men in accessing and benefiting from small-scale aquaculture. It further aims to fill the data gaps on gender dynamics in small-scale aquaculture households in rural Myanmar and provide recommendations for programs which aims to address gender inequalities in small-scale aquaculture value chains.

RATIONALE OF THE STUDY

This study was conducted to understand the normative factors that influence various groups of women and men in their engagement and the benefits they derive from small-scale aquaculture interventions in Myanmar. Furthermore, COVID-19 and the political instability that affected Myanmar during study period have an impact on the lives and livelihoods of people including those who are reliant on small-scale aquaculture in the study communities.

THE GENDER RELATIONS FRAMEWORK

The conceptual framework underpinning this study is the four dimensions of gender relations. Danielsen & Newton's (2018) Gender Strategy for the African Chicken Genetic Gains program provided this conceptual framework that informed the question guide used for this study. The framework is based on a concept that considers 'gender as a social relation' rather than distinct categories. The writers referenced Kabeer & Subrahmanian's (1996) papers, which were introduced to shift the focus away from the latter viewpoint and onto the social relations that characterized them as unequal social categories (Danielsen and Newton 2018). Often, projects or programs aimed at integrating gender focus solely on gender roles and gender gaps. This can lead to recommendations or solutions to provide women with training, assets, or resources to close the gender gap (Hillenbrand et al., 2014). However, these interventions, which fail to consider gendered relations and their dynamics, can lead implementers to misjudge their impact on women and men (Hillenbrand et al., 2014).

Gender division of labor is the first dimension of the gender relations framework. It is concerned with how labor is divided between men and women in households and fish farming activities. This component primarily requires an examination of women's and men's productive (i.e., income-generating livelihood activities) and reproductive (i.e., caregiving tasks and home chores) roles and responsibilities. This will enable them to see whether the division of labor is strictly adhered to, whether the roles complement one another, or whether they overlap (i.e., if women and men are able to perform the roles normatively assigned to one gender in their community, especially when either one of them is not around). For this study, questions were designed to elucidate the distinct roles and responsibilities of men and women as well as whether (and under what conditions) these are interchangeable.

Gender norms constitute the second dimension of gender interactions. These are the social rules and expectations that maintain the gender system in place (Cislaghi & Heise, 2019). Gender norms reinforce widely held gender stereotypes and idealized notions or beliefs about men and women, and these often change (van Eerdewijk & Danielsen, 2015). This dimension influences the other three dimensions.

The third dimension explores access to and control over resources and benefits. Land and ponds, inputs and equipment required for fish farming, and human resources (labor) are all examples of resources (Murnyak, 2010). It also includes social capital, which refers to other fish and personnel from government agencies and non-governmental organizations involved in or working on fish farming inventions and information. The ability of men and women to engage in and benefit from fish farming activities is determined by their access to and control over these important resources.

Decision-making is the fourth and final dimension. This also has implications for men and women's access to and control over resources. However, it must be studied separately to see how resource control affects how women and men make decisions (van Eerdewijk & Danielsen, 2015). This framework is applicable to other sectors and farming systems, including small-scale agriculture. It can also be used for more than one node in the value chain. This tool was largely used by the researchers in this project to investigate gender relations at the production (and market) nodes of the value chain.

METHODOLOGY

A study within a small-scale aquaculture project in Myanmar was conducted to identify gendered barriers that exist within the project context to suggest feasible recommendations that can be implemented by any organization (i.e., government, NGOs, and/or the private sector) working with the study communities.

This study used a purposive sampling technique to gain deeper insights, as it is cost-efficient, flexible, and able to target information-rich and specific informants (Othman et al., 2019; Tajik et al., 2025). The researchers developed a list of criteria that guided the selection of informants for this case study. The project staff assisted in selecting informants for this study based on a set of criteria, which included their role as active fish farmers, gender, and willingness to share their experiences with the interviewers. They were also selected to provide insights into the production, post-production, and market parts of the aquaculture value chain, to provide a range of diversity (i.e., from two different communities located in separate townships). Small-scale homestead aquaculture production was selected for this study not only because of the project

intervention that targets this production system, but also because women are often able to engage in the production system, and it is a popular system for gender accommodative approaches. The case study enables deeper insight into the lives of women and men with each other.

This study was conducted using a qualitative case study methodology as it allows exploration of complex phenomena within their context (Baxter & Jack, 2008). Due to COVID-19 and security-related restrictions which prevented the study team from traveling to the study communities, this study was conducted via phone interviews. Phone interviews were used by past studies in times when in-person interviews were not able to be conducted (Rahman et al., 2024). Prior to the fieldwork, a team of researchers in Myanmar was trained virtually in English on the question guide and on ways to conduct the mobile phone interview. The researchers obtained verbal consent from the informants to participate in the study and to allow the conversation to be recorded for recall purposes before the interviews started. Key-informant phone interviews were conducted with village/community leaders (n=4), while in-depth phone interviews were conducted with women (n=10) and men fish farmers (n=10), both in Burmese language by the researchers. Upon completion of the mobile phone interviews, the researchers translated and transcribed the recordings from Burmese language to English. The content of the transcripts was then analyzed thematically using QSR's NVivo12 software. Codes were derived after reading and highlighting the transcripts in the software. These codes were then categorized into themes, that informed the results and discussion in the following section.

DISSEMINATION OF RESEARCH FINDINGS IN A STAKEHOLDER MEETING FOR KEY RECOMMENDATIONS

The results of the study conducted with the community were then presented at a meeting with key stakeholders, including local policy makers, representatives of the relevant government agencies and members of civil society organizations. The meeting aimed to present the study's findings on gender dynamics in small-scale aquaculture households in rural Myanmar and discuss recommendations to improve gender equality in small-scale aquaculture in the country. The meeting also aimed to stimulate dialog among stakeholders and find ways to strengthen partnerships and develop strategies that integrate gender-sensitive approaches in small-scale aquaculture. Feedback was gathered from participants on the key challenges and opportunities for improving gender equality in small-scale aquaculture value chains, as well as the feasibility and potential impact of the recommendations presented at the meeting. Stakeholder feedback was analyzed and synthesized to refine the recommendations further and inform future implementation strategies, some of which are presented in this paper.

ETHICS

The study was not able to obtain any ethical approval from the national ethics body in Myanmar due to political instability during the time of the study. Nevertheless, all the researchers completed an online training by UNICEF titled 'Introduction to Ethics in Evidence Generation.' The researchers also ensured that all ethical standards required are followed throughout the study period.

RESULTS AND DISCUSSION

TABLE 1 and TABLE 2 are snapshot of the characteristics of the people in the two townships studied by class. The two townships differed in the ethnic and religious composition of their community members. In Kyaiklat Township, the people in the community where the study was conducted were predominantly Karen Christians, except for one or two Myanmar Buddhist families. In Dedaye Township, where the study was conducted, the community members were predominantly Myanmar Buddhists. There are 14-15 ethnic minorities in these villages, including Kayin Christians.

TABLE 1. Key characteristics of women and men fish farmers interviewed

Sr	Gender	Age	Marital status	Socioeconomic class	Township	Village Tract	Position
1	Female	57	Married	Middle	Dedaye	Kan Seik	Farmer
2	Male	49	Married	Middle	Dedaye	Kan Seik	Farmer Leader
3	Male	25	Married	Middle	Dedaye	Kan Seik	Farmer
4	Female	56	Married	Middle	Dedaye	Kan Seik	Farmer
5	Female	60	Married	Middle	Dedaye	Hmaw Bi Su	Farmer
6	Female	52	Married	Middle	Dedaye	Hmaw Bi Su	Farmer
7	Male	62	Married	Poor	Dedaye	Hmaw Bi Su	Farmer
8	Male	55	Married	Poor	Dedaye	Myin Ka Kone	Farmer
9	Female	32	Married	Poor	Kyaiklat	Sar Hpo Thaing Chaung	Farmer
10	Female	51	Widow	Middle	Kyaiklat	Sar Hpo Thaing Chaung	Farmer Leader
11	Male	67	Married	Poor	Kyaiklat	Sar Hpo Thaing Chaung	Farmer
12	Female	36	Married	Poor	Dedaye	Ohn Pin	Farmer
13	Male	59	Married	Poor	Dedaye	Ohn Pin	Farmer Leader
14	Male	60	Married	Rich	Kyaiklat	Sar Hpo Thaing Chaung	Farmer
15	Female	32	Single	Middle	Kyaiklat	Sar Hpo Thaing Chaung	Farmer
16	Male	65	Married	Rich	Kyaiklat	Sar Hpo Thaing Chaung	Farmer
17	Male	53	Married	Middle	Kyaiklat	Sar Hpo Thaing Chaung	Farmer
18	Male	50	Married	Middle	Kyaiklat	Sar Hpo Thaing Chaung	Farmer
19	Female	62	Married	Middle	Kyaiklat	Sar Hpo Thaing Chaung	Farmer
20	Male	25	Married	Rich	Dedaye	Kan Seik	Farmer

TABLE 2. Key characteristics of community leaders interviewed.

Sr.	Gender	Age	Marital status	Socioeconomic class	Township	Village Tract	Position
1	Male	N/A	Married	Rich	Dedaye	Kan Seik	Village tract administrative leader
2	Male	46	Married	Middle	Kyaiklat	Sar Hpo Thaing Chaung	Village tract administrative leader
3	Male	62	Married	Rich	Dedaye	Ohn Pin	Village tract administrative leader
4	Male	42	Married	Rich	Kyaiklat	Sar Hpo Thaing Chaung	Village tract administrative leader

GENDERED ACCESS TO KEY RESOURCES NEEDED FOR SMALL-SCALE AQUACULTURE

In small-scale aquaculture, access to and control over resources plays an important role in determining who benefits from their engagement in the sector. Access to and control over resources are key concepts in small-scale aquaculture development in communities. Access here can refer to the ability of women and men to use a resource, whereas control refers to the power to define and decide on its use. Women and men informants were found to have different levels of access to productive resources (e.g. knowledge, technologies, ponds, seeds and inputs, fishing grounds, fishing gear and credit) in different social classes (see TABLE 3.). Even when women have access to a resource, they may not be able to decide how these resources are used (and benefit), as this is influenced by their gender and their intersecting identities within the social hierarchy.

TABLE 3. Classification of study communities by class

Class	**Key Characteristics**	**Income range (MMK)**	**Common Occupations**	
			Men	**Women**
Poor	Work as daily labours. Collect fish, prawns and crabs from farms and streams using nets and traps. Often travel to Pyapone town to work as daily labour during the rainy season. Children in the household often tend to work as daily labours as their parents do not own land and are financially poor.	Approx. 7000 - 8000 (daily income) Over 100,000 kyats per year	Work as daily labour within their village or in towns nearby	Work as daily labour in rice fields (planting and harvesting), and in gardens (eg. beans).
Middle-class	Engage in small-scale farming on and own approx. 1-10 acres of farm land. Engage in farming of seasonal crops. Engage in fishing small scale (own 1 fishing boat). Engage in animal husbandry. Children from the middle-class households tend to work in the factory or work in Thailand and send money back to the family. Parents use the money to buy more farmland.	2,000,000 - 2,500,000 kyats per year	Men engage in small-scale fishing, farming and gardening (eg. betel leaves).	Operate a small grocery shop
Rich	Main source of livelihood is through farming on and own approx. 30-100 acres of farm land. Engage in gardening on own land. Engage in livestock activities (ie.raising chicken and	10,000,000 - 20,000,000 kyats per year from farming	Men do farming and hired labours for farming	Women do animal husbandry - chicken and pigs

pigs) Engage in capture fisheries using drift nets and raft drift net Engage in fish farming and own fish ponds with the size of approximately 2 acres. Own boats and do boat transportation businesses. Have parents who own farmland (which are inherited) and plantations. They have children who work in other countries based on their higher level of education, they tend to land a job as a manager, salesperson, or in construction sites. They are able to send money back to their family. Some families use the money to expand their business, engage in business in a new area or buy farmland in the village. Own grocery shop or dry good shop. Own cars. Own sawmill businesses.	Men also do fishing with fish boats

Little information was elicited about access to and control over resources, as informants believe that the common resources (e.g., water bodies) within their family are accessible to all and are not differentiated by gender. Among the different types of resources accessed by project beneficiaries are human resources. The informants in this study mostly had family members who often worked with them in fish farming. They also own physical resources such as land, ponds, fish farming equipment (e.g. motorbikes, motor boats and boats) and inputs. However, these vary by class (as indicated in TABLE 1). Although the project provides some of the needed inputs for fish farming, they often have to travel far from their villages to fetch these inputs such as fish seed, feeds and fertilizers. In addition, the access roads to the villages are reportedly in poor condition, especially during the rainy season, so that the machinery needed for them (especially for agricultural activities) cannot be delivered:

> *Due to terrible road conditions, paddy harvesting machines cannot be brought in during the rainy season. Our village is also close to a deepwater area.*
>
> *(Men, 53 years old, Kyaiklat Township, IDM17)*

The quote highlights the challenges related to infrastructure and environment faced by people in the community. Apart from these, we also found intangible resources such as social capital and information to be gendered. In the case of aquaculture, men were found to have better access to knowledge (through training from governmental and non-governmental organizations) and to people who know about fish farming:

> *We may say that my husband is primarily in charge of this business because he is the one who attended the training and shared his knowledge with us on how to run it….Unfortunately, I could not attend the training because they held the training in the township (Pyapon).*
>
> *(Women, 57 years, Dedaye Township, IDW01)*

Although the response highlights gender disparity in access to knowledge and training in the community, there are instances in some of the households where women attend trainings when their husbands are unable to:

> *I go to the training when my husband is busy with other things. If the training is held in a nearby location, I attend it; but if it is held in a township, my husband attends it.*
>
> *(Women, 56 years old, Dedaye Township, IDW04).*

However, some of these informants are able to attend training given that it is held within or nearby their community. The gender differences in access to aquaculture training programs can be one of the reason why men are predominantly and primarily responsible for aquaculture business in this community.

THE ROLES AND RESPONSIBILITIES OF WOMEN AND MEN IN SMALL-SCALE AQUACULTURE

In the study communities, women are predominantly responsible for household chores, which consume most of their time in a day. In addition to these household responsibilities, they also play key roles in aquaculture. According to the informants of this study, women involved in the project were generally tasked with feeding the fish and monitoring both the fish and the pond as part of their daily aquaculture responsibilities:

> *In the fish farming business, men mainly work in repairing ponds, manuring, putting lime, and irrigating. And the main tasks for women are feeding and selling fish.*
>
> *(Women, 52 years old, Dedaye Township, IDW06)*

Women engage in these aquaculture activities alongside men, who are generally responsible for activities, such as management of the pond, which includes liming and irrigating. Women travel to nearby markets to sell fish harvested from their homestead ponds:

> *Women mostly help their husbands when they start breeding fish after building a pond. Women are normally involved in buying fish food and feeding them. In small-scale fish farming, women can do better. Because women spend most of their time at home, they are responsible for feeding fish and irrigating water into the ponds when their husbands are going outside.*
>
> *(Men, 62 years old, Dedaye Township, IDM07)*

As reported in the quote above, women play an active and often central role in managing the fish farming activities because they spend more time at home compared to men. Men are predominantly responsible for digging and maintaining the pond. They manage the laborers they hire to assist in the aquaculture activities and handle water pumps when irrigating their ponds. Men are also responsible for harvesting fish from their ponds, and together with women, they sell their harvests to nearby markets. Apart from these roles, men are responsible for purchasing fish feeds and other inputs needed for their fish farms. However, most of these roles and responsibilities were reported not to be strictly adhered to by gender and were conducted by both women and men in the community:

> *My spouse and sons in our family are in charge of these responsibilities. Women are less likely to take the lead in this business because they prefer to rely on their husbands. On the other hand, women take the lead on their availability while men are not around.*
>
> *(Men, 53 years old, Kyaiklat Township, IDM17)*

The quote highlights the perception of men that women prefer to assume leadership only in the absence of men. Nevertheless, there are no roles that were mentioned to be not conducted by women in the community in aquaculture especially when needed. In some circumstances, such as illness and other emergencies, either gender can take over the responsibilities of the other to keep their fish farming activities on track:

> *There are no unusual jobs for women. We also don't assign separate tasks to different gender. Because my spouse and I share the same tasks, it's hard to bring out the differences. However, due to my knee injury, I can now assist with managing things from home. So, my husband assists in putting lime, water pumping, household chores, and fish sales. My two sons also assist their father. The older son catches the fish, and the younger son weighs it. For our family, this is a small business.*
>
> *(Women, 60 years old, Dedaye Township, IDW05)*

Additionally, the statement by the informant suggests that she currently oversees the operations of the business from her house, while her husband and sons are now responsible for executing physical duties such as the application of lime, water pumping, and the sale of fish. Under specific conditions, men in the communities may undertake caregiving duties, such as cooking meals for their family members. However, it has been found that women tend to participate more actively in productive roles in situations in which their partners are unable to generate income due to reasons such as illness, death, gambling, or alcoholism. This highlights the burden women carry where they fulfil both productive and reproductive roles, with their former role often becoming more important to compensate for men's insufficient or lack of involvement/engagement. This reinforces gender inequalities and can have negative impacts on women's economic empowerment and overall well-being.

This study also found informants to report changes in the attitudes and behaviors of people in the community with regards to gender roles and responsibilities. The following quote by an informant highlights such changes in her community:

> *In the past, when men did the labour intensive jobs, some women also thought these things were not related to them. But things are changing now that people are becoming more conscious that 'all people have the equal rights.' As a result, women today assist men even in the male jobs as they can. People are also no longer differentiating tasks based on gender because they try to adapt with the changes.*
>
> *(Woman, 32 years old, Kyaiklat Township - IDW09)*

Changes in the way people view labor-intensive jobs, which were previously associated with gender, and traditionally considered as roles of men, have blurred the lines between the roles of women and men within aquaculture. As a result, more women are now performing roles within aquaculture that were previously dominated and played by men. Although the roles that women play are conditional and can be under specific circumstances or even constraints, the shift itself can be considered empowering for women in communities.

WOMEN'S AND MEN'S RELATIONSHIP AND THEIR DECISION MAKING IN SMALL- SCALE AQUACULTURE

In most of the study communities, women make decisions about household finances and the distribution and consumption of fish. They are also involved in a variety of fish farming activities, including marketing the fish they produce. Therefore, they are able to make decisions about these activities. However, their decision-making ability is also dependent upon the relationship between the woman and her husband or other male household members. The following quotation is from an informant who explains how and in what areas of aquaculture he and his wife make decisions. He also shares how important continuity of the activities is to him even in his absence:

> *My wife mainly decides about family consumption, livelihood, and selling the products. We don't take any advice from other people regarding the family's business. Even if we have different views, my wife can do the better job in selling the products because she is expert in that field. Usually, I involve 60% and my wife involves 40% in making a decision. Regarding the business, we both discuss everything with each other before doing it. We don't [have any] concerns about making decisions. I asked my wife 'would you be able to maintain the ponds when I am not around?', and she told me that she can. So I don't need to worry about that anymore.*
>
> *(Man, 62 years old, Dedaye Township - IDM07)*

The informant highlighted that he and his wife maintain regular communication prior to making any business decisions, despite any differences in their respective decision-making areas. Other informants also reported that they discuss with their spouses and/or (adult) children before making any decision regarding their aquaculture business. According to one of the informants, who is unmarried, she exercises independent decision-making. The marital status of an individual may have an impact on their decision-making process. However, additional research is required to examine this correlation:

> *I am the sole decision-maker in this business. My brothers just support me in what I want to do. Even if I can do it, they help me. So, I share with them what I want to do. They never compel me to do anything.*
>
> *(Woman, 32 years old, Kyaiklat Township - IDW15)*

The informant asserts her autonomy in decision-making while also acknowledging the assistance provided by her male siblings in carrying out her work. In addition to marital status, education, knowledge, and experience were found to influence decision-making ability.

> *Women are not included in the decision-making process because women can't decide well due to a lack of education and limited experiences.*
>
> *(Women, 57 years old, Dedaye Township)*

> *Before I make any decisions, my wife and I always discuss the issues. She also discusses her issues and obligations with me. However, since my wife did not attend training and was unfamiliar with fish breeding processes, I make most of the decisions in those areas.*
>
> *(Man, 49 years old, Dedaye Township)*

Both the informant's assertion that women's lack of education or knowledge and experience conducting certain or all of the activities within the fish farming cycle can be attributed to the latter not attending training programs on the activities. These training programs organized by government and non-governmental agencies are often held in distant places (e.g., townships), rather than in their communities. The distance and the travel requirements prevent people, especially the women and other marginalized groups who are not able to travel from participating and learning from the programs. Women in the communities are typically responsible for their household chores and children, hence they are often not able to leave their family and travel far to attend the programs and meetings:

> *Women's participation in training is not much related with their family's economic condition. Some women are just busy with their children or household chores and can't go to the training.*
>
> *(Woman, 32 years old, Kyaiklat Township, IDW09)*

Women obtain information regarding activities and new lessons through their spouses or other family members who have taken part in the training. Consequently, the absence of an avenue for these women to establish a connection with instructors or fellow participants hinders their capacity to obtain the necessary guidance. As a result, it is frequently seen that women are excluded from decision-making processes, including aquaculture activities, input acquisition, and/or labor engagement.

Several male informants reported that they engage in discussions with their spouses and/or children before reaching a decision. The majority of informants indicated a preference for engaging in decision-making processes with their family members as opposed to receiving suggestions from other people. However, it was discovered that in situations where opposing viewpoints existed, men were the ones who ultimately made the decision. The aforementioned proposition implies that despite the importance placed on familial participation, traditional gender norms continues to have a substantial influence on the decision-making processes that take place within households.

OTHER CONSTRAINTS FACED IN SMALL-SCALE AQUACULTURE

Women and men informants in the communities reported that they are generally interested in and open to engaging in fish farming but have some difficulties starting it up and/or running it. This is especially true for the poorer community members, who can't afford the investment, typically over a period of six months. Some of the challenges faced by predominantly poor to moderate women and men in starting and sustaining their fish farming business activities include and are not limited to lack of space for pond, lack of capital to build a pond, inputs (e.g.,feed, fertilizers, lime) and/or equipment (e.g., water pump), increase in fuel price which affects the use of water pump, high cost of laborers. The process of registering a fish farm on the land they are using is challenging for some, while others experience difficulties in identifying suitable land for fish farming. Middle-class farmers also mentioned lack of markets to expand into, especially larger markets. Other general constraints mentioned included GIFT Tilapia can't find its own food, and in some areas people do not prefer to consume GIFT Tilapia. For the informants of this study, fish farming is similar to raising pigs, ducks, or chickens for their eggs and meat. When the fish mature, aquaculture provides them with a source of fish for consumption. They further stated that although they would like to regard it as successful when explicitly asked, only one out of five individuals who initiated fish farming can be considered successful in this venture given all the challenges stated above.

It was expressed that many impoverished families experience difficulties and strained relationships, often as a result of alcohol consumption among male family members, which leads to conflict. Furthermore, the substance abuse of individuals was reported to hinder their capacity to engage in small-scale aquaculture and reap its potential benefits:

> *Men, too, love drinking alcohol, and their actions might impact the business. On the other hand, women can focus well on the business and do no negative things that could affect the business.*
>
> *(Women, 51 years old, Kyaiklat Township, IDW10)*

The woman informant places emphasis on the prevalence of substance abuse among the men in her community and its detrimental impact on their fish farming activities. In another interview, a male informant from the same township also shared the issue of substance abuse among men and, additionally, lottery games among women:

> *Some women cannot engage in the fish farming sector because they do not understand the economic benefits. For example, men drink alcohol in some households while women play three-digit lottery games..I primarily manage this business on my own, and I do not [prefer to] hire laborers since I do not think they are trustworthy. If I give them a task, all they want to do is drinking alcohol or spending on a gamble on cockfights.*
>
> *(Men, 60 years old, Kyaiklat Township, IDM14)*

The present study did not focus on determining the prevalence and impact of gambling and alcohol consumption within the communities under investigation. Therefore, no conclusive data regarding these issues could be obtained. Further research into these issues within those communities may provide additional insights. Natural disasters and weather-related impacts, such as storms, acid rain, and floods; excessive heat; and low water levels, which can reduce the oxygen levels in the pond water and kill the fish, also pose threats to the small-scale aquaculture business in the community. In addition, poaching was mentioned, including shocking and killing fish with a battery.

Despite the interest from women and men in the communities in fish farming, they face difficulties in starting and/or maintaining their business due to the challenges identified in the paragraphs above. Addressing these challenges is crucial to ensure uptake and sustainability of fish farming in these communities.

DISCUSSION AND RECOMMENDATIONS

In this study, women and men informants had access to a variety of productive assets, including information, technology, credit, fishponds, seeds, inputs, fishing areas, and gear, based on their socio-economic status. However, due to their gender and intersecting positions within the social hierarchy, more women than men may lack the ability to decide how to use and benefit from some or most of these resources. This differential access can significantly impact women's productivity and income (Fon, 2016) leading to physical, material, and emotional depletion (Hedström & Olivius, 2020). Previous studies (Glazebrook et al., 2020; Huyer, 2016; Uduji et al., 2019) has shown that the ability to benefit from resources varies not only between women and men but also among women themselves (Shitima, 2018).

In the case of women in the study communities, their ability to use and benefit from the resources varies predominantly and is not limited to their age, marital status, whether their husbands are addicted to alcohol and/or gambling. Additionally, gender norms and gender division of labor further shape this differential access of women and men, to resources and their decision making abilities (Morgan et al., 2016) subsequently hindering women from benefiting from these resources. These barriers disproportionately affect women, especially those with intersecting marginal identities. Moreover, the contribution of women to aquaculture often remains unrecognized due to patriarchal norms, limiting their access to training opportunities and decision-making processes (Bosma et al., 2019). Consequently, these barriers does not only prevent women from engaging in and benefiting from aquaculture, but it also perpetuates inequalities.

Furthermore, the impact of climate change can exacerbate these existing barriers for women and other marginalized people in aquaculture (Phan et al., 2019). Climate-related impacts such as extreme weather, changes in rainfall pattern and water quality can destroy aquaculture infrastructure, creating vulnerability, which is often higher among marginalized groups such as women, children, indigenous peoples, elderly and disabled (Poulain et al., 2018). Therefore, small-

scale aquaculture programs and initiatives in countries at high risk of and impacted by climate change like Myanmar must be consider gender and climate risks to improve livelihoods, income, and nutrition and ensure that everyone has an equal opportunity to participate and benefit from them.

In order to have a gender-inclusive, climate-resilient small-scale aquaculture intervention in Myanmar, where different groups of women and men are able to equally access and benefit from, it is important that gender and other relevant normative barriers are addressed. The following four key areas that interventions can focus on are:

(1) Identifying different groups of women and men and providing them with social and technical support based on their interest and needs through a gender-responsive interventions/programs. There is a need to identify different categories of beneficiaries and be provided with assistance based on their interest and needs. Interventions may target people who have good relationships/connected to the community leaders and/or any other people in power as these people are easier to be identified. However, targeting and providing them with needed support (i.e., and not limited to aquaculture inputs, trainings and market linkages) by aquaculture interventions are not the best way to meet the project outcome. Furthermore, it is important that small-scale aquaculture interventions identify and address patriarchy and normative barriers that leads to inequalities in the communities. These barriers restrict equal participation and constrain the distribution of benefits derived from the initiatives. Patriarchy and normative barriers also causes social challenges within communities, which also needs attention as it impacts people and their ability to benefit from aquaculture.

Interventions needs to (2) identify and address social issues in the community that impact the lives of women and men, including those who are engaged in aquaculture. Social issues in the community that was reported to impact women, men, and their family and that prevents them from engaging in any livelihood activities are men's addiction to alcohol and their gambling habits. There is a need for future intervention implementers to work with the relevant local authorities (i.e. government and non-governmental agencies) including community health and enforcement agencies to identify and address these challenges. People who are from the higher class, who often own large and many fishponds, generally can afford to purchase inputs and access trainings. But those who would benefit more are those from middle class, who owns smaller fishponds but maybe less able to afford to purchase inputs and access trainings. People from the lower socio-economic group may need to be assisted in other ways. These can include training them on skills that could earn them living, providing them access to project or even community ponds where they can raise fish, and providing them with inputs and guidance throughout the project period. To ensure that women are also able to attend and benefit from trainings conducted by the project, it is important that the project adopts a gender-responsive approach to training. There is a need to identify suitable time, location and delivery modality. This needs to be integrated in the manual of the trainers to ensure that these factors are considered when decisions are made to conduct trainings for fish farmers.

(3) Providing fish farmers with access to key inputs and market linkages is key to ensuring their sustainable engagement in small-scale aquaculture. It is important to identify the key inputs fish farmers need to raise and sell their fish successfully. Fish feed was mentioned to be one of the most important inputs which is expensive and unaffordable for many of the informants in this study. High-quality fish feeds were needed by the farmers to ensure that the fish growth is not hindered. Other inputs such as quality fish seeds and market linkages ensures that the farmers can harvest and sell their produce in time and get decent income.

(4) Identify context-specific climate change impacts and design adaptation (and mitigation) mechanisms together with the community members engaged in aquaculture. As the changes in climate continue to impact the communities reliant on aquaculture in Myanmar, it is crucial for future programs to engage with community members and develop context- and sector-specific climate change adaptation and mitigation strategies. These strategies will result in increased resilience towards climate change impacts, especially extreme weather events, and changes in water levels, temperature, and salinity.

LIMITATIONS OF THIS STUDY AND SUGGESTIONS FOR FUTURE STUDIES

This study has several limitations because of the short timeframe, resources, and mobility restrictions in Myanmar. First, the study was not conducted in person, but via phone. Limitations of using mobile phone interviews include the challenges of building rapport with the informants, with network connections, the limited time required to conduct the interview, and the inability of researchers to observe the social environment of the informants. Rapport building may not have been as effective as in-person interviews if it was conducted. However, the project staff, who had a good working relationship with the fish farmers, ensured that the informant's trust was obtained before they conversed with the researchers via their mobile phones. Second, the number of informants in this study was small, and the duration of the call was shorter than in typical face-to-face interviews. Third, only members in two communities/villages participated in this study. Future studies could include more communities/villages to capture variations in social contexts and issues, reducing context- specific biases. Future studies could also examine fisheries and aquaculture policies, including their implementation and implications, to assess how responsive they are to the needs of both women and men engaged in small-scale aquaculture in Myanmar.

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REFERENCES

Aung, Y. M., Khor, L. Y., Tran, N., Shikuku, K. M., & Zeller, M. (2021). Technical efficiency of small-scale aquaculture in Myanmar: Does women's participation in decision-making matter? *Aquaculture Reports*, 21, 100841. https://doi.org/10.1016/j.aqrep.2021.100841

Belton, B. (2013). *Small-scale aquaculture, development and poverty: A reassessment* [Report]. WorldFish. http://www.worldfishcenter.org/resource_centre/WF-3717.pdf

Belton, B., Hein, A., Htoo, K., Kham, L. S., Nischan, U., Reardon, T., & Boughton, D. (2015). *Aquaculture in transition: Value chain transformation, fish and food security in Myanmar.* [Working paper]. International Food Policy Research Institute. https://www.ifpri.org/publication/aquaculture-transition-value-chain-transformation-fish-and-food-security-myanmar-0

Bosma, R. H., Nguyen, T. D., Calumpang, L. M., & Carandang, S. A. (2019). Gender action plans in the aquaculture value chain: What's missing? *Reviews in Aquaculture,* 11(4), 1297–1307. https://doi.org/10.1111/raq.12293

Brugere, C., & Williams, M. (2017, November 16). Women in aquaculture. G*ender in Aquaculture and Fisheries.* https://genderaquafish.org/portfolio/women-in-aquaculture/

Carnegie, M., Cornish, P. S., Htwe, K. K., & Htwe, N. N. (2020). Gender, decision-making and farm practice change: An action learning intervention in Myanmar. *Journal of Rural Studies*, *78*, 503–515. https://doi.org/10.1016/j.jrurstud.2020.01.002

Danielsen, K., & Newton, J. (2018). *Gender strategy: African Chicken Genetic Gains program* [Report]. International Livestock Research Institute. https://cgspace.cgiar.org/handle/10568/91218

EIGE. (2016). Gender dynamics. In *European Institute for Gender Equality.* https://eige.europa.eu/publications-resources/thesaurus/terms/1326?language_content_entity=en

Fon, D. E. (2016, April 12). *African women and sustainable small scale agricultural production.* Semantic Scholar. https://www.semanticscholar.org/paper/African-Women-and-Sustainable-Small-Scale-Fon/324eded8b396d8c1ea40b6b34547d7e2b5b0c011

Food and Agriculture Organization, & Network of Aquaculture Centres in Asia-Pacific. (2003). Myanmar aquaculture and inland fisheries (RAP Publication).

Food and Agriculture Organization. (2022). Towards blue transformation. In *The state of world fisheries and aquaculture* (No. 266). https://doi.org/10.4060/cc0461en

Garlock, T., Asche, F., Anderson, J., Ceballos-Concha, A., Love, D. C., Osmundsen, T. C., & Pincinato, R. B. M. (2022). Aquaculture: The missing contributor in the food security agenda. *Global Food Security, 32,* 100620. https://doi.org/10.1016/j.gfs.2022.100620

Glazebrook, T., Noll, S., & Opoku, E. (2020). Gender matters: Climate change, gender bias, and women's farming in the global south and north. *Agriculture*, *10*(7). https://doi.org/10.3390/agriculture10070267

Hedström, J., & Olivius, E. (2020). Insecurity, dispossession, depletion: Women's experiences of post-war development in Myanmar. *European Journal of Development Research, 32*(2), 379–403. https://doi.org/10.1057/s41287-020-00255-2

Hillenbrand, E., Lakzadeh, P., Sokhoin, L., Talukder, Z., Green, T., & McLean, J. (2014). Using the social relations approach to capture complexity in women's empowerment: Using gender analysis in the Fish on Farms project in Cambodia. *Gender and Development, 22*(2), 351–368. https://doi.org/10.1080/13552074.2014.920992

Huyer, S. (2016). Closing the gender gap in agriculture. *Gender, Technology and Development, 20*(2), 105–116. https://doi.org/10.1177/0971852416643872

Kabeer, N., & Subrahmanian, R. (1996). *Institutions, relations and outcomes: Framework and tools for gender-aware planning.* [Report]. IDS.

Karim, M., Leemans, K., Akester, M., & Phillips, M. (2020). Performance of emergent aquaculture technologies in Myanmar; challenges and opportunities. *Aquaculture*, *519*, 734875. https://doi.org/10.1016/j.aquaculture.2019.734875

Kruijssen, F., McDougall, C. L., & van Asseldonk, I. J. M. (2018). Gender and aquaculture value chains: A review of key issues and implications for research. *Aquaculture, 493,* 328–337. https://doi.org/10.1016/j.aquaculture.2017.12.038

Lambrecht, I., & Mahrt, K. (2019). *Gender and assets in rural myanmar: a cautionary tale for the analyst* [Working paper]. https://papers.ssrn.com/abstract=3507755.

Maung Soe, K., Baran, E., Grantham, R., Tezzo, X., & Johnstone, G. (2020). *Myanmar inland fisheries and aquaculture: A decade* (ACIAR Monograph No. 209). Australian Centre for International Agricultural Research. https://digitalarchive.worldfishcenter.org/handle/20.500.12348/4049.

Morgan, M., Terry, G., Rajaratnam, S., & Pant, J. (2016). Socio-cultural dynamics shaping the potential of aquaculture to deliver development outcomes. *Reviews in Aquaculture, 9*(4), 317–325. https://doi.org/10.1111/raq.12137

Murnyak, D. (2010). *Fish Farming: Basics of Raising Tilapia & Implementing Aquaculture Projects*. ECHOcommunity. https://www.echocommunity.org/resources/c3b7c2bd-47d4-4dd6-9b48-d49983e58618

Othman, N., Latip, A. R. A., & Sa'at, N. H. (2019). Fasa Peralihan Nelayan Laut Dalam serta Kesan ke atas Ekonomi, Sosiobudaya dan Persekitaran (Transitional Phase of Deep-Sea Fishermen and Impact on Economic, Sociocultural and Environment). *Akademika*, *89*(2). http://ejournal.ukm.my/akademika/article/view/30360

Phan, L. T., Jou, S. C., & Lin, J.-H. (2019). Gender inequality and adaptive capacity: The role of social capital on the impacts of climate change in Vietnam. *Sustainability, 11*(5). https://doi.org/10.3390/su11051257

Poulain, F., Himes-Cornell, A., & Shelton, C. (2018). Methods and tools for climate change adaptation in fisheries and aquaculture. In *Impacts of climate change on fisheries and aquaculture: Synthesis of current knowledge, adaptation and mitigation options.* Food and Agriculture Organization of the United Nations.

Rahman, M. H. A., Othman, A., & Binti Zubairi, Y. Z. (2024). Women and Poverty: A Qualitative Study on Selected Female-Headed Households in Kuala Lumpur and Selangor, Malaysia. *Akademika*, *94*(3), 335–350. https://doi.org/10.17576/akad-2024-9403-19

Rajaratnam, S., Ahern, M., & McDougall, C. (2020). Gender and the political economy of fish agri-food systems in the global South. In C. E. Sachs, L. Jensen, P. Castellanos & K. Sexsmith (Eds.), *Routledge handbook of gender and agriculture*. Routledge.

Rashid, S., Minot, N., & Lemma, S. (2019). Does a "Blue Revolution" help the poor? Evidence from Bangladesh. *Agricultural Economics, 50*(2), 139–150. https://doi.org/10.1111/agec.12472

Sarker, S., Basak, S. C., Hasan, J., Hossain, M. S., Rahman, M. M., & Ahsanul Islam, M. (2017). Production in small scale aquaculture farm: A success story from Bangladesh. *Journal of Aquaculture Research and Development, 8*(10). https://doi.org/10.4172/2155-9546.1000515

Shitima, C. M. (2018). Intersections of gender and age in accessing River Basin Resources in Tanzania: A comparative analysis of fishing and agro-pastoralist communities in rural areas of Tanzania. *Afrika Focus, 31*(1), article 1. https://doi.org/10.21825/af.v31i1.9043

St. Louis, T. J., & Oliveira, N. M. (2022). Women's contribution to aquaculture's regional development: A literature review. *Journal of Applied Aquaculture, 34*(2), 294–313. https://doi.org/10.1080/10454438.2020.1842284

Tajik, O., Golzar, J., & Noor, S. (2025). Purposive sampling. *International Journal of Education & Language Studies*, *2*(2), 1–9. https://doi.org/10.22034/ijels.2025.490681.1029

Thant, P. S., Espino, A., Soria, G., Myae, C., Rodriguez, E., Barbon, W. J., & Gonsalves, J. (2022). Myanmar local food systems in a changing climate: Insights from multiple stakeholders. *Environmental and Sustainability Indicators*, *14*, 100170. https://doi.org/10.1016/j.indic.2022.100170

Uduji, J. I., Okolo-Obasi, E. N., & Asongu, S. A. (2019). Corporate social responsibility and the role of rural women in sustainable agricultural development in sub-Saharan Africa: Evidence from the Niger Delta in Nigeria. *Sustainable Development, 27*(4), 692–703. https://doi.org/10.1002/sd.1933

van Eerdewijk, A., & Danielsen, K. (2015). *Gender matters in farm power.* [Report]. KIT (Royal Tropical Institute). https://www.kit.nl/wp-content/uploads/2018/08/551bcea41f1f2_Gender-Matters-in-Farm-Power-final- 150227-AE-KD.pdf

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