

ENDLINE REPORT MEGHNA BASIN (BANGLADESH)

The impact on river basin communities participating
in the Transboundary Rivers of South Asia
(TROSA) Program

February 2022



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EXECUTIVE SUMMARY

Transboundary Rivers of South Asia (TROSA) is a five-year (2017-2021) program, funded by Swedish International Development Cooperation Agency (Sida). The program aims to reduce poverty of marginalised and vulnerable river basin communities through increased access to and control over water resources. The program works with marginalised and vulnerable communities along the Sharda-Mahakali, Brahmaputra-Saralbhanga-Teesta, Meghna and Salween River basins in Bangladesh, India, Myanmar, and Nepal.

This report focuses on the impact achieved by the TROSA program in the Meghna basin by comparing the results of the endline study (October 2021) with the baseline (May 2018). The main objective of this study was to determine to what extent the TROSA program had an impact on reduced poverty and marginalisation of river basin communities (impact), communities being better able to reduce their vulnerability to water-related shocks (outcome 4.1), communities having more secure access and control over water resources (outcome 4.2), and increased participation and influence of women in transboundary water governance, policies, and practices (outcome 5). This study builds primarily on insights from community members gathered through surveys. A two-day online reflection workshop ensured results were put into context and perspective.

We found positive changes in almost all outcome areas when comparing the baseline situation to the situation at the endline. According to reflection workshop participants, the most important findings were the progress made regarding increased knowledge on flood risk reduction (impact), increased women's interest and participation in water governance (outcome 5), and increased awareness regarding rights and entitlement to the river (outcome 4.2). For many of the indicators, endline levels for TROSA participants were higher than the baseline levels, indicating the likely role of TROSA in contributing to these improvements. However, for many indicators, non-participants also experienced improvements. Consequently, it is important to acknowledge possible external factors that might also have contributed to positive changes. Furthermore, the fact that TROSA is primarily an advocacy and influencing program working at multiple administrative levels might point to potential spill-over effects of TROSA activities beyond directly targeted areas. Hence, TROSA may also be (partly) responsible for the progress for non-participants.

The last two implementation years of TROSA were amidst the Covid-19 pandemic; hence the fact that we still found improvements in many outcome areas is promising.

Lastly, it should be mentioned that some of the results for the Meghna basin did not match the experience of experts in Bangladesh. Hence, by taking a quantitative approach to the endline study, we have likely missed out on some of the more in-depth stories of change because of TROSA.

Based on the insights, experiences and results presented in this report and discussed with project staff and partners, the following recommendations for future programmes have been formulated:

- **Acknowledge the private sector as a crucial ally for the achievement of common goals related to water governance.** Since water is a key element in the value chain of many enterprises, it is important to reinforce the bridge between communities and the private sector to jointly collaborate for sustainable use and access to water resources. Furthermore, it is important to keep demanding the private sector to respect communities' rights and needs in decisions related to the use of the river.
- **Amplify communities' voices.** Citizens must have and use the power to speak up to reach out to stakeholders and find solutions to specific issues. Hence, it is crucial to continue working on empowering communities to raise their voices and stand up for their interest and needs.
- **Promote new platforms to take actions to empower communities to speak up and solve water-related issues.** Supporting communities in raising their voice via a broader range of activities could help empower them and create more beneficial opportunities for communities in terms of water governance, which should be explored in future programs.
- **Continue to support women's leadership in water governance.** Gender inequalities should be an essential point to continue addressing in future programs, especially improving women's influence in the decision-making process, encouraging women to take broader actions to speak up and promoting collaborative relationships between women and their partners (for instance when it comes to the division of unpaid care work).
- **Work on Water, Sanitation and Hygiene (WASH).** Water is a vital resource for public health. Many people had insufficient access to quality water for domestic purposes. Hence, adding WASH components to future programs will likely contribute to improved quality of life for these communities.
- **Increase the focus on (water-related) livelihood development for poverty reduction.** Future programs should include a greater emphasis on direct livelihood support (e.g. facilitating access to financial markets, especially for women and fisherfolks) to decrease poverty numbers, as well as to ensure continued buy-in and engagement from the community. In short, future programs should combine advocacy efforts with direct livelihood programming on the ground.
- **Promote peer-to-peer learning and capacity strengthening within civil society.** Capacity building initiatives for local CSOs and CBOs can help strengthen civil society. Future programs should consider capacity strengthening initiatives of local civil society, to empower local communities to act on their own issues in their own ways.
- **When working on water governance involving multiple countries, adopt a transboundary approach:** A best practice from TROSA worth sharing is the focus on basins, which are transboundary, rather than on separate countries. Taking this basin-wise approach has contributed considerably to increased transboundary awareness and collaboration, which is a crucial step in improving transboundary water governance.
- **Consider the sustainability of the program, even after program implementation has ended.** Future programs should consider ways in which to continue and sustain the work and

progress made. For some of the best practices employed by TROSA, such as Nodi Boithoks and Hilsa Watch, it is evident that it is helping the communities to speak up and solve their (water-related) issues. These activities have been established within and facilitate collaboration on water governance even after the TROSA program has ended.

ACKNOWLEDGEMENTS

This report is based on the information provided by hundreds of community members who were interviewed in the Bangladeshi districts of Chandpur and Shariatpur over the course of four years (in 2018 and 2021). First and foremost, we want to express our gratitude to all of them for participating. Their willingness to give their time and discuss their vulnerability to water-related shocks, access and control over water resources, and participation in water governance resulted in valuable information to ensure evidence-based and adaptive program implementation (at baseline stage) and made this evaluation (endline) possible. The evaluation will be useful for accountability purposes as well as for informing the design of future programs with similar objectives.

This endline study was achieved through the extensive contributions and expertise of the entire TROSA team, including the Center for Natural Resource Studies (CNRS), Gana Unnayan Kendra (GUK), Consumer Unity and Trust Society (CUTS International), International Union for Conservation of Nature (IUCN), Oxfam staff in Bangladesh, the Impact Measurement and Knowledge (IMK) team of Oxfam Novib (part of the Learning, Innovation and Knowledge (LINK) unit), and of course the data collection team led by Change Initiative.

Finally, we are grateful to the Swedish International Development Cooperation Agency (Sida) for funding the TROSA program and this evaluation.

ACRONYMS

CBO	Community Based Organization
Covid-19	Coronavirus Disease 2019
CNRS	Center for Natural Resource Studies
CSO	Civil Society Organization
GUK	Gana Unnayan Kendra
CUTS	Consumer Unity and Trust Society
IUCN	International Union for Conservation of Nature
EWS	Early Warning System
SIDA	Swedish International Development Cooperation Agency
IMK	Impact Measurement and Knowledge
IWT	Inland Waterways Transport
KPI	Key Performance Indicator
LINK	Learning, Innovation and Knowledge
NGO	Non-Governmental Organisation
PMU	Program Management Unit
WASH	Water, Sanitation and Hygiene
ToC	Theory of Change
TROSA	Transboundary Rivers of South Asia
SRI	SheRose Initiative
GBM	Gange, Brahmaputra, Meghna
MKF	Meghna Knowledge Forum
IWRM	Integrated Water Resources Management
ICT	Information Communication Technology

1 INTRODUCTION

Transboundary Rivers of South Asia (TROSAs) is a five-year (2017-2021) program, funded by Swedish International Development Cooperation Agency (Sida). The program aims to reduce poverty of marginalised and vulnerable river basin communities through increased access to and control over water resources. The program works with marginalised and vulnerable communities along the Sharda-Mahakali, Brahmaputra-Saralbhanga-Teesta, Meghna and Salween River basins in Bangladesh, India, Myanmar, and Nepal.

The Impact Measurement and Knowledge (IMK) team, part of the Learning, Innovation and Knowledge (LINK) unit, of Oxfam Novib conducted an endline study of the TROSAs program in each of these four basins. In the Meghna basin, the endline study is conducted in collaboration with Oxfam in Bangladesh and their partners Center for Natural Resource Studies (CNRS), Gana Unnayan Kendra (GUK), Consumer Unity and Trust Society (CUTS International), International Union for Conservation of Nature (IUCN), This endline study compares findings of the endline situation (October 2021) to the situation at baseline (May 2018).

A quantitative approach was used to estimate the impact of the TROSAs program. The endline study focuses on changes in people's lives and is therefore only concerned with outcomes 4.1, 4.2, 5 and the impact level of the TROSAs program. These are:

- Impact: Reduced poverty and marginalisation of vulnerable river basin communities through increased access to, and control over, riverine water resources on which their livelihoods depend.
- Outcome 4.1: Local communities are better able to reduce their vulnerability to water resource-related shock, including from conflict & disasters.
- Outcome 4.2: Local communities have more secure access and control over their water resources.
- Outcome 5: Increased participation & influence of women in transboundary water governance, policies & processes.

This endline study aims to measure progress with respect to these outcomes, and to what extent this progress can be attributed to TROSAs program activities. Furthermore, some findings related to change in government, private sector, and civil society (outcome 1-3) are included in the report as well. In addition, the report aims to shed light on some dynamics that are basin specific. For the Meghna basin, this means analysing the participation of people in fisheries management and sandmining or erosion management of TROSAs program participants and non-participants.

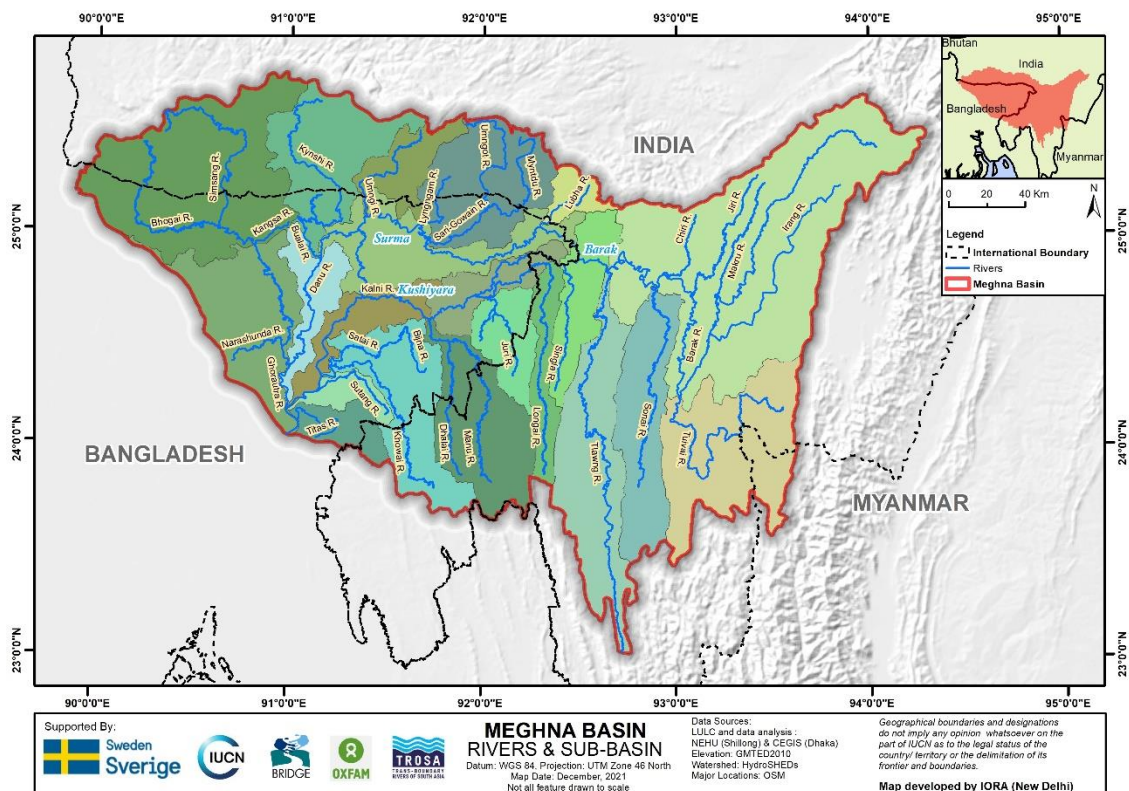
During program implementation, and at the time of writing this report, the world, including communities residing along the Meghna basin, were hit by the coronavirus pandemic (Covid-19). Since the Covid-19 pandemic likely has an impact on the poverty situation of river basin communities, the findings of this study are contextualised with respect to Covid-19 where applicable.

2 PROGRAM OVERVIEW

The TROSA program aims to reduce poverty of marginalised and vulnerable river basin communities through increased access to and control over water resources.

The Meghna basin in Bangladesh (see Figure 1) had a specific focus on sustainable management of river sand resources and on promoting inclusive transboundary trade and inclusive and fair management of transboundary fisheries. Hence, the Meghna basin's Theory of Change (ToC) promotes an inclusive and cooperative environment in the basin.

Figure 1: Meghna basin and sub-basin rivers



TROSA activities in this basin were implemented through a 'Citizen Science Approach'. Key herein was the bringing together of various stakeholders, including youth, for water sampling and testing and subsequently community dialogue on the results¹. Below is a list of key TROSA activities implemented in the Meghna basin:

¹ 'Citizen Science' is a term used when different members jointly collaborate with stakeholders for a common goal by analysing different points to deal with an issue. Under this context, citizens become active advocates and agent of change to create more opportunities to improve the current context. In TROSA, this approach is mostly used to empower communities to be aware and take ownership with riverine governance policies by including

- Nodi-Boithok: a bottom-up approach starting with monthly meetings at the village level to listen to stories of the communities living around the TROSA working areas in the basins. Nodi-Boitok provides the community (men, women and youth) with a platform where they talk about their concerns and how they think of the approaches to solve those concerns. These events are organised by local partners CNRS and GUK, who use reflections from the Nodi-Boithoks to forge partnerships with other relevant CSOs and other stakeholders.
- Dialogues: including basin dialogues, public hearings, and policy dialogues on various topics, such as river sand management, community-led erosion management, and inclusive fisheries, river zoning and land-use controls. Different dialogues have different participants, although they often overlap. In basin dialogues, for instance, communities and CSOs participate, but depending on the demand or the topic there can be representatives of the government and private sector as well. Policy dialogues are focused on policy recommendations/discussions and to make these more inclusive for communities. Hence, policy dialogues include government representatives, experts, CSOs and communities, and sometimes the private sector. Public hearings are discussions mainly between the community and government representatives. Again, if the topic demands, CSOs and private sector representatives are also present to strengthen and support community participants and/or to give a different perspective.
- Hilsa Watch: a Citizen Science Approach which collects information from grassroot fisher communities. This activity helps to generate evidence for advocacy activities in the area of fisheries management.
- Community-led erosion management, incl. Bandal installations: Facilitation of community-led initiatives that prevented riverbank erosion through the installation of Bandals.
- Community movement building: Supporting communities to advance towards solving their issues. This included issues on female leadership, for instance documentation of women in water leadership stories through the SheRose Initiative (SRI), and collaborative work with the TROSA PMU across Ganges, Brahmaputra, Meghna (GBM) & Salween basin.
- Awareness raising: Promotion of the innovative use of multi-channel communication, traditional and popular culture, and social media to help raise awareness of the value of cooperation in the GBM river basin. For instance, radio broadcast and podcast episodes were organized about sand mining and water governance. But also on ecologically and culturally sustainable activities that benefit local communities and support the conservation of riverine ecosystems.
- Research: For instance, analysis of necessary regulatory reforms in cage fish farming in rivers and its conflicts with rights of fisherfolks and the Inland Waterways Transport (IWT) sector².
- Advocacy: For instance, influencing of local, national, and regional government policies for the inclusion of Integrated Water Resources Management (IWRM) components.

different stakeholders in the process (e.g government, private sector and others) (Sameer Singh, 2020. TROSA Learning Brief series - Citizen Science- Engaging and empowering local communities, p 1).

² The report is available here: <https://cuts-citee.org/pdf/cage-fish-farming-in-india-and-bangladesh.pdf>. The Policy brief is available here: <https://cuts-citee.org/pdf/policy-brief-cage-fish-farming.pdf>.

- Sub-basin delineation and maps: Development of sub-basin delineation and the creation of more than 15 sub-basin maps.
- Webinars: For instance on sustainable and inclusive water governance practices³.
- Interface and consultation with government: For instance, preparing and facilitating inter-agency and/or ministries consultation at the national level. Virtual consultations were planned during the Covid-19 pandemic, for instance at the local, sub-national, regional and sub-regional level. Some of these are currently ongoing.
- Meghna Knowledge Forum (MKF): on promoting youth engagement, the foundation for a multi-stakeholder platform in the Barak-Meghna River basin, boosting cooperation for ecosystem services in the Meghna basin and trade potentials of river routes mostly unused. During the MKF, a short film on the Meghna river basin was developed. Some films were published online⁴.
- Guidance notes: Developing guidance notes and/or policy briefs on operationalising cooperation in the Meghna Basin. The results of policy analysis were shared in meetings with the government and in the Meghna Knowledge Forum (MKF). One think piece developed articulating the role of multi-level governance in the Meghna basin.
- Water Governance Course: a course for female leaders to promote women's participation in water governance.

It is important to point out that due to the local and national mobility restrictions produced by the Covid-19 pandemic, many of these activities in year four and five of implementation were executed through online platforms. For instance, in Bangladesh, Nodi-Boithoks and other dialogues were conducted online, which often had hindrances because of the lack of proper digital equipment and facilities at the community level. Also, since advocacy works depend on the trust-building process, they became hard during the Covid-19 pandemic due to the restrictions on face-to-face or physical interactions.

³ Webinars reports are available here: <https://cuts-citee.org/iw-events/>.

⁴ A documentary was produced based on the insights from Nodi-Boithoks. It is available here: <https://youtu.be/TxAQtehvhy4>.

3 EVALUATION DESIGN

3.1 EVALUATION AND LEARNING QUESTIONS

The main objective of this endline study was to determine to what extent the TROSA program had an impact on reduced poverty and marginalisation of river basin communities (impact), communities being better able to reduce their vulnerability to water related shocks (outcome 4.1), communities having more secure access and control over water resources (outcome 4.2), and increased participation and influence of women in transboundary water governance, policies and practices (outcome 5). The report will also explore more deeply the regional (country) and gendered differences for the relevant outcomes and will contextualise findings with respect to Covid-19.

Table 1: Overview of evaluation questions

Impact: To what extent is there reduced poverty and marginalisation of river basin communities, and can these changes be attributed to the TROSA program?

Outcome 4.1: To what extent are local communities better able to reduce their vulnerability to water resource-related shocks, and can these changes be attributed to the TROSA program?

Outcome 4.2: To what extent have local communities more secure access and control over water resources, and can these changes be attributed to the TROSA program?

Outcome 5: To what extent is there increased participation and influence of women in transboundary water governance, policies and practices, and can these changes be attributed to the TROSA program?

In addition to answering these evaluation questions, program staff in the Meghna basin were interested in understanding the participation of people in fisheries management and sandmining or erosion management. They were interested into the extent there were differences between TROSA program participants and non-participants (especially women and youth) regarding these topics. The findings of these learning questions are presented in chapter 5.

Table 2: Overview of learning questions

- To what extent do people, especially women and youth, participate on the topic of fisheries management? And is this different for people participating and people not participating in TROSA?
- To what extent do people, especially women and youth, participate on the topic of sandmining/erosion management? And is this different for people participating and people not participating in TROSA?

3.2 EVALUATION DESIGN

This evaluation is a quasi-experimental⁵ impact assessment, meaning that it benefits from (quantitative) data collected from a target group of program participants as well as a comparison group of respondents with a similar demographic profile as the target group who are living in communities that are not targeted by TROSA program activities. The selection of respondents and their assignment to the target and comparison groups is not random, which is what makes this study "quasi-experimental", in contrast to a fully randomised control trial. Still, comparing data from these two groups allows us to look not only at trends in outcomes over time for the target group, but also whether any changes over time may be attributable to program activities (i.e. the impact of the TROSA program). Please refer to Annex 8.1 for more details on the statistical methodology.

A series of virtual workshops were held on 5-6 January 2021 to reflect on the preliminary results of the endline study. In total, there were 20-28 participants from different geographies in Bangladesh: they include Oxfam staff (Oxfam in Bangladesh, Program Management Unit (PMU)), external evaluators, Community members, and partner staff (CUTS International, IUCN, CNRS). Over the two days, participants reflected together on the results presented. The main objective was to validate the results and find possible explanations for certain results. Reflections and suggestions from participants have been incorporated into this report and are clearly labelled where they appear.

3.3 OVERVIEW OF THE SAMPLE

The sampling approach for this endline study was designed for maximum comparability between the baseline and the endline. Practically speaking, this meant that the endline sample mimicked the baseline sample (N= 368). Target locations included unions in Chandpur district; comparison locations included unions in Chandpur district and Shariatpur district.

Although TROSA had worked outside Chandpur district as well (including Sylhet, Sunamgajn, Moulvibazar, and Bhola district), we deemed it more important to have a comparable sample between the baseline and the endline than to have a perfectly representative sample at endline only. Also, Chandpur represents the majority of people reached by TROSA in terms of size (82% of all TROSA participants resides in Chandpur), hence this validated the decision to keep the baseline and the endline sample consistent and to not include additional locations for the endline sample. Not expanding the endline sample in terms of geographical scope also considerably reduced data collection costs (since other TROSA locations are located 100-350 kilometres away from Chandpur).

At the baseline we tracked records of respondents, including their contact information. Hence, respondents for the endline sample were selected based on these baseline respondent lists. In case a respondent from the respondent list was not available for the endline interview, they were replaced with a newly

⁵ A quasi-experiment is an empirical interventional study used to estimate the causal impact of an intervention on target population without random assignment.

selected respondent using the method of 'random walk'. We collected panel data for 98% of respondents. All respondents were interviewed between September-October 2021.

Please refer to Annex 8.2 for a detailed overview of the baseline and the endline sample.

3.4 LIMITATIONS

This endline study had some limitations. The first limitation related to the way the indicators and survey questions were formulated. First, there was the trade-off between standardisation across basins and adaptation to the local context. Hence, it could be that we missed progress in areas and activities that were specific to the Meghna basin. The basin-specific learning questions (see chapter 5) complemented the global indicator analysis at least to some extent. However, it is still likely we failed to capture some of the more detailed basin-specific progress.

Second, many of the outcomes are complex and sometimes qualitative in nature. Hence, by operationalising these into quantitative survey questions, we have risked losing some of the nuances around these outcomes. To deal with this risk, we tried to complement the quantitative analysis by organising reflection workshops, where participants could share their insights and nuances.

Lastly, TROSA is primarily an advocacy and influencing program; hence, progress made because of advocacy efforts at higher administrative levels are likely to impact comparison communities who are also part of this administrative level. Hence, by design, there may be spill-over effects of program advocacy and influencing efforts into the comparison area, complicating the quasi-experimental design of this endline study. We tried to limit this risk by sampling the comparison group from different municipalities. However, there is an overlap between target and comparison locations at the district level (Chandpur district).

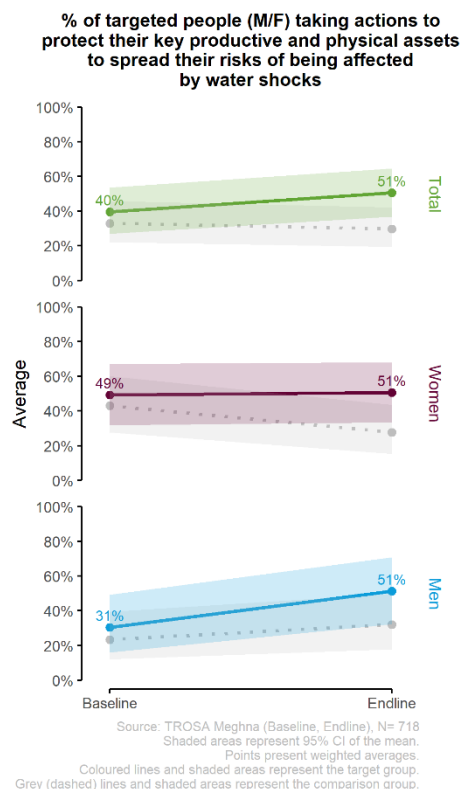
3.5 EXPLANATORY NOTE ON THE FINDINGS, FIGURES AND TABLES

The next chapter presents the main findings⁶ of the endline study. The TROSA program was judged to have made a *significant impact* on an outcome indicator if the change observed among the program participants (target group), from the baseline to the endline, was higher than the changes observed among non-participants (comparison group). Generally, positive impact means that program participants experienced a higher increase in a certain indicator, for example, the level of soft skills, than non-participants. A negative impact means that the change for non-participants was larger than the change for participants. A negative impact is often, but not always, associated with a decrease in the level of a certain indicator. It could also indicate that a positive change is higher for non-participants, resulting in a negative impact for participants.

⁶ Please note that the sample size for each outcome indicator can be different from the sample size mentioned in section 3.3. This could be due to one or both of the following reasons: respondents did not answer the question(s) related to that outcome indicator, respondents answered 'I don't know', or there was missing information in any of the covariates included in the model.

When the report mentions a *significant impact*, it means that the difference between program participants and non-participants for that outcome indicator between the baseline and the endline was statistically significant at a confidence level of 95%. This means that if the survey were re-run 20 times, we would find that the program had an impact for 19 of those 20 times. **In short, a *significant impact* means that we have enough statistical evidence to believe that a change in an outcome indicator was entirely due to TROSA program activities.**⁷

Figure 2



Most figures in this report visualise the results as line or bar graphs that show the average response to a given question by respondents in the baseline and endline studies (Figure 2). The y-axis indicates the highest value a certain indicator can have.

Because the data is based on responses from a sample of people in the baseline and endline studies, the results were subject to a degree of sampling error. These errors are visualised with a confidence interval, representing the range of the estimate at a confidence level of 95%. In graphs such as Figure 2, the confidence interval is depicted as the shaded area above and below the straight lines. Coloured lines and shaded areas represent the target group; grey (dashed) lines and shaded areas represent the comparison group.

Generally, if the confidence intervals of two estimates overlap, then it is likely that the difference between the estimates is not statistically significant. If the confidence intervals do not overlap, then the difference between the estimates is statistically significant. However, there are

exceptions to this general rule, as the evaluation model – and hence the conclusions on significance – rely on many interacting factors (such as the influence of weights, covariates, and sample size). Therefore, readers are encouraged to rely on the report text and summary tables for definitive results regarding which comparisons or associations were statistically significant and which were not.

In the following chapter, summary tables are presented for each section. These tables present the results of each indicator. Hence, the tables provide an overview of all the analyses performed for the section. Most of these results are described in the text. However, results for some indicators are not described extensively in the text.

In the summary tables, an equals sign (=) means that there is no significant difference or result to report. An upward arrow (↑) indicates a positive impact, while a downward arrow (↓) indicates a negative

⁷ It is worth noting that in some cases, the outcome indicator might not have changed among program participants, but we still may find a significant impact. This can be the case when we observed a negative change in the group of non-participants, but the project helped to maintain an outcome indicator at the same level or helped to reduce a negative trend in the political and socio-economic context.

impact. The number of asterisks behind the arrow indicates the level of significance (*, **, *** for $p < 0.1$, $p < 0.05$, $p < 0.01$, respectively). Hence, more asterisks mean stronger evidence for the result. Some indicators are not relevant for a specific subgroup; in these cases, the table says 'Not Applicable' (NA). When the table says 'No variation', it means that there is a low data variation so it was not possible to perform impact estimations. In some of those cases, we present the impact at a sub-indicator level or at the endline only.

Some Key Performance Indicators (KPIs) were only estimated at the endline. Here, we estimate whether the endline value is higher for the target group than the comparison group. In the table, this is indicated as 'Yes' (a higher value for the target group than the comparison group) or 'Yes, comparison' (a lower value for the target group than the comparison group). Again, asterisks indicate the level of significance.

4 PROGRAM IMPACT

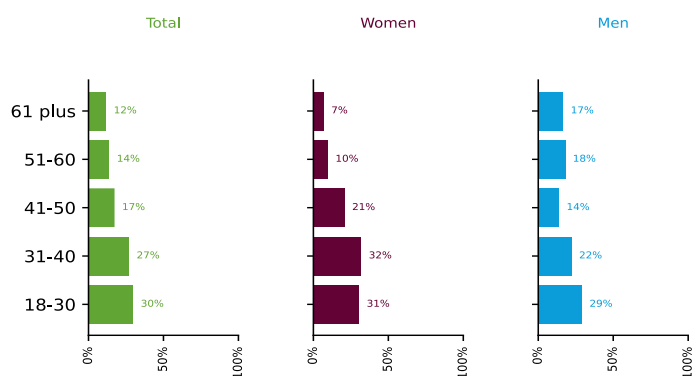
This chapter presents the findings from the endline study. The chapter begins by describing the sample of community members targeted by TROSA program activities: who they are and their characteristics (section 4.1). Next, we explore the results of five years of the TROSA program in relation to poverty and resilience (section 4.2), perceptions on institutions (section 4.3), vulnerability to water-related shocks (section 4.4), access and control over water resources (section 4.5), and women's participation in water governance (section 4.6). Please be referred to Annex 8.3 for an overview of how the KPIs were calculated.

4.1 CHARACTERISTICS OF INTERVIEWED PEOPLE

At the endline, 146 TROSA program participants were interviewed in Bangladesh, in which the gender balance was equal (50% men; 50% women). This section presents some of the key socio-demographic characteristics of TROSA participants at the endline. Although we are only presenting a limited number of characteristics, we recognise the fact that community members are a diverse group who may identify

Figure 3

What is your age?



Source: TROSA Meghna Basin (Endline Target), N=144.

with other or additional characteristics other than the ones presented in this section.

We interviewed community members who were 18 years or older (see Figure 3). Around half of TROSA participants in the endline sample were between 18-40 years of age (63% women; 51% men).

Figure 4

What is the highest level of education you completed?



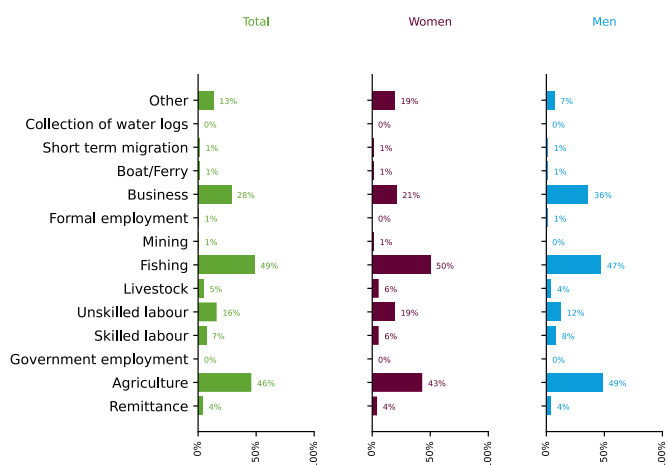
Source: TROSA Meghna Basin (Endline Target), N=144.

Additionally, most of the respondents were married or in a relationship (90% women; 82% men).

TROSA participants had different levels of education (see Figure 4). At the endline, 62% had some level of education (primary school or higher). Still, 38% had achieved no education. Around half of TROSA participants were literate.

Figure 5

What are your sources of income?



Source: TROSA Meghna Basin (Endline Target), N=144.

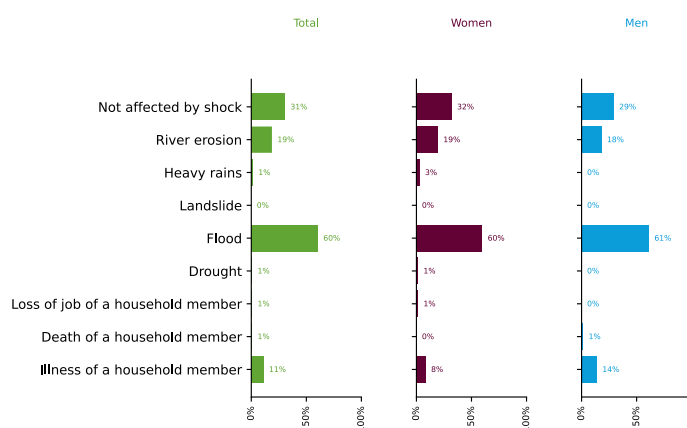
The main source of income for the majority of TROSA participants was fishing and/or agriculture (Figure 5): 49% of TROSA participants mentioned fishing, and 46% mentioned agriculture as the main source of income. Moreover, about 45% of TROSA participants who were engaged with agriculture were also engaged with fishing. Naturally, 93% of participants engaged in fishing depend on the river for their livelihood, and it is 92% for those engaged in agriculture. Other frequently mentioned sources of income

by TROSA participants in the Meghna basin were business (28%) and unskilled labour (16%). It is important to remark that there were less women engaged with business (21%) and more with unskilled labour (19%) and other (19%) compared to men (36%, 12% and 7%, respectively).

The most frequently mentioned shock at the endline was floods; experienced by three in five TROSA participants (Figure 6). The exposure to floods had increased compared to the baseline (at that time, the percentage of TROSA participants experiencing floods was 35%). Exposure to river erosion, the second most frequently mentioned shock, has remained more or less stable (baseline and endline levels are 16% and 19%, respectively). Respondents who experienced shocks were asked when and how many times in the past five years they experienced these shocks.

Figure 6

During the past five years, was your household affected negatively by...



Source: TROSA Meghna Basin (Endline Target), N=144.

Results show that communities were affected by floods and river erosions quite recently: 55% mentioned a flood and 46% river erosions between 2020-2021.

Nonetheless, even when the incidence of floods increased compared to the baseline, the frequency of floods decreased. On average, two floods were mentioned at the baseline, and it declined to only one at the endline. Hence, few shocks were experienced, but more households were negatively affected compared to the baseline. Indeed, Oxfam staff confirmed that floods became more severe and coupled with high levels of erosion this adds to the intensity of water related shocks. All in all, these findings

suggest that climate-related extreme weather events are posing threats to river basin communities in the Meghna basin. Hence, improving the resilience of communities to deal with threats posed by these shocks is of utmost importance.

4.2 POVERTY AND RESILIENCE OF COMMUNITIES (IMPACT)

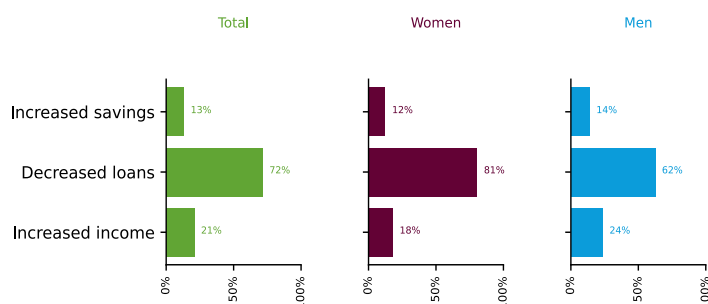
KPI #: Impact: Poverty reduction of marginalised and vulnerable river basin communities.		Bangladesh		
		Total	Women	Men
Endline data only		Is there a significant effect for the target group at endline?		
0.1	% of targeted people (M/F) who perceived / claimed having increased income and/or savings and/or decreased loans (poverty)	=	=	=
Baseline-Endline data		Is there a significant effect for the target group over time? (Impact)		
0.2	% of targeted people (M/F) who perceived / claimed being resilient towards water related shocks	↓*	=	↓**
0.3	% of targeted people (M/F/youth ⁸) who perceived / claimed being able to cope with the incidence of, and damage by, water related events/disasters such as floods	=	=	=
0.4	% of targeted people (M/F) with increased knowledge on dealing with floods and who recognise the importance of this knowledge for dealing with future floods	=	↓*	↑*

Poverty

The overall aim of the TROSA program was to reduce poverty and marginalisation of vulnerable river basin communities. Poverty is multi-dimensional: hence we tracked changes in income, savings and loans. Respondents were asked to report on their change in income, savings and loans since the baseline. The poverty situation was argued to have improved if at least two of the following conditions were met: 1) increased income, 2) increased savings, 3) decreased loans.

Figure 7

% of targeted people (M/F) who, in the past 3 years, experienced:



Source: TROSA Meghna Basin (Endline Target), N=144.

At the endline, few program participants had experienced an increase in savings or an increase in income, 12% and 21%, respectively (Figure 7). The majority of TROSA participants mentioned decreased loans (72%). Non-participants experienced a similar situation, so we could not

make strong impact claims of TROSA in reducing poverty.

The findings on poverty reduction did not completely resonate with participants in the reflection workshop. In their experience, as a consequence of Covid-19, fewer people were able to pay their loans. Hence, they were surprised by the high percentage of TROSA participants who mentioned

⁸ Similar results for youth.

decreased loans. Additionally, they mentioned that TROSA had executed activities to improve the livelihoods (and income) of river basin communities. These activities, for instance, mainly focused on increasing the awareness of different types of injustices experienced by fisherfolks (including bribes). Hence, in their opinion, because the work against these adverse circumstances, they had expected higher increases in communities' income. It is important to emphasise that some TROSA activities were implemented at the district level (Chandpur), for instance advocacy work on the social safety net during the fishing ban period and advocacy against unlawful actions undertaken by administrative agencies during the ban period. Since these activities were implemented at the district level; hence possibly, in districts such as Chandpur, possibly there were spill-over effects to non-participants.

It is important to mention the likely substantial influence of the Covid-19 pandemic in the financial situation of community members at the endline. Hence, in the survey, we added questions that asked specifically about the influence of Covid-19 on the change in income. On average, 81% of TROSA participants mentioned their income to have decreased relative to the months before the Covid-19 outbreak.

Resilience

In addition to poverty reduction, an overall objective of the TROSA program was improving the resilience of river basin communities to climate-related extreme events. As section **Error! Reference source not found.** showed, river basin communities in the Meghna basin are increasingly exposed to floods. Hence, reducing vulnerability through resilience is of utmost importance to deal with threats posed by these shocks.

We look at two aspects of resilience: absorptive capacities and adaptive capacities. Absorptive capacity is the ability of people to deal with sudden shocks and stresses that happen occasionally. Adaptive capacity is the ability of people to make incremental changes in their lives, so they can respond to shocks better and create more flexibility for themselves (Oxfam, 2016⁹). In this study, absorptive capacity and adaptive capacity together determine communities' resilience to shocks, such as floods.

Since one of the major climate-related shocks are floods, several questions were asked related to heavy flooding and community members' ability to cope with this. Households were considered to have absorptive capacity if they would be able to cope with 1) drinking water losses, 2) erosion, 3) income losses, and 4) crop losses posed by floods. Hence, respondents were asked the extent to which coping with each of these impacts in case of flooding would be a problem. In case three or more impacts would not be problematic, they were considered to have *absorptive* capacity. At the endline, more program participants mentioned being able to cope (see Figure 8) with any damage or incident that occurs due to water-related disasters. We found increases from 4% at the baseline to 19% at the endline. Nonetheless, non-participants also improved their absorptive capacities. Hence we cannot make strong impact claims. However, it is likely that TROSA contributed to increased absorptive capacities. It is important to highlight the impact of the Covid-19 pandemic on the ability to cope with floods. Around 7

⁹ Oxfam (2016). The future is a choice. The Oxfam Framework and Guidance for Resilient Development.

out of 10 participants mentioned a decrease in the ability to cope with threats by floods because of Covid-19.

Figure 8

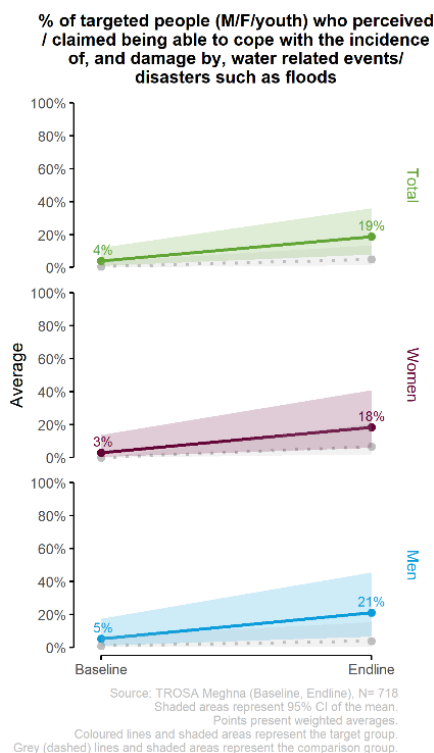
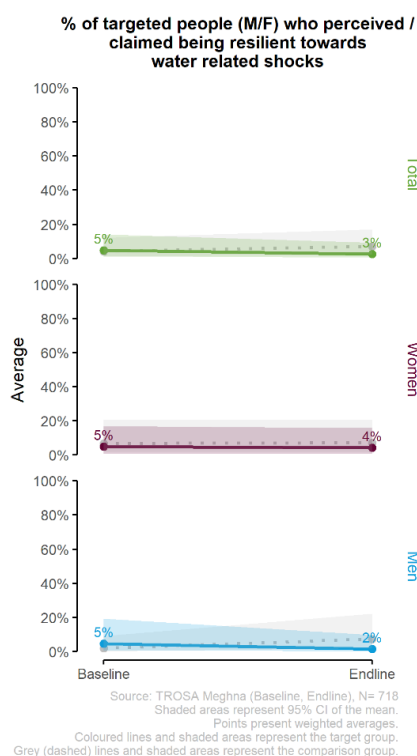


Figure 9



Secondly, we looked at communities' *adaptive capacity*. This indicator was estimated by whether, in the case of heavy flooding, community members would have 1) access to sufficient financial resources, 2) the ability to successfully adapt to changing threats in the future, and 3) support for recovery. In this case, two out of three of these conditions needed to be met in order to be resilient towards water-related shocks (adaptive capacity). Compared to absorptive capacity, a different picture emerged when looking at communities' adaptive capacity (Figure 9). Only 3% of participants perceived to be resilient towards water-related shocks, which was more or less the same as the baseline (5%)¹⁰. Adaptive capacity was low and unchanged for non-participants as well.

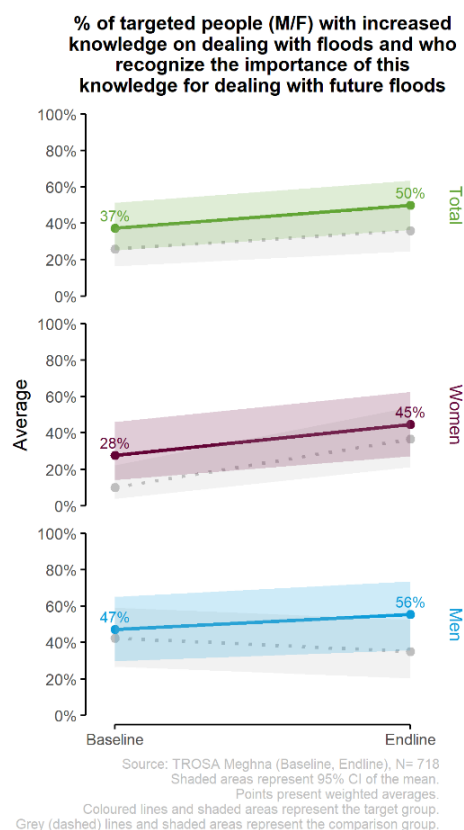
In the reflection workshop, it was stated that, although Covid-19 made it more challenging to deal with floods, the low levels of resilience were very surprising. According to workshop participants, the resilience trend should have been positive and higher. That is because, during Covid-19 times, Oxfam in Bangladesh implemented some emergency response activities to increase the capacity to respond to water-related shocks, such as river erosion. One of the actions was to increase funds to provide assistance to the people affected by the pandemic, especially vulnerable communities in Rajrajeshwar and Chandpur. Hence, according to workshop participants, communities should now be more resilient to water-related shocks than at baseline.

¹⁰ When estimating the impact on each of the three sub-indicators separately, we have found similar results: percentages are very low and unchanged, or in some cases even slightly lower, relative to the baseline.

Lastly, related to adaptive capacity, respondents were asked whether they have learned from dealing with past floods to be able to deal with future floods successfully. We found an increase in knowledge compared to baseline (from 37% to 50%). Nevertheless, if we disaggregate by gender, we found mixed results when we looked at impact (Figure 10). On the one hand, for male participants, we found a positive impact of TROSA in improving knowledge on floods at the 10% significance level. On the other hand, for female participants, even though knowledge levels improved from baseline to endline (even steeper than for men), we also found improvements for female non-participants. This means that we found the so-called 'negative impact' for women.

However, this last point contradicts the experience of reflection workshop participants. They mentioned that the increase should have been higher for female participants than non-participants, since TROSA had worked a lot with women, for instance, in the module on female leadership in water governance. This module, which mainly targeted women, aimed to improve women's knowledge, capacity, and leadership skills to engage in water governance (more on this in section 4.6). Hence, concluding, it is likely that TROSA contributed to women's increased knowledge of dealing with floods.

Figure 10



4.3 PERCEPTIONS ON INSTITUTIONS (OUTCOME 1-3)

KPI #: Outcome 1-3		Bangladesh		
		Total	Women	Men
Baseline-Endline data		Is there a significant effect for the target group over time? (Impact)		
Outcome 1. Government policies & practices at all levels, in water resource management are more inclusive of community concerns & meet national & international standards.				
1.6	% of targeted people (M/F) with trust in the government	=	=	=
1.7	% of targeted people (M/F) with external political efficacy (i.e. believing that the government cares about the community)	=	=	=
1.8	% of targeted people (M/F) with internal political efficacy (i.e. understanding politics and governance, feeling like a full and equal citizen with rights and protections, feeling capable to change things)	=	=	=
Outcome 2. Practices of private sector respect community access to water resources actively contributing to reduced conflict				
2.5	% of targeted people (M/F) reporting that the private sector is responsibly dealing with river basins	=	=	=
Outcome 3: CSOs increasingly participate in or influence transboundary water governance, women's inclusion and resolution of water conflicts.				
3.6	% of targeted people (M/F) that trust and are supportive of civil society	=	=	=

The main focus in the endline study and corresponding survey was to measure changes in the lives of river basin communities. Other methods, like Outcome Harvesting, were used to measure progress

towards outcomes 1-3 (formulated at government, private sector, and civil society level). However, community members' perceptions of these institutions define to a large extent whether the program can be successful in increasing participation in water governance. Hence, we considered trust in institutions, political efficacy, and attitudes and norms towards civil society organisations (CSOs) as key enablers or barriers to community participation in water governance.

In Bangladesh, community members' satisfaction with the government has decreased¹¹. In total, it fell from 52% (at the baseline) to 15% (at the endline). Reflection workshop participants agreed to this finding, mentioning that recently, in the Meghna basin, citizens have experienced an increase in crimes, bribes, and lack of responsiveness on behalf of these institutions, which have driven the population to discontent.

With internal political efficacy, we refer to a citizen's "*feeling that political and social change is possible and that the individual citizen can play a part in bringing about this change*" (Campbell, Gurin and Miller, 1954, p. 187)¹². Thus, it primarily refers to the individual – the concept is about the individual's feelings on how much impact they have due to their own personal knowledge and abilities. External political efficacy is defined as political responsiveness: how people feel their government responds to their needs and how well the political system and government reflect on their needs and concerns.

Regarding external political efficacy (Figure 11), there is a decrease from 26% at the baseline to 16% at the endline. Non-participants experienced a similar downward trend in their external political efficacy. The finding of decreased political efficacy is in line with the finding of decreased satisfaction with the government.

On the contrary, a positive trend is seen in internal political efficacy (Figure 12). However, we also found increases for non-participants. Hence, we could not make strong impact claims, but the higher internal political efficacy levels of TROSA participants at the endline compared to the baseline suggest that it is likely that TROSA contributed to improved internal political efficacy. According to reflection workshop participants, communities are more aware of their rights and entitlements now than before. Now, more than at the baseline, they are able to identify the issues they face and to explore ways to tackle them. Hence they agreed with increased levels of internal political efficacy.

¹¹ This indicator was calculated by asking how often people trust that 1) the local government and the 2) national government are doing the right things. People are perceived as trusting these actors if they mentioned to trust them to do the right things 'all the time' or 'most of the time'.

¹² Campbell, A., Gurin, G., & Miller, W. E. (1954). The voter decides.

Figure 11

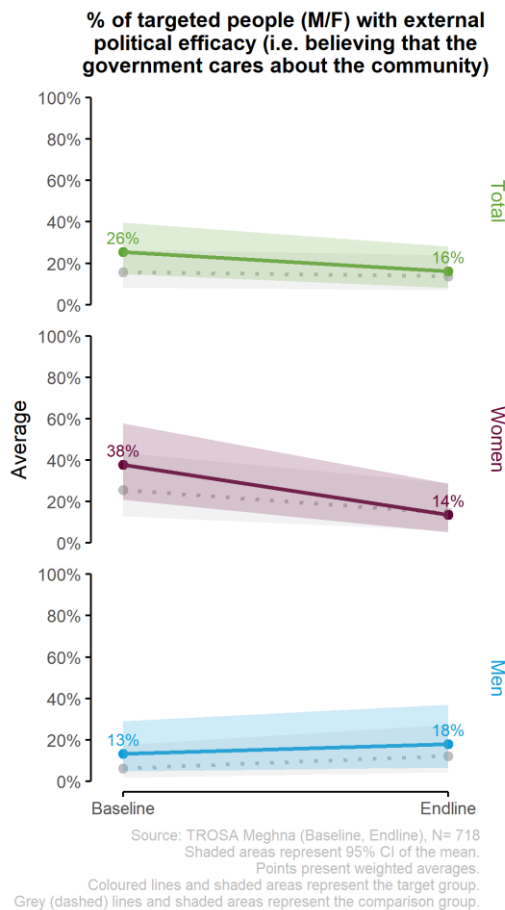
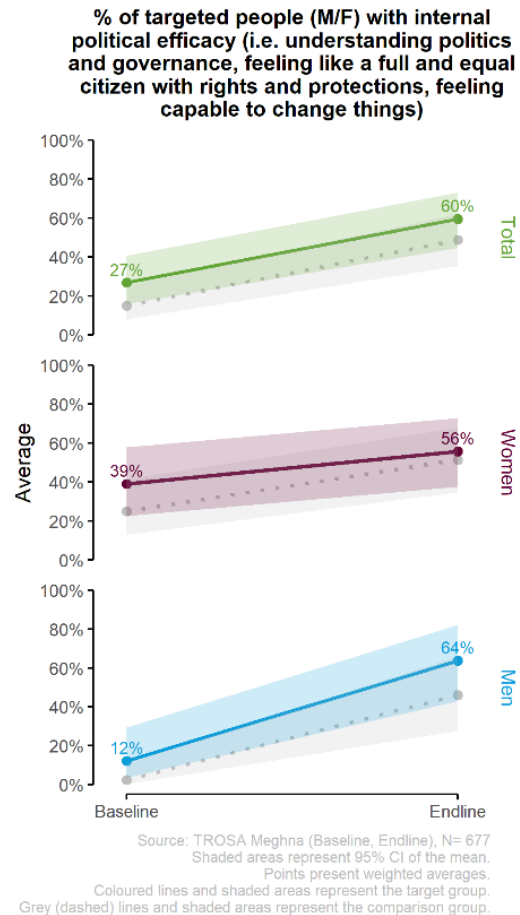


Figure 12



Regarding perceptions towards the private sector, respondents were asked whether the private sector is responsibly dealing with river basins. At the endline, 36% of TROSA participants mentioned that the private sector is responsible in their usage of river basins compared to 32% at the baseline. Overall, the perception of TROSA participants on this indicator has not changed over time, both for TROSA participants and non-participants¹³. That said, still the majority of TROSA participants (64%) mentioned the private sector to have irresponsible behaviour when it comes to dealing with river basins.

Lastly, regarding CSOs, respondents were asked whether they trust CSOs and non-governmental organisations (NGOs) and how they would feel if the government took measures to limit the work of NGOs that defend human rights. Both questions were combined into one indicator measuring community members' trust and support towards CSOs. There was a decrease from 18% at the baseline to 11% at the endline. Similarly, non-participants also experienced decreased trust and support towards CSOs. This was a surprising result, since TROSA extensively engaged the communities and their

¹³ Note that, at the baseline, around 6 out of 10 TROSA participants answered this question with "I don't know" and, at the endline, this ratio decreased to 3 out of 10. Hence, this suggests that participants are now more aware of the different actors, especially the private sector, making use of river basins as compared to the baseline.

relationships with CSOs. Hence, according to reflection workshop participants, the decrease did not make sense. One possible explanation brought forward was that CSOs might not be meeting communities' expectations. However, still, the general feeling among workshop participants was that trust levels should have been improved instead of deteriorated.

4.4 VULNERABILITY TO WATER-RELATED SHOCKS (OUTCOME 4.1)

KPI #: Outcome 4.1: local communities are better able to reduce vulnerability to water resource-related-shocks resulting from conflicts and disasters;		Bangladesh		
		Total	Women	Men
Endline data only		Is there a significant effect for the target group at endline?		
4.1.1	% of targeted people (M/F) who are aware of cross-border interdependency of having a shared base (historical, ethnical, cultural and the river), shared interests, and shared responsibilities	=	=	=
Baseline-Endline data		Is there a significant effect for the target group over time? (Impact)		
4.1.2	% of targeted people (M/F) taking actions to protect their key productive and physical assets to spread their risks of being affected by water shocks	↑*	↑*	=
4.1.3	% of targeted people (M/F) reporting to have working relationships with the government for support in water governance issues	=	=	=
4.1.4	% of targeted people (M/F) reporting to have working relationships with CBOs for support in water governance issues	=	=	=
	Sub-indicator: % targeted people (M/F) reporting to get information from about water issues from civil organisations (NGO's and community leaders)	=	=	=
	Sub-indicator: % targeted people (M/F) reporting that CSOs consulting them about transboundary water issues sometimes	↓*	=	=
4.1.5	Sub-indicator: % targeted people (M/F) reporting to complain to community groups about water management	↑**	=	↑**
	% of targeted people (M/F) reporting to collaborate with the local government on water governance	=	=	↑*
4.1.6	% of targeted people (M/F) reporting to collaborate with cross-border communities on early warning information and/or water governance	=	=	=
4.1.7	% of targeted people (M/F) who feel capable to complain about water management problems and who are confident that complaints will be heard	↑*	=	=
4.1.8	% of targeted people (M/F/youth), who have conflicts with local government or cross-border communities, who regularly participate in water conflict resolution and/or governance mechanisms	=	=	=
	Condition: % of targeted people (M/F) who at least sometimes have conflicts with cross-border communities or local government	↓***	↓***	↓**

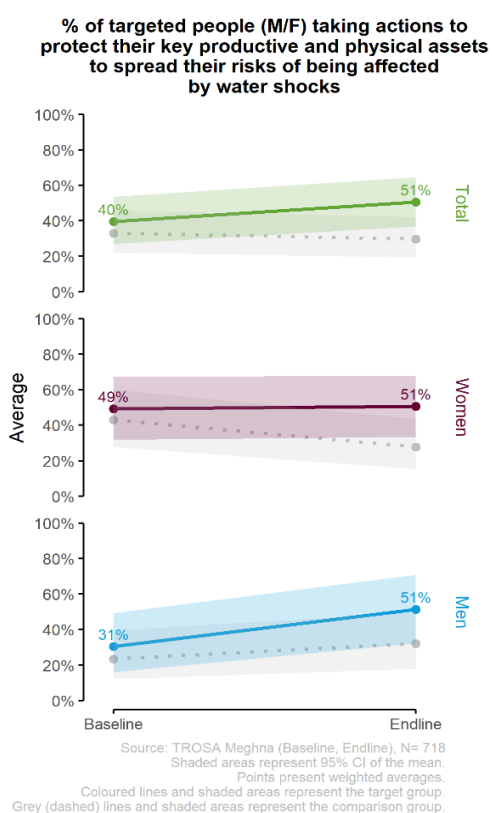
Awareness of cross-border interdependency

At the base of TROSA's ToC lies understanding of the water-related context, including that water rights are shared with cross-border communities. That is, sustainable water governance starts with the recognition by all stakeholders that rivers are shared. We analysed awareness of cross-border interdependency by asking respondents whether they feel that river basins are 1) a common interest of communities and cross-border communities; 2) a common responsibility of communities and cross-border communities; and 3) to what extent cross-border communities are responsibly dealing with river

basins. Respondents were considered to be aware of cross-border interdependency if mentioning at least two of the three conditions.

At the baseline, all respondents (both TROSA participants and non-participants) mentioned to not know an answer to these questions. However, at the endline, considerably more respondents provided an answer (28%), indicating a first step in awareness raising. All respondents who provided an answer to these questions were aware of cross-border interdependency. That said, at the endline, awareness levels were similar for participants and non-participants. Hence, because participants and non-participants experienced similar improvements in their awareness of cross-border interdependency we could not make strong impact claims. However it is likely that TROSA contributed to improved awareness levels.

Figure 13



Preventing measures

Physical assets are essential for the community. When communities take preventive measures for protecting their key productive and physical assets (like land, animals, and houses), potential risks posed by water shocks can be spread. For instance, the destruction of fisheries equipment would mean a big hamper on the lives of fisherfolk. More program participants were taking actions to protect their key productive and physical assets to spread risks of floods now than at the baseline (it improved from 40% to 51% at the endline; see Figure 13). For women, the positive trend was steeper for participants than for non-participants. We found that this positive change was an impact of TROSA. For men, participants and non-participants followed a similar trend. So, we could not claim impact.

Participants in the workshop mentioned that they also expected a positive impact in the case of men. According to them, TROSA has executed many initiatives that

contributed to protecting key productive and physical assets for TROSA communities.

Collaboration on water governance

Effective collaboration with the local government, CBOs and CSOs, and cross-border communities might improve communities' involvement in water governance, and hence their vulnerability to water-

related shocks. Two types of indicators were constructed: 1) one representing working relationships¹⁴, and 2) representing effective collaboration¹⁵.

In the Meghna basin, there was an increase in the percentage of TROSA participants reporting to have *working relationships* with the government (34% in the endline, compared to 6% in the baseline) and with CBOs (10% in the endline, compared to 2% in the baseline). However, this increase was also experienced by non-participants, so we could not claim impact, but it is very likely that TROSA contributed to these improved working relationships. In terms of working relationships with CBOs, we found similar results. Working relationships with CBOs improved from almost non-existent at the baseline (2%) to 10% at the endline. Since the improvement was experienced by both TROSA participants and non-participants, we could not make strong impact claims. However, again, it is likely that TROSA at least positively contributed to these improved working relationships. When looking at the sub-indicators separately, we found that more people were complaining to community groups to solve water-related issues now than at the baseline. We found a positive impact of TROSA on improving this sub-indicator.

Overall, the results showed no significant change in the percentage of TROSA participants reporting to *effectively collaborate* with the government and cross-border communities on water governance (see Figure 14). However, for women separately, we did find improvements in terms of collaboration with the government (from 7% at the baseline to 12% at the endline). For male TROSA participants collaboration levels with the government did not change. However, because levels deteriorated for male non-participants, we found a positive impact of TROSA at the 10% significance level, suggesting that

¹⁴ The following questions were used to estimate working relationships with the government: What are the sources your household gets information from about water issues?; Who would your household complain to if you had problems in water management?; How often is your local government consulting you about transboundary water issues?; Which sources provide your household with information through early warning systems?

The following questions were used to estimate working relationships with CBOs: What are the sources your household gets information from about water issues?; How often are CSOs consulting you about transboundary water issues?; Who would your household complain to if you had problems in water management?; Which sources provide your household with information through early warning systems?

¹⁵ The following questions were used to estimate collaboration with the government: With which statement do you agree? *My community and the local government work well together to improve the lives of households like mine*; *The local government does not understand the needs of my community*.; How often do you collaborate with your local government on the use of river basins?; How satisfied are you with the collaboration with your local government on the use of water?

The following questions were used to estimate collaboration with cross-border communities: How often do you share Early Warning Information on floods/disasters with cross-border communities?; How often do you get Early Warning Information on floods/disasters from cross-border communities?; How often do you collaborate with cross-border communities on the use of river basins?; How satisfied are you with the collaboration with cross-border communities on the use of water?

TROSA contributed to keeping collaboration levels between communities and the government at least the same. In terms of cross-border communities, almost all TROSA participants at both the baseline and the endline mentioned *not to* collaborate with cross-border communities. Non-participants followed the same trend (see Figure 15).

Figure 14

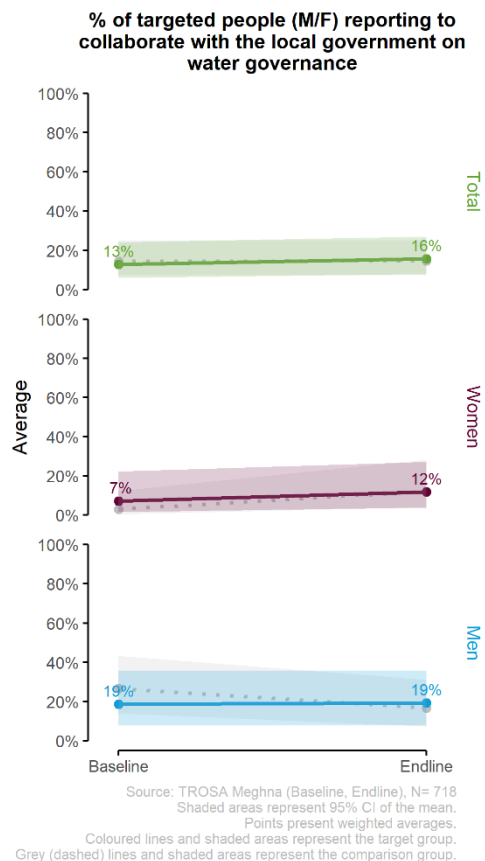
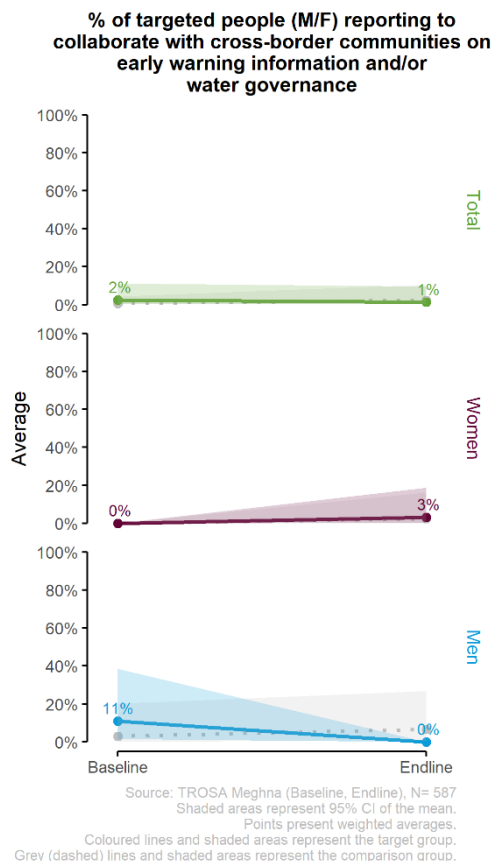


Figure 15



The participants in the reflection workshop disagreed with the steady trend in collaboration with the government and cross-border communities. For instance, since TROSA activities were geared towards lobby and advocacy, involving lobbying the government, the collaboration with the government should have been higher. Workshop participants added that respondents might have had difficulty understanding the survey questions. Furthermore, low government responsiveness on issues raised by citizens from the Meghna basin might have translated into low perceived collaboration. In terms of collaboration with cross-border communities, workshop participants remarked that while the indicator on cross-border collaboration focuses primarily on collaboration on early warning information, in practice early warning systems in the Meghna basin are not transboundary in nature. Hence, this might explain why we found very low levels of collaboration between communities and cross-border communities. Furthermore, because of Covid-19, TROSA had organised several online webinars to reach and engage communities. This has facilitated the connection between communities and cross-border communities. With these activities in place, workshop participants had expected a higher and a positive trend regarding these indicators.

Feeling capable to complain

Part of active and effective involvement in water governance is standing up for one's rights related to water. Therefore, respondents were asked several questions about their ability to lodge complaints

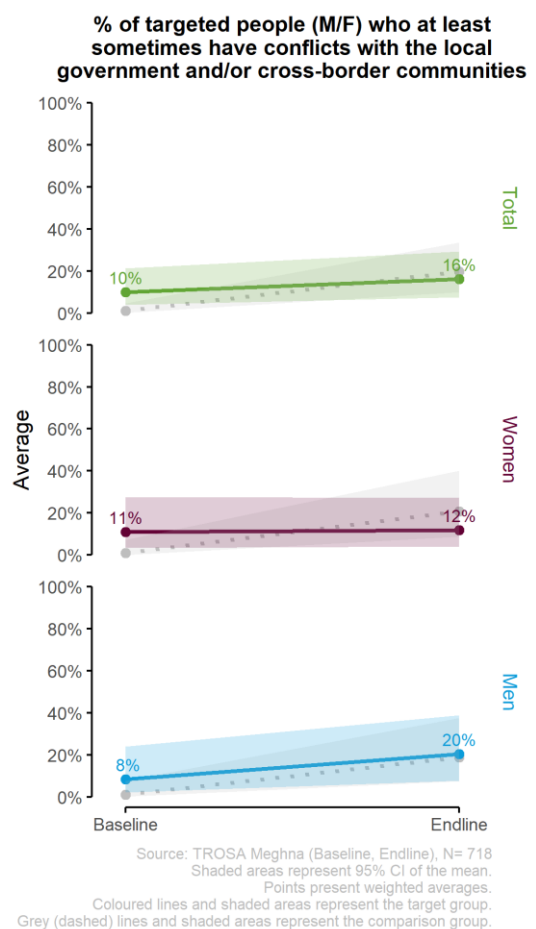
about water governance and whether they felt something was done with their input¹⁶. At the endline, respondents most often filed complaints with the local government (86% of TROSA participants). Additionally, more TROSA participants at the endline than at the baseline felt capable of complaining, and they were confident that complaints were heard (it improved from 18% at the baseline to 27% at the endline). This increase was slightly steeper for participants than non-participants, hence this suggests a positive impact of TROSA in improving communities' ability to complain and let themselves' be heard. Nodi-Boithoks, which provided a platform for communities to identify their issues, discuss them, and work on solutions, are one of the examples in which TROSA improved communities' ability to complain. That said, still almost three in four TROSA participants at the endline did not feel capable of complaining and being heard, hence there remains room for improvement in this indicator.

Conflicts

The majority of TROSA participants indicate *not having* regular conflicts with the local government (84%) and cross-border communities (99%). That said, the percentage of TROSA participants who have conflicts with either of those actors slightly increased over time (see Figure 16). However, the increase was steeper for non-participants, hence we found a positive impact of TROSA in preventing a steeper increase in the incidence of conflicts with the local government and/or with cross-border communities.

Respondents who had at least sometimes experienced conflicts with either the local government or cross-border communities were asked whether they participated in conflict resolution and/or grievance mechanisms. Almost all participants and non-participants mentioned that they had *not* participated in conflict resolution. There were no changes from the baseline to the endline. Nonetheless, the TROSA program facilitated several events (e.g. public hearings and policy dialogues) where the community shared their conflicts with the local government or cross-border communities.

Figure 16



¹⁶ The three survey questions used for this indicator include:

- To what extent does your household feel capable to complain about water management problems if you face such problems?
- Is your household confident that your complaints will be heard?
- Is your household confident that your community's concerns/proposals will be heard?

4.5 ACCESS AND CONTROL OVER WATER RESOURCES (OUTCOME 4.2)

KPI #: Outcome 4.2: Local communities have more secure access and control over their water resources		Bangladesh		
		Total	Women	Men
Baseline-Endline data		Is there a significant effect for the target group over time? (Impact)		
4.2.1	% of targeted people (M/F) reporting to complain to private sector if they had problems in water management and/or to regularly experience a removal of barriers that prevent the use of water resources	No variation		
4.2.3	% of targeted people (M/F/youth) having timely access (via ICT or channels) to communication/information on floods and disasters (for both receiving and spreading information)	=	↑***	↓***
4.2.4	% of targeted people (M/F) with sufficient access of water for domestic use	↓***	↓*	↓***
4.2.5	% of targeted people (M/F), who use the river for agricultural livelihood, with sufficient access of water for agricultural use	↓*	=	=

Complaining to the private sector and experiencing a removal of barriers

It was not possible to analyse the impact of TROSA on whether communities complain to the private sector if they had problems in water management and have experienced a removal of barriers. This was because of the low variation present in the answers of respondents. At the endline and the baseline, 100% of TROSA participants and non-participants *did not* mention to complain to the private sector if they have problems with water management. Additionally, 100% of TROSA participants and non-participants mentioned that they *have not* experienced a removal of barriers preventing their water resources usage.

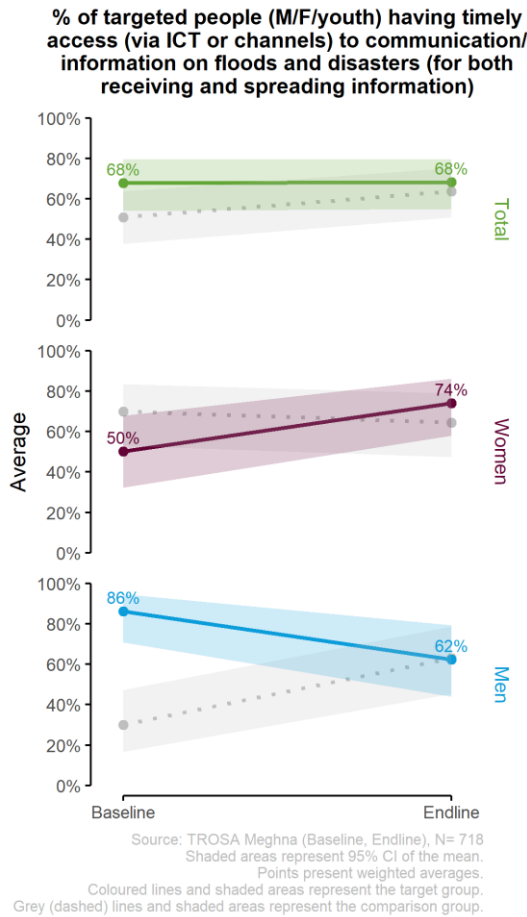
Early warning systems

Early warning systems (EWS)¹⁷ provide households with early warning information on risks, for instance, related to floods and disasters. When knowing whether floods and disasters are forecasted to occur in the near future, households can timely respond and prepare for the adverse event. This should minimise the negative impact of floods and disasters.

¹⁷The survey questions used for this indicator include:

- Does your household have access to information through early warning systems on floods and disasters?
- How often does your household get information on time regarding floods and disasters?

Figure 17



The indicator considers the household's access to information through EWS and the frequency they get information on time regarding floods and disasters. Around two in three TROSA participants (68%) had access to early warning information on time (Figure 17). On average, this percentage was similar at the baseline and the endline. Additionally, this trend is similar to non-participants, which means that no impact was found. Nonetheless, analysing the trend by gender, it is found that in the case of women, since the increase is steeper for participants than for non-participants, a positive change in timely access to EWS can be attributed to TROSA activities. In the case of men, we found an opposite scheme. Fewer male participants have timely access now (62%) than at the baseline (86%), while non-participants have more access now than before. Hence, we found a negative impact.

In the reflection workshop, participants disagreed with the overall steady trend and the negative

impact of TROSA on male access to EWS. One group, in which all the participants were men, mentioned an increase in access to information on floods compared to baseline, because people have increased access to the internet and other means of communication, such as mobile phones. However, it was also mentioned that TROSA could not claim this improvement, since increased access to the internet and ICT applies to everyone in the basin, and TROSA did not initiate a specific community-to-community mechanism to share early warning information.

Domestic and agricultural use of water

Water is essential for every form of life, for all aspects of socio-economic development, and for maintaining healthy ecosystems. Analysing the access to water for agricultural activities (Figure 18), we found that there was an increase in people with sufficient water access for agricultural usage (from 38% at the baseline to 95% at the endline). Similarly, access for non-participants increased, so we could not make strong impact claims,

There was a decrease in access to water for domestic usage (43% at the endline, compared to 50% at the baseline). Nevertheless, this is not the case for non-participants, for whom access to water for domestic activities increased, so we found a "negative impact" (Figure 19). The fact that less than half of TROSA participants have sufficient access to water for domestic purposes is alarming. According to Oxfam in Bangladesh, several people have been forced to migrate due to the loss of land caused by river erosion. They settled in various places, including newly formed "char" land (new land rise in the river formed by siltation). Nonetheless, settling down in a "char" land is like starting life almost from scratch, and many times access to water for domestic purposes is insufficient in these places.

Figure 18

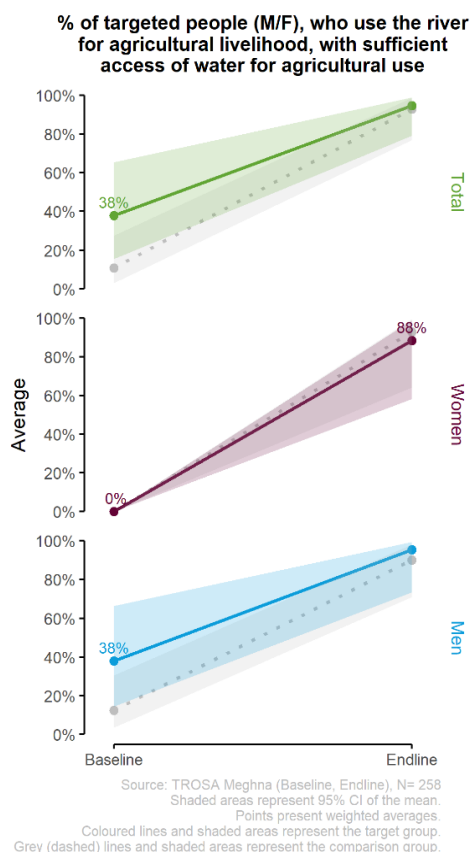
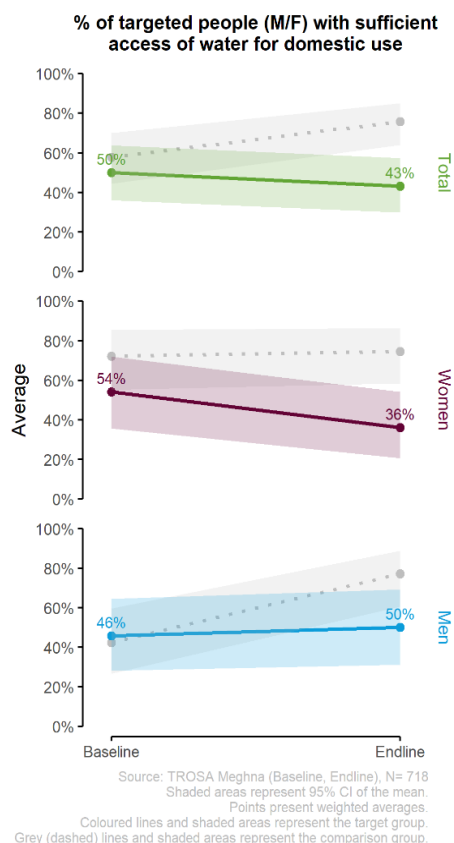


Figure 19



Also, in terms of the quality of water, the findings suggested room for improvement. At the endline, the most frequently mentioned source of water for domestic purposes for TROSA participants was surface water (for example, rivers and lakes) (55%); at the baseline, the main sources were tube wells or boreholes (68%). This change of sources could jeopardise water quality since surface water is more exposed to pollutants. According to the findings, drinking water quality dropped between the baseline and the endline. At the endline, 66% of TROSA participants mentioned that the quality of the water was fair or poor, compared to 41% at the baseline. Hence, including Water, Sanitation and Hygiene (WASH) components in future programs will likely contribute to improved quality of life for these communities.

4.6 WOMEN'S PARTICIPATION IN WATER GOVERNANCE (OUTCOME 5)

KPI #: Outcome 5: Increased participation and influence of women in transboundary water governance, policies and processes		Bangladesh		
		Total	Women	Men
Endline data only		Is there a significant effect for the target group at the endline?		
5.1	% of targeted women (F) who attend meetings related to water governance in their community	NA	Yes**	NA
5.4	% of targeted women (F) who claimed / perceived being involved and/or having influence in decision-making processes related to water governance in the community	NA	=	NA
5.6	% of targeted men (M) reporting increased time spend on child care	NA	NA	=

Baseline-Endline data		Is there a significant effect for the target group over time? (Impact)		
5.2	% of targeted women (F) who claimed / perceived having knowledge about decision-making processes related to water governance	NA	=	NA
5.3	% of targeted women and youth (F/youth) who are willing to engage in water governance	NA	=	NA
5.5	% of targeted men (M) with attitudes that are supportive of women's leadership in water governance and/or who know how and are willing to support women's leadership	NA	NA	↓***

Women's participation in water governance

Access and control over water resources play an essential role in communities living around river basins. Water access and control comes with power, and power among different community members is unevenly distributed. Especially women are not always able to benefit in the same way from water as men do. Hence, the TROSA program aimed to improve opportunities for women to participate in decision-making around water access and control meaningfully.

Around two in three female TROSA participants indicated to be willing to engage in water governance. Percentages were similar at the baseline and the endline (64% vs 68%). Both female participants and non-participants experienced unchanged levels of willingness to engage, so we could not find impact¹⁸.

Women's willingness to engage in water governance translated into improved attendance rates of women in water governance meetings (see Figure 20). More women were attending meetings at the endline (16%) than at the baseline (0%). TROSA positively impacted women's attendance rate in meetings related to water governance. According to the workshop participants, Nodi-Boithoks took an important role in these results because it provided a platform to speak up and solve water-related issues.

Furthermore, more women have knowledge about decision-making processes related to water governance now (22%) than at the baseline (2%) (Figure 21). However, the increase was also found for non-participants, hence we could not make strong impact claims. That said, it is likely that TROSA contributed to improved knowledge levels, since, for instance, it implemented a module on female leadership in water governance.

¹⁸ Contrary, for men we found positive impact of TROSA in improving men's willingness to engage in water governance. Percentages for TROSA participants improved from 54% at the baseline to 84% at the endline. Increases were steeper for participants than for non-participants.

Figure 20

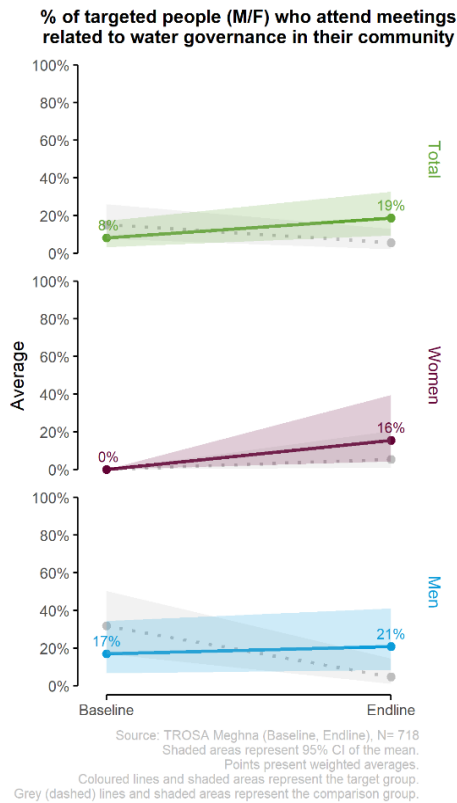
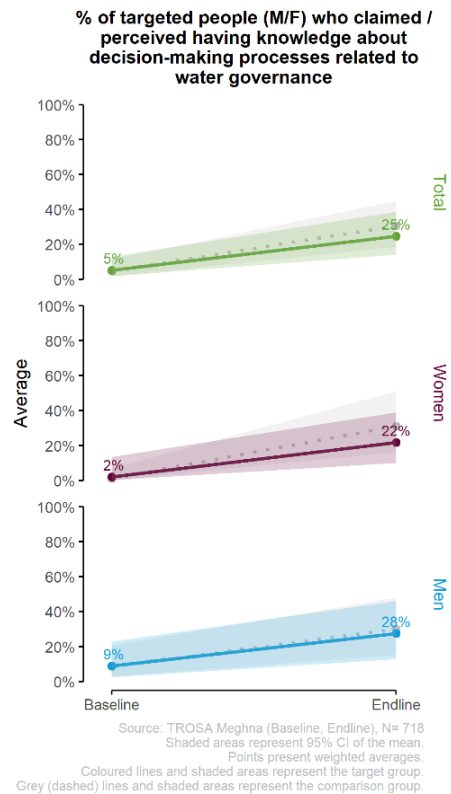


Figure 21



However, improved attendance and knowledge on decision-making does not necessarily translate into improved meaningful participation in the decision-making process. Involvement in decision-making was estimated by 1) whether women report feeling involved in decision-making processes in the community; 2) whether women report having influence in decision-making processes in the community; and 3) whether women report being involved in making important decisions in the water governance meetings they attend. Only very few TROSA participants felt they were involved and had influence in decision-making processes related to water governance: 2% of women and 3% of men at the endline. Percentages were similarly low at the baseline for participants as well as non-participants.

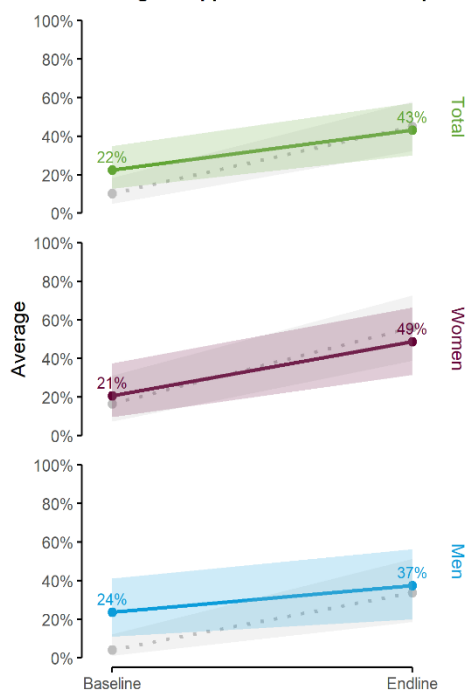
Participants in the reflection workshop responded affirmatively to these low levels of involvement in decision-making processes. The Covid-19 pandemic has made participation in water governance even more challenging. Since the pandemic started, there have been limited presential activities, most of which are now online. Under these circumstances, some participants have faced network issues or did not have the tools to join the meetings (if organised online at all). Consequently, this has made attendance in meetings and participation in decision-making more difficult.

Workshop participants also added that despite the challenges with in-person meetings due to the Covid-19 pandemic, more women and men participate in meetings now than before (see also Figure 20). In 2018, men were in the first place in the power structure, and women were left behind in the decision-

making process. When TROSA started working with the communities, they brought women upfront to be part of public gatherings and of the decision-making process..

Figure 22

% of targeted people (M/F) with attitudes that are supportive of womens leadership in water governance and/or who know how and are willing to support womens leadership



Source: TROSA Meghna (Baseline, Endline), N= 718
 Shaded areas represent 95% CI of the mean.
 Points present weighted averages.
 Coloured lines and shaded areas represent the target group.
 Grey (dashed) lines and shaded areas represent the comparison group.

Men's attitudes and behaviour towards female leadership

Positive attitudes towards women’s participation in decision-making are needed to increase participation and influence of women. Men were more supportive of female leadership now than at the baseline: 37% of male program participants support women's leadership in water governance compared to 24% at the baseline (see Figure 22). However, non-participants had an even steeper increase in supportive attitudes. Hence, we found a 'negative impact'. That said, still the largest share of men (63%) is not supportive of female leadership. This points to the importance of shifting social norms: society needs to accept that women can be equal partners in decision-making for women to start taking leadership roles and have influence in decision-making. Future programs should explore a greater emphasis on social norms change and include male counterparts in women empowerment activities.

Lastly, in order to participate in water governance, women often lack time as they have household responsibilities, including childcare. To increase participation rates of women

in water governance, it is helpful if husband and wife more equally distribute childcare responsibilities. Hence, we estimated the percentage of men with increased time spent on child care as compared to the situation at the baseline¹⁹. At the endline, only 4% of male TROSA participants reported increased child care time, which was similar to non-participants.

¹⁹ This indicator considers both the time spend on childcare as reported by male respondents, as well as the responses from female respondents on their husband’s time spend on childcare.

5 LEARNING QUESTIONS

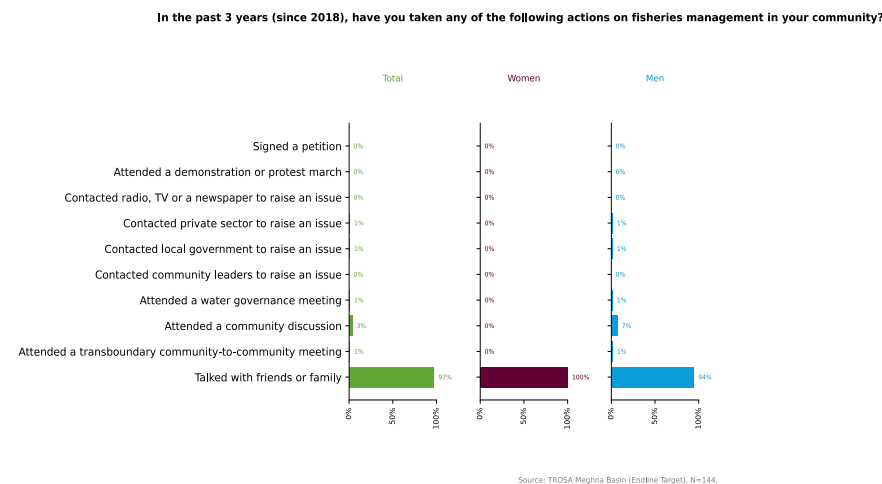
In addition to analysing TROSA's impact on its formulated outcomes, we analysed communities' participation in fisheries management and sandmining or erosion management. In both analyses, we have focused our attention on the main differences between the target and the comparison group (especially women and youth). This chapter presents the results found regarding the two learning questions.

Increasing citizens' voice involves citizens taking action to have their concerns heard by those who bear the duty of ensuring that human rights are respected, protected, and fulfilled. Citizens also raise their voice when they take action to challenge the power of the state and the corporate sector to have a say in the future direction of their society. This ensures that duty bearers consult and consider the citizens to whom they are accountable. As mentioned above, in the case of Meghna basin, the program was interested whether citizens participate and raise their voice on the topics of fisheries management and/or sandmining or erosion management.

Citizens can raise their voices in different ways and on different occasions. Hence, respondents were asked whether they, since 2018, had taken any of a wide range of civil actions to contact duty bearers and demand their rights, including online and offline actions, on the topic of fisheries management²⁰. Similarly, the same question was asked on the topic of sandmining or erosion.

Fisheries management

Figure 23



It is shown in Figure 23 that most of TROSA participants talked with their friends, community members, neighbours and/or relatives about fisheries management (97%). Almost none of the other actions were mentioned. Results were similar for non-participants.

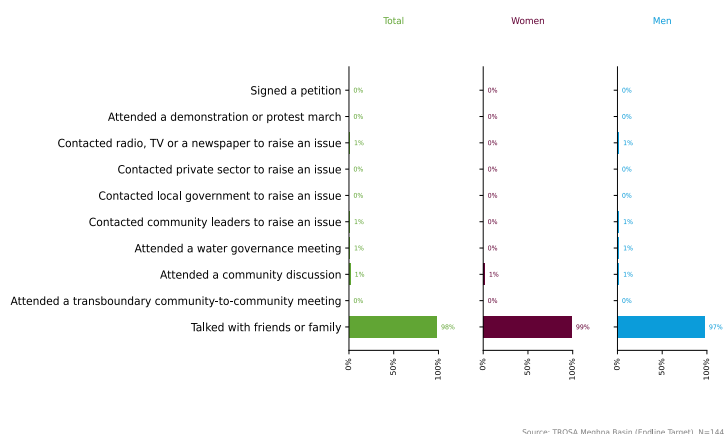
²⁰ The list of actions included: talking with friends or family; attending a community discussion; attending a transboundary community-to-community meeting; attending a water governance meeting; contacting community leaders; contacting local government representatives; contacting private sector; contacting radio, TV or a newspaper; attending a demonstration or protest march; and signing a petition.

This analysis did not differ a lot if we look at the results by gender (see Figure 23). Nonetheless, it is important to note that 7% of men attended community meetings, 1% contacted the government, and 1% the private sector to raise an issue about fisheries management. In the case of women, 100% did not cross over the family atmosphere. Therefore, even when the majority of men only talked about fisheries management with family and friends, we found a broader range of actions on this topic for them than for women.

Sand mining and erosion management

Figure 24

In the past 3 years (since 2018), have you taken any of the following actions on sand-mining or erosion in your community?



The river's sand resources and community-led erosion management aim to raise stakeholder awareness of system-scale challenges and the need for a positive transformation of the sector. Hence, it is important that people in the community, jointly with other

stakeholders, work together to solve sandmining or erosion management issues.

In Figure 24, it is shown that most of TROSA participants prefer talking with their social circle about sandmining or erosion management (98%). Almost none of the other actions were mentioned. Results were similar for non-participants.

When analysing by gender, we found similar results as for fisheries management. Even though most women and men only talked to friends, community members, neighbours and/or relatives about sandmining or erosion, men mentioned a broader range of actions as compared to women.

6 CONCLUSIONS

This chapter presents the conclusions of the endline study of the TROSA program in the Meghna basin. The endline study has assessed to what extent the TROSA program had an impact on reduced poverty and marginalisation of river basin communities (impact), communities being better able to reduce their vulnerability to water-related shocks (outcome 4.1), communities having more secure access and control over water resources (outcome 4.2), and increased participation and influence of women in transboundary water governance, policies and practices (outcome 5). In this chapter, first, each of the four evaluation questions related to TROSA's outcome areas is answered individually. Then, the two learning questions are answered. We close with an overall conclusion.

6.1 CONCLUSIONS TO EVALUATION QUESTIONS

6.1.1 TO WHAT EXTENT IS THEIR REDUCED POVERTY AND MARGINALISATION OF RIVER BASIN COMMUNITIES, AND CAN THESE CHANGES BE ATTRIBUTED TO THE TROSA PROGRAM?

The overall aim of the TROSA program was to reduce poverty and marginalisation of vulnerable river basin communities. At the endline, few program participants reported increased savings or income, 12% and 21%, respectively; but many reported a decrease in loans (72%). Non-participants experienced a similar situation on poverty reduction, so we could not make strong impact claims. These findings did not completely resonate with participants in the reflection workshop. According to them, the percentage of people experiencing an increase in income should have been higher, for instance, since TROSA executed activities like awareness raising in different types of injustices experienced by fisherfolks. These activities should have contributed to improved livelihoods (and income) of river basin communities. It is important to mention the substantial influence of the Covid-19 pandemic on the financial situation of community members at the endline, since eight in ten TROSA participants mentioned a drop in income because of Covid-19.

In addition to poverty reduction, an overall objective of the TROSA program was improving the resilience of river basin communities to climate-related extreme events. We evaluated two aspects of resilience: absorptive capacities and adaptive capacities. For both TROSA participants and non-participants, absorptive capacities improved (from 4% to 19% for participants). Although we could not make strong impact claims, it is very likely that TROSA contributed to increased absorptive capacities. A different picture emerged when we looked at communities' adaptive capacity; only very few participants and non-participants at both the baseline and endline perceived to be resilient towards water-related shocks (5% and 3% for participants, respectively). Nonetheless, to reflection workshop participants, the low levels of resilience were very surprising. TROSA activities, including Covid-19 emergency response, should have improved communities' capacity to respond to water-related shocks.

Lastly, we found an increase in knowledge on dealing with floods from 37% at the baseline to 50% at the endline. For male participants, we found positive impact of TROSA in improving knowledge levels. For female participants, even though knowledge levels improved from baseline to endline, we found

that this positive trend was steeper for non-participants; hence we found a so-called 'negative impact'. However, this finding contradicted the experience of reflection workshop participants, who emphasized the module on female leadership in water governance implemented by TROSA. Hence, in their experience the increase should have been higher for female participants than for non-participants.

6.1.2 TO WHAT EXTENT ARE LOCAL COMMUNITIES BETTER ABLE TO REDUCE THEIR VULNERABILITY TO WATER RESOURCE-RELATED SHOCKS, AND CAN THESE CHANGES BE ATTRIBUTED TO THE TROSA PROGRAM?

Sustainable water governance starts with the recognition by stakeholders that rivers are shared. Awareness levels were very low at the baseline for both TROSA participants and non-participants. At the endline, more respondents were aware of cross-border interdependency. That said, at the endline, awareness levels were similar for TROSA participants and non-participants. Although we could not make strong impact claims, it is likely that TROSA contributed to improved awareness levels.

Physical assets are essential for the community, and their destruction would mean a big hamper on people's lives. Hence, actions to protect key productive and physical assets can spread the risks of floods. More TROSA participants mentioned to protect their assets now than at the baseline (51% vs 40%). For women, we found a positive impact of TROSA on taking these prevention measures. For men, participants and non-participants followed a similar trend.

Effective collaboration with the local government, CBOs and CSOs, and cross-border communities is expected to improve communities' involvement in water governance, and hence their vulnerability to water-related shocks. We found improvements in both working relations between communities and the government, as well as in working relationships between communities and CBOs/CSOs. Since improvements were experienced by both TROSA participants and non-participants we could not make strong impact claims, but it is likely that TROSA positively contributed to improved working relationships (for instance through facilitating basin dialogues). In terms of effective collaboration, overall, the results show no significant changes over time (both in the case for collaboration with the government and collaboration with cross-border communities). Participants in the reflection workshop disagreed with this steady trend in collaboration. For instance, the collaboration with the government should have improved through TROSA's lobby and advocacy activities. Furthermore, in the case of collaboration with cross-border communities, the survey questions focused primarily on collaboration in terms of early warning systems, which in the case for the Meghna basin were not transboundary in nature. Hence, this might explain the low levels of collaboration with cross-border communities.

Part of active and effective involvement in water governance is standing up for one's rights related to water. More TROSA participants at the endline than at the baseline felt capable of complaining, and they were confident that complaints were heard (it improved from 18% at the baseline to 27% at the endline); and this positive change can be attributed to TROSA. Nodi-Boithoks, which provided a platform for communities to identify their issues, discuss them, and work on solutions, were one of the examples in which TROSA improved communities' ability to complain. That said, still almost three in four TROSA participants at the endline did not feel capable of complaining and being heard, hence there remains room for improvement in this indicator.

Lastly, the majority of TROSA participants indicated not having regular conflicts with the local government (84%) and cross-border communities (99%). That said, the incidence of conflicts with either of those actors slightly increased over time. However, the increase was steeper for non-participants, hence we found a positive impact of TROSA in preventing a further increases in the incidence of conflicts. Almost all TROSA participants and non-participants who experienced conflicts mentioned that they had *not* participated in conflict resolution.

6.1.3 TO WHAT EXTENT HAVE LOCAL COMMUNITIES MORE SECURE ACCESS AND CONTROL OVER WATER RESOURCES, AND CAN THESE CHANGES BE ATTRIBUTED TO THE TROSA PROGRAM?

Complaining to the private sector if facing problems in water management is not a common practice. At both the baseline and the endline, all TROSA participants as well as non-participants *did not* mention to complain to the private sector if they have problems with water management. Additionally, all respondents mentioned that they had *not* experience a removal of barriers preventing their usage of water resources.

Early warning systems provide households with early warning information on risks, for instance, related to floods and disasters. This should minimise the negative impact of floods and disasters because people can respond timely to any adverse climate-related event. At the endline, two in three TROSA participants had access to early warning information. The percentage was unchanged relative to the baseline. However, in the case of women access to EWS improved, and this improvement can be attributed to TROSA. In the case of men, fewer participants have timely access now (62%) than at the baseline (86%), while non-participants have reported improved access. Hence, we found a negative impact. In the workshop, participants disagreed with the overall steady trend and moreover the negative impact of TROSA on male access to EWS. It was mentioned that there should have been an increase in access to information on floods because more people have access to the internet and other means of communication now than at the baseline.

Lastly, water is essential for every form of life, for all aspects of socio-economic development, and for maintaining healthy ecosystems. We found an increase in TROSA participants with sufficient water access of water for agricultural usage (from 38% to 95%). Access for non-participants increased as well. We found a decrease in TROSA participants' access to water for domestic usage (from 50% to 43%); on the contrary, it improved for non-participants. Drinking water quality dropped between the baseline and the endline. This might be explained by the fact that the main source of water for domestic purposes changed from tube well or borehole to surface water. Around two in three TROSA participants mentioned the quality of drinking water to be fair or poor. This suggests the importance of considering to include WASH components in future programs.

6.1.4 TO WHAT EXTENT IS THEIR INCREASED PARTICIPATION AND INFLUENCE OF WOMEN IN TRANSBOUNDARY WATER GOVERNANCE, POLICIES AND PRACTICES, AND CAN THESE CHANGES BE ATTRIBUTED TO THE TROSA PROGRAM?

Water access and control comes with power, and power among different community members is unevenly distributed. Especially women are not always able to benefit in the same way from water as men do. Hence, the TROSA program aimed to improve opportunities for women to participate in

decision-making around water access and control meaningfully. Overall, around two in three female TROSA participants indicated to be willing to engage in water governance at both the baseline and the endline. Additionally, more women were attending to meetings now (16%) than at the baseline (0%). TROSA positively impacted women's attendance rates in water governance meetings. According to reflection workshop participants, Nodi Boithoks have taken an important role in these results by providing a platform to speak up and solve water-related issues.

Furthermore, more women have knowledge about the decision-making process at the endline (22%) than at the baseline (2%). That said, improved attendance and knowledge on decision-making does not necessarily translate into improved meaningful participation in the decision-making process. Only very few women at the endline (2%) felt they were involved and had influence in decision-making processes related to water governance. Participants in the reflection workshop responded affirmatively to these low levels of involvement in decision-making processes. Covid-19 has made participation in water governance even more challenging due to limited presential activities.

Positive attitudes towards women's participation in decision-making are needed to increase participation and influence of women. Men were more supportive of female leadership now (37%) than at the baseline (24%). Non-participants had an even steeper increase in supportive attitudes. That said, still the largest share of men (63%) is not supportive of female leadership.

6.2 CONCLUSIONS TO LEARNING QUESTIONS

Increasing citizens' voice involves citizens taking action to have their concerns heard by those who bear the duty of ensuring that human rights are respected, protected, and fulfilled. Citizens also raise their voice when they take action to challenge the power of the state and the corporate sector to have a say in the future direction of their society. In the case of the Meghna basin, the program was interested whether citizens participate and raise their voice on the topics of fisheries management and/or sandmining or erosion management.

Most TROSA participants talked with their friends, community members, neighbours and/or relatives about fisheries management (97%) and/or sandmining or erosion management (98%). Results were similar for non-participants. Most women and men did not take any other action on fisheries management and/or sandmining or erosion management beyond discussions within their personal social sphere. That said, in general men mentioned a slightly broader range of actions as compared to women (for instance few mentioned to attend community meetings to discuss the matter).

6.3 OVERALL CONCLUSION

We found positive changes in almost all outcome areas when comparing the baseline situation to the situation at the endline. According to reflection workshop participants, the most important findings were the progress made regarding increased knowledge on flood risk reduction (impact), increased women's interest and participation in water governance (outcome 5), and increased awareness regarding rights and entitlement to the river (outcome 4.2). For many of the indicators, endline levels for TROSA participants were higher than the baseline levels, indicating the likely role of TROSA in contributing to these improvements. However, for many indicators, non-participants also experienced improvements.

Consequently, it is important to acknowledge possible external factors that might also have contributed to positive changes. Furthermore, the fact that TROSA is primarily an advocacy and influencing program working at multiple administrative levels might point to potential spill-over effects of TROSA activities beyond directly targeted areas. Hence, TROSA may also be (partly) responsible for the progress for non-participants.

The last two implementation years of TROSA were amidst the Covid-19 pandemic; hence the fact that we still found improvements in many outcome areas is promising.

Lastly, it should be mentioned that some of the results did not match the experience of experts in Bangladesh. Hence, by taking a quantitative approach to the endline study, we have likely missed out on some of the more in-depth stories of change because of TROSA.

7 RECOMMENDATIONS FOR FUTURE PROGRAMS

Based on the insights, experiences and results presented in this report and discussed with program staff and partners, the following recommendations for future programs have been formulated. These recommendations specifically apply to the river basin communities in Bangladesh residing along the Meghna basin, but could also be relevant for other river basin communities and for civil society sector and future programs working on water governance.

- **Acknowledge the private sector as a crucial ally for the achievement of common goals related to water governance.** Few people mentioned the private sector to responsibly deal with river basins. Since water is a key element in the value chain of many enterprises, it is important to reinforce the bridge between communities and the private sector to jointly collaborate for sustainable use and access to water resources. Furthermore, it is important to keep demanding the private sector to respect communities' rights and needs in decisions related to the use of the river.
- **Amplify communities' voices.** It is essential that citizens have and use the power to speak up to reach out to stakeholders and find solutions to specific (water-related) issues. Around 3 out of 4 TROSA participants *did not* feel capable of complaining and being heard. Hence, there is room for improvements to continue working on empowering communities to raise their voices and stand up for their interest and needs.
- **Promote new platforms to take actions to empower communities to speak up and solve water-related issues.** Communities' actions on issues related to fisheries, sandmining or erosion management were relatively limited. Most community members talked about these topic with family and friends, but their actions did not go beyond their personal social sphere. Supporting communities in raising their voice via a broader range of activities could help empower them and create more beneficial opportunities for communities in terms of water governance, which should be explored in future programs.
- **Continue to support women's leadership in water governance.** There were several improvements that empowered women to act on water-related issues. However, the challenge to bring women upfront to be fully involved in water governance is still present. Hence, gender inequalities should be an essential point to continue addressing in future programs, especially improving women's influence in decision-making processes, encouraging women to take broader actions to speak up and promoting collaborative relationships between women and their partners (for instance, when it comes to the division of unpaid care work).
- **Work on Water, Sanitation and Hygiene (WASH).** Water is a vital resource for public health. Its use and provision should be sustainable to contribute to reducing poverty and inequalities.

Less than half of TROSA participants have sufficient access to water for domestic purposes, and two in three participants mentioned that their primary source of water has fair or poor quality. Furthermore, several people have been forced to migrate due to river erosion. They settled in various places, including newly formed "char" lands. Especially in these areas there is a lack of quality domestic water. Hence, WASH components in future programs will likely contribute to improved quality of life for these communities.

- **Increase the focus on (water-related) livelihood development for poverty reduction.** The results show that poverty reduction has not seen big jumps in the past five years. The Covid-19 pandemic has had an adverse effect on poverty. TROSA has worked, on the side, on water-related livelihoods, mainly through advocacy and influencing work. Since communities are struggling to sustain their livelihood day-to-day, program staff mentioned that future programs should include a greater emphasis on direct livelihood support (e.g. facilitating access to financial markets, especially for women and fisherfolks) to decrease poverty numbers, as well as to ensure continued buy-in and engagement from the community. In short, future programs should combine advocacy efforts with direct livelihood programming on the ground.
- **Promote peer-to-peer learning and capacity strengthening within civil society.** Capacity building initiatives for local CSOs and CBOs can help strengthen civil society. Future programs should consider capacity strengthening initiatives of local civil society, to empower local communities to act on their own issues in their own ways.
- **When working on water governance involving multiple countries, adopt a transboundary approach:** A best practice from TROSA worth sharing is the focus on basins, which are transboundary, rather than on separate countries. Taking this basin-wise approach has contributed considerably to increased transboundary awareness and collaboration, which is a crucial step in improving transboundary water governance. In this basin approach, it is important to find commonalities to inspire peer-to-peer learning and generate possible actions and strategies adapted to each basin's context.
- **Consider the sustainability of the program, even after program implementation has ended.** Future programs should consider ways in which to continue and sustain the work and progress made. For some of the best practices employed by TROSA, such as Nodi Boithoks, it is evident that it is helping the communities to speak up and solve their (water-related) issues. Or the implementation of Hilsa Watch, which has been a valuable tool to understand the main problems and expectations about fisheries management. These activities have been established within and facilitate collaboration on water governance even after the TROSA program has ended.

8 ANNEX

8.1 STATISTICAL APPROACH

Assessing the impact of the TROSA programme: a counterfactual approach

To assess the program's effects on each of the KPIs, we investigated to what extent the KPIs changed over time. We compared the values of the outcomes at the baseline (2018, the start of the program) with those at the endline (2021, the end of the program).

Assessing change in a KPI over time for those who participated in the program is not a robust method for assessing the impact of the program, as we are only looking at those who actually participated. The outcomes can be affected by a myriad of factors that are not in the program's sphere of influence. So, it would be inaccurate and 'unfair' to claim all changes that occurred between the baseline and the endline as evidence of the impact of the program.

A more reasonable and accurate method would be to ask ourselves the question, "What would have happened in the absence of the program?" in addition to describing what has happened to the program participants. In order to arrive at a reasonable estimate of the effects of the program on a KPI, one would need to compare the change over time for a group of people who participated in the program's activities with the change over time in a situation where the program was not implemented. Both groups operate in the same context, but the only difference between them is whether they participated in the program's activities. This is a so-called counterfactual approach – comparing changes over time among a group of people who participated in the program with changes over time in a similar group of people who have not participated in the program. This comparison group consisted of people living in areas where TROSA did not work.

We then compare the changes over time for a KPI in the target group with the change over time for the same KPI in the comparison group. We can then assess the program's impact as we have a decent understanding of what would have happened when the program was not implemented.

Estimating attributable impact: analysing differences over time

Our analyses estimate the value of each outcome indicator, for instance, timely access to early warning information (measured through a set of survey questions). The average level of timely access to early warning information is then estimated at the baseline and the endline for both the comparison and target groups. We can determine the trend or change over time for the target and comparison groups with these four estimates. We can then see whether people's level of timely access to early warning information increased or decreased over time for the target group. Similarly, for the comparison group, we can see how people's level of timely access to early warning information has developed over time, without any program activities being implemented.

The expectation is that people's level of timely access to early warning information would improve over the program duration for the target group. The supposed increase in timely access to early warning

information, or 'growth', for the target group is calculated by taking the baseline values of this and subtracting them from the corresponding endline values. This is called the first-order difference.

Similarly, we assess the change among non-participants. Indeed, there might have been changes in the level of timely access to early warning information unrelated to the program. If we also find an increase in the level of timely access to early warning information in this comparison group, the changes cannot be attributed to the program as there have not been any program activities with people in the comparison group.

For an accurate judgement of the program's impact, we need to compare the change over time in the comparison group with the change over time in the target group. If the change over time in the target group is bigger than the change over time in the comparison group, the program has had an attributable impact. So, in this example, if the increase in people's level of timely access to early warning information in the target group is bigger than the increase in timely access to early warning information observed in the comparison group, one may speak of positive, attributable impact. This technique is called a difference-in-difference estimation²¹. An important assumption of difference-in-difference estimation is that program participants and non-program participants are exposed to similar external shocks. This is the so-called parallel trends assumption.

To assess changes over time in any outcome indicator, one would ideally want to interview the same people at each survey round to accurately assess changes over time (collect panel data). We interviewed the same person in the baseline and the endline for 98% of respondents. However, although we have panel data for most respondents, we decided to implement a repeated cross-sections model as primary estimation model instead of a panel model. This was a pragmatic decision: the former model is more efficient to implement. The panel model was implemented as robustness check. Both models yielded more or less similar results, confirming our decision to move ahead with the repeated cross-sections model using all respondents.

Matching: ensuring the comparability of the target and comparison group

As well as incorporating a comparison group in our design and using a difference-in-difference technique, we also know that it is likely that the target and comparison groups are not directly comparable. They may differ systematically for a range of characteristics at the baseline. For instance, the targeted communities might be more impoverished or be less well educated than those in the comparison group as programs choose to implement their activities among marginalised groups. Thus, it is likely that some socio-demographic characteristics influence whether the program targets a household or community.

Moreover, socio-demographic characteristics, such as age, might also influence our KPIs. In econometric terms, this means that both the probability of participating in the program's activities and the outcomes may be affected by pre-existing differences between the target and comparison groups.

²¹ Athey, S., & Imbens, G. W. (2017). The state of applied econometrics: Causality and policy evaluation. *Journal of Economic Perspectives*, 31(2), p. 3-32.

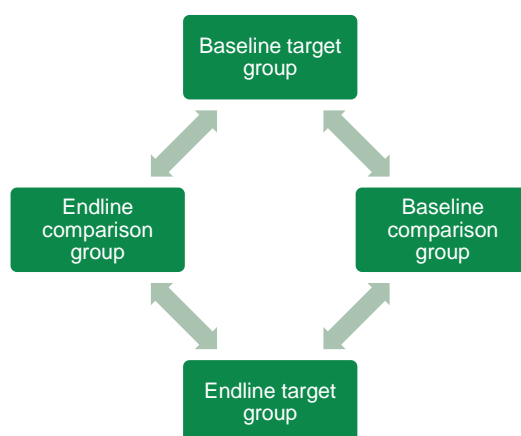
The probability of participating in the program activities is called the propensity score. This probability is not equal for all young people and is unknown²².

We use this propensity score to reduce incomparability between the target and comparison groups in two stages. This technique is called propensity score matching. In the first stage, we calculate the propensity score to select or match a comparison group similar to the target group based on a set of mostly demographic determinants. In the second stage, we estimate our impacts using these matched target and comparison groups.

Calculating propensity scores

We have implemented propensity score matching using a multinomial logistic regression, where each person is given a weighting based on the characteristics used in the matching model²³. This weighting is expressed as a proportion of closeness between a subject in the baseline target group, baseline comparison group, endline comparison group, and the endline target group. By estimating a propensity score weight using multinomial logistic regression, we ensured that the target and comparison groups of the baseline and the endline were comparable and balanced while still employing a large share of the sample that we had collected. This is illustrated in the diagram below.

Figure 25



A range of characteristics was considered to be included in this multinomial logistic regression. Covariates include gender, literacy, and education. Subsequently, when calculating the average values for the outcome indicator, each person was given a weighting, so that closer and better matches, thus more comparable people, had a greater influence on this average compared to worse matches .

²² Compare this to a situation where participation in the program would be determined by a coin toss (a randomized experiment). In this case, participation in the program would be solely determined by chance, not by any pre-existing characteristics of the people that (intend to) participate in the program. In this case the propensity score (the probability of being in the target group) would be known and equal to 0.5

²³ Stuart, E.A., Huskamp, H.A., Duckworth, K. et al. (2014). Using propensity scores in difference-in-differences models to estimate the effects of a policy change. *Health Services and Outcomes Research Methodology*, 14(4), p. 166–182.

Matched differences over time

In the analyses, we combined the weights from the multinomial logistic regression with the difference-in-difference-approach as outlined in the previous section. In the difference-in-difference model, we controlled for age, gender, literacy, education, marital status and the interaction between education and time, and literacy and time. This is to further reduce any potential influence of factors other than participation in the TROSA program.

We used the statistical software STATA for data cleaning and analysis. We have used STATA's STATA's MLOGIT package to estimate the weights and STATA's REGRESS and PROBIT packages to estimate the weighted-difference-in-difference analyses. STATA's PREDICT command was used to estimate predicted values of the estimation sample. We also used various Python and R packages to visualise these parameters.

Administrative					Baseline			Endline		
Country	District	Municipality	Village	Treatment status	Total	Men	Women	Total	Men	Women
Bangladesh	Chandpur	Chandpur Sadar	Bishnupur	Target	74	37	37	72	36	36
			Rajrajeshwar	Target	74	37	37	74	37	37
		Uttar Matlab	Farajikandi	Comparison	105	53	52	103	50	53
	Shariatpur	Bhedarganj	Kachikata	Comparison	115	57	58	115	57	58
Total					368	184	184	364	180	184
						50%	50%		50%	50%

8.2 DETAILS OF THE SAMPLE

8.3 KEY PERFORMANCE INDICATOR CALCULATION

Please click [here](#) to be directed to the KPI table. This table presents 1) how the KPIs are calculated, and 2) the values for the target group at the baseline and the endline.

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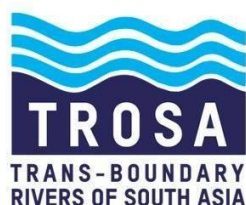
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