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# What factors influence women's participation in co-management? A case study of Sundarban mangrove forest management in Bangladesh

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Understanding what factors influence women's participation in forest co-management is vital for effective policy planning and women's empowerment. The views of women and men from four villages in the Chandpai forest range on what influences women's participation in forest co-management were gathered qualitatively. Data were collected through focus group discussions ( $n = 16$ ) and in-depth interviews with key informants ( $n = 29$ ), and thematically analyzed. The participation of women in forest co-management was mostly influenced by family expectations, then religious and societal norms. Women stated that these expectations constrained their participation, whereas men suggested it was less influential. Men reported that women's participation was motivated by a sense of responsibility to protect the forest, while women reported that participation was mainly focused on economic security for the family. Activities to increase women's participation could include training (e.g. forest protection, leadership), awareness campaigns regarding women's roles, and gender-balanced involvement in household activities.

**Keywords:** gender equity; participatory forest management; policy planning; forest conservation; forest governance

## 1. Introduction

### 1.1. Co-management of protected conservation areas

The long-term sustainability of forest resource conservation often depends on a management system that is led by the local people (Chhetri *et al.* 2013; Triguero-Mas *et al.* 2009), without which the depletion of forests is likely to increase (Kabir and Hossain 2008). Over the last few decades, local people's participation in forest resources management has increased due to the efforts of governments and non-governmental organizations (NGOs) (Ameha, Larsen, and Lemenih 2014; Islam *et al.* 2013). This

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participatory approach to forest management gradually changed the status of local people from “lawbreakers” (e.g. poaching or undesired logging) to “lawmakers” in forest management (Duguma *et al.* 2019; Ribot, Lund, and Treue 2010). In this context, the co-management approach emerges to support the application of the community’s customary knowledge and joint monitoring to limit illegal harvesting by providing a grouping of property rights to local resource user groups (Matose 2006). Co-management seeks to involve resource users in forest management and decision-making activities and shares the responsibility among several stakeholders, potentially resulting in more equitable and sustainable resource conservation practices (Essoungong, Foundjem-Tita, and Minang 2019; GIZ 2018). The co-management approach signifies the collective actions by which communities and other actors manage natural resources together, drawing from everyone’s strengths, vantage points, and capacities (Borrini *et al.* 2007). This also benefits the sharing mechanism by allocating the benefits through multi-level governance processes (Nkhata *et al.* 2012).

Co-management approaches have been adopted in many countries as a participatory form of governance for forest resource management to improve the conservation outcomes (Mukul and Quazi 2009). Co-management is an important tool, particularly in developing countries, for managing protected areas (Freitas *et al.* 2020; Gamarra *et al.* 2022; Islam and Hossain 2017). For example, in parts of South Asia, co-management is practised in protected areas, where joint ventures with relevant stakeholders are developed that guarantee their respective functions, rights, and responsibilities (Borrini-Feyerabend 1999). In Indonesia, co-management aims to restore mangrove forest and to reduce forest degradation through activities, such as law enforcement on violators, recognition awards to community groups, monitoring by government, and facilitation of intercommunity conflicts (Adenan 2018). The Vietnamese government has also attempted to institutionalize co-management through shared actions or commitments with local stakeholders, shared decision-making, and two-way communication and information exchange to engage local stakeholders in forest management systems and to protect forest biodiversity (Dung 2019).

Involving local people (particularly women) in forest co-management plays a vital role in improving their livelihoods through empowerment, greater access to forest resources, increased recognition of their rights, and reducing inequalities (De Vente *et al.* 2016; Islam *et al.* 2013; Oldekop *et al.* 2016). Moreover, women’s involvement in forest management also brings about significant environmental outcomes, through improved forest governance, which are directly linked to successful and sustainable conservation of forest biodiversity (Ameha, Larsen, and Lemenih 2014; Jashimuddin, Islam, and Nath 2021). For the proper functioning of forest co-management, it also requires equitable access to forest resources for women and their full participation in decision-making in the protected forest areas (Islam *et al.* 2013; Oldekop *et al.* 2016).

The co-management approach to forest resources management in Bangladesh was first introduced by creating buffer zones around protected areas (PA) (Zasimuddin 2004). The Bangladesh Forest Department (BFD), a government agency, first developed a program of forest co-management in some PAs in 2002 (Manzoor Rashid *et al.* 2013; Quazi, Bushley, and Miles 2008). In addition, the Convention on Biological Diversity (CBD) of the United Nations (UN)-led initiatives, such as the “Strategic Plan for Biodiversity 2011–2020,” have also been adopted by the Bangladesh Government to expand the protected areas of the Sundarban mangrove forest (SMF) from 139,699 to 317,950 ha and brought the management of these PAs under the co-management approach (Mahmood *et al.* 2021; Mollick

*et al.* 2023; Sarker *et al.* 2019) (Appendix A). The management structure was initiated as a three-tiered system under national legislation (Wildlife Preservation and Security Act of 2012). The first tier is at the community level, the “Village Conservation Forum” (VCF) comprises representatives of people who live within 5 km of the forest. The next tier is at forest range level, called the “People’s Forum” (PF) which consists of men and women representatives from each VCF. The highest level is the Co-management General Committee and Co-management Executive Committee, consisting of members from the PF, the Bangladesh Forest Department (BFD), government agencies, local government, civil society, and other relevant stakeholders (Bowler *et al.* 2012; GIZ 2018). Participation by women in forest co-management in some of the structures in Sundarban mangrove forest co-management commenced with the establishment of the Sundarban Management Project (SMP) in 2017, with earlier projects established in 2009 (Begum *et al.* 2021).

### **1.2. Women’s participation in co-management**

To bring about positive outcomes for the co-management system, women’s participation in this system has been reported as crucial to ensure inclusive and effective governance of the forest resources (Agarwal 2010; Colua *et al.* 2021). The International Union for Conservation of Nature (IUCN) also emphasized gender equity as an important factor for efficient governance in nature conservation initiatives (IUCN 2007; Macinnis-Ng and Zhao 2022). The Sustainable Development Goal for gender equality (SDG-5) emphasizes the involvement of both men and women in sustainable community-based forestry programs, as the majority of the forest conservation-related activities involved women (Agarwal 2018; UN 2015). The equitable participation of women in forest co-management can only be achieved if society removes the influences that prevent women from having equal opportunity to participate in forest management (Duguma *et al.* 2022; UN 2015).

The factors influencing women’s participation (i.e. barriers to participation or ways to encourage participation) in co-management initiatives are multifaceted and encompass various social, economic, cultural, and institutional dimensions (Bocci and Mishra 2021; Treviño and Murillo-Sandoval 2021). For example, the persistence of traditional gender roles and stereotypes often relegates women to domestic responsibilities and limits their access to decision-making spaces related to forest management (Bockstael *et al.* 2016; Purdy 2012). Under these sociocultural influences, a positive relationship between women’s participation and environmental outcomes can only be achieved when women are considered equally as decision-makers in forest conservation activities (Agarwal 2010; Begum *et al.* 2022; James *et al.* 2021). Gender equity in forest co-management could also enhance ecofeminism, which seeks to transform power relationships from dominance to mutual understanding between men and women and to create an environment where both men and women will share responsibility for restoring equity between the genders (Mallory 2006).

Despite the potential socio-economic and environmental benefits of women’s participation in forest co-management, their roles and contributions were not recognized in the Sundarban mangrove forest co-management due to societal and cultural norms (Begum *et al.* 2021). Several weaknesses in co-management systems have been raised in the existing literature, such as the risk of elite capture, dominance in decision-making by men, unequal distribution of benefits, conflict among stakeholders, and asymmetrical integration of stakeholders’ needs (Manzoor Rashid *et al.* 2013; Ward, Holmes, and Stringer 2018).

Literature has also indicated that the level of participation by local people in forest management is influenced by their gender and socio-cultural relationships (Liu and Innes 2015), where women are often excluded or ignored due to cultural norms (Coleman and Mwangi 2013). Inequitable participation within or between local forest-dependent communities due to pre-existing socioeconomic inequalities, power relationships, and gender-bias has been raised (Nhem and Lee 2019). Co-management may also lead to undesirable outcomes, with unrepresentative governance and destructive activities, such as poisoning the wetlands for fishing (Rahman 2022).

Despite a well-designed platform created by the co-management approach, local people, especially women, have limited opportunities to share their views on the benefits, problems, and challenges of co-management due to the lack of gender-responsive actions (Begum *et al.* 2021; Duguma *et al.* 2022). Thus, there is a critical need to explore the prevailing influences on women's participation and examine whether the nature of these influences varies depending on socioeconomic settings. Furthermore, in patriarchal societies where men dominate women (Ondiba and Matsui 2019), the question arises as to what motivates rural women to participate in environmental management activities and co-management. This study focuses on identifying the most relevant factors that motivate women to participate in the SMF co-management, in the context of local sociocultural influences.

A significant body of literature has demonstrated that people's motivation to participate in any conservation activities can be driven by socio-cultural or economic factors (Coulibaly-Lingani *et al.* 2011; Ranjit 2014). For example, previous studies have indicated that the driving forces behind women's participation were cultural benefits, financial benefits, incentives, and well-established links with conservation agents (Islam *et al.* 2013; Raufirad *et al.* 2017). Furthermore, literature has also argued that women's participation in community forest management was positively influenced by social benefits (e.g. social networking), direct contact with the local environment (e.g. gain knowledge about local flora and fauna), and institutional benefits (e.g. training on value of community forest) (Apiwoonyanon *et al.* 2020; Akwa, Marcus, and Rahman 2008; Ondiba and Matsui 2021).

For effective forest conservation co-management programs with equitable gender participation to achieve positive outcomes for conservation, women's empowerment, and livelihoods of local households, it is imperative to examine gendered views on what factors motivate local women to participate in forest co-management and what influences affect their participation. This study, therefore examined the following objectives to:

1. Determine what factors influence women's participation in forest co-management by understanding men's and women's views on the topic;
2. Examine the factors that motivate local women to participate in forest co-management despite experiencing difficulties; and
3. Present policy recommendations to address identified limitations in women's participation in forest co-management.

## 2. Methods

### 2.1. Selection and description of the study area

The overall methodology of this research is shown in [Appendix B](#). The explanation and rationale for the selection of study participants, data collection, and data analysis methods follow.

According to the Bangladesh Forest Department (BFD) and local NGOs, who were contacted before field research in 2019, the co-management approach to managing the SMF operates in four administrative forest ranges of the BFD: Chandpai, Sarankhola, Khulna, and Satkhira. Chandpai range of the Sundarban Reserved Forest (SRF) was selected as the study area for this research. Chandpai range was selected from the four ranges with forest management activities, as local women are involved in forest co-management and Chandpai range is representative of the other three forest ranges with the advantage of vehicle access to the study villages (Begum *et al.* 2021). In the co-management system, sharing of responsibilities among the participating stakeholders is established through the formation of the Co-management Committee (CMC). This CMC has different layers: the Village Conservation Forum (VCF), the People's Forum (PF), and the Community Patrol Group (CPG). VCF is the lowest tier where local people have the greatest opportunity for membership and involvement in forest co-management. There are 37 VCF villages in the Chandpai range, where the involvement of local women in forest management activities is widespread. Among these 37 villages, six villages are under the Dacope Upazila of Khulna district and the remaining 31 villages are in the Satkhira and Bagerhat districts.

The villages were selected based on proximity to the SMF (Figure 1), the communities' general reliance on forest resources, variations in the predominant religion, and the participation of local women in co-management activities (Appendices C and D). Four villages from the Chandpai range with two villages, Purbo Dhangamari and Poschim Dhangamari, selected from the Banishanta Union of Dacope Upazila (sub-district) in Khulna, and another two villages, Baidyamari and Kachubunia, selected from the Sundarban Union of Mongla Upazila (sub-district) in Bagerhat (Figure 1). Previous research in the study area has also shown that women have fewer educational qualifications and have a lower monthly income than men in these selected villages (Begum *et al.* 2021). It is possible to examine the influences on, and motivations for, local women to participate in forest co-management as the villages studied have distinct socioeconomic features and existing roles and participation by local women in forest co-management activities.

## 2.2. Data sources and selection of participants

Human ethics clearance was gained for the data collection from the University of New England's Human Research Ethics Committee (Approval No. HE19-173). Primary data were collected using focus group discussions (FGDs) and key informants (KIs) who were interviewed in-depth from November 2019 to February 2020 using a semi-structured interview schedule (i.e. open and closed-ended questions). The interviewees were chosen based on the status and expertise of the person, but also the key informant's "expert" status was not solely relied on as they may not fully understand and represent local communities (Lokot 2021). FGDs complement in-depth interviews with the KIs and document the local people's views on co-management issues in a group and in a non-threatening and safe environment (Nyumba *et al.* 2018). Both techniques allowed the research insights based on participants' expertise or experience in forest co-management. A purposive sampling procedure was used to select participants for the FGDs and KIs. The lead author interviewed from each village, a man and a woman within the forest co-management organization and external to it, which included VCF, PF, and village leaders. In total, 24 in-depth interviewees were conducted with key

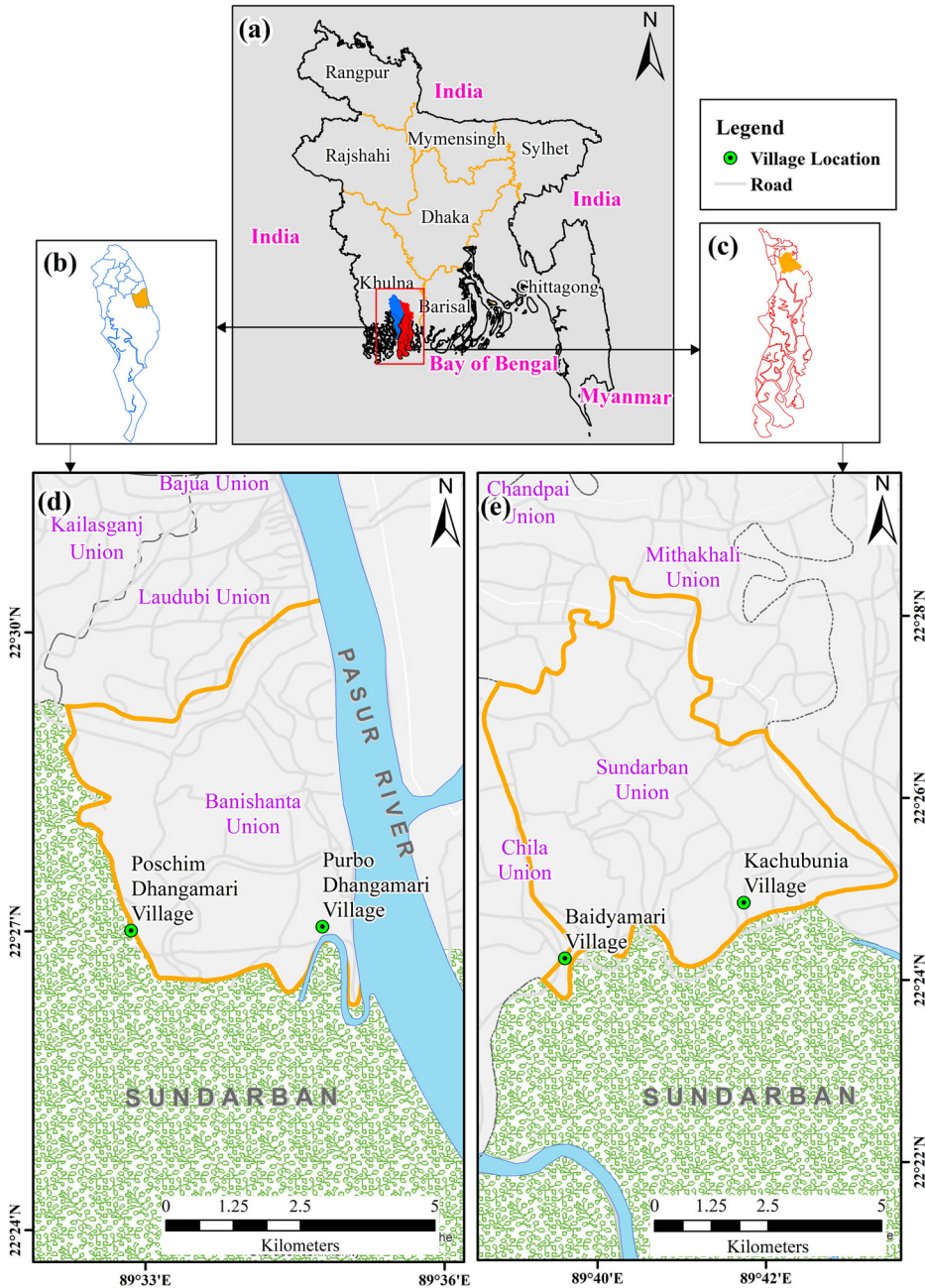


Figure 1. Location of study areas in (a) Bangladesh with (b) Dacope Upazila and (c) Mongla Upazila in the Sundarban region in the south and their respective villages: (d) Purbo Dhangamari and Poschim Dhangamari and (e) Baidyamari and Kachubunia.

informants from the villages, consisting of 8 women and 16 men. There were 5 in-depth interviews with key informants from outside the village who represented the NGO, district, and national Bangladesh Forest Department (BFD) government officials and were all men (Appendices E and F).

Following the in-depth interviews with KIs, four FGs were conducted in each of the four selected villages (total FGs = 16) with separate FGs for men and women, either involved or not involved in co-management activities, which were spread over several hours. FG participants were selected from the lowest tiers of the co-management system (i.e. Village Conservation Forum/Peoples Forum and local people who were not participating). Each FGD had six participants from separate households.

The lead author conducted all 29 in-depth interviews with KIs, each of which lasted for around 90 min. The same questions were asked of all the KIs—socio-demographic details (i.e. age, educational qualification, occupation, monthly income, etc.), their role in the organization or committee, participation and roles of men and women in forest co-management, influences on women's participation and the factors that motivated local women to participate in forest co-management.

The lead author facilitated each FGD and the interaction between the participants, and with the permission of the participants, wrote up reflections after each FGD. The FGDs were conducted to understand the particular roles of local women, their motivating factors, and influences on participation in forest co-management (Begum *et al.* 2023).

### 2.3. Thematic content analysis

Data collected from the in-depth interviews with KIs and FGs were transcribed in Bangla. The transcribed data were then translated into English and used as the primary source material for analysis. NVivo 12 Plus software (Edhlund and McDougall 2019) allows qualitative data gathered from the FGs and KIs to be coded to themes that are represented by nodes and sub-nodes. The responses of all the KIs or FGs were coded under each theme node but kept separate due to the different roles of these techniques.

This study used inductive thematic content analysis to examine the qualitative data from focus groups and in-depth interviewing of key informants into themes as they emerged. The themes were data-driven, and responses to multiple questions were coded to the themes (i.e. coded responses) under the two areas of interest: influences on women's participation in forest co-management and motivation of women to participate in forest co-management. The emerging themes were not influenced by any conceptual framework or the researcher's previous beliefs on the subject (Begum *et al.* 2023; Braun and Clarke 2006; Kiger and Varpio 2020).

Themes emerged from content analysis of the data as it was coded. The first thematic area was defining the influences on women's participation in forest co-management, such as family, personal, religious, and societal influences, with sub-nodes reflective of negative or positive views on those influences. Examples of how KI and FG responses were coded as family influences were responses showing a lack of support from family members or responses related to family dynamics; responses coded as personal influences were related to responses on the participating women's attitudes, such as shyness or hesitation to talk in front of others; responses coded as religious influences were related to religious beliefs (e.g. responses showing rejection of women's participation in outside jobs as it is considered a violation of religious beliefs); and responses coded as societal influences were related to views from outside of the family structure, such as village elder or neighbors (e.g. who expressed a lack of appreciation for women's outside work). The second thematic area was the motivation of women to participate in forest co-management. Thematic nodes were created and



could be separated by gender. Data from the FGs and KIs were coded under a motivational theme as they emerged, such as income, future financial support, sense of responsibility, and forest conservation.

Matrix query searches were used to examine the variation in participants' views on influences on local women's participation in forest co-management across villages' socioeconomic settings or conditions. The matrix coding query results, which were the total number of coded responses per theme for each attribute type, were tallied and then averaged per unit of study (i.e. number of participants) to present them as a value that could be compared where sample size had varied. To explore stakeholders' views on local involved women's influences and how these views varied according to gender, for each influence the average proportion of coded responses for men and women participants in FGs and KIs were calculated. There were eight women KIs and 19 men KIs out of 29, and five women's FGs, and one men's FG out of the 16 FGs that responded to questions related to women's participation, so the average proportion of coded responses was calculated under each of the themes. This adjustment of the qualitative data allowed an equivalent voice for men and women and comparison of views based on participant attributes where there was an unequal sample size.

Word frequency searches were used to examine the gender-based motivational factors for the participating women. This method is useful in qualitative research to highlight the frequency of keywords or phrases (Begum *et al.* 2022; Jemison *et al.* 2018).

### 3. Results

#### 3.1. Variation in influences on women's participation in forest co-management in study villages

Despite analysis of all 16 FGs and 29 KIs, <37.5% of the FGD, and 93% of the KIs, respectively discussed the issue of women's participation, with the majority who were vocal coming from participating women's FGs (5 of 8 women's FGs, 62%), and only one participating men's FG from Kachubunia (1 of 8 FGD, 12.5%). Those FGs who voiced their influences on women participating in forest co-management were represented by each village for women, but men's opinions only came from Kachubunia. The low response rate to this focus question means that there is a large proportion of the FGDs that remained silent on the matter. In contrast, 27 of the 29 key informants were able to discuss the matter, and the two men who had no response were local leaders from Purbo Dhangamari and Poschim Dhangamari.

Thematic analysis of all the data from the FGs and KIs identified four influences from those who responded: family role, personal attributes, religious and societal norms (Figure 2). The prevalence of a theme for women's participation in forest co-management varied depending on the village location. However, there was no consistent pattern in each village. Family influences were by far the dominant influence on participating in forest co-management, with the highest proportion of coded responses (82%) being recorded from Purbo Dhangamari, followed by Baidyamari (76%). The lowest proportion of coded responses emanated from Poschim Dhangamari (43%). Personal influences of women were only reported from one NGO officer and one female key informant participant from Purbo Dhangamari People's Forum. In relation to the religious influences, the participants from Poschim Dhangamari (Hindu) had the highest proportion of coded responses (36%), followed by the participants from Kachubunia (Muslim) (25%). Societal influences were consistent across the four villages and ranged from 14 to 22%.

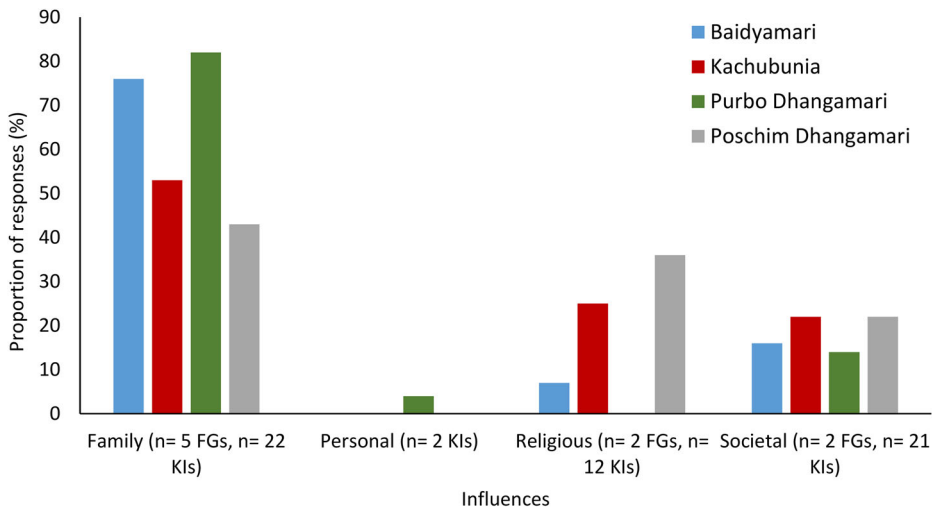


Figure 2. Prevalence of thematic influences on women's participation in forest co-management from the four study villages. Note:  $n$  = total number of FGs and in-depth interview with KIs; total number of FGs = 6 of total 16 (i.e. Baidyamari participating women's FG; Kachubunia participating women's FG; Kachubunia participating men's FG; Purbo Dhangamari participating women's FG; Purbo Dhangamari not participating women's FG; Poschim Dhangamari participating women's FG); total number of KIs = 27 of 29 (women = 8 and men = 19).

### 3.2. Gendered perspectives on women's participation in forest co-management

The average proportion of responses was presented due to unequal sample size for the main influences on women's participation and separated by gender (Figure 3). In connection to family influences, participants in the men-only FGs had a higher proportion of coded responses (2.1%) about women's influences than the participants in the women-only FGs (1.3%) (Figure 3, top). However, among the KIs, women had a higher proportion of coded responses (1.8%) than the men interviewed concerning family influences (Figure 3, bottom). In the case of religious influences, the women interviewed had a higher proportion of coded responses (1.5%) than the men interviewed as key informants (1.0%). Participants from the women's FGs reported 0.8% coded responses, while the men's FG participants did not report any religious influences. Concerning societal influences, women from FGs mentioned this almost twice (0.8%) as often as men in FGs (0.5%). In contrast, the men and women key informants held a similar emphasis on the societal influences.

This section describes the nature of these influences. What constitutes a family influence, was reported by a male key informant that certain groups of local women were not supported by their families to participate in VCF/PF meetings because there is no financial reward,

As there is no financial support for their participation in forest co-management and most the family are very poor, women do not get support from their family to participate in forest co-management. The family think that it is just a waste of their time. (KI, Co-management Committee)

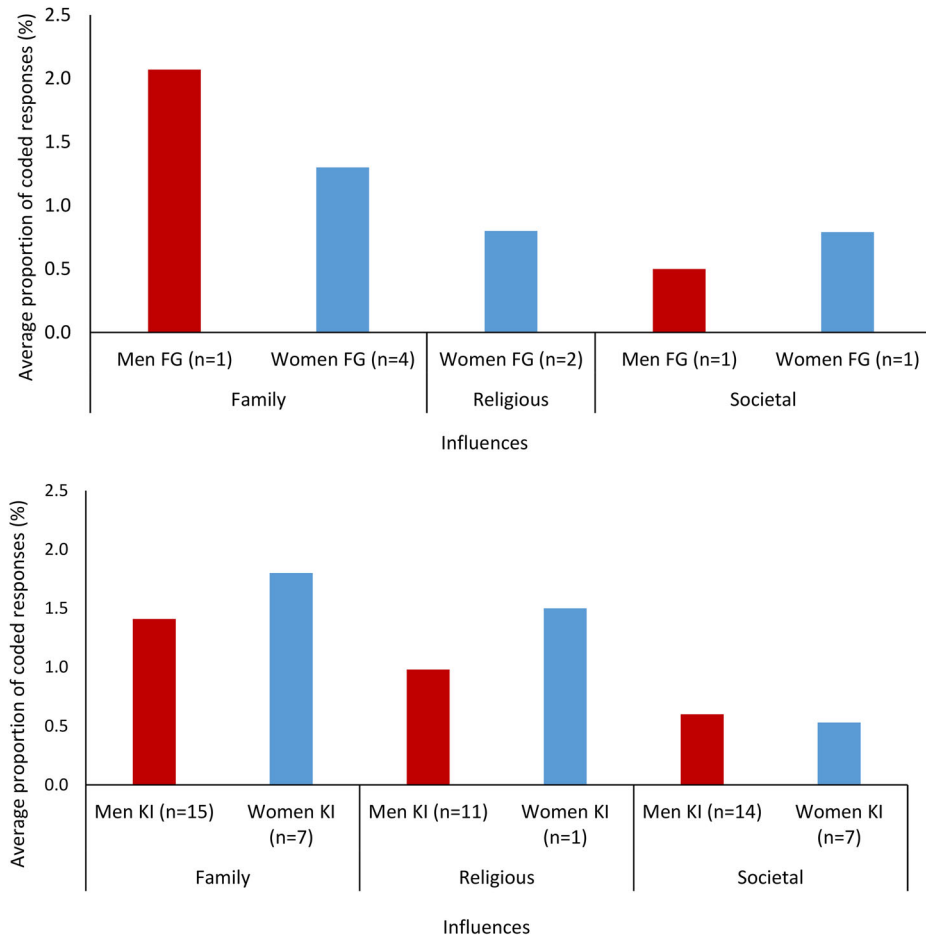


Figure 3. Gender-based views on what influences women's participation in forest co-management, based on FGs (top) and in-depth interview with KIs (bottom). Note: red bars represent male participants and blue bars represent female participants;  $n$  = total number of FGs and KIs; total number of FGs = 6 of 16 (i.e. Baidyamari participating women's FG; Kachubunia participating women's FG; Kachubunia participating men's FG; Purbo Dhangamari participating women's FG; Purbo Dhangamari not participating women's FG; Poschim Dhangamari participating women's FG); total number of KIs = 27 of 29 (women = 8 and men = 19). Colour online.

Participating women also concurred with men that the lack of financial support or employment opportunities from participating on a committee made it difficult for them to contribute. "Women having problems from the male members in the family. If women from any family participate in the meeting what they will do there and what benefit they will get ... all these issues raised from the male members behind them" (KI, Women Peoples Forum member, Kachubunia). In addition, only the men from the FGD in Kachubunia said that it is not socially acceptable, and women's husbands or other older male members of the family even actively discouraged them from attending a meeting. Some family members are also not supportive of women working with men outside of the home. Women are also ignored if they tell their husband not to

undertake illegal activities inside the forest and to follow Bangladesh Forest Department rules. In extreme cases, husbands may threaten their wives with violence if they attempt to discourage them from undertaking illegal activities in the forest.

Most of the local harvesters have one income source. If the harvesters do not engage in illegal activities how they will manage family expenditure during restricted season or when they have no permission to enter the forest. At that time husbands got angry if their wives protest them to enter the forest illegally and even extreme cases, they beat their wives. (KI, male local leader, Kachubunia)

Most of the time, wife is busy in household activities such as cooking, taking care of children and elder members and has very limited time available. Usually, husband is not involved in such kind of household activities. If they participate, who will do their household activities? Women need to manage everything and before participation they need permission from their husband or any older person from the family. (KI, Peoples Forum member, Baidyamari)

One NGO officer reported that some rural households do not allow their female family members to participate in outside activities. It was also reported by the female Village Conservation Forum members that due to the patriarchal nature of the society in Bangladesh, many families think that women should prioritize domestic roles and not seek work outside the home. "As women have many jobs in the family and some have small kids, it is sometimes difficult for them to manage time and to attend in the forest management works" (KI, Purbo Dhangamari).

With regard to personal characteristics as influences, it was only reported by two KIs. A male NGO officer indicated that women lack confidence outside of the family and are reticent about participating outside of the confines of their family or speaking in front of others. This view was supported by a female People's Forum member, who said that "Women are very polite in nature and feel afraid to talk in front of others" (KI, Purbo Dhangamari). However, it was reported by an NGO officer that this behavioral response by women could be changed through training that can empower them to participate in outside activities.

In terms of religious influences, those interviewed reported that some families in the villages have strong religious beliefs and are unsupportive of women working outside of the family home. It was also reported by the local leaders that certain religious people in the villages do not support women's involvement in co-management activities (i.e. VCF/PF meetings). Strict Muslim and Hindu religious beliefs have prevented certain groups of women from becoming members of the Village Conservation Forum. Women would challenge these beliefs if they participate and it would be in violation of their religious beliefs. "There are some families who have strict religious beliefs, they are not interested to send their female members to work outside. They think if they participate in outside work, it is a violation of their religious beliefs" (KI, male local leader, Poschim Dhangamari). For example, a small proportion of Muslim women from Baidyamari and Kachubunia FGD explained that women participating with men in forest co-management meetings is a violation of "parda" (religious and social practices of Muslim women) as they have to sit together or need to work with male colleagues. On the other hand, some Hindu KIs in Poschim Dhangamari village explained that due to the caste system, women should not work outside in the evening or use the same glass or plate as men with higher status for eating purposes in the

workplace. One NGO officer also reported that in some areas where religious sensitivities are common, women are not able to work outside of the home, and religious leaders in those areas actively discourage women from participating. These views were held by men and women key informants from Baidyamari and Kachubunia villages and averaged per person to aid comparison.

In terms of societal influences, certain social norms and personal security affect women's participation in outside activities. Most of the men interviewed as key informants suggested that village members, both male and female, may not be supportive of women being part of forest co-management. It was suggested by them that neighbors or other local villagers and religious leaders viewed women working alongside male colleagues in forest co-management as not socially acceptable. Village members would make disparaging comments and exclude women from other outside activities if they returned home in the night from a forest co-management meeting. These types of societal views would affect women's movements and choice of outside activities (Women participating in FGD, Kachubunia). In addition, the society is not a secure place for women, and they may face physical or sexual harassment while working outside, which has been reported by key informants. One woman KI stated that "Women have less security while going outside to do work related to forest management and to enter into the forest" (KI, Village Conservation Forum member, Poschim Dhangamari village). Also, an NGO officer stated that "Some villages have social constraints on women, and therefore, women are not allowed to go outside for work" (KI man). It was also reported by another male NGO officer that if there are any meetings that are organized far from the home, women find it difficult to participate as the society is not a secure place for them.

### ***3.3. Gendered views on motivational factors for women's participation in forest co-management***

This section discusses the views of both men and women on the motivational factors that encourage local women to become involved in forest co-management (Figure 4). The words men most frequently used in expressing their views on motivating factors for women in forest co-management were associated with *income*, *responsibility*, *alternate*, and *natural*, and the less frequently used words were *support*, *linkage*, *financial*, and *build*. By considering these words in their context of use, most male key informants reported that women are motivated to be involved in forest co-management to protect their income source by learning about conservation of forest resources. Some of the men interviewed also reported that through women's involvement in VCF/PF meetings and heightened awareness of forest practices women can engage in alternative income-generating activities. In addition, men who were interviewed as KIs suggested that local women were motivated by a sense of responsibility to conserve their local forest, so it will be the income source for the next generation of their family. For example, one of the KI participants reported, "If they participate in forest co-management, they will be aware of different methods of harvesting forest resources and later they can make their family and neighbors aware of this. In this way the forest will be conserved" (local male leader, Purbo Dhangamari).

It was also reported by certain male local leaders from Baidyamari and Kachubunia and from NGO officers that women are involved in forest co-management

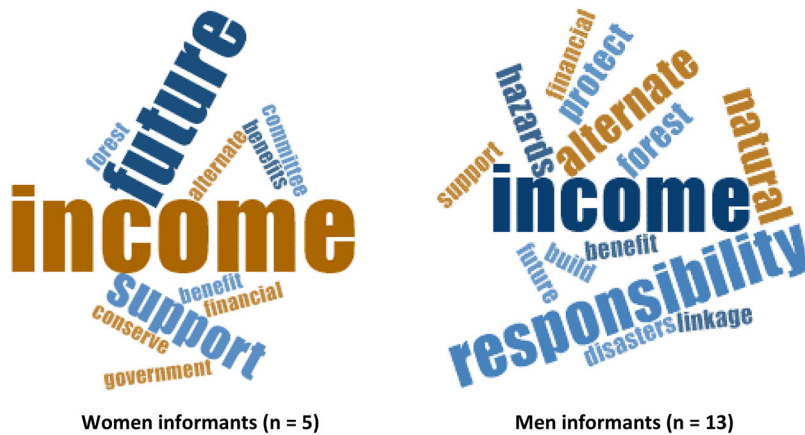


Figure 4. Word cloud showing the most frequently used words by women and men key informants during in-depth interviews in relation to questions on motivating factors for local women's participation in forest co-management (total  $n = 18$  out of 29).

out of a sense of responsibility and a desire to protect the forest for their family security and livelihood. One of the VCF male participants reported:

Some women are motivated, attend in forest conservation meeting and develop their linkage while working with several stakeholders. Their expectation is to get future benefits in terms of cash or in-kind benefits. Through linkage build up, they can be able to engage themselves in alternate income generating activities in future. (KI, Baidyamari)

From the woman's perspective, the most frequently used words when referring to the motivating factors for local women were associated with *income*, *future*, *support*, *alternate*, and *benefits* (Figure 4). These words from the word cloud represent motivating factors that facilitate a woman's decision to become, and continue to be, involved in forest co-management. Most of the women key informants reported that local women are participating in VCF meetings because it brings financial benefits to their families and helps them to secure an alternate income source. Therefore, future financial support has motivated many local women to participate in forest co-management. Participating women KIs also reported that if local women were involved in forest co-management, the forest has a greater chance of being conserved, which also protects the income source for their family. One of the women key informants reported, "I can get government support like loan from government which will assist me and my husband to buy a van, or I can engage myself in poultry rearing activities that can assist my family financially. That's why I am participating here" (Peoples Forum member, Purbo Dhangamari). One female village elder reported that local women are participating in forest co-management as they want to know how to conserve and protect the forest from which they harvest. If they participate in forest co-management, they will learn about methods of harvesting forest resources and wildlife conservation that are less destructive.

#### 4. Discussion

Women's participation in forest co-management activities is limited due to various social, economic, cultural, and institutional dimensions. Despite these influences, women's motivation to participate in the co-management of forest resources can be supported by socio-cultural or economic factors, and how these factors are framed by the men and women necessitate the importance of this study. The following sub-sections evaluate the influences that prevent women from participating effectively in forest co-management and then discuss their motivations that triggered them to participate in co-management. Finally, potential policy interventions and implications of the findings of this study for future community-based conservation efforts in Bangladesh are discussed.

##### *4.1. Factors influencing local women's participation in forest co-management*

Three broad thematic areas of influence were identified by women and men from FGs and in-depth interviews with KIs relating to women's participation in mangrove forest co-management. These influences were family, religious, and societal. The men and women key informants from Kachubunia and Poschim Dhangamari agreed on these thematic influences, which were more prevalent for these villages than the other two villages. This study also showed that it is probably impossible to separate the interconnections between family, religious, and societal influences as they are interrelated. Family influences for FGD participants are the most immediate influence on them, with religious and societal less immediate to the family relationship, but nevertheless important. Male patriarchy is one such example where women are discouraged from participating in any outside activities, or they need permission from their husband or an older person from the family, which negatively affects their participation in forest co-management. Religious and societal influences, associated with social norms and taboos, effectively exclude women from outside work because societal expectations are that women's role is in household and child-rearing activities (Bradford and Katikiro 2019). In the study area, an important societal challenge to women's participation in forest co-management is to gain greater societal acceptance of women working with men in forest co-management work (e.g. attending meetings, forest monitoring).

This study showed that family influences have a pervasive control at the local level on women's participation, whereas a high proportion of the FGD participants, mainly from non-participating women and men, were not forthcoming as to the influences on women participating in forest co-management. The reason for these groups not being forthcoming in their views can only be conjectured. For non-participating women and men, it is outside their experience, whereas for participating men it could be that the presence of women on committees is not a priority for them. Why participating men chose not to discuss women's participation in forest co-management, can only be surmised, but it may be indifference or a lack of interest in furthering women's involvement in forest co-management. Previous studies have also demonstrated that cultural norms (e.g. women's stereotypic role as homemaker, women not expected to fulfill roles in the public sphere, negative societal attitudes), and family matters (e.g. spousal pressure, societal attitude) as key influences on women's participation in natural resources management and other forms of organizational arrangement (Evans, Flores, and Larson 2019).

Household and domestic work (cooking, caring for children, and other family members) fell mostly upon women, in this study, leaving their capacity and interest diminished to commit to work outside the home. Other studies have also reported how high domestic work and family responsibilities limit the participation of women in forest governance (Colfer and Minarchek 2013; Nhem and Lee 2019; Rahman 2022). It was argued that women are time-poor due to having a greater share than men of the domestic responsibilities (Lyon, Mutersbaugh, and Worthen 2017). The imbalance between men and women in domestic work means the disproportionate amount of domestic labor carried by women limits their ability to participate in co-management activities, such as attending Village Conservation Forum and Peoples Forum meetings. Therefore, recalibrating women's domestic labor is necessary to create time for them to engage in forest co-management. Rural women will only be able to prioritize time away from the home setting to be involved in forest co-management if the forest co-management work is financially rewarded, so they can reduce their domestic commitments.

While the religious influence was raised by the FGs and during in-depth interviews with key informants from three of the studied villages (i.e. Baidyamari, Kachubunia, and Poschim Dhangamari), but not raised by the FGD participants from Purbo Dhangamari village, which is predominantly Hindu. Religious influence from family members and religious leaders in two of the three villages is such that it prevents women from working outside the family home, especially alongside men. Most of the people who live in Baidyamari and Kachubunia are Muslim and identify with the religious influences (e.g. *parda*) that are prevalent. Whereas in Poschim Dhangamari, which is Hindu, people might feel isolated as a religious minority in Bangladesh, which could translate to women feeling they cannot contribute to the forest co-management activities. In addition to family and societal influences, religious norms and related perceptions strongly affect whether women will participate in outside work and local governance activities (e.g. works in Union Parishad, food for work) or not (Paul *et al.* 2019).

Another societal influence on women's involvement in forest co-management is their physical security in communities, especially for certain groups of women (e.g. particularly younger women). The physical and mental harassment of women by men discourages women from becoming involved in economic and community activities (Begum *et al.* 1970). Previous research from the study area also found that by increasing women's participation in groups, such as the Village Conservation Forum, the women in those committees felt more secure in the society and their confidence was boosted (Begum *et al.* 2021).

The gendered division of labor in society where men are visible and active in public life, but women are restricted to the domestic environment hinders women's participation in outside sectors. Women were also discouraged from becoming involved in forest management because they lack the time and are offered no institutional support (Lau *et al.* 2021). However, greater valorization of women's role in society, particularly from men and local influential leaders, along with institutional support can enhance women's participation in natural resource management activities (Begum *et al.* 2021). As only a small proportion of women are participating in VCF in the study area, leaving them isolated on a committee, therefore increasing the numbers of women through affirmative action or quotas on the committees would address these issues. A previous study also indicated that changing social norms by increasing



women's mobility and men's recognition of women's role on committees could increase women's participation in forest resource management (Nuggehalli and Prokopy 2009).

#### **4.2. Motivations of local women's participation in forest co-management activities**

Drivers of women's participation in forest co-management, despite the largely discouraging influences outlined above, were related to securing income, a sense of self-worth, building social support networks, future financial support, economic benefits, such as economic support from co-management and alternate income sources. All these factors either directly motivate or indirectly facilitate a woman's decision to participate. This study suggests that a woman's sense of responsibility to conserve the forest for future generations was identified by both the men and women study participants as being the most important determinant of women's participation. This means that for the women who have a strong sense of responsibility to conserve the forest, participating in forest co-management meetings and increasing their awareness of Forest Department rules is a strong incentive for their engagement. Appropriate training can reinforce the views of participants who already have a sense of responsibility and also those of the people with little responsibility to protect the forest and can thus increase local villagers' participation (Apipoonyanon *et al.* 2020).

Previous studies have indicated that women are motivated to participate in forest co-management due to the benefits gained, such as social responsibility, forest protection, and ecosystem benefits (Kimengsi *et al.* 2019; Nuggehalli and Prokopy 2009). Our study demonstrated that the future economic security of the women's families was an important motivating factor for their participation in forest co-management. Women who participated in forest co-management gained knowledge, skills, and access to loans for sustainable forest harvesting, which are also attributed as co-benefits of their involvement in forest co-management. While few women in the study areas are participating directly in forest conservation practices, previous studies have reported that women were motivated to participate in forest co-management activities as part of future earning potential (Ferdous 2015; Ondiba and Matsui 2021). Currently, in the study areas, most of the families have low monthly incomes (Begum *et al.* 2021); therefore, local participating women could strengthen their negotiating power within the household if they were provided with alternate income-generating support or financial support to counter the negative family pressure to not be involved in co-management.

#### **4.3. Implications for forest management policy planning**

The findings of this study demonstrated several influences on women's participation and identified some crucial factors that motivate women to participate in forest co-management activities. Policy recommendations from this research suggest that responding to various drivers of change and an effective benefit-sharing mechanism with trusted actors in the co-management governance to enhance and maintain equal and equitable participation by women in forest co-management will also sustain community wellbeing and forest protection.

To address the most prevalent family-related influences, it is necessary to provide greater recognition of women's roles in the household and society. Increasing women's

decision-making rights within the family or their leadership capacity in the community would bolster their self-confidence, especially in certain contexts where it is low. As this study demonstrated, women's current position in the family is an immediate influence on their full participation in forest co-management, reinforced by prevailing sociocultural norms.

To address these sociocultural norms and present a positive role for women in forest co-management, advertising programs in social media (e.g. TV, Facebook) or by poster representation in each co-management institutional meeting place could have some impact. The government can introduce such initiatives in active projects in forest co-management. Building women's groups and the associations within the co-management institutions could provide a supportive environment for women to discuss and resolve certain family and social influences raised. Having such organizations provides a safe space for women to develop their self-confidence, which empowers them and helps them recognize their expertise and accomplishments (Espada and Kainer 2023). Local women contributed most to voicing the influences on their participation in this paper along with key informants, who were mostly men, which suggests these people are concerned about participation, whereas only 12.5% of local men's FGD offered an opinion on the matter. Possibly educating male counterparts on committees on the role of women would improve the awareness of women's impediments to working on these committees and recognize the asymmetrical domestic workload and societal expectations women must accommodate (Rahman 2021).

To gain greater acceptance of women's participation in social activities, the religious leaders in the society should be encouraged to offer gender-related teachings that prioritize the role of women. Additionally, religious leaders and Imams should be engaged in empowering activities for rural women designed by the implementing projects/authority locally. Formal programs with religious leaders and gender-responsive actions could reduce religious barriers to women's participation in forest co-management (Anugrah *et al.* 2022). The fact that local village men chose not to speak on women's involvement in forest co-management could suggest that the current situation is not concerning to them, but more research would be needed to be certain of the reason for their beliefs. We also emphasize that the forest policies need to prioritize training and motivational activities that can modify local people's perceptions of women working outside the home; in particular, men's awareness of the difficulties women encounter when participating in forest co-management. In addition, encouraging male members of the family to take a more active role in household activities can release more time for women to participate in forest co-management.

Forest co-management practices should prioritize the local community, especially local women's needs/expectations from co-management institutions. To understand local community interests, this study suggests that locally led adaptation practice be employed, which will prioritize local community needs, especially women's needs and influences. With the initiation of locally led adaptation practice, there will be a chance to evaluate and monitor adaptation practice by the local community that will shift power to local stakeholders (Rahman *et al.* 2023). Co-management institutional practices need to reduce negative influences on women's participation and institutionalize motivating factors, such as secure and safe meeting places and funding for meeting attendance.

As women have direct involvement in the extraction of mangrove forest resources and contribute to household and community activities through forest co-management

participation (Begum *et al.* 2022), increasing the quota of women to various tiers of co-management, and including a gender-responsive allowance (e.g. safe transport for women to committee meeting venues) and creating economic opportunities could be a way to manage an equal and equitable participation of women in forest co-management. Therefore, government-led initiatives introducing diversified livelihood opportunities for the local women could be a way to support them economically. For the SMF, we suggest other initiatives, such as online business trading and an improved working environment for women with support by local NGO and civil society organizations. However, these types of initiatives will only be possible to implement in SMF when attitudes of local people, especially men, accept women working outside the family, and acknowledge women as equal colleagues in the workplace. Therefore, from the government perspective, some intervention activities can promote initiatives, such as supporting local NGOs under the Department of Environment to provide a safe and inclusive meeting place for women in forest co-management. In addition, the availability of economic and non-economic incentives for the participating women through specially designed projects is essential for the success of co-management governance, especially for enhancing cooperative behaviours and reducing family members' resistance to letting women participate in committees where they previously received no recompense.

## 5. Conclusions

Defining the influences on women's participation is an important undertaking for effective forest management practice. In the SMF areas, women are participating in forest co-management despite the difficulties they encounter. Through their participation, women have played vital roles in their households, community activities, and forest conservation (Begum *et al.* 2022). However, the factors that motivated these women to participate in forest co-management and influenced their experience were largely unknown. This study investigated the influences that limit women's participation and the motivating factors that could drive greater inclusion of women in forest co-management.

This study indicated that women's participation in forest co-management was mostly influenced by family expectations, followed by religious and societal norms, which constrained their participation rather than encouraged it. Despite these influences, several factors motivate them to participate in forest co-management, especially economic benefits and a sense of responsibility for forest protection. Relevant government policy initiatives could be implemented in the SMF region which focuses on increasing the quota of women to various tiers of co-management, providing economic and non-economic incentives, ensuring safe and inclusive meeting places and settings, effective benefit-sharing mechanisms with the monitoring authority, and enhancing cooperative behaviours by the male counterparts. Such project activities also need to monitor the effectiveness of such initiatives if they are to benefit rural women's development and their overall empowerment in forest co-management.

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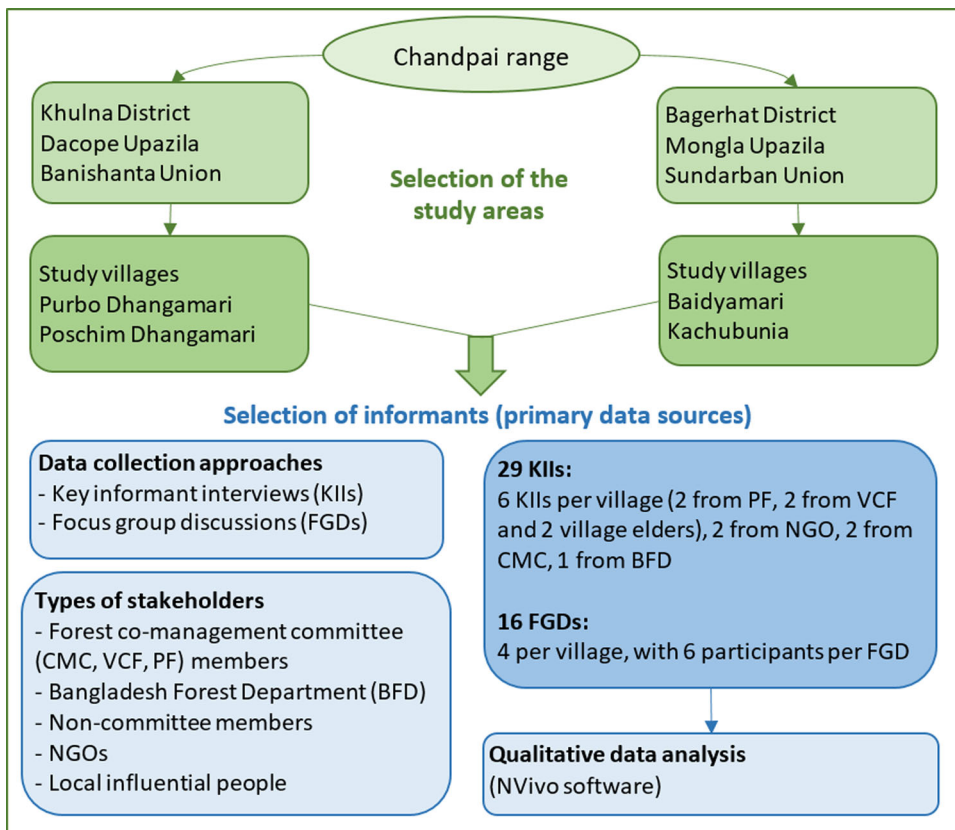


## Appendices

### Appendix A. Characteristics of relevant forest co-management project activities in Sundarban mangrove forest

Name of the projects	Donor agency/ funding authority	Duration	Location	Objectives
Integrated Protected Area Co-management	USAID	2009–2013	VCF villages in four ranges of Sundarban	Capacity building among institutions at local and central levels
Climate Resilient Ecosystems and Livelihoods	USAID	2013–2018	VCF villages in four ranges of Sundarban	Institutional capacity building, enabling sustainable communities and ecosystem
Bengal Tiger Activity Project	USAID	2014–2018	Sundarban	Wildlife conservation
SMP 1 (Sundarban Management Project 1)	GIZ	2017–2019	VCF villages in Chandpai range	Institutional and capacity development, identify resource users
SMP 2 (Sundarban Management Project 2)	GIZ	2019–2022	VCF villages in Chandpai range	Institutional and capacity development, identify resource users
Dolphin Project	UNDP	2015–2020	Three wildlife sanctuaries in East Sundarban (Dhangamari wildlife sanctuaries, Chandpai wildlife sanctuaries and Dudhmukhi wildlife sanctuaries)	Dolphin conservation, improving local community livelihoods
Protibesh	USAID	Started 2021 (5-year project)	Four ranges in Sundarban	Co-management activities
Surokkha	Bangladesh Government	Started 2020 (5-year project)	Four ranges in Sundarban	Alternate income generation for the local community

**Appendix B. Schematic representation of sampling strategy and data collection methods**



**Appendix C. Socio-demographic characteristics of the four study villages (Source: BBS 2011)**

	Kachubunia	Baidyamari	Purbo Dhangamari	Poschim Dhangamari
Population	2,282	525	2,514	2,553
Proportion of females (%)	50	52	49	49
Number of households	486	72	586	290
Total area (km <sup>2</sup> )	2.75	0.90	0.75	3.20
Household income (USD/month)	144	96	84	120
Religion (% of people)				
Muslim	95	100	30	20
Hindu	5	0	60	80
Christian	0	0	10	0

**Appendix D. VCF membership of women among the four study villages (Source: SMP 2018)**

Study villages	Number of VCF members				Total
	Male		Female		
	Count	%	Count	%	
Baidyamari	69	95	4	5	73
Kachubunia	155	96	6	4	161
Purbo Dhangamari	252	88	35	12	287
Poschim Dhangamari	174	94	11	6	185

**Appendix E. Multi-level purposive sampling of key informants**

District	Subdistrict	Village	Key informant category	Number of informants			
				Male	Female		
Khulna	Dacope	Baidyamari	VCF	1	1		
			PF	1	1		
			LIP	2	–		
		Kachubunia	VCF	1	1		
			PF	1	1		
			LIP	2	–		
Bagerhat	Mongla	Purbo Dhangamari	Local NGO	2	–		
			VCF	1	1		
			PF	1	1		
		Poschim Dhangamari	VCF	1	1		
			PF	1	1		
			LIP	2	–		
		Dhaka			CMC members	2	–
					National level	1	–
					Total	21	8

VCF: village conservation forum; KII: key informant interview; PF: people's forum; LIP: local influential person; NGO: non-government organization.

**Appendix F. Purposive sampling of focus group discussion (FGD) participants based on gender and involvement in forest co-management**

Villages	Number of FGDs per category (participants per FGD)			
	Women involved in forest co-management	Not involved	Men involved in forest co-management	Not involved
Baidyamari	1 (6)	1 (6)	1 (6)	1 (6)
Kachubunia	1 (6)	1 (6)	1 (6)	1 (6)
Purbo Dhangamari	1 (6)	1 (6)	1 (6)	1 (6)
Poschim Dhangamari	1 (6)	1 (6)	1 (6)	1 (6)
Total	4 (24)	4 (24)	4 (24)	4 (24)