CGIAR RESEARCH PROGRAM ON Fish
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Can climate-smart aquaculture enable women's empowerment in rural Bangladesh?

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CGIAR RESEARCH PROGRAM ON Climate Change, Agriculture and Food Security
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List of abbreviations

FGD	focus group discussion
KII	key informant interview
SSI	semi-structured interview

Summary

Climate-smart aquaculture provides a means to ensure sustainable fish supply to those who experience negative impacts of climate change. However, there has been little research on possible benefits of climate-smart aquaculture for enabling the empowerment of women who are fish farmers. This brief outlines the key findings of a study that investigated a WorldFish homestead pond intervention, which is considered a climate-smart practice. In particular, the study assessed whether this intervention acted as an enabler toward empowerment for women in two divisions in rural Bangladesh. Demonstration of contributions to women's empowerment from such interventions could be an important element in promoting climate-smart aquaculture. Conversely, surfacing of any unintended negative consequences are important to improve the gender-inclusive and responsive design of climate-smart interventions.

Key messages

1 The central involvement of women as fish farmers in a participatory climate-smart aquaculture intervention was perceived by study participants to have facilitated increases in women's household decision-making (an aspect of empowerment).

2 Study participants identified this shift in household decision-making (related to the climate-smart aquaculture intervention) as having increased their ability to contribute to household food security and, in particular, income. These shifts in decision-making were linked by participants to women's increased practical knowledge and skills (such as about climate-smart species and best management practices) and their having direct access to and control over a key asset involved (fingerlings).

3 Women expressed that the time involved in the climate-smart intervention and practices was not a burden; in some cases, women saw these as time saving overall due to the increased availability of fish in the homestead pond.

4 There were limits to the increases in women's decision-making power; the key constraining factor was identified by women as gendered household power dynamics. As such, understanding how climate-smart aquaculture interventions can engage constructively with household dynamics is recommended as a key component for the successful adoption of climate-smart practices by both women and men farmers.

5 A gender-integrated approach (not only a women-targeted approach) to planning, implementing and monitoring climate-smart aquaculture practices is crucial if such practices are to act as an enabler to women's empowerment.

Introduction

Homestead aquaculture and climate change

Fisheries and aquaculture play a major role in food and nutrition security and in the economy of Bangladesh. They are valued at USD 3.6 billion (CIAT 2017) and employ 17 million people, or 11% of the total population (CIAT 2017). They consist of 48% capture fisheries (29% inland and 18.5% coastal) and 52% aquaculture, highlighting the importance the role of aquaculture plays in achieving food and nutritional security in this context (CIAT 2017). In Bangladesh, fish is consumed daily and provides the main source of animal protein. Fish supplies 56% of animal protein consumption in Bangladesh (CIAT 2017). Homestead pond aquaculture can provide households with a supply of fish, which can in turn contribute to food and nutrition security (Castine et al. 2017).

Homestead ponds are a significant contributor to household food security in rural areas in Bangladesh. According to Belton et al. (2012), although homestead ponds do not provide enough income to sustain a household in terms of livelihood (mainly because the relatively small pond size restricts the amount of fish cultivated), they are important in providing fish to households. The study notes that virtually all homestead pond owners will consume a portion of fish produced in their pond, making it an important contributor to food and nutrition security (Belton et al. 2012). However, fish supply from homestead ponds has been decreasing, a trend which is being attributed to unpredictable weather events (Goosen et al. 2018). Weather events are considered to have led to changes in fishpond ecosystems, leading to the decrease in abundance of native fish populations (Goosen et al. 2018). According to WorldFish project findings (in progress), flash floods and salinity intrusion have led to a further decrease in fish numbers in homestead ponds, compromising food security for those households that rely on such fish supply for food and nutrition (CCAFS 2016).

The aquaculture sector requires both policy and technical investments and innovation to address production and climate change challenges. Climate-smart aquaculture (Figure 1) has been recognized by the Bangladesh government and WorldFish as one such approach (Commission 2015).

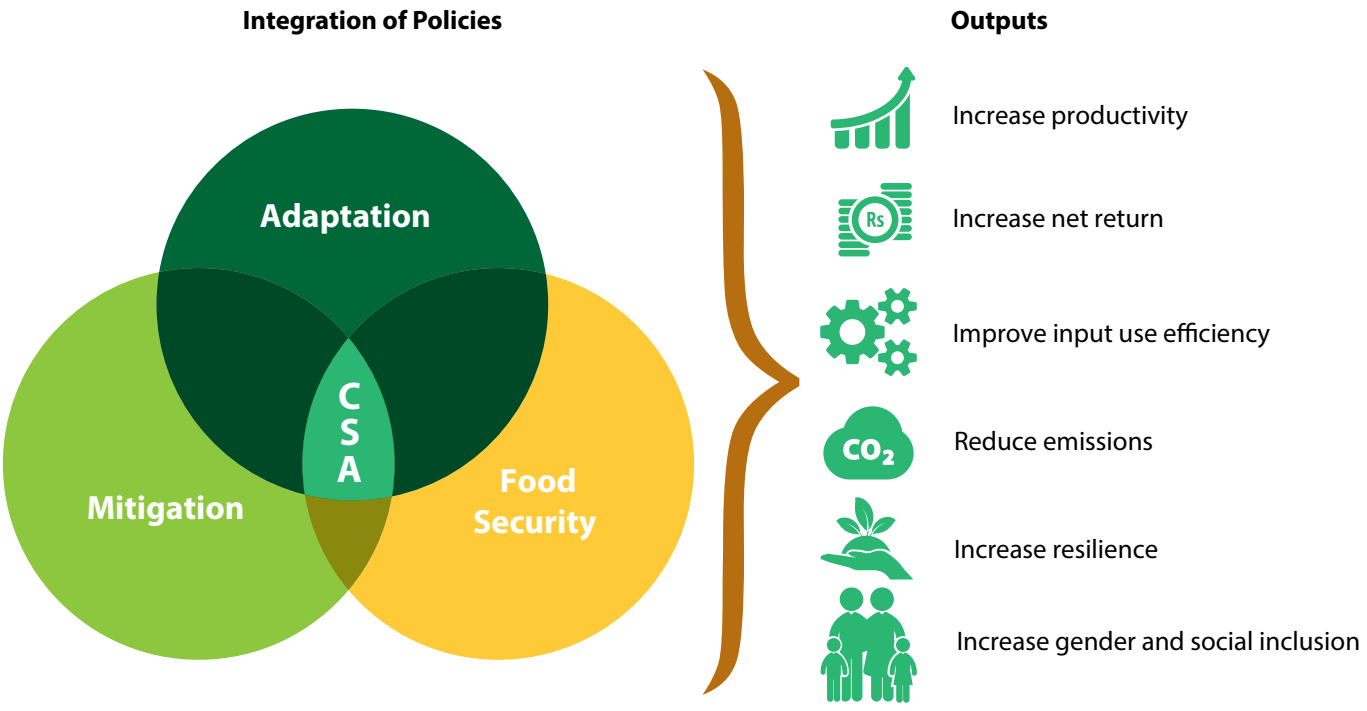


Figure 1. Climate-smart aquaculture: Policy focus and key outputs.

Gender dynamics

Despite progress toward gender parity in some spheres, women in Bangladesh frequently continue to lack the same rights as men, potentially leaving women more vulnerable to climate change (UNDP 2016). For instance, the gender pay gap in the fishing and aquaculture sector provides an example where women do not have the same rights as men, i.e. the right to work and the right to equal pay (Jahan et al. 2015). Such unequal rights translate into women having less access to benefits from income-generating activities in sectors such as aquaculture, compounded by restricted access to fisheries extension services and training (Aregu et al. 2018).

In addition to these formal (policy) gender barriers, constraining social norms in Bangladesh (and many countries) represent widespread informal gender barriers. These include gender norms in Bangladesh that widely frame women as 'homemakers' thereby imposing domestic time burdens on women (Choudhury et al. 2017). These care activities and household burdens can act as barriers to women's involvement in climate-smart activities at the household level. Conversely, men are traditionally considered the 'decision makers' in rural Bangladesh and as such tend to hold more power within households (Aregu et al. 2018). The corresponding lack of women's decision-making power and unequal power dynamics can further limit women's engagement in the adoption of climate-smart practices.

Addressing such barriers has the potential to enable women to play a more significant part in the scaling up of much-needed climate-smart aquaculture practices. More fundamentally, it can enable (contribute to) the empowerment of women, which is both a national goal in Bangladesh and embodied in the UN's Sustainable Development Goal 5 (achieve gender equality and empower all women and girls).

Study focus: Women's empowerment and climate-smart aquaculture

While investments that enable women's empowerment in Bangladesh are clearly needed, as of yet there is a dearth of research examining if and how climate-smart aquaculture can influence the empowerment of women. This study seeks to contribute to addressing that gap.

The definition of empowerment used for the purpose of this study is "*the expansion of choice and strengthening of voice through the transformation of power relations, so women and girls have more control over their lives and future. Empowerment is considered both a process and an outcome*" (Van Eerdewijk et al. 2016, see Figure 2). The study specifically examines two aspects of empowerment: the **time burdens of women**, and **women's decision-making power** within the household.

Time, specifically the allocation and control over it, is a critical asset and dimension of empowerment. Conversely, time burdens, which are associated with heavy workloads and unequal gendered distribution of paid and unpaid work, are recognized as a significant disempowering factor for women (Alkire et al. 2013; Van Eerdewijk et al. 2016). As well as impacting well-being, when newly introduced interventions impose additional time burdens onto women farmers, the adoption of such interventions or technologies is lower (Choudhury et al. 2017).

Strengthening equitable decision-making within farming households is key in enabling the empowerment of women, including women having increased choice over and a stronger voice to speak about production, resources and income (Van Eerdewijk et al. 2016). Increasing decision-making power can strengthen the choice and voices of those often ignored within a household. Increases in decision-making power allow women to have more control over their environment, for example, to choose what crop to grow or what fish to cultivate that will best suit the farmer's needs, which typically translates into what best suits the needs of the family. Women's involvement in decision-making opens the opportunity for women to also have the choice to reinvest earned income. Without the option to make decisions, women may be prevented from pursuing opportunities as farmers or in other areas that could benefit their lives. Decision-making is thus an important factor toward enabling the empowerment of women (Leder et al. 2015).

In the following sections, this brief first presents the study methods (page 5), followed by a description of the climate-smart aquaculture intervention in Bangladesh and its influence on fish production (page 6). It then presents findings regarding time burdens and decision-making (page 8), which are the two domains of empowerment assessed here. It rounds out the analysis by presenting factors identified as constraining empowerment (page 12) and concludes with a synthesis and signals ways forward (page 14).

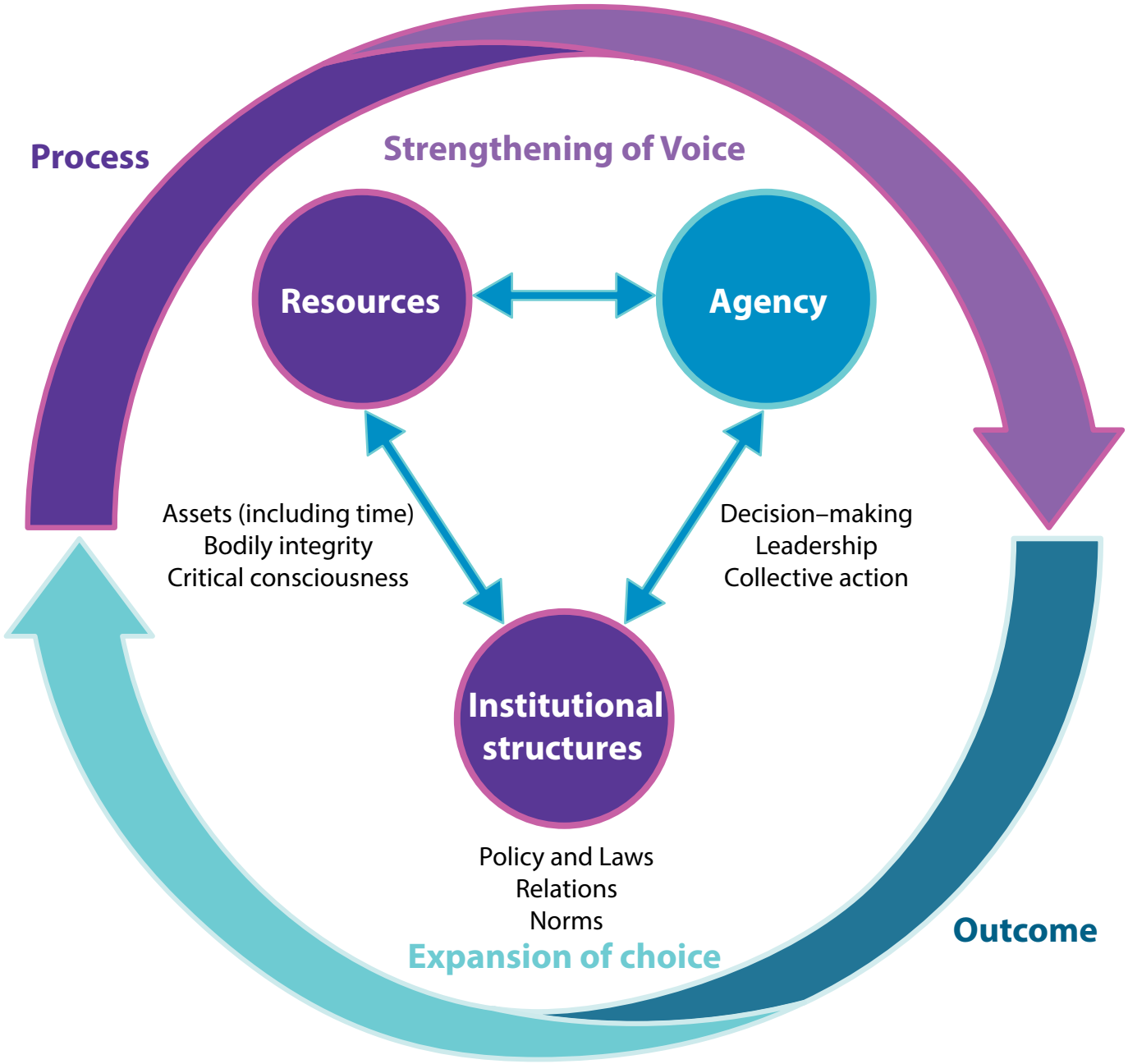


Figure 2. Women's and Girls' Empowerment: A Conceptual Framework, including **Time** and **Decision-Making**.

Methods

The study applied a qualitative approach to investigate changes in and factors shaping women's empowerment following the implementation of a climate-smart aquaculture homestead pond intervention. The climate-smart aquaculture project, 'Effects of fish composition on homestead pond production in challenged area of Southern Bangladesh (homestead pond intervention)' ran for two years (2016 to 2018). The women's empowerment study took place as an interim assessment, between May and November 2018.

The study involved a sample size of 170 farmers (80 men and 90 women) across 9 villages in the Barisal and Khulna divisions of rural Bangladesh. Seven of the nine villages were sites in which the climate-smart aquaculture had been carried out; two non-climate-smart aquaculture intervention neighboring villages were included for comparative purposes. Out of the seven villages that implemented the climate-smart intervention, two were deemed 'climate-smart villages' (Pargopalpur and Pathuria), and five were 'scaling out villages' (Annex Tables 1 and 2).

The farmers were purposively selected for gender-balanced representation. In the seven climate-smart aquaculture intervention villages, study participants were from households that had implemented the climate-smart aquaculture intervention.

The study was performed as a research collaboration between the MSc degree program in Climate Change, Agriculture and Food Security (CCAFS) at the National University of Ireland Galway and the CGIAR Research Program on Fish Agri-Food Systems (FISH).

Phase 1 and phase 2 data collection

In the first phase of data collection, the qualitative methods comprised focus group discussions (FGDs) (n=16) and semi-structured interviews (SSIs) (n=32). The focus groups were held separately by gender and each had 10 participants. The SSIs comprised 16 with men and 16 with women. Additionally, 16 key informant interviews (KIIs) were conducted to gain a better understanding of village dynamics.

Phase 2 of data collection consisted of a further 21 mini FGDs across six villages. Each mini FGD consisted of three women farmers. The objective of using smaller groups was to dive deeper into issues identified during phase 1 and to enable greater space for all participants to speak. The study design aimed to group women according to age, to enable intersectional analysis along this axis; however because some women farmers had previous commitments this was not achievable.

See Tables 1 and 2 in the Annex for more details about the study sites.

Measuring women's empowerment

During the FGDs in phase 1 and mini FGDs in phase 2, the "ladder of power and freedom" tool (Petesch et al. 2018) was used to catalyze insights regarding changes in women's decision-making power since the implementation of the homestead pond intervention, and to understand the underlying reasons for any such change. Study participants were asked to focus on decision-making within their households and the tool was adapted accordingly. During the 'ladder' exercise, each woman placed a mark on the rung of the ladder where they see themselves, both before the intervention was implemented and after. Each rung on the ladder represents a level of decision-making power within the household. The first step represents women having no power and freedom to make decisions about her life, while Step 5 represents having the power and freedom to make all life decisions. For example, Step 1 on the ladder was described by the research team as having to ask permission to take money if they needed to buy clothes or permission to leave the home, while Step 5 was described as the freedom to use money as they needed it, the ability to go to the next village freely and to choose what to cook. Step 5 was described as the ability to make choices without consulting their husbands or in-laws.

The WorldFish climate-smart aquaculture intervention

Farmers living in the Barisal and Khulna divisions of Bangladesh, have been looking for ways to ensure fish supply in the face of extreme weather events including flash floods, increased temperature and increased salinity. These weather events have been reported by farmers to be affecting the level of fish supply coming from homestead ponds. The WorldFish climate-smart aquaculture intervention was introduced so that farmers within this region could gain access to knowledge and skills to secure fish supply from homestead ponds despite these extreme weather events.

The intervention targeted women farmers (hereafter 'the farmers' or 'women')[1] living in rural villages in the Khulna and Barisal divisions. To be eligible, these women had to have access to a pond, fall into either poor or middle economic status and express an interest to learn new aquaculture skills. During the first stage of the intervention, WorldFish staff targeted 24 such farmers in the two 'climate-smart villages': Pathuria and Pargopalpur. These 24 farmers took on the role of being aquaculture co-researchers. Specifically, while applying the production information and using the fingerlings supplied by WorldFish, the women assessed and recorded productivity information in their pond production systems. In particular, the farmers examined which fish grew the fastest and which had the highest survival rate despite extreme weather events, higher salinity and varying temperature conditions (Box 1).

In addition to co-researching, these farmers also took part in key technical training (best current practice) focused on how to cultivate the select climate-smart fish species and on techniques for sustaining a healthy pond environment for the new fish, such as adding lime and hanging nets over their ponds to prevent leaves from falling into the pond. The intent of such practices was to control acidity, prevent harmful pathogens and mitigate turbidity so that the fish have a healthier environment to grow efficiently. Additionally, training covered information regarding the best season to harvest fish.

As a complementary strategy, during the dissemination phase, the project team also encouraged the involved farmers to use homemade feed rather than commercial feed, with the aim of reducing greenhouse gas emissions during the cultivation of fish. Commercial feed was considered by the project team in this context to be expensive and not climate friendly. Greenhouse gas emissions are associated with commercial feed due to the production, processing and transport components of its lifecycle. By using homemade feed, there is the potential to reduce costs and greenhouse gas emissions, relative to use of commercial feed (Robb et al. 2017). This represents a 'circular economy' approach to fish cultivation (Stahel 2016). The homemade feed that farmers were encouraged to use consisted of leftovers from dinner, mainly rice or husk.

After this initial group of 24 farmers (all women) completed their identification of which fish were the most productive and felt knowledgeable on how to maintain a productive pond ecosystem, the farmer schools were opened to neighboring villages. In this way, the farmer field schools enabled scaling out of the climate-smart intervention to neighboring 'scaling villages'. Five of these scaling villages were identified by WorldFish staff and included in this study. The initial 24 farmers appointed two lead farmers (both women, one from each village) to run the extensions of the schools. Farmers from neighboring villages heard through word of mouth about the farmer group training and came to learn how they could increase fish supply from their ponds. These were focused on being a space where women could exchange information and learn from each other's experience on the most successful way to cultivate fish in their home ponds.

In addition to the farmer schools, the intervention's theory of change was that the knowledge and skills would be further disseminated by informal farmer-to-farmer exchanges (to women and to men farmers), in a range of forums, for example, in the market, within households or within neighbor visits. This farmer-to-farmer knowledge sharing

regarding improved management practices and the most productive fish species, namely carp and tilapia, is expected to result in a greater supply of fish to households for those who have access to homestead ponds. Testing of this and details regarding these dissemination channels and how they played out was beyond the scope of this study.

Overall, as outlined above, the climate-smart aquaculture intervention contributed to increasing women's fish farming knowledge and skills, which enabled them to better adapt their fish production in the face of a continuously changing climate. While these are important capacity and food security outcomes, the question remains: to what extent has this process also enabled (contributed to) empowerment for women who are fish farmers?

Box 1. Findings from climate-smart aquaculture farmer groups' research

The 24 farmer-researchers (all women) engaged in the climate-smart intervention assessed nine species adapted for saline water homestead ponds (pangus, silver carp, carpio, mrigal, climbing perch, catla, rohu, tilapia and stinging catfish) and eight fish species adapted for freshwater ponds (pangus, silver carp, climbing perch, rohu, tilapia, mola, puti and grass carp). During the intervention, women farmers recorded the 'most productive' fish composition, which included an assessment of viability in relation to extreme weather events.

During the intervention, farmer-researchers indicated that the climate-smart aquaculture intervention did increase fish production. Specifically, farmers recorded production of fish before they implemented the intervention as between 2.7 kg and 3.2 kg/decimal/year and after the intervention an increase of fish supply between 6.68 kg and 7.3 kg/decimal/year.

The most productive fish species was identified by the farmer-researchers as tilapia, mainly because it grew the fastest and had the best survival rates. Silver and grass carp were recorded as the second-most productive fish species.

Farmer placing her mark on the 'ladder of power and freedom' in Pargurpalpur village.

Has the WorldFish climate-smart aquaculture intervention enabled women's empowerment?

The study investigated women's empowerment in relation to the climate-smart intervention in two domains: (i) time burdens and (ii) decision-making. Overall, as outlined below, study participants, in particular women, highlighted that the climate-smart aquaculture intervention contributed to the process of women's empowerment in these two domains. However, as also explored below, this was not experienced equally among the women who participated in the climate-smart intervention (see also Box 2 for a gender-related risk).

Time burdens

Overall, the women who adopted the climate-smart aquaculture intervention described the intervention as taking up minimal amounts of their time, and did not describe their involvement in the intervention as a time burden. For example, some time was needed to feed the fish or to clear leaves from the ponds. The women explained that these duties did not take up that much extra time and they could easily fit them into their household duties mainly because their ponds were so close to their house. Additionally, there was appreciation among the women for the fish they received back from the work they put in. Women also identified that they did not feel these extra duties were a burden because the work was offset by their genuine interest in learning new skills (knowledge), implementing their new skill and receiving benefits from these implemented skills.

> *All farm work takes time, but we get benefits from the ponds.*
>
> ***— Female farmer, Birla Juri Village, FGD***

> *To cultivate fish there is no burden. It is not difficult physically. I find that the practice is time saving. The pond is close to my house. Before I had to wait for my husband or father in-law to bring fish from the market, or I had to go all the way to the market.*
>
> ***— Female farmer, Jangnnathpur village, SSI***

Moreover, an unexpected finding was that some women also perceived the climate-smart intervention overall as time saving. Specifically, some women indicated that it saved them time in accessing fish. Prior to the intervention, when little or no fish was available in the pond, women had to wait for their husbands to bring fish from the market or (those that were less mobility constrained) had to go to the market themselves. Women reported that because of the increased fish supply in their homestead ponds resulting from the interventions, they no longer had to do either of these,[2] which women framed as time saving. Similarly, women reported that prior to the intervention, they had to

Box 2. A gender and time-related risk

While no participating farmer identified the climate-smart aquaculture as a time burden, one farmer interviewed (who was not part of this WorldFish climate-smart aquaculture intervention) underscored a gender and time-related risk for any training program.

> *Listen, we are people who live in a village. Now they [a development program] will give us training till 4 p.m. and there is nothing cooked in the house. Later the man will come home and start to yell at us for not cooking anything. That is a problem for us. It is risky for us.".*
>
> ***— Female farmer, Durgapur village, FGD***

wait for their husbands to come home to catch fish, as women did not know how to use the nets. During the climate-smart intervention, women learned how to catch fish using a net; some women reported that as a result they can do so independently, thus avoiding the wait time.

> *If relatives come over, we do not have to go to the market for a fish.*
>
> ***— Female farmer, Pargopalpur village, FGD***

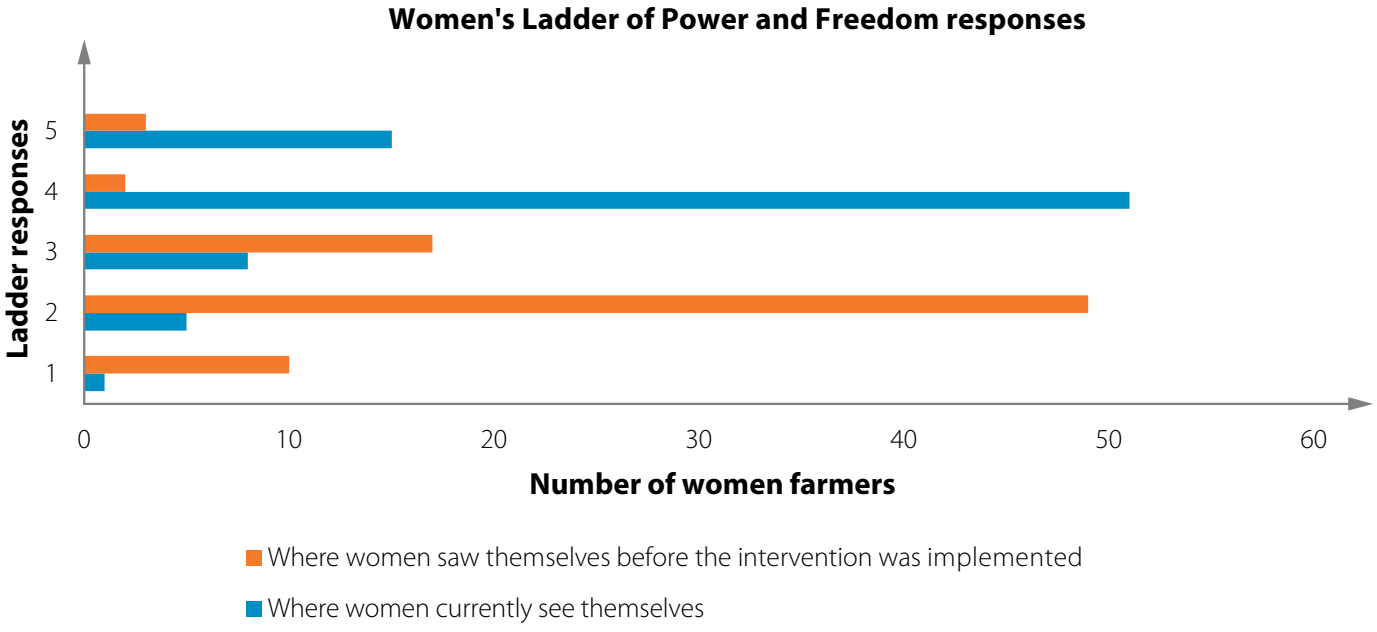
> *We don't have to wait for men to bring back fish from the market.*
>
> ***— Female farmer, Bhandaria village, FGD***

> *The intervention is time saving. We do not have to go to the market. We can get the fish from the pond.*
>
> ***— Female farmer, Jagannathpur village, FGD***

Decision-making power

There was a positive change in decision-making power reported by more than three-quarters of the women in the study (Figure 3). Women who reported this change often noted that this was positively influenced by their having increased their access to production knowledge, which translated into an increase in fish supply, and an associated increase in income from fish sales. (See Box 3 for male study participants' perceptions).

In terms of what kinds of knowledge contributed to their decision-making power, women identified information regarding the effective fish production (best practices) as significant. For example, they noted the value of knowledge regarding using a net to protect their ponds from falling leaves, and regarding how much and when to feed fish, in which season to harvest, and how to spot fish diseases. Women indicated that such knowledge enabled them to make more informed decisions about how to sustain fish supply despite seasonal and other changes. Women reported that the increased (sustained) fish supply contributed to their status within the household, which they saw as linked to decision-making power. For example, one farmer described that she is now listened to more compared to before the intervention, expressing specifically that her opinion (voice) is valued more now that she has the knowledge and skills to increase fish supply to the household.



Note: Step 1 represents having no power or freedom to make decisions in the household, while Step 5 represents having full power or freedom to make decisions in the household.

Figure 3. Ladder of Power and Freedom results from women that implemented the climate-smart aquaculture intervention.

If I take decisions now my husband or my children will not ignore me.

— Female farmer, Biral Juri mini FGD

In terms of income, some women reported that the household spent less on fish as its own supply increased, thus creating more disposable income. Additionally, 20 of the participants reported that they produced enough fish that they started to sell it to neighbors or, for a few women with higher mobility, in the market.

Some women expressed that because they earn their own income, their decision-making power and agency is also expanding. In particular, some women stated they now decide how to use the money earned from the climate-smart intervention, to invest further into aquaculture or to save for themselves and the household. This has implications for women's decision-making and agency in other spheres as well. For example, some women noted that they can now make the decision to send their children to school or begin a new income-generating activity, such as raising chickens or ducks.

Now that we have more experience, I can invest 2000 taka and expect 5000 taka, then I invest 5000 taka then I can get 7000 taka.

— Female farmer, Biral Juri, mini FGD

If we invest 5000 taka for the homestead pond, then we will make sure that we will not spend the money but save money or maybe we give fish to others.

— Female farmer, Biral Juri, mini FGD

In some cases, women indicated that the climate-smart aquaculture intervention was a contributing factor to empowerment together with income from other activities (such as sewing or raising cows, chickens or ducks). For other women, the climate-smart aquaculture intervention was their first income-generating experience. The common thread across all cases was the strong link women expressed between their accessing knowledge and in some cases earning an income to their increase in household decision-making power.

Photo credit: Jorie Colgan/Worldfish

A farmer and son in Kali Bari village.

> *I have much more decision- making power because I bring in an income.*
>
> ***— Female farmer, Pargopalpur village, SSI***

> *I can sell the fish in the market, which helps my economic status. I can provide any accessories for the children by my own money. I don't need to ask money from my husband.*
>
> ***— Female farmer, Pathuria village, mini FGD***

> *Before I was not involved with fish intervention and agriculture production, but now I can cultivate fish. I can even sell fish and vegetables in the market. These are helping me for my decision-making.*
>
> ***— Female farmer, Pathuria village, mini FGD***

However, not all women benefited equally in terms of accessing knowledge and income and/or increased fish supply and the related contributions to decision-making. Specifically, the study revealed that several barriers limit some women's ability to access or benefits. These barriers existed in every village and must be considered if diverse women (and men) are to benefit equally from the implementation of climate-smart aquaculture interventions. These barriers are the focus of the next section.

Moreover, it is important to note that this study was short term and focused only on this area of change. Studies in aquaculture and other fields using a range of methods and over various time periods have surfaced a lack of sustained or even perverse outcomes from women-targeted interventions, ranging from exacerbating gender asset gaps to time burdens to gender-based violence (Kabeer 2005; Slegh et al. 2013).

Box 3. Male study participants' perceptions of connections among women's knowledge, skills and decision-making power.

The study noted that among women's perceptions there was a connection between their increasing knowledge and skills and their feeling of enhanced decision-making power (above). Some male farmers in the study also expressed some form of this linkage. In Pargopalpur village, for example, one man expressed that his wife has increased her status within the household because of her knowledge and her earning an income (both of which resulted from the implementation of the adoption of the climate-smart intervention). The man expressed this as contributing to his wife as having the power and freedom to make more decisions within the household than she had previously. Interestingly, although this man was the only male participant who expressed this degree of (relative) equality between spouses, male participants across all villages highlighted that when they saw their wives contributing fish supply to the household and/or income as a result of aquaculture knowledge gained, they trusted their wives more to make independent decisions, and they found making decisions together becoming more common in their household.

> *If women earn for themselves, they earn status within the household. They don't have to ask their husbands for money.*
>
> ***— Male farmer, Biral Juri village, FGD***

Barriers to empowerment

As outlined above, for some women, the climate-smart intervention enabled their decision-making power in the household, and the women associated this with a feeling of empowerment. However, not all women experienced a positive change in decision-making power. Figure 3 highlights that although the overall trend was positive, after implementing the intervention, just under a quarter of all women in the study (n=23), still saw themselves on Step 3 or below, which represent little to no decision-making power.

In relation to this, the key limiting factor identified by women in the study was **constraining household (power) dynamics**. Household dynamics acting as a barrier was associated with married women and, in particular, with the phenomenon of women moving into their husband's family home. In these cases, decision-making power appeared to continue to be held by the husband, mother-in-law or father-in-law. Given that it is common practice for women in rural Bangladesh to marry young (and move into their husband's house), these gendered household dynamics may be of particular significance for younger women, as found by Choudhury et al. (2017) in Bangladesh. However, examining age as a specific barrier was beyond the scope of this study.

> *My mother-in-law has control over many decisions.*
>
> ***— Female farmer, Durgrapur village, SSI***

Women noted that these dynamics may change, and they may increase their decision-making power, but linked such potential changes to only substantive household events (largely beyond their control) such as the death of an elder in the household or moving into their own house (without in-laws). The significance of household dynamics as a barrier—and the perceived lack of agency of women to address these on their own—confirms similar patterns in other studies in aquaculture in Bangladesh (Aregu et al. 2018; Choudhury et al. 2017; Morgan et al. 2015). This underscores the need for climate-smart aquaculture interventions to take a gender-integrated approach to their design (not only a women-targeting approach) so that the projects can identify such barriers at the outset (not only at the end). Going one step further, this signals the potential for interventions (with sufficient gender capacity) to use that information to design gender transformative (not only accommodative) strategies to support effective engagement with household barriers (McDougall et al. 2015).

> *I didn't have much power three years back. My grandmother used to take most decisions back then.*
>
> ***— Female farmer, Biral Juri village, mini FGD***

> *Before, I had my mother-in-law with me. Now I have my own house. I could go against my husband's will, but I don't. I always consult him before doing anything.*
>
> ***— Female farmer, Bhandaria village, mini FGD***

The **individual livelihood interests and aspirations** of women were also identified as a factor shaping the outcomes for different women. The situation for each woman is different, and the level of interest of women as farmers in the climate-smart aquaculture intervention varied. Some women expressed a greater interest in sewing or raising cows as a way to generate an income. This appeared to lead to these women focusing less on fish cultivation and thus also experiencing fewer benefits than women who were fully engaged in the climate-smart intervention. Further research into rural women's livelihoods aspirations and fit of aquaculture as a livelihood option will be important to elucidate this.

In relation to the above, while **access to and control over key assets** was not a specific focus of this study, having access to a pond was criteria for engagement in the climate-smart aquaculture project, thus de facto precluding the poorest of the poor women (those without ponds) from the benefits. Moreover, studies such as Choudhury et al. (2017) and Choudhury and McDougall (2018)

suggest that women's limited ownership over aquaculture assets may shape their ability to control, benefit from and succeed in aquaculture. Further study regarding gendered access and control over climate-smart aquaculture assets—and the sustainability of women's benefits and empowerment associated with those—will be important, in particular to assess if there is male-capture of the improved technologies, fish supply or income post-project.

Photo credit: Harun Or Rashid

Farmer collecting her dishes from her homestead pond in Kali Bari village.

Perspective

This study investigated whether a WorldFish climate-smart aquaculture intervention in Barisal and Khulna divisions of Bangladesh influenced women's empowerment, particularly in relation to the time burdens and decision-making power of women who are fish farmers. The findings indicate that time-related outcomes were perceived by the women involved as either neutral or positive. Additionally, as outlined in Figure 4, many women expressed a perception of increases in their decision-making power in the household (and in some cases, expanding to savings or new livelihoods) in connection with the climate-smart aquaculture intervention. Moreover, the findings suggest that women's access to their own income-generating activities and to knowledge, such as how to cultivate climate-resilient fish species, can support empowerment processes. Thus, the introduction of climate-smart aquaculture interventions that include women-targeting and income generation and/or increasing fish supply has some potential to positively contribute to women's empowerment at the household scale.

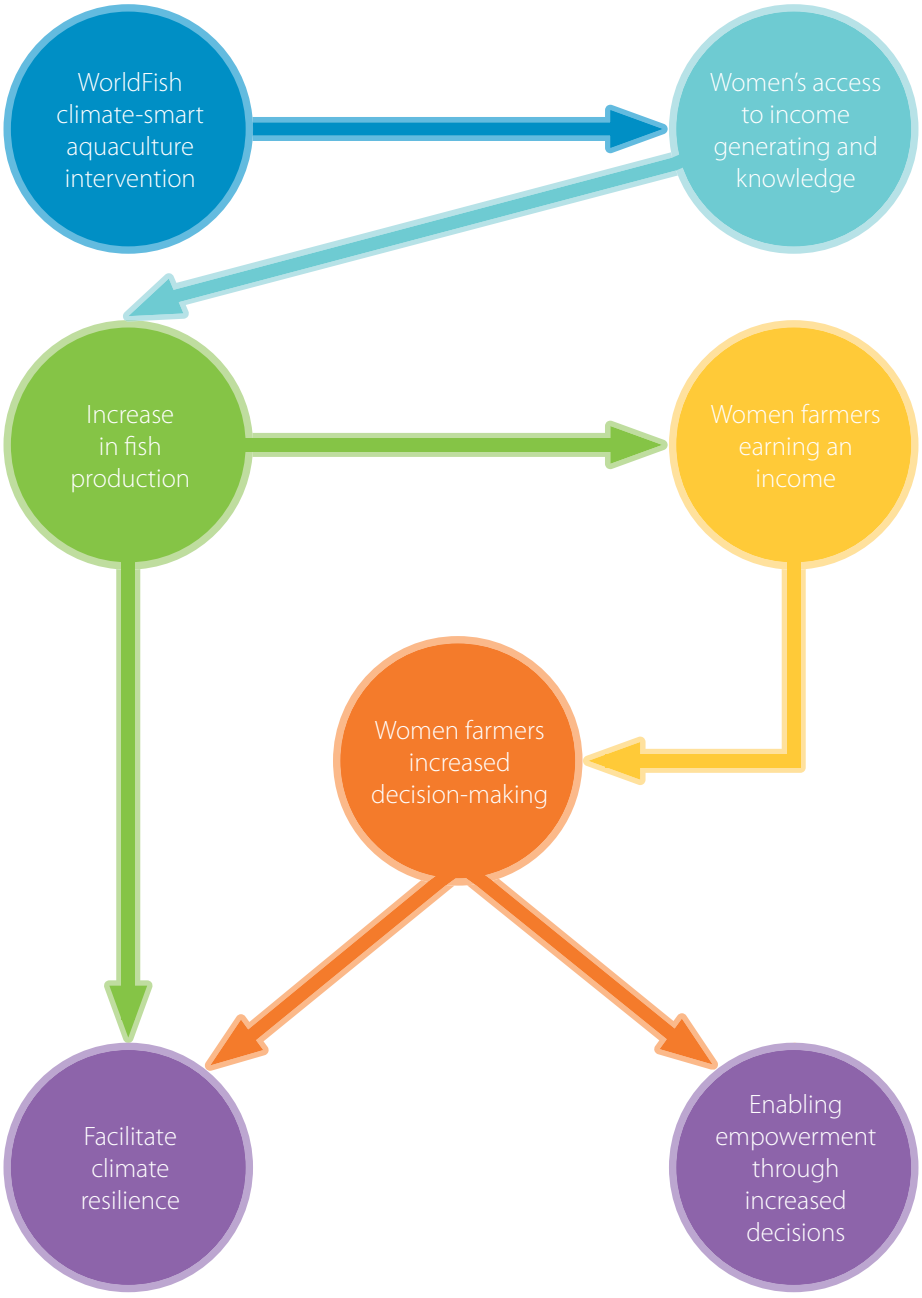


Figure 4. Co-benefits observed between the aquaculture intervention, women's empowerment and climate resilience.

The study also sheds some light on challenges facing women who are fish farmers in rural Bangladesh, in relation to climate-smart aquaculture interventions and empowerment processes. Central to these challenges are constraining gender dynamics, including (but not only) complex intra-household norms and relationships. Moreover, the study surfaced that women experience constraints differently, including for reasons of age. Looking ahead, it is important to underscore that the access to knowledge or income-generating activities that climate-smart aquaculture offers cannot on its own enable women's empowerment; it can only create opportunities for and support the process. The above widespread barriers need to be understood and effectively engaged with in order to support women's empowerment, in particular that of young married women, which was outside the scope of this study but is recommended for further research. If these are not effectively addressed, perverse or unsustainable outcomes may occur even within women-targeting approaches. The implication for practice is that when introducing climate-smart aquaculture interventions, a gender-integrated approach will be necessary for equitable access and benefits as well as sustained adoption. A gender-integrated approach recognizes the contributions of both women and men and the gender relations between them in any intervention to support climate-smart aquaculture. This can be enabled through interventions taking into consideration the social dynamics and norms that act as barriers to gender-equitable benefits or women's empowerment, including household decision-making, gendered division of labor, and mobility. Taking a gender-integrated approach can help prevent gender disparities from widening, enable both women and men to access the benefits gained from climate-smart practices, and is in the long term more sustainable. Overall, greater consideration of gender can result in an inclusive approach that benefits both women and men farmers, encouraging more equitable outcomes and improving a household's ability to sustain a livelihood despite the challenges posed by climate change.

Farmer from Pargopalpur village feeding her fish.

Notes

[1] This language is chosen to avoid the potential implication of 'otherness' that is invoked by the term 'women farmers.' Drawing on gender and sociological theory, as the term 'farmer' is often implicitly used and inferred as male, the term "women farmers" represents "the other" and potentially lesser category. See, for example, the roots of this framing in de Beauvoir (1949, i): "She is defined and differentiated with reference to man and not he with reference to her; she is the incidental, the inessential as opposed to the essential. He is the Subject, he is the Absolute—she is the Other."

[2] Taking this further, the question of whether or not less time in the market may be a disempowering factor, and/or how that balances with the empowerment aspects noted, is an important question but is beyond the scope of this study.

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Annex

Villages	Pond type	Method used
Pargopalpur (climate-smart village) 10 female farmers 10 male farmers	Freshwater	FGDs (2) KIIs (2) SSIs (4) Ladder of power and freedom tool (2)
Pathuria (climate-smart village) 10 female farmers 10 male farmers	Saline water	FGDs (2) KIIs (2) SSIs (32) Ladder of power and freedom tool (2)
Biral Juri (scaling-out village) 10 female farmers 10 male farmers	Freshwater	FGDs (2) KIIs (2) SSIs (4) Ladder of power and freedom tool (2)
Jagannathpur (scaling village) 10 female farmers 10 male farmers	Freshwater	FGDs (2) KIIs (2) SSIs (4) Ladder of power and freedom tool (2)
Kali Bari (scaling village) 10 female farmers 10 male farmers	Saline water	FGDs (2) KIIs (2) SSIs (4) Ladder of power and freedom tool (2)
Galua Durgapur (scaling village) 10 female farmers 10 male farmers	Freshwater	FGDs (2) KIIs (2) SSIs (4) Ladder of power and freedom tool (2)
Bhandaria (scaling village) 10 female farmers 10 male farmers	Freshwater	FGDs (16) KIIs (2) SSIs (32)
Galua (non-intervention village) 10 female farmers 10 male farmers	Freshwater	FGDs (2) KIIs (2) SSIs (4) Ladder of power and freedom tool (2)

Table 1. Sites.

Second round field data collection	
Villages	**Method**
Galua (non-intervention village) 10 female farmers	FGD (1)
Bhandaria (scaling-out village)	Mini FGDs (3)
Jagannathpur (scaling-out village)	Mini FGDs (3)
Biral Juri (scaling-out village)	Mini FGDs (3)
Pathuria (climate-smart village)	Mini FGDs (3)
Durgapur (non-intervention village)	FGD (1)

Table 2. Sites for second round data collection.

CGIAR

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The CGIAR Research Program on Fish Agri-Food Systems (FISH) is a multidisciplinary research program. Designed in collaboration with research partners, beneficiaries and stakeholders, FISH develops and implements research innovations that optimize the individual and joint contributions of aquaculture and small-scale fisheries to reducing poverty, improving food and nutrition security and sustaining the underlying natural resources and ecosystems services upon which both depend. The program is led by WorldFish, a member of the CGIAR Consortium. CGIAR is a global research partnership for a food secure future.

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