

Community-based volunteer management to mitigate human tiger conflict in the Bangladesh Sundarbans



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Abbreviations and acronyms

FGD	Focus Group Discussion
NGO	Non-Governmental Organisation
USD	US Dollar
UNESCO	The United Nations Educational, Scientific and Cultural Organisation
VRTT	Village Tiger Response Team

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Background

The Bangladesh Sundarbans suffers the highest level of human tiger conflict in the world (Ahmad et al., 2009; Barlow et al., 2013). Every year, approximately 20-50 people and 80 livestock are killed and many more are injured by tiger attack whereas, 1-3 tigers are killed by the villagers (Barlow, 2009; Rahman et al., 2009; Barlow et al. 2013). To reduce human tiger conflict in the area a community based volunteer team, Village Tiger Response Team (VTRT) was formed by the Forest Department of Bangladesh with the collaboration of WildTeam (previously known as Wildlife Trust of Bangladesh) in the adjacent villages to the Bangladesh Sundarbans. The aims of this initiative were to involve and train local community people to reduce human tiger conflict. Initially, 29 teams were formed considering the most human tiger conflict prone area, but now 49 teams are contributing to reduce human tiger conflict as well as to save tiger. The main responsibility of these teams is to act as an emergency responder during stray tiger situation to save the tiger and also the villagers and their livestock. Their responsibility also includes emergency patrolling, transporting tiger victims and providing emergency medical assistance. After forming these teams, there is a significant change in human tiger conflict situation in the area. They have successfully managed several stray tiger situations and saved several tigers from the villagers. For a significant role in human tiger conflict management, villagers are now relying on them for emergency assistance. Through their courage, motivation and hard labour, they have achieved their acceptability to local community and are being respected as the safeguard of the tiger.

About 350 VTRT members of 49 teams are contributing to reduce human tiger conflict in the Bangladesh Sundarbans. This is one of the most successful community based initiatives in Bangladesh where local people are united voluntarily to mitigate human tiger conflict. These people are risking their lives to control stray tiger situation in the villages, ultimately which saves the tigers, the villagers and their livestock. Even among the team members, some have lost their family members by tiger attacks. Moreover, they are doing this without any salary or financial incentives where most of the people are living below poverty level (Chowdhury, 2010). Not only that, in the adjacent villages to the forest, it is very common, the local people used to kill the tiger that usually come into the villages. Understanding the motivations of the VTRT members and their management process is very important to initiate a holistic human tiger conflict management approach.

VTRT is the first community based volunteer team that is working for wildlife conservation in Bangladesh. Every year 1-3 tigers are killed by the local villagers (Barlow, 2009; Barlow et al., 2011; Rahman et al., 2009). In some cases, tigers are killed through retribution killings associated with human tiger conflict (Ahmad et al., 2009). These retribution killings are related to the attitude of the local people derived from their experiences due to human killing or livestock killing incidents. Moreover, these incidents creating negative attitudes in the local community against the tigers which ultimately affects the long term tiger conservation initiatives in the Sundarbans (Ahmad et al., 2009). After the formation of the VTRTs, the situation started improving. Now if a tiger strays into a village, the VTRT members try to save both the villagers and tiger, thus they are contributing to wildlife conservation. However, a recent study shows that VTRTs are important in this area for reducing human tiger conflict (Inskip et al. 2014).

Study area

The Sundarbans

The Sundarbans is the largest mangrove forest in the world situated between 21°30'- 22°30' N latitudes, and 89°12'-90°18' E longitudes, at the south side of the tropic of cancer (Iftekhar and Islam, 2004). This forest lies on the world's largest delta, the Ganges Brahmaputra basin, where three mighty rivers the Ganges, Brahmaputra and Meghna flow over it and the Bay of Bengal is to the south of the forest (Iftekhar and Islam, 2004).

The Sundarbans shares its border with India and Bangladesh. The total area of Bangladesh Sundarbans is 6,017 km² which comprises 62% of the total forest (Iftekhar and Islam, 2004). The remaining 4,246 km² is situated in the Indian state of West Bengal, and the international border is marked by the river Raimangal (called Haribhanga in India). In Bangladesh the Sundarbans is located at the south-west corner of the country (Figure 1). In Bangladesh, about 50% of the revenue from the forestry sector comes from the Sundarbans, and it constitutes about 44% of the total forestry of Bangladesh (Tamang, 1993).

The Sundarbans is the only place in Bangladesh where wild tigers (*Panthera tigris*) are found and in there are about 300-500 tigers, probably one of the largest populations in the world (Barlow, 2009). The Bangladesh Sundarbans (hereafter referred as the Sundarbans) is a reserved forest and there is no human habitation inside it (Khan, 2004). People live in the villages around forest and extract resources from it. The Sundarbans is also a UNESCO World Heritage Site which consists of three wildlife sanctuaries: Sundarbans West, Sundarbans East, and Sundarbans South.

The Sundarbans is surrounded by 8 *upazilas* (sub-districts): Shyamnagar; Koyra; Dacope; Mongla; Morrelganj; Sarankhola; Mothbaria and Pathorghata (Figure 1). Of these 6 *upazilas* (Shyamnagar; Koyra; Dacope; Mongla; Morrelganj; Sarankhola) are immediate adjacent to the forest and the rest 2 (Mothbaria and Pathorghata) are on the east side of the Sundarbans, and the river Baleshwar is situated between these 2 *upazilas* and the forest (Figure 1). For administrative purpose, the forest department has divided the Sundarbans into 4 parts as Satkhira range, Khulna range, Chandpai range and Sarankhola range (Figure 2).

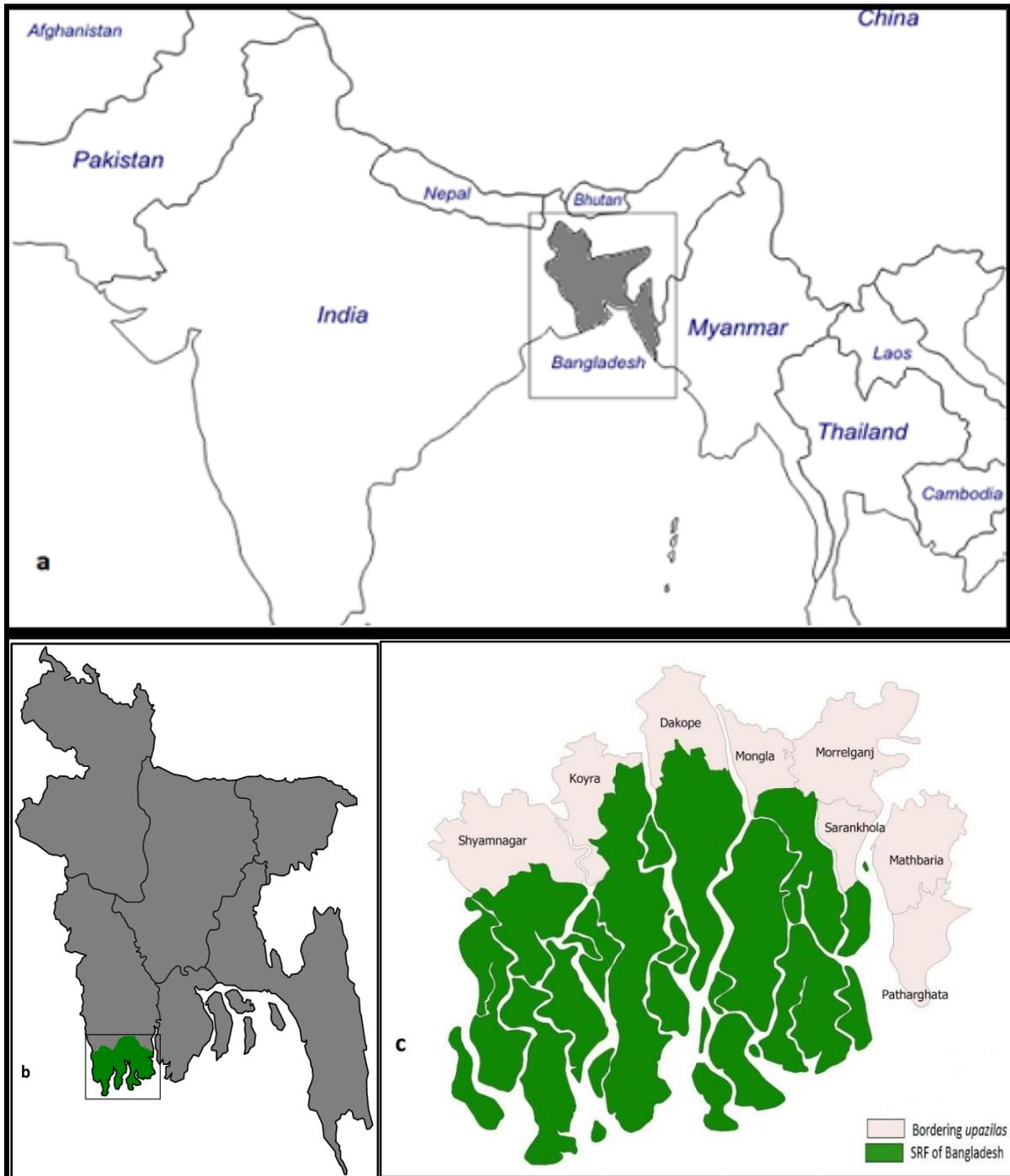


Figure 1. Geographic location of Bangladesh (a); location of the Bangladesh Sundarbans in Bangladesh (b), and locations of the adjacent *upazilas* of the Bangladesh Sundarbans (c).

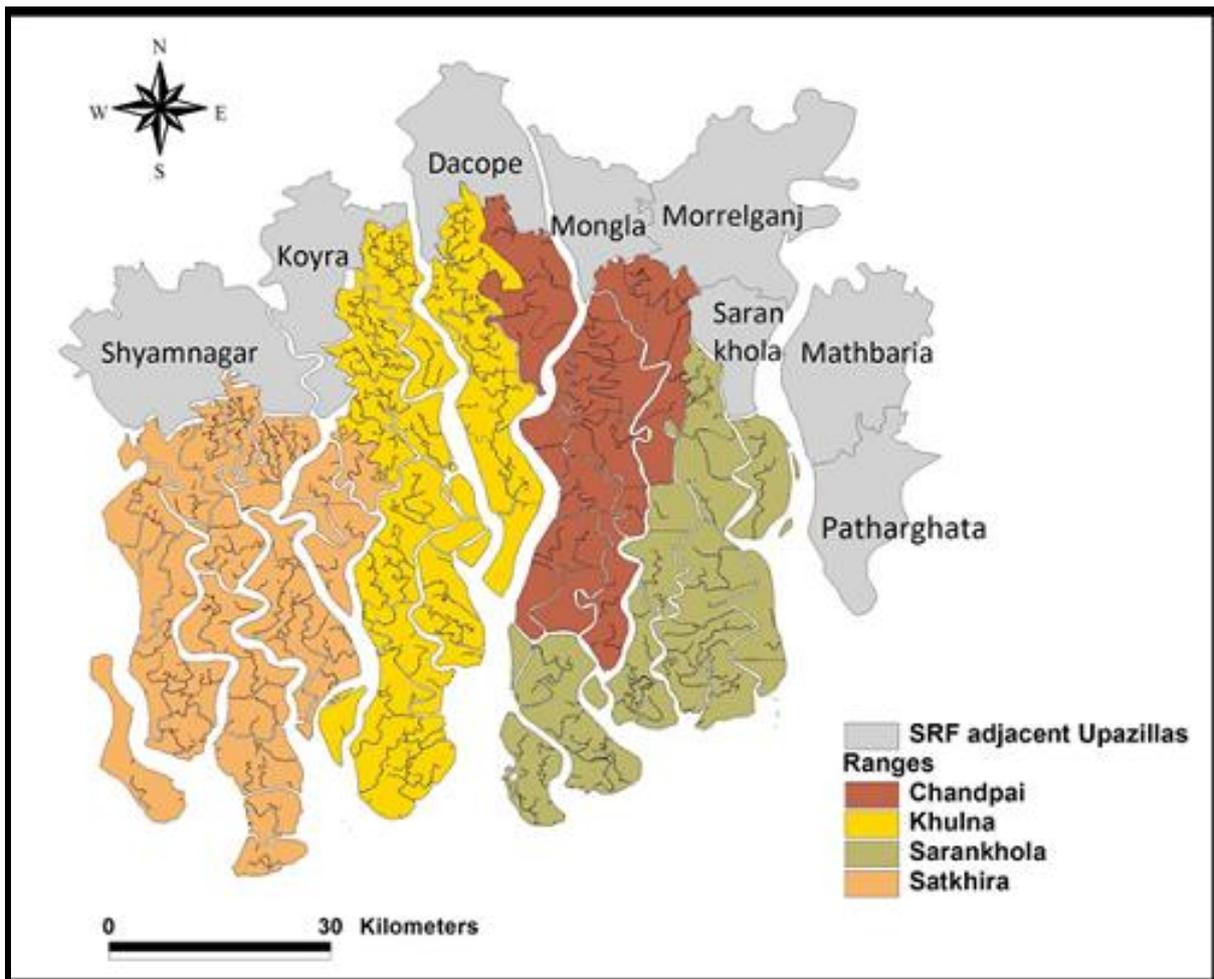


Figure 2. The 4 ranges of the Sundarbans with the adjacent *upazilas*.

People around the Sundarbans

There is no human settlement inside the Sundarbans except few forest camps. The forest is surrounded by villages and about 3.5 million people living in the adjacent areas of the forest are directly or indirectly dependent on the Sundarbans for their livelihood due to lack of employment opportunity in the area (Islam, 2008; Dhar, 2011; Shah and Datta, 2011; Inskip et al., 2013). The people around the Sundarbans are mainly fisherman, crab collector, woodcutter, honey collector, or leaf collector (Khan, 2004). The land area around the Sundarbans is not suitable for agriculture due to salinity (Chowdhury, 2010) and some people go to other places and work as farmer to the land of other people. Some people work as day labour in the village when they get a chance.

Fishing is one of the main sources of income of the local community people. Most of the fishermen collect fish, shrimp, prawn and crab from the forest (Islam and Haque, 2004). However, life as a fisherman is not very simple. The fishermen need to collect permit from the forest department before going for to the reserved forest for fishing or collecting crab. In the forest there is the fear of pirates. Pirates kidnap fishermen for ransom and in every fishing season they fishermen need to pay a certain amount to the pirates depending on how many boats or fishermen he has in his team (Samia Saif pers. comm.). Unable to pay the money to the pirates sometimes cause beating or killing of the fisherman.

Beside this, a large number of people collect honey from the deepest part of the forest. The honey collection season starts in April when people go inside the forest with paddle boat to collect honey in a small group of 8-9 people (Chakrabarti, 1987). Most of the human deaths by tiger attack occur during honey collection season. People also depend on this forest for collecting firewood, timber and grazing their livestock.

Human tiger conflict in the area

The villages around the Sundarbans are separated from the forest by small canals and conflict between human and tiger is a very common in the adjacent villages of the Sundarbans. People have to take life risk while entering into the forest due to the presence of tiger. The Sundarbans of Bangladesh and India as a whole has the highest rate of human death to tiger or carnivore attack (Barlow et al., 2013). The Bangladesh Sundarbans suffers the highest level of human tiger conflict in the world that includes human killing, livestock depredation and ultimately retribution killing of tigers by the affected local communities (Barlow, 2009). In the Sundarbans, about 50 people, 80 livestock and 1-3 tigers are killed and many other are injured every year (Barlow, 2009). Over the time, the trend of human death by tiger attack is quite consistent (Barlow et al., 2013). Sometimes, many incidents remain unreported as many people do not take prior permission from the Forest Department and go inside the forest illegally, or are not documented by if an injured tiger victim dies later (Barlow, 2009). Most of the human tiger conflict incidents took place when people go inside the forest to collect resources, whereas most of the tigers are killed when they enter into the villages.

The financial impact on the tiger victim or the victim's family is also severe. The human tiger conflicts increase financial crises to the victim's family due to the reduction or loss of victim's income and/or, livestock, reconstruct effected house, and medical treatment (Inskip et al., 2013). The medical treatment for a tiger victim costs an average of USD 657; where the average annual income of a family in the area is USD 718 (Akhter et al., 2009; Inskip et al., 2013). The Government of Bangladesh started to pay compensation of BDT 100,000 (USD 1,240) to the family members of the person who is killed, and BDT 50,000 (USD 625) to the person who is injured by tiger attack. However, getting the compensation is not very easy due to corruption (Islam and Chuenpagdee, 2003).

Village Tiger Response Team (VTRT)

To reduce human tiger conflict, the first initiative was taken by an NGO in Bangladesh- the WildTeam. Due to high frequency of the conflict, active participation of the community people was needed to reduce the human tiger conflict. So community based volunteer teams, known as Village Tiger Response Teams (VTRTs) were formed. The aim of this initiative was to train local people to mitigate human tiger conflict. Initially, 29 teams were formed covering 76 villages adjacent to the Sundarbans considering the most human tiger conflict prone areas in 2008 (Figure 3). Moreover, within last 2 years additional 20 teams have been developed, and now about 350 members of 49 teams (7 members in a team, with a team leader) are volunteering around the Sundarbans (Figure 3). Among these teams, two have successfully saved stray tigers which were rescued and released back to the forest in 2007 and 2011. On the other hand, two teams were unsuccessful to rescue tigers from the villagers in 2010 and 2012. The duties of these teams are to act as an emergency responder. VTRT's work includes emergency patrolling, announcing in the village when a

tiger enters into a village to ensure safety of the villagers and their livestock, and managing and convincing villagers not to kill the tiger. All these teams are connected to local people with a 24 hours emergency hotline service. Before forming the VTRTs, any tiger which strayed into the village was killed by the villagers. Since 2008, after forming VTRTs, the situation has been improved. If a tiger is nearby or enters into the village VTRTs patrol the area, use firecrackers, manage the crowd and try to chase the tiger back to the forest until the Forest Department arrives to rescue it and take it back to the forest. The objective of this initiative was to build the grass root level conservation capacity within the vicinity. These teams are leading their communities towards the natural resource conservation practices focusing in tiger conservation. With the support from local communities the VTRTs have been regarded as local conservation governing unit in their surroundings.

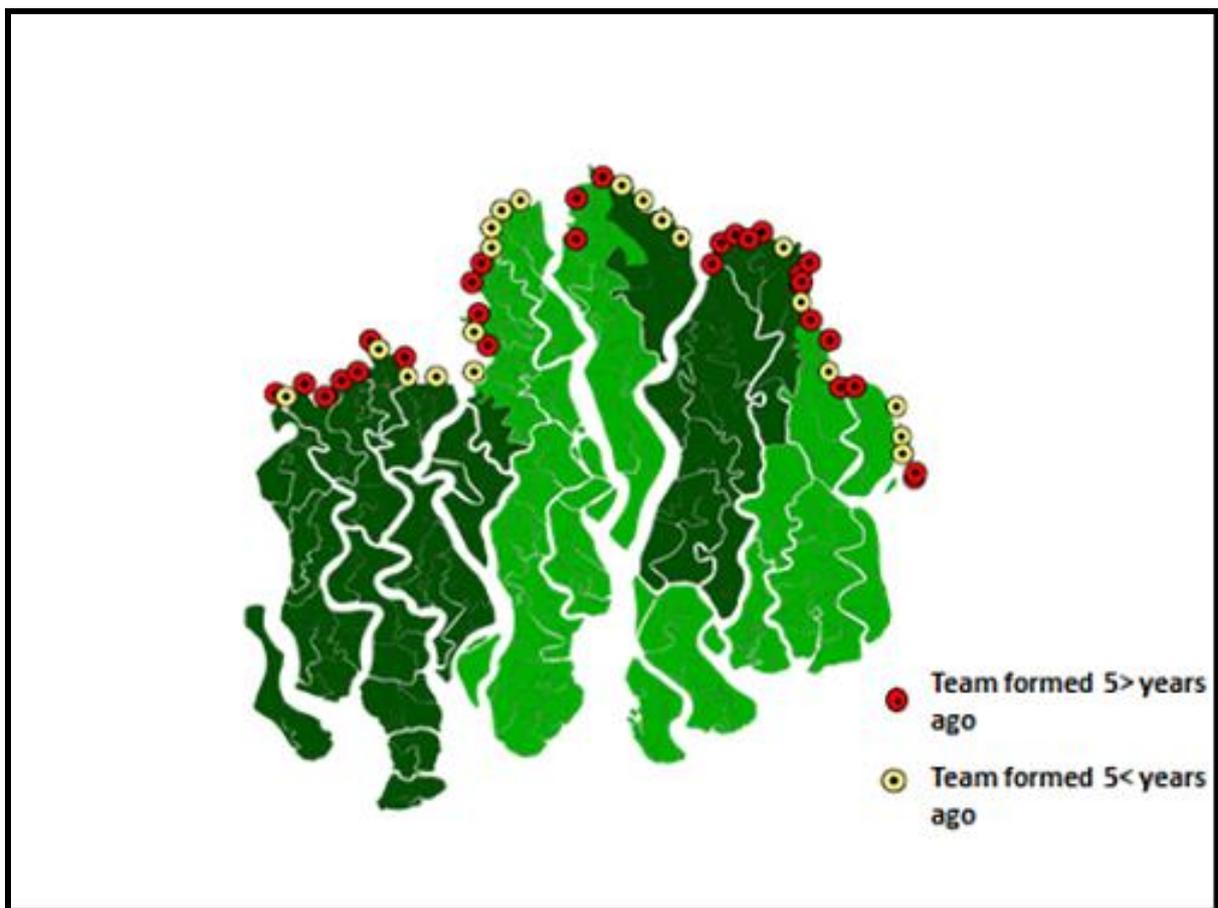


Figure 3. Location of the 29 old and 20 new VTRT teams around the Sundarbans.

Methodology

Sampling strategy

To understand the motivations of the VTRT members and their acceptability to the community people targeted sampling were carried out with 3 groups for data collection.

Group 1: VTRT members

VTRT members were selected for data collection to understand their motivation and reasons for joining the community based team as volunteer. In depth, semi-structured interviews were conducted with the VTRT members. An interview guide predominantly with open ended questions was followed to aid the researcher to cover all the points during the interviews. The questions of the interviews mainly focused on the followings:

- Motivation to join VTRT
- Their working process
- Problems to work as VTRT
- Relationship with other villagers, government and NGO staff
- Financial and non-financial incentives for VTRT member
- Sustainability of the VTRT

Group 2: Villagers

VTRTs are working within their communities and it is important for them to be accepted and supported by the other people in the community for their work. In that point of view, support and encouragement by the community people towards VTRT activities is important to make the VTRT sustainable. The villagers were selected for data collection to know the perception and attitude of the community people towards the VTRTs and their activities. Focus Group Discussions (FGDs) were carried out with the villagers to understand how the VTRTs are accepted within the community and how to make these teams sustainable. A topic guide was used for conducting the FGDs. The topic guide mainly covers the following topics:

- Their knowledge about the VTRTs
- VTRTs role and performance during stray tiger situation
- Changes in human tiger conflict situation after VTRTs formation
- Villagers' perception of the VTRTs status
- Barriers of the VTRTs
- Options and interest to get involved with the VTRTs
- Sustainability of the VTRTs

The villagers who were injured by tiger attack, lost family members or livestock, tiger widow, local forest staff, local community member, teacher, businessman, shopkeeper, forest resource users were selected for the FGDs.

Group 3: VTRT managers

Meetings were carried out with the VTRT managers at WildTeam to understand their management process and their plan to make these teams sustainable.

Meetings were conducted with the VTRT managers during the fieldwork to know about how they formed the VTRTs, and convince the villagers to work as volunteers for mitigating human tiger conflict around the villagers of the Sundarbans, which has a perceived risk of getting attack when a tiger is in the village. Two meetings were carried out at WildTeam field office. During the meetings the following topics were covered:

- The development process of the VTRTs
- Selection or recruitment of the VTRTs
- Management process of the VTRTs
- Trainings provided for the VTRTs
- Financial or non-financial support provided for the VTRTs
- Sustainability plan for the VTRTs

Data collection

Data were collected between July and September 2014. During this time, 98 semi-structured interviews were carried out with the VTRT members of 30 different teams (Figure 4) belonging to 4 ranges (Figure 5). Of these 30 teams, 19 teams were old teams, which means these teams were formed 5> years ago; and 11 teams were new teams, which means these teams were formed 5< years ago. Among the interviewees, 72 VTRT members were belonging to old teams and 26 VTRT members from new teams (Table 1).

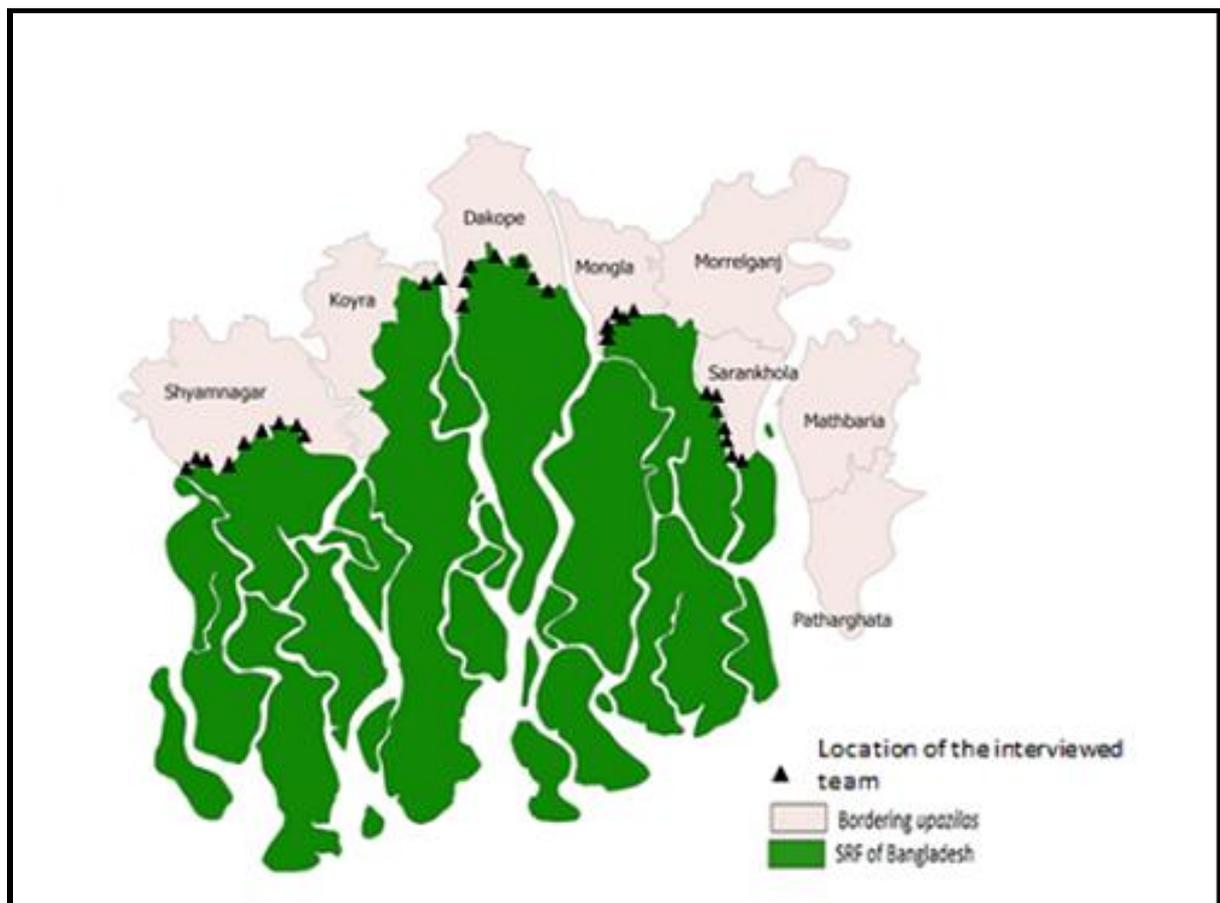


Figure 4. The location of the Village Tiger Response Teams interviewed for data collection.

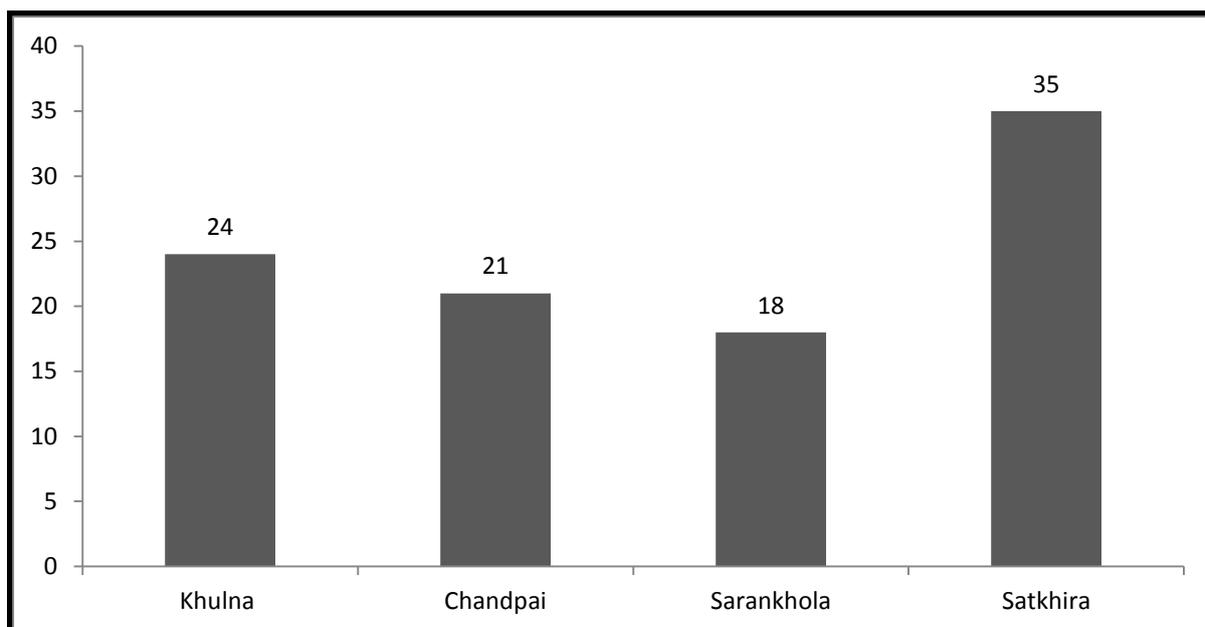


Figure 5. Number of VTRT members interviewed from the 4 administrative ranges of the Sundarbans.

Team name	Number interviewees	of	Team formation	Range
Ghagramari	4		Old	Khulna
Koilashganj	5		Old	Khulna
Lawdobe East	6		New	Khulna
Lawdobe West	1		New	Khulna
Gazi Fish	1		New	Khulna
Sutarkhali	3		New	Khulna
Dacope	1		New	Khulna
Shorbotkhali	3		Old	Khulna
Chandpai	3		Old	Chandpai
Katakali	5		Old	Chandpai
Boiddomari	3		Old	Chandpai
Kochubunia	3		Old	Chandpai
Jewdhara	4		Old	Chandpai
Gulishakhali	1		New	Chandpai
Amurbunia E.	2		New	Chandpai
Dashervarani	4		Old	Sarankhola
Panirghat	4		New	Sarankhola
Vola	3		Old	Sarankhola
Terabeka	3		Old	Sarankhola
Sarankhola	3		Old	Sarankhola
Khurikhali	1		New	Sarankhola
Tengrakhali 1	4		Old	Satkhira
Kolbari	3		New	Satkhira
Tengrakhali 2	3		New	Satkhira

Mirgang	1	Old	Satkhira
Kodomtola	7	Old	Satkhira
Chunkuri	4	Old	Satkhira
Golakhali	4	Old	Satkhira
Munshiganj	3	Old	Satkhira
Burigoalini	6	Old	Satkhira

Table 1. Number of VTRT members interviewed from 30 teams.

The age of the interviewees varies from 19 to 67 (Figure 6). The teams and the members were selected considering the human tiger conflict prone area and the availability of the VTRT members. During this period, 12 FGDs were conducted in 4 ranges of the Sundarbans. Three different locations from each range were selected for the FGDs. Each FGD consists of 7-8 people which includes local elites, businessmen, teachers, tiger victims (people who were injured by tiger attack or lost their livestock to tiger attack), family members of the people killed by tiger attack, forest resource users and Forest Department staff.

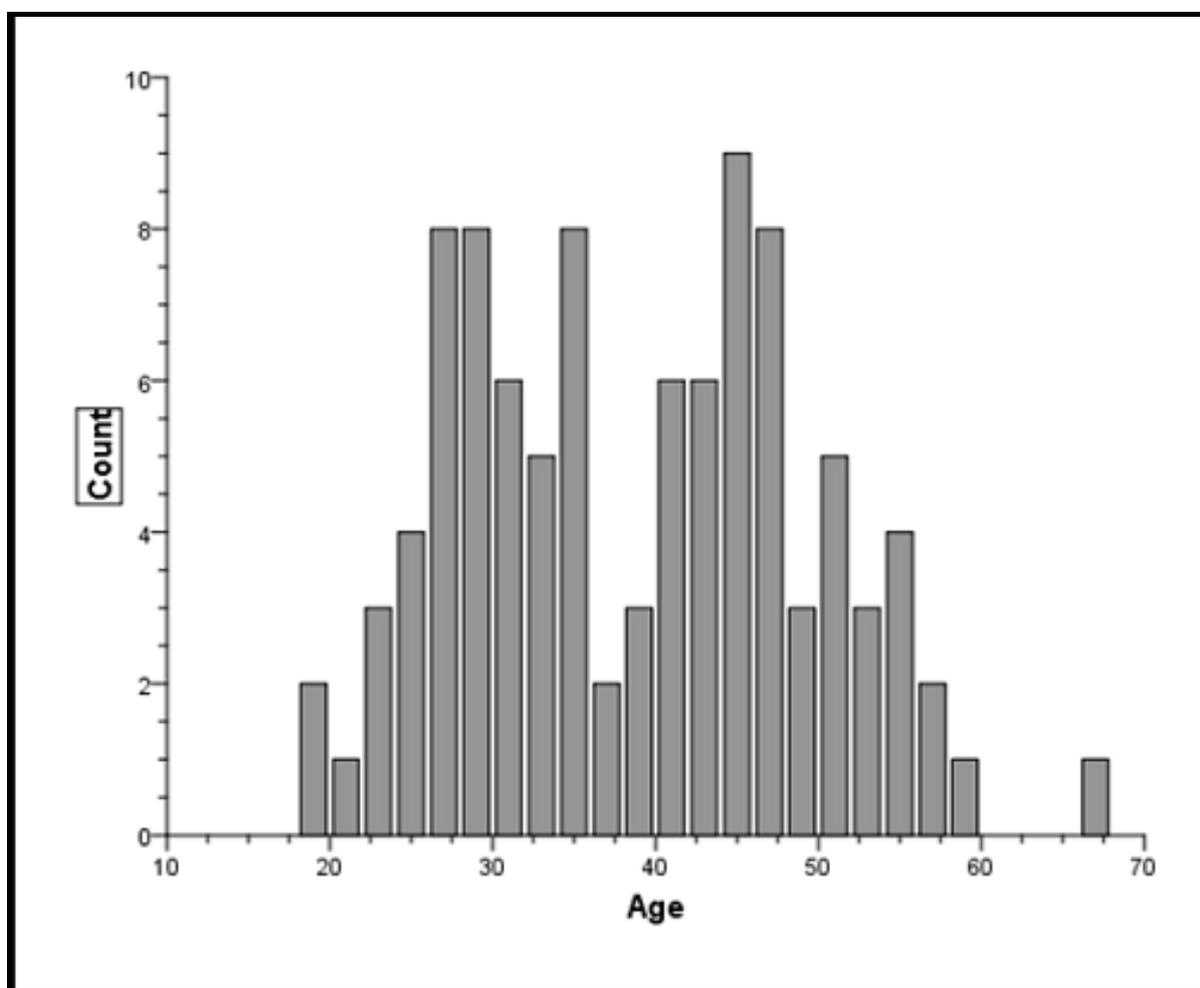


Figure 6. Number of VTRT interviewees and their ages.

The teams were approached depending on the availability of the members. The VTRT members were contacted over mobile phone by WildTeam staff, and the VTRT members who agreed to be interviewed and not occupied with other works were selected for the interviews. The local field staff of WildTeam introduced the researcher to the potential

villagers i.e. tiger victim, community member, local elites, etc. for the FGDs. However, the researcher was directly involved in developing VTRTs for 2 years, therefore is known to the VTRT members and the community people.

Research team

Two research assistants (Aal Maruf Russell and Muttaki Bin Kamal) were recruited for conducting the interviews and FGDs along with the main researcher. An initial training was carried out with the research team before starting data collection on interview techniques and ethical issues. The expenses for data collection were provided by the Rufford Foundation.

Ethical issues

The research outline was explained to the VTRT managers- the WildTeam, and a representative from WildTeam was assigned to inform the VTRT members about this research to assure them that there is no legal obligation to give information to the researcher. All the participants of the interviews and the FGDs were assured about the anonymity of the data and their identity will not be disclosed. Participants were informed not to respond to any questions if they do not want to and can end the interview anytime they want.

Interviews and FGD were fixed in a time when the participants were free, so that the data collection for this research does not affect their livelihood activity. Snacks were provided to all the interviewees and participants of FGDs by the research team.

Data Analysis

All interviews were transcribed while conducting the interviews, and the FGD discussions were recorded in a recorder, and transcribed later. The quantitative data on different factors were entered in an excel sheet to quantify how many interviewees mentioned about different factors, for example, motivating factors, barriers as VTRT, link with human tiger conflict, sustainability option, etc.

For the qualitative data no specialized qualitative data analysis software was used due to time limitation. Instead, the transcriptions of the interviews and the FGDs were read several times to build a narrative account of the VTRT work. By going through the data several times the data on different issues were identified and categorized by using colour coding. Later all the colour coded data on a particular issue of the VTRTs were combined in an excel sheet (Microsoft 2010) for better management of analysis. The qualitative data were also used as explanation and supporting evidence of the different factors of the VTRTs mentioned by the participants. Pearson's Chi-square test was performed in SPSS (version 21, IBM) to find out the significance difference between the motivation for joining VTRT and other factors i.e. age, profession, area, tiger related experience. Pie charts and bar charts were used to describe the basic trends within the questionnaire data. Graphs were produced in Excel (Microsoft 2010).

Results, analysis and evaluation of results

This research explores the motivating factors for the VTRT members to join the team as volunteer; the barriers they face to work as a volunteer; the scopes of the VTRT members; VTRT management process and VTRT sustainability.

Motivations of the VTRT members

This research identifies four motivating factors which drive the local people to be a member of the Village Tiger Response Team: saving tiger, non-financial incentive (i.e. honour), and financial incentive i.e. job and money.

Saving tiger

Interviewees (n=78/98) reported saving tiger as a motivation for joining the VTRT. Of these VTRT members, some mentioned saving tiger is the only (n=23/78) motivation for joining the team as volunteer while others reported it as one of the reasons (n=55/78) to join the team (Figure 7). They also reported that, tiger is the safeguard of the forest and without the presence of tiger this forest is going to be destroyed. Moreover, as a community member they think that it is their responsibility to save their local resources. A VTRT member stated: *“tiger is the pride of Bangladesh and as local people it is our duty to save it.”*

The participants of the focus group discussion reported that, the local people mostly depend on the Sundarbans for their livelihood and, they believe that tiger is protecting the forest. Tiger is important to save their livelihood options and it is not possible to save tigers without the help of local people. A participant stated: *“VTRT member has training to save tiger and they help Forest Department in stray tiger situation”*

Non-financial incentive

Some interviewees reported that, they are working in this team as they are respected by the local people. They believe that, now most of the people living in the villages around the forest know about VTRT and respect their work. ‘Respect’ as a non-financial incentive was mentioned by the interviewees as the only motivating factor (n=8/98), or one of the motivating factors (n=35/98) to join VTRT (Figure 7). They also mentioned that local people consider them as brave people due to the risk involved in this work. Moreover, the local people respect them as they are doing it as volunteer. A VTRT member stated: *“at first, people did not have any idea about volunteerism and they used to call me a fool because I do not get any salary. But for the time being, they have realised that I am risking my life for the welfare of the village. Now we have acceptability to them and they also help us in emergency situation.”*

The villagers also mentioned about their respect for the VTRT members. The participants in the focus group discussions reported that, to them VTRT members are different from the members of other organisations, because the work of the VTRT member is risky. Moreover, for this service they do not get any salary. The villagers expressed their respect by stating: *“we can sleep in peace because now we know some people are guarding us to protect from tiger attack. We have nothing to give them but to respect.”*

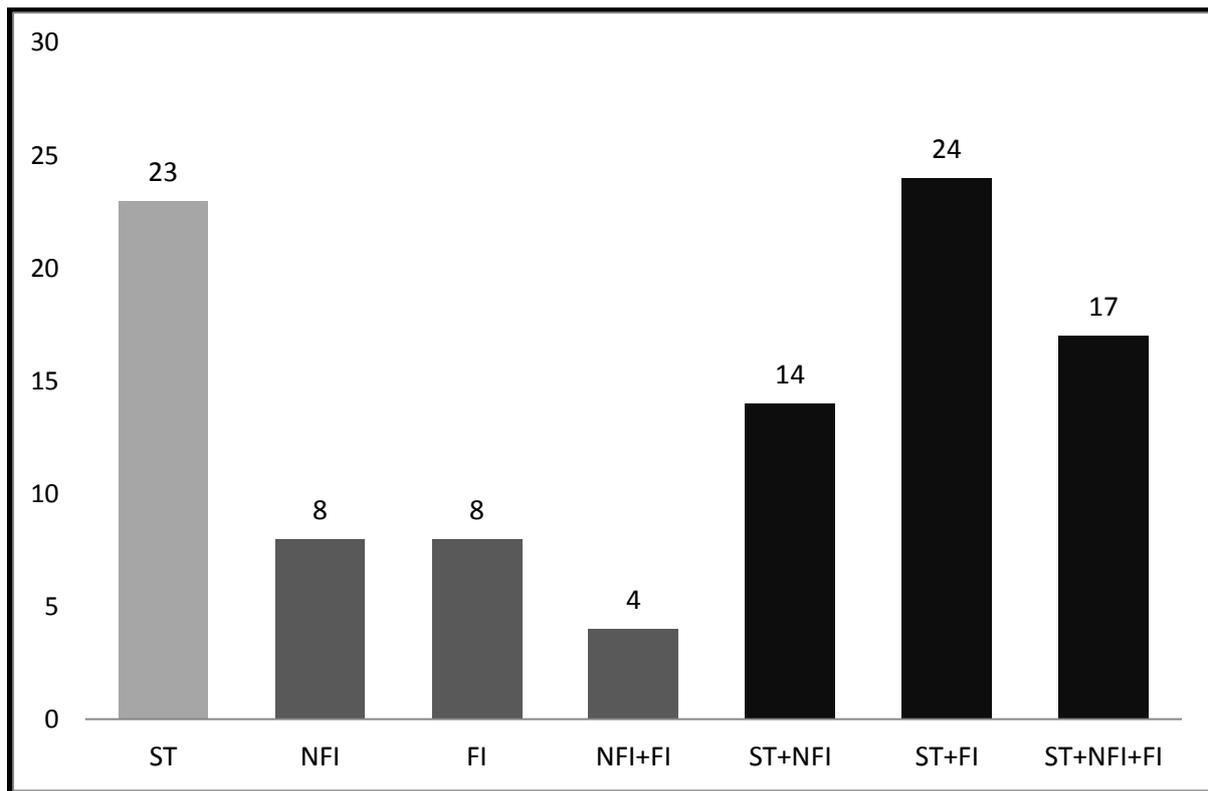


Figure 7. Number of VTRT members mentioned different motivating factors for joining the team as volunteer. ST: saving tiger; NFI: non-financial incentive; FI: financial incentive. The light grey bar represents the VTRTs who mentioned saving tiger as the only motivation; the grey bars represent the VTRT members who mentioned non-financial and/or financial incentives as their motivation/s; and the black bars represent the VTRT members who mentioned saving tiger and non-financial and/or financial incentives as their motivations.

Financial incentives

Some VTRT members (n=53/98), reported financial incentives as a motivation to join the team as volunteer (Figure 7). Of these VTRT members, some (n=8/53) mentioned financial incentive as the only motivation, and others (n=45/53) reported it as their one of the motivations to join the VTRT. From the narratives of the interviewees and the villagers, 2 types of financial incentives were found: job and financial support.

Job

One of the reasons that encouraged people to join the VTRT is to get a permanent job. Interviewees (n=21/98) reported that they had expectation of getting a permanent job in the long run. The participants in the focus group discussions also reported that some VTRT members may have expectation to get a permanent job in the organisation. A VTRT member expressed his motivation as: *“we are working for this team from the very beginning; our managers can make us permanent staff now.”*

Financial support

Some interviewees (n=45/98) reported that they joined the VTRT to get money from their managers. They also added that, they knew as a volunteer they are not supposed to get any salary from their manager. However, they expected that, their manager would arrange some financial support for them in the long run. A VTRT member mentioned: *“our economic*

condition is not well enough to spend all the times running after tiger, we need financial support. We know, as a volunteer we are not supposed to get any salary, but our manager should arrange something else."

The participants of the focus group discussions reported that, the local people experienced two devastating cyclones, Sidr and Aila in 2007 and 2009 respectively. These cyclones had a bad impact on the economy of this area. After these cyclones, different organisations started working in the area and provided financial support to the local people. So, the expectation of getting any financial support from the organisation is one of the main factors that encouraged local people to join VTRT. A VTRT member stated: *"we do not know what is the plan of the managers with us [VTRT members], but we believe that they will arrange some financial support for us in future."*

Management Process

Village Tiger Response Team formation

From the VTRT managers, it has been found that the WildTeam staff went to the villages around the Sundarbans to identify the most human tiger conflict prone areas, and had meetings with local people about the community based volunteer teams to mitigate or reduce human tiger conflict. Team members were selected from the villagers, who were interested to join the teams and found enthusiastic to work for tiger conservation, who had good reputation in the area in terms of acceptability among the villagers and not involved in any illegal activity. In the first phase of VTRT formation 29 teams were formed in the 4 ranges of the Sundarbans, each team consists of 7 members including a team leader. The team members decide the team leader from the team members.

Team activity

The team members of each team conducts a team meeting each month. The team leaders of each range have a monthly meeting with their managers. During the meetings the team members discuss about the team's progress, inform the team leader about any issue or problem they face for conducting their work. The team leader informs the managers during their meeting with the team manager in team leader's meeting.

As one meeting for the team leaders in each range is carried out monthly, the team members have to travel to the meeting place from their village. The travel cost of the team leaders are provided by the managers. The managers also provide some money to the team leaders for buying snacks during the meeting with his team members.

Training and incentive for the VTRT members

Training sessions were conducted with the team members on how to respond on emergency situation, communication strategy with their managers, crowd control, safety training, and tiger behaviour. Each team members were given a vest to wear during stray tiger situation or emergency situation. Over the time, other logistic support such as torch light, batteries, rain coat, and jacket have been provided to all the members.

Apart from that, each year 'refresher training' is conducted with the VTRT members in each range. In the refresher training the team members are provided with new materials, and introduced to the forest staff and elite people of the society, which helps to improve the relations of the VTRT members to their community people. This also acts as non-financial incentive for the members. These events get media coverage and the VTRT members are highlighted as the local heroes.

Scope for the VTRTs

From the VTRT members' narrative, it has been found that the main objective of the VTRTs is to manage stray tiger situation in a villages around the Sundarbans. However, this study documented other activities which are carried out by the VTRT members along with their main responsibility.

Raising social awareness

Most of the VTRT members (n=84/98) reported that, they are engaged in social awareness activities for tiger conservation within their community. Apart from helping other NGOs for conducting social awareness activities, VTRT members also try to raise awareness about the tiger and the forest to the villagers during social gatherings.

Providing information

Some interviewees (n=25/98) reported that, they help the Forest Department to identify the fishermen who are engaged in poison fishing. A few (n=12/98) mentioned that, in the area poaching is a threat for wildlife in the Sundarbans, i.e. tiger, deer, crocodile, and they actively participate in any action against these poachers by providing information or any other support to the Forest Department. For example, a VTRT member mentioned that once a tiger was in a bush near their village. At that time he and his team members found the location of the tiger, and monitored its movement, so that any poacher cannot kill it and provided the information to the Forest Department.

The participants of the focus group discussions mention that during stray tiger situation poachers appear in the villages to kill the tiger that entered the village. They also added that at that time the VTRT members collect information from the villagers about the poacher to save the tiger.

Rescuing other wildlife

Some interviewees (n=25/98) reported that, apart from saving the tiger they also participate in securing other wild animals, i.e. deer, wild boar, snake, etc. when it comes to the village. For example, the volunteers of the Chandpai and Boiddomari VTRT rescued a python in 2012; a macaque was rescued by the Boiddomari team in 2012; the Sarankhola team rescued a deer from the village in 2013.

Providing support to tiger victims

Some interviewees (n=20/98) reported that, they willingly provide first aid treatment among the villagers if they are injured by tiger attack or other accidents. Some (n=30/98) mentioned that they willingly retrieve dead bodies from the forest. The participants of the focus group discussions reported that, VTRT members help the local people to retrieve dead bodies from the forest which is a very risky. They added that, in past many people who went

to the forest to retrieve dead bodies were killed by tigers. They also added that, beside the regular human tiger activities, there is a scope for the VTRT members to be involved in other activities if they are guided and trained properly.

Barriers

The research identifies the barriers that impact the activities of the volunteers. Some interviewees (n= 56/98) reported that they face barriers to work as volunteers and, others (n=42/98) reported that they do not face any. These barriers are manifested in social, economic and managerial sector.

Social Barriers

Most of the interviewees (n=89/98) reported that, community people support VTRT activities; others (n=7/98) reported that, the community people do not support them; and rest (n=2/98) reported that they do not know about this (Figure 8).

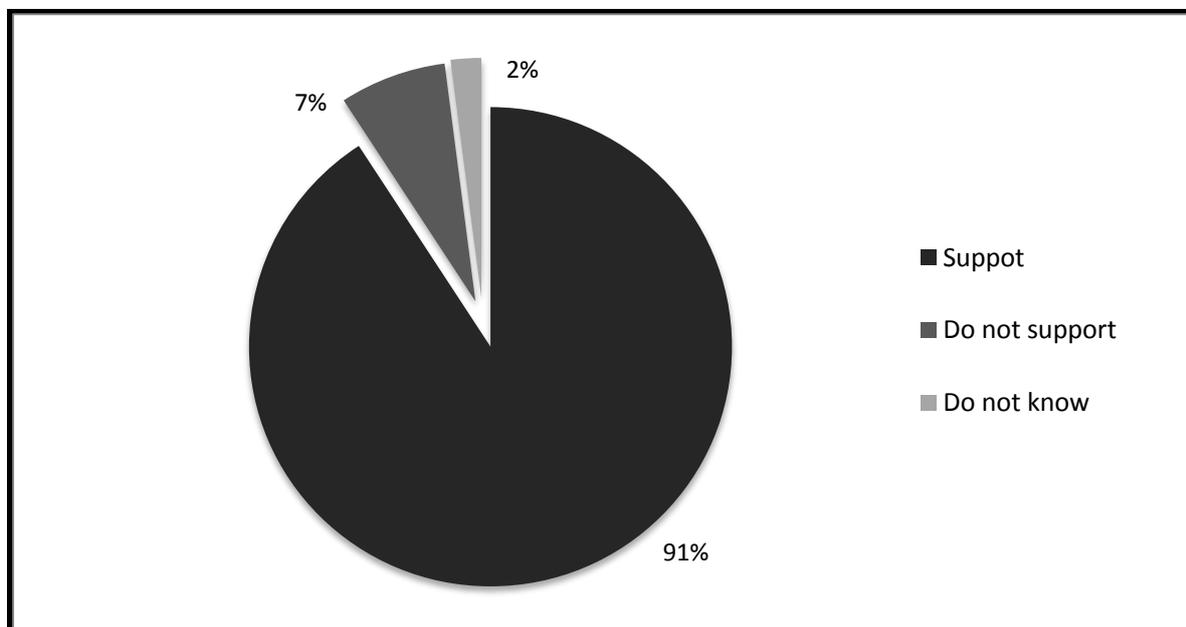


Figure 8. Percentage of interviewees mentioned about community people's support for their work.

The participants of the focus group discussions mentioned that, the VTRTs are working for the interest of the local community, and local people always try to support and help them. They also added that, sometimes the illegal forest resource users, i.e. poachers, fishermen who use poison, wood cutter without permission usually do not support VTRT activities. Some interviewees (n=30/98) mentioned that the illegal forest resource users sometimes act as a barrier to continue their activities. For example, they provide false information of tiger's presence in the village to harass the VTRT members. The focus group discussion participants also reported that the illegal forest resource users have collaboration with some corrupt Forest Department staff. The illegal forest resource users and sometimes the corrupt Forest Department staff consider VTRTs as their threat.

Some interviewees (n=43/98) reported that, the corruption of some of the Forest Department staff is a barrier for their activities for tiger conservation. The VTRT members also added, the corrupt Forest Department staff, sometimes file false accusation against the

VTRT members. For example, a VTRT member provided information to a forest staff regarding a deer poacher. The forest staff did not take any action against that deer poacher. Moreover, the local Forest Department staff filed a false accusation against him in charge of deer meat consumption. Another VTRT member mentioned about reporting deer poaching activity to the forest staff but, the next day he was threatened by the deer poacher as the forest staff informed the deer poacher.

Economic Barrier

The study identifies the economic barriers in VTRT management that can hamper the VTRT's regular activities. Some interviewees (n=14/98) reported that, the economic problem impacts on their activities. They mentioned that in stray tiger situation, sometimes they have to patrol in the villages for few days in a row. In some cases they have to continue even for a week. At that time they cannot go to their work. Moreover, as a volunteer, they do not get any financial support or compensation for those days. For example, a VTRT member reported that, two years ago, they had to patrol regularly in their village during winter season because, the local villagers were afraid of a tiger that killed some livestock in the area. At that time he could not go to work and had to depend on his relatives for food. As he did not have any alternative option, after four or five days, he left patrolling and went to his work again.

The participants of the focus group discussions reported that, most of the VTRT members are day labourer, if they do not go to work, they will not get anything for their family to feed. They also reported that, if the managers of the VTRT can arrange any financial support for the volunteers, they will get extra services from them.

Managerial Barrier

The interviewees reported about their expectations as a VTRT volunteer from their managers such as getting some social and economic benefits, and recognition. Some interviewees (n=61/98) mentioned that as a VTRT volunteer their expectations have not met, while others (n=37/98) reported that their expectations have met (Figure 9).

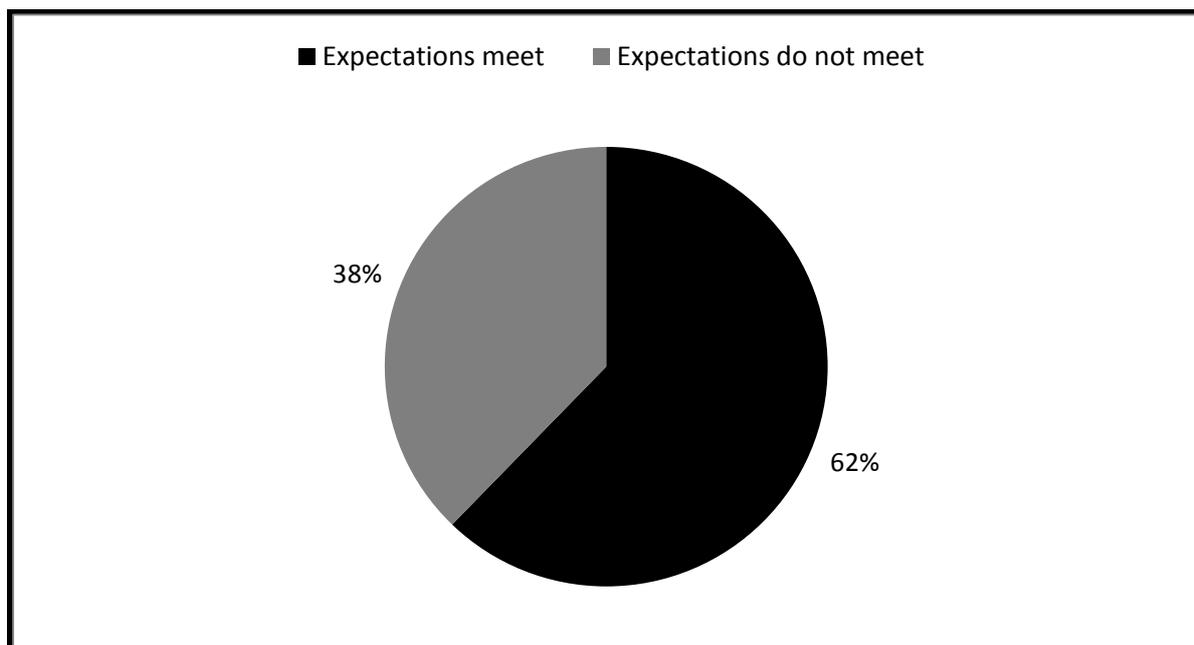


Figure 9. Number of VTRT members mentioned

Of these 61 interviewees who were dissatisfied with their managers, 17 mentioned saving tiger as the only motivation, 12 mentioned non-financial and/or financial incentives, and 32 mentioned saving tiger and non-financial and/or financial incentives as their motivations for joining the team (Figure 10); which shows that the number of dissatisfied VTRT members are higher in all categories of motivations for joining the VTRT.

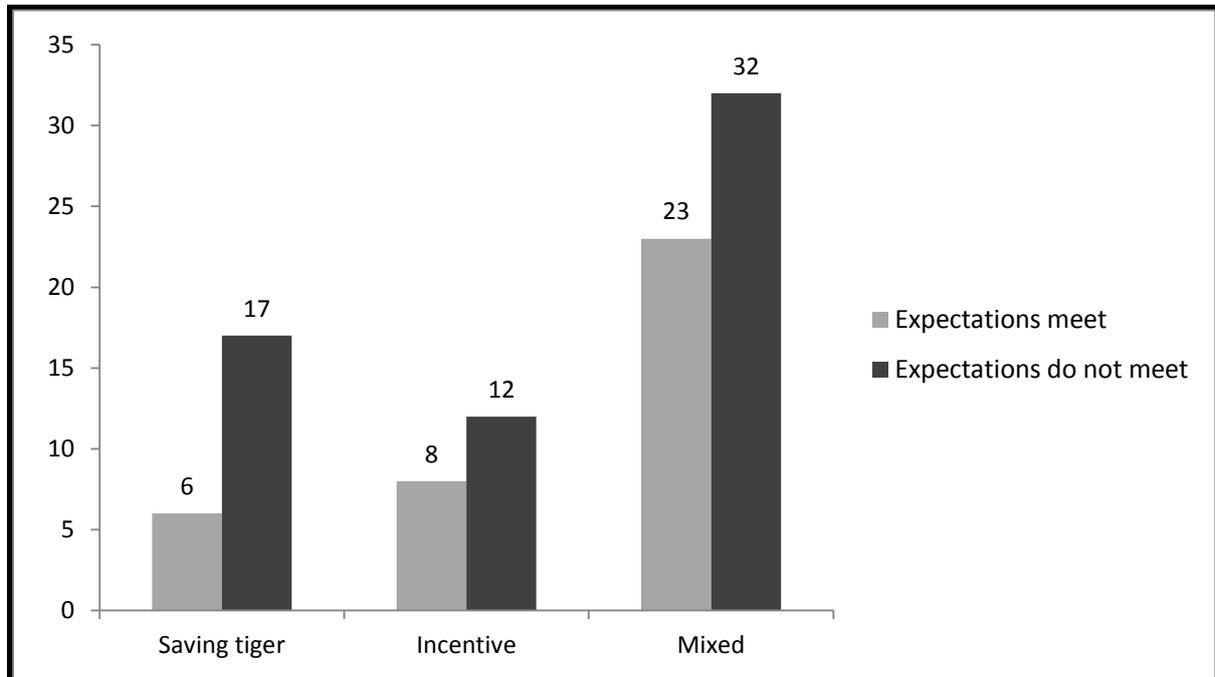


Figure 10. Number of VTRT members mentioned about their expectations (meet or do not meet) with their motivations to join the VTRT

To analyse the expectations of the VTRT members which are met or not met with other factors, Chi-square analysis was conducted. The results show that there is no significant difference between the expectations and motivations ($\chi^2 = 3.259$, $df = 3$, $p = 0.353$); administrative ranges ($\chi^2 = 3.259$, $df = 3$, $p = 0.353$); formation phase (old or new VTRT) ($\chi^2 = 0.148$, $df = 1$, $P = 0.7$).

Dissatisfaction

The interviewees mentioned about different reasons for their dissatisfaction (Figure 11). Some interviewees ($n=41/98$) reported that, neither they have any official recognition, nor they have any ID card. VTRT members mentioned recognition as an important factor for empowering VTRT. Few interviewees ($n=16/98$) reported that, they do not get any financial support from their managers. Other interviewees ($n=8/98$) mentioned that, their managers did not create any job opportunity for them by networking with other NGOs and the government. A number of interviewees ($n=12/98$) reported that they do not have enough logistic support from their managers, so they feel insecure during emergency situation. For example, they do not get enough firecrackers from their managers to use it when a tiger is nearby, during rainy season they cannot go to the place where tiger enters as they cannot use the road and the team do not have a boat.

Some interviewees (n=18/98) mentioned that at the very beginning their main duty was to patrol in the villages during stray tiger situation. But now their managers are engaging them into other social activities which are time consuming and had an impact over their own professions. For example, a VTRT member stated: *“now we are engaged in social campaign activities and we have to attend seminar, rally and other activities. I have to spend more time and have to give more effort as a volunteer but I do not get extra support from the managers.”* Beside this, few interviewees (n=5/98) mentioned that, their managers do not arrange proper training for them. For example, a VTRT member reported that he got only primary level of training on managing stray tiger situation, forest safety and first aid, but he needs advanced level of training on these, as well as on smart patrolling and retrieving wounded from the forest. The participants of the focus group discussions reported that when the people joined as volunteer, they got some materials i.e. hand mike, torch, vest, battery, raincoat, and jacket. But after 5-6 years, they are still getting the same equipment though VTRT’s activities have extended a lot. The interviewees also mentioned that, the VTRT members need equipment, but getting the same equipment is not improving their skills or facility to work more effectively.

Satisfaction

The interviewees who reported that their expectations have met as a member of the VTRT explained the reasons for their satisfaction. They mentioned that, they join the VTRT as a volunteer to deal with stray tiger situation, which is a risky job. The villagers respect them for working for saving people’s life and livestock and also the tiger and in the local area, they are treated as the hero.

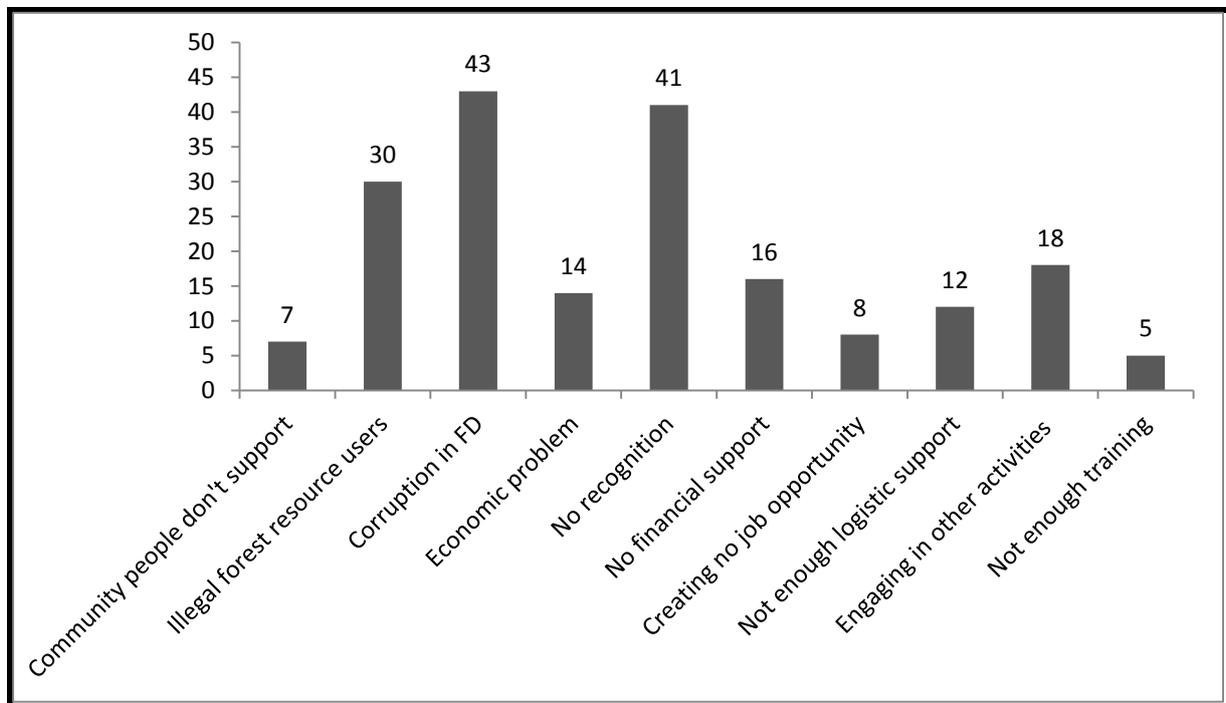


Figure 11. Number of VTRT members mentioned about different barriers they face to work as a VTRT member.

VTRT Sustainability

Involvement with the government

This study identified some requirements that may help to make these volunteer teams sustainable. A number of interviewees (n=49/98) reported that, the involvement of the Government, in the VTRT management process is important to make these teams sustainable. The participants of the FGDs mentioned that, as VTRT is a community based team, the managers of these volunteers should involve Government or Local Government with their activities. They opined, the local government has the legislative power to empower and rehabilitate these volunteers, and it will help to remove some social barriers.

VTRT registration

Many VTRT members (n=64/98) reported that, they need government registration as a 'community based organisation'. They also added that as a registered organisation, these volunteers will be under a well-defined regulation, which will also empower them in the society. The participants of the focus group discussions mentioned that, if the VTRTs are registered, all the members of these teams will have acceptability to the villagers, Forest Department and other law enforcement agencies.

Providing livelihood option

Most of the interviewees (n=79/98) mentioned that, the managers should create the opportunity for source of income for the members of the team so that their need cannot distract them for their voluntary service towards tiger conservation. Many interviewees (n=83/98) reported that, proper networking with other NGOs and Government can create income opportunities for the volunteers.

Providing socio-economic benefits

A number of interviewees (n=28/98) mentioned that, their managers can provide them loan in flexible rate to create source of income. The participants of the focus group discussions mentioned that, the economic condition of the volunteer is poor and if the members of VTRT team do not get any financial or non-financial benefits, they may quit working as a volunteer. Their managers can provide them financial support so that they can create a source of income. They can provide loan personally or team wise. They can help their members to start a cooperative society. Some interviewees (n=37/98) reported that, the managers should provide them some incentive like insurance. Other interviewees (n=51/98) mentioned that, the managers should give them risk allowance. Some VTRT members (n=12/98) ask for medical allowance for them from their manager.

Analysis and Discussion

This study found that, the number of VTRT members mentioned saving tiger or incentive as only motivation for joining the VTRT is almost similar in all age groups (Figure 12). However, the numbers of VTRT members are higher in each age group who mentioned saving tiger and getting incentive both as their motivations to join the VTRT (Figure 12). When analysing the motivations for joining VTRTs, results from Chi-square analysis shows that there is no significant difference between age groups ($\chi^2 = 4.928$, $df = 6$, $p = 0.553$).

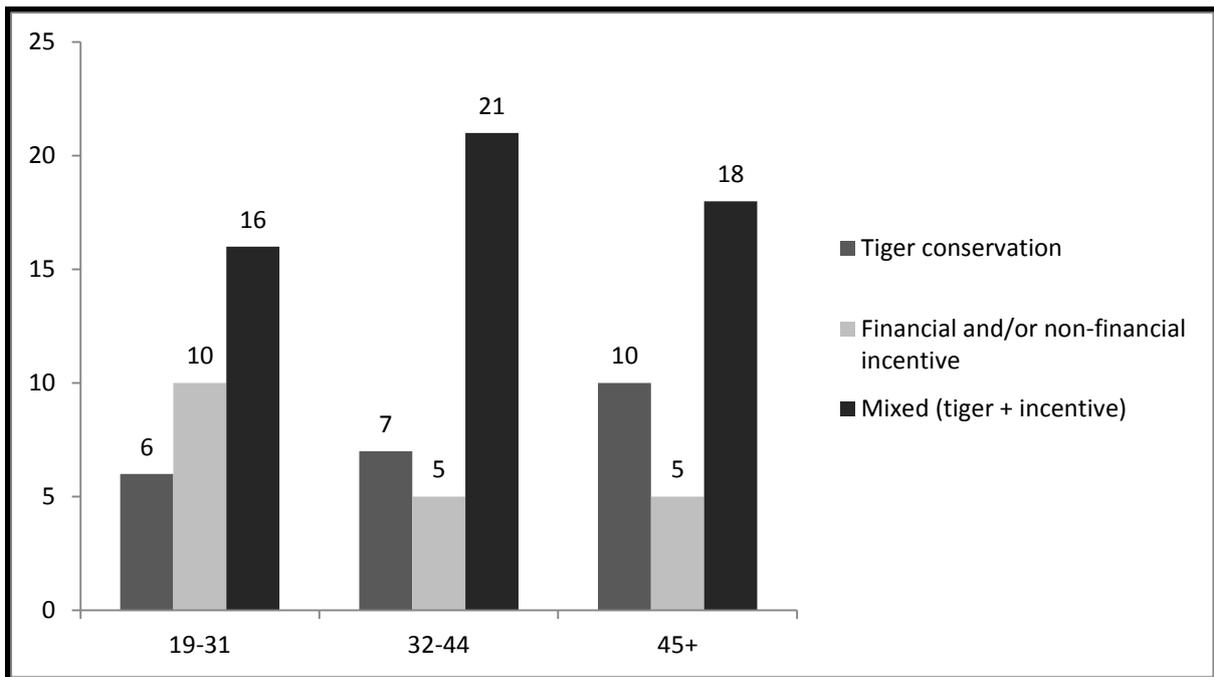


Figure 12. Different motivations for joining VTRT among different age groups.

The motivation of saving tiger and non-financial and/or financial incentive was higher than only saving tiger or only incentive in all the ranges, and are more or less similar (Figure 13). Mentioning saving tiger as a motivation with the non-financial or financial incentive is safe to answer as a VTRT member. Moreover, social awareness campaign on tiger and forest conservation is running in the area by the VTRT managers. This may influence the VTRT members to mention saving tiger as one of the motivating factors to join the VTRT. On the other side, getting non-financial and/or financial incentive as the only motivation to join the VTRT was mentioned higher in the age group 19 to 31 comparing to the other age groups.

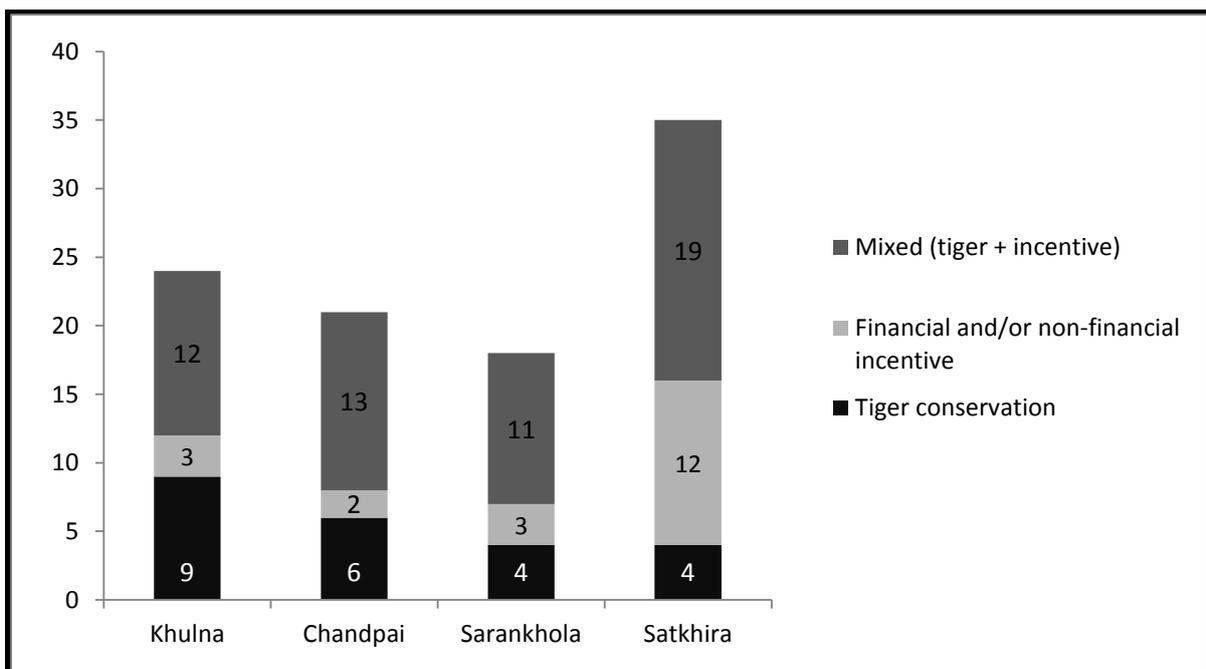


Figure 13. Number of VTRT members of 4 administrative ranges mentioned different motivating factors to join VTRT.

Motivations	Administrative ranges			
	Khulna	Chandpai	Sarankhola	Satkhira
ST	37.5%	28.57%	22.22%	11.43%
NFI/ FI	12.5%	9.52%	16.7%	34.3%
ST + NFI/ FI	50%	62%	61.1%	54.28%

Table 2. Percentage of the interviewees of 4 administrative ranges with different motivations to join the VTRT. ST: saving tiger; NFI: Non-financial incentive; and FI: financial incentive.

The Chi-square analysis shows no significance difference between the motivations and the administrative ranges to which the VTRT members belong to ($\chi^2 = 10.187$, $df = 6$, $p = 0.117$). However, it has been found that, in Chandpai and Khulna range the percentage of the VTRT members joined the VTRT for getting only benefits is lower than Sarankhola and Satkhira ranges (Table 2). On the other side, the motivation for joining the VTRT to save tiger is higher in Khulna and Chandpai range than other ranges (Table 2). It suggests that, the VTRT members in the Chandpai range and Khulna range are more motivated to save tigers than the VTRT members of Sarankhola range and Satkhira range. The VTRT members of Chandpai range and Khulna range have participated in managing stray tiger situations where expert team had come and tranquilized the tiger and took the tiger away from the village. These incidents got media coverage both in print and electronic media that made the VTRT members of those teams as local heroes in their area. These incidents acted as a great non-financial incentive for them. VTRT members of other teams reported that, they want to be the local heroes as well by saving a tiger, but for doing that a tiger needs to come to their village.

In Satkhira range, highest percentage of VTRT members mentioned about getting incentive as the only motivating factor and lowest percentage of VTRT members reported saving tiger as the only motivation for joining VTRT (Table 2). It suggests that, the management of VTRT members of Satkhira range needs more attention in terms of convincing them about tiger conservation or creating incentives opportunities. One of the reasons for this situation may be because the south west part of the Sundarbans i.e. Satkhira range was the most affected area of the Sundarbans by the devastating cyclones Sidr and Aila in 2007 and 2009 respectively. After that many NGOs came to that area with reliefs for the people. This influenced the villagers to expect and demand non-financial or financial incentives from any NGO in the area and thus the VTRT members from their managers.

			Motivations 3 (saving tiger/incentive/saving tiger + incentive)		
			Saving tiger	Financial and/or non-financial incentive	Mixed (saving tiger + incentive)
Profession	Student	Count	0	2	3
		% within Profession	0.0%	40.0%	60.0%
	Unemployed	Count	1	1	0
		% within Profession	50.0%	50.0%	0.0%
	Business	Count	10	8	35
		% within Profession	18.9%	15.1%	66.0%
	Farmer	Count	4	2	9
		% within Profession	26.7%	13.3%	60.0%
	Driver/boatman/carpenter/Labour/doctor	Count	8	7	8
		% within Profession	34.8%	30.4%	34.8%

Table 3. Cross tabulation of different professions and their motivation to join the VTRT.

The professions of the VTRT members were also analysed with their motivations (Table 3). The results from the Chi-square analysis shows no significant difference between the motivations and the professions of the VTRT members ($\chi^2 = 11.575$, $df = 8$, $p = 0.171$).

It has been found that, greater percentage of VTRT members (25%) with no loss comparing to the people with self-injury and/or other loss (livestock/ family member) (14.28%) have mentioned about incentives as their only motivations for joining the VTRT (Figure 14). On the other side, the percentages of VTRT members with loss, who reported saving tiger as their only motivation to join the team (26.19%), and both saving tiger and getting incentive as the motivation (59.52%) are slightly higher than the VTRT members with no loss (Figure 14).

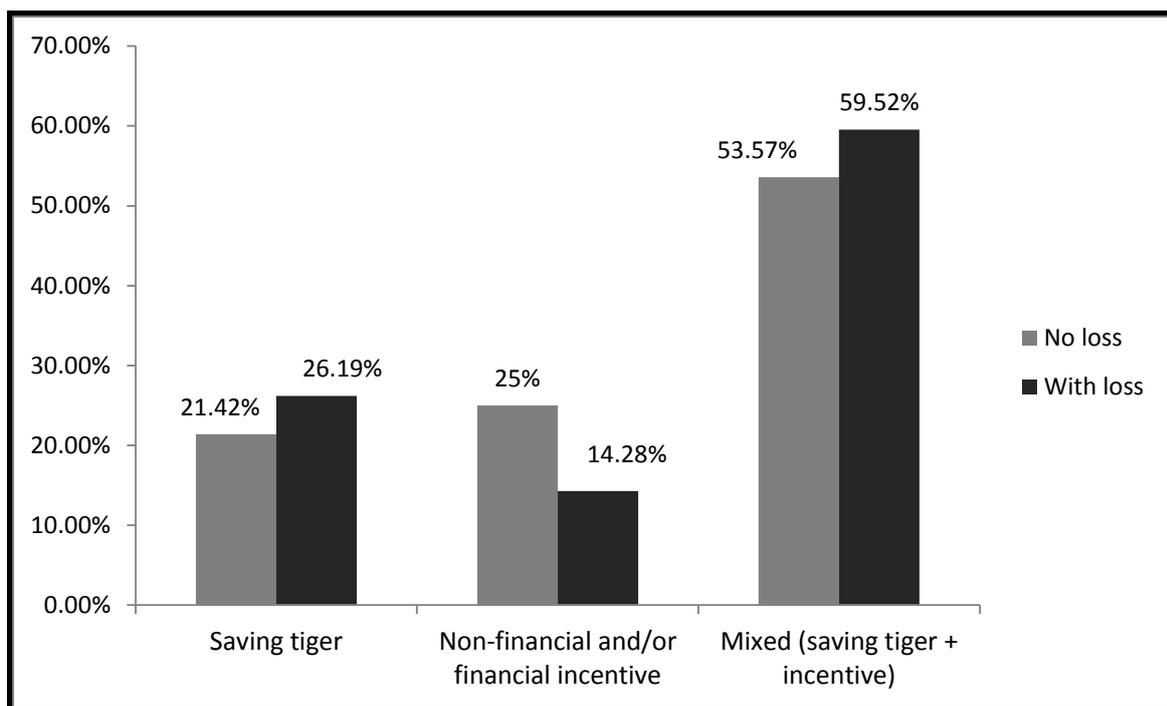


Figure 14. Percentage of the VTRT members with different motivations to join the VTRT and loss to tiger attack

Statistical analysis was conducted with the numbers of VTRT members mentioned about different motivations to join the VTRT and their experience with tiger attack (Table 4). The Chi-square analysis shows there is no significant difference between the motivations of the VTRT members and their experience with tiger attack or loss type ($\chi^2 = 3.073$, $df = 6$, $p = 0.8$)

			Loss type 4 category			
			No loss	Self-Injury	Loss of family member and/or livestock	Mixed (self-injury+ loss of family member and/or livestock)
Motivations 3 (tiger/incentive/mixed)	Saving tiger	Count	12	1	7	3
		% within Motivations 3 (tiger/incentive/mixed)	52.2%	4.3%	30.4%	13.0%
	Financial and/or non-financial incentive	Count	14	0	5	1
		% within Motivations 3 (tiger/incentive/mixed)	70.0%	0.0%	25.0%	5.0%
	Mixed (saving tiger + incentive)	Count	30	3	18	4
		% within Motivations 3 (tiger/incentive/mixed)	54.5%	5.5%	32.7%	7.3%

Table 4. Cross tabulation of different loss type experienced and the motivations of the VTRT member

To investigate the type of loss or injury that members of VTRT had experienced, a Chi-square analysis was conducted (using a Monte-Carlo exact test to account for violations in the assumptions of the model: 75% of cells have an expected count of less than five and the minimum count is 0.08). The results show that there are significant differences in the type of loss an individual may have experienced based on their profession ($\chi^2 = 24.2$, $df = 12$, $p = 0.037$, lower bound $p = 0.032$, upper bound $p = 0.042$). A post-hoc z-test show that farmers are the only professional where there is a significant difference in the type of loss that people suffer (Table 5). Results show that a significantly greater proportion of farmers have suffered personal injury than expected compared to having experienced no loss, livestock depredation and/or loss of family member.

Post-hoc z-test with Bonnferoni adjusted p-values. Each subscript letter denotes a category whose column proportions do not differ significantly from each other at the level $p = 0.05$. Therefore the proportion of 'a' is significantly greater than 'b'.

		Type of loss				Sig
		No loss	Personal-Injury	Loss of family member and/or livestock	Mixed (self-injury + loss of family member and/or livestock)	
Profession	Student	5 _a	0 _a	0 _a	0 _a	NS
	Unemployed	1 _a	0 _a	0 _a	1 _a	NS
	Business	26 _a	1 _a	22 _a	4 _a	NS
	Farmer	8 _b	3 _a	3 _b	1 _{a, b}	*
	Driver/ boatman/ carpenter/ Labour/ doctor	16 _a	0 _a	5 _a	2 _a	NS

Table 5. Cross tabulation of the type of loss experienced with the professions of the VTRT members.

While conducting a Chi-square analysis, the research has found significant difference in the motivations of the Village Tiger Response Teams based on the time period the teams are working on ($\chi^2 = 6.99$, $df = 2$, $p = 0.03$). It suggests that statistically there is a significant relationship between the motivations of the team members and the time of the teams when they were formed. From the cross tabulation (Table 6) of the Chi-square analysis shows that, the VTRT members who joined the VTRT as volunteer for getting only non-financial and/or financial incentives are mostly (80%) from the old teams (formed $5 >$ years ago) comparing to the VTRT members of the new teams (formed $5 <$ years ago) (20%). Similarly, the percentage of the team members of the old VTRTs (80%) is higher comparing to the new VTRT members (20%) who mentioned saving tiger and getting non-financial and/or financial incentive as their motivations to join the VTRTs. The percentage of the team members of the new VTRTs who reported saving tiger as their only motivation is higher than any other motivations. It suggests that, the work of the old VTRT members have a positive impact on the community people that encourages the villagers to join the VTRTs and work for tiger conservation.

			VTRT Old or New Team	
			Old	New
Motivations (tiger/incentive mixed)	Saving tiger	Count	12	11
		% within Motivations 3 (tiger/incentive / mixed)	52.2%	47.8%
	Financial and/or non- financial incentive	Count	16	4
		% within Motivations (tiger/incentive / mixed)	80.0%	20.0%
	Mixed (saving tiger + incentive)	Count	44	11
		% within Motivations 3 (tiger/incentive / mixed)	80.0%	20.0%

Table 6. Cross tabulation of the Old and New VTRT with their motivations.

A Chi-square analysis also found a significant difference in the old and team members based on their age groups ($\chi^2 = 7.228$, $df = 2$, $p = 0.027$), which means statistically there is a significance relation between the team members of the old team and new team, and their age groups. The VTRT members of the new teams between the age 19 and 31 are more like to join the volunteer teams than the members of other age groups (Table 7).

			VTRT New or Old Team	
			Old	New
Age in Groups	19-31	Count	18	14
		% within Age In Groups	56.3%	43.8%
	32-44	Count	27	6
		% within Age In Groups	81.8%	18.2%
	45+	Count	27	6
		% within Age In Groups	81.8%	18.2%

Table 7. Cross tabulation of the Old and new VTRT with their age groups.

Life around the Sundarbans is not easy due to the socio-economic condition, limited facilities to health and medical care, poor and the frequent natural disasters. However, despite of having these hardships, and the tiger encountering experiences I have found that, 80% of the VTRT members joined the team for saving tiger as the only or one of their main motivations. The interest of the VTRT members for saving tiger is an important component for the sustainability and management of the team, and also for tiger conservation (Inskip et al., 2014). From the analysis, I also found that the work of the VTRT members have influenced other people in the community to join the VTRTs for saving tiger. However, the expectations of the VTRT members have not met for a large proportion (62%) of them, and if their expectations are not met the sustainability of these teams will be uncertain and the management will be difficult.

The VTRTs were formed to take actions during emergency situation when a tiger is in the village, which includes managing crowd and to chase the tiger back to the forest. However, beside their assigned work the VTRT members are involved in other tiger related activities due to social liabilities; for example retrieving dead body from the forest. Beside this, the community people inform the VTRT members about illegal fishing, woodcutting or wildlife poaching, as to the villagers the VTRT members are easier to reach than the forest department staff, and they feel comfortable to report about a clandestine activity to their community people than to a forest staff. However, there is a distance between the VTRT

members and the forest officers. Moreover, the corruption of some of the forest staff creates problem for the VTRT member if they reports about illegal activities in the forest. I have found that, sometimes the VTRT members are involved in other additional activities by their managers such as, participation in social awareness campaign, seminar, rally and organisation's events. But the volunteers do not receive any incentive for their extra time and afford. Volunteers are non-paid staff of an organisation (Wilson, 2003). Involving volunteers apart from their assigned work creates extra burden on them and requires incentives in the form of money or other benefits.

Achieving sustainability for any volunteer team especially in conservation field is a major challenge. In volunteer organisation, usually volunteers work for few years, gain experience and move to other place, but in conservation recruiting new volunteer is not easy as it requires training and experience. Moreover, the conservation organisations sometimes may not have big budgets for it. To keep the volunteers in the team, they require incentives (Wilson, 2003). In this study, I found that the managers of the VTRTs explained the concept of volunteerism while developing the teams and as a management strategy provided predominantly non-financial incentives to the team members. The main strategy of the managers is to create the local hero image among the team members. It is a good strategy as for managing volunteers non-financial incentive is a good component (Wilson, 2003) and to motivate the volunteers the managers need to provide some incentives. However, providing only the social status or heroic image to the VTRT members is not enough for their sustainability as it fades away if there is no tiger attack for some time. The lack of livelihood or income source is also a factor that makes difficult to motivate the volunteers with local hero image. However, all the team members do not get the chance to save a stray tiger, as tiger does not enter to all the villages with the volunteer team.

Giving official recognition or providing ID cards as demanded by the VTRT members may act as an incentive for some time, but again like the social status or the hero image it may not keep the volunteers motivated for a long time. However, the VTRT members are already recognized among the community people, and the community people are aware of their activity. Moreover, providing ID card to the VTRT members may also cause unforeseen issues for the managers. For example, if any VTRT member involves in any illegal activity, that may impact on VTRT activity.

Proving financial incentive or salary will not be a practical solution for VTRT management as it will contradict with the concept of volunteerism. Moreover, direct payment to the VTRT members may create competition and conflict between the VTRT members and the other villagers. However, social benefits can be arranged for the VTRT members such as, tax holiday, free or cheap access to medical facilities, priority training session on improved livelihood etc.

Bibliography

- Ahmad, I. U., Greenwood, C.J., Barlow, A.C.D., Islam, M.A., Hossain, A.N.M., Khan, M.M.H. and Smith, J.L.D (2009). *Bangladesh tiger action plan*. Dhaka: Bangladesh Forest Department.
- Barlow, A. (2009). *The Sundarbans tiger: adaptation, population status and conflict*. PhD. University of Minnesota, USA.
- Barlow, A., Ahmad, I. and Smith, J. (2013). Profiling tigers (*Panthera tigris*) to formulate management responses to human-killing in the Bangladesh Sundarbans. *Wildl. Biol. Pract.*, 9(2).
- Chakrabarti, K. (1987). Sundarbans honey and the mangrove swamp. *Journal of the Bombay Natural History Society* 84, pp.133-137.
- Chowdhury, T. (2010). *Resource-dependent livelihoods*. CRBOM Small Publications Series No. 18. Indonesia: Center for River Basin Organizations and Management.
- Dhar, S. (2011). Impact of Climate Change on the Salinity Situation of the Piyali River, Sundarbans, India. *Journal of Water Resource and Protection*, 03(07), pp.495-503.
- Iftexhar, M., S. and Islam, M., R. (2004). Managing mangroves in Bangladesh: A strategy analysis. *Journal of Coastal Conservation*, 10, pp.139-146.
- Inskip, C., Ridout, M., Fahad, Z., Tully, R., Barlow, A., Barlow, C., Islam, M., Roberts, T. and MacMillan, D. (2013). Human–Tiger Conflict in Context: Risks to Lives and Livelihoods in the Bangladesh Sundarbans. *Human Ecology*, 41(2), pp.169-186.
- Inskip, C., Fahad, Z., Tully, R., Roberts, T. and MacMillan, D. (2014). Understanding carnivore Killing behaviour: Exploring the motivations for tiger killing in the Sundarbans, Bangladesh. *Biological Conservation*, 180, pp.42-50.
- Islam, M. and Haque, M. (2004). The mangrove-based coastal and nearshore fisheries of Bangladesh: ecology, exploitation and management. *Rev Fish Biol Fisheries*, 14(2), pp.153-180.
- Islam, M. and Wahab, M. (2005). A review on the present status and management of mangrove wetland habitat resources in Bangladesh with emphasis on mangrove fisheries and aquaculture. *Hydrobiologia*, 542(1), pp.165-190.
- Islam, M.M and Chuenpagdee, R. (2013). Negotiating risk and poverty in mangrove fishing communities of the Bangladesh Sundarbans. *Maritime Studies*, 12(7).
- Rahman, H., Barlow, A., Greenwood, C., Islam, M. and Ahmed, I. (2009). *Livestock depredation by tiger on the edge of the Bangladesh Sundarbans*. Technical report. Wildlife Trust of Bangladesh, Dhaka, Bangladesh.
- Wilson, J. (2000). Volunteering. *Annual Review of Sociology*, 26(1), pp.215-240.

Appendix

Appendix i: SPSS cross tabulations

Motivations (tiger/incentive/mixed) * VTRT range Cross tabulation						
		Administrative range				Total
		Khulna	Chandpai	Sarankhola	Satkhira	
Motivations (tiger/incentive /mixed)	Tiger conservation	9	6	4	4	23
	Financial and/or non- financial incentive	3	2	3	12	20
	Mixed (tiger + incentive)	12	13	11	19	55
Total		24	21	18	35	98

Motivations 3 (tiger/incentive / mixed) * Age In Groups Cross tabulation					
		Age In Groups			Total
		19-31	32-44	45+	
Motivations 3 (tiger/incentive / mixed)	Tiger conservation	6	7	10	23
	Financial and/or non- financial incentive	10	5	5	20
	Mixed (tiger + incentive)	16	21	18	55
Total		32	33	33	98

Expectation met/not met * Motivations 3 (tiger/incentive / mixed) Cross tabulation					
		Motivations (tiger/ incentive / mixed)			Total
		Tiger conservation	Financial and/or non-financial incentive	Mixed (tiger + incentive)	
Expectation met/not met	Expectations meet	6	8	23	37
	Expectations do not meet	17	12	32	61
Total		23	20	55	98

VTRT range * Expectation met/not met Cross tabulation				
Count				
		Expectation met/not met		Total
		Expectations meet	Expectations do not meet	
VTRT range	Khulna	7	17	24
	Chandpai	6	15	21
	Sarankhola	7	11	18
	Satkhira	17	18	35
Total		37	61	98

Appendix ii: Photos



Photo 1. Conducting interview with a VTRT member



Photo 2. Conducting a FGD with the villagers



Photo 3. A VTRT member showing his body mark from tiger attack



Photo 4. Research team in the field



Photo 5. Interview on boat



Photo 6. On the way to conduct an interview