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Working Paper

War impacts on youth business groups in Tigray

Centre for Land Tenure Studies Working Paper, No. 07/24

Provided in Cooperation with:

Centre for Land Tenure Studies (CLTS), Norwegian University of Life Sciences (NMBU)

Suggested Citation: Holden, Stein Terje; Tilahun, Mesfin; Gebremedhin, Tsegabirhan (2024) : War impacts on youth business groups in Tigray, Centre for Land Tenure Studies Working Paper, No. 07/24, ISBN 978-82-7490-329-6, Norwegian University of Life Sciences (NMBU), Centre for Land Tenure Studies (CLTS), Ås,
<https://hdl.handle.net/11250/3166553>

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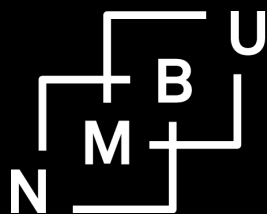
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Norwegian University of Life Sciences
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Centre for Land Tenure Studies Working Paper 07/24

ISBN: 978-82-7490-329-6

War Impacts on Youth Business Groups in Tigray

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Abstract

Our study investigates the impact of the November 2020 to November 2022 Tigray war on youth groups and their members based on survey data from 281 youth group leaders and 2528 youth group members in five districts in the Tigray region of northern Ethiopia. The data was collected from August to December 2023 using standardized survey instruments. Our data is complemented with baseline data that indicate the pre-war situation for the same groups and members in 2019. This gives us unique data to compare the situation of a large sample of business groups and members one year before the war started with that one year after the war ended.

Our results show that the war has had devastating effects on the youth groups and their members in terms of forcing them to stop their business activities, causing a loss of 90% of their group assets, and almost eliminating all investments during the war. The business group members faced less severe asset losses but income losses were still high due to a severe narrowing of their livelihood options during the war. This also resulted in a very severe food insecurity situation for most of the members. During the war, most (87.5%) of the youth group members were forced to temporarily migrate.

The most encouraging finding was that by the time we carried out our postwar survey (August-November 2023), about 80% of the business groups have restarted their group activities by meeting regularly and planning to restart their joint production activities. Most of the members were optimistic that the youth business groups would become an important source of future livelihood for them. This represents strong evidence that resource-poor youth with limited education have the potential and capacity to self-organize and build business activities provided they have the motivation and institutional backing in terms of the provision of resources, adequate guidance and regulation, and the market opportunities are there.

Keywords: War impacts, Rural youth business groups, Livelihood opportunities, Income, Investment, Food Insecurity, Tigray, Ethiopia

JEL Codes: D74, L1, Q1, Q2, R2

1. Introduction

From November 2020 to November 2022, Ethiopia waged one of the deadliest internal conflicts in modern day world history that drew international attention. The war was between federal government forces with its allies and the militants from its northmost region of Tigray ([Center for Preventive Action, 2023](#)). The war was formally ended on November 3, 2022, following the signing of agreement in Pretoria between The Federal Government of Ethiopia and The Tigray People's Liberation Front (TPLF) for lasting peace through a permanent cessation of hostilities ([AU, 2022](#)). However, the social, economic, environmental, and political impacts of the two years-long war need to be studied for drawing lessons for reconstruction and lasting peace in the country and elsewhere in conflict affected countries.

In December 2022, The Government of Ethiopia with the support of the World Bank and other development partners reported the Ethiopia Damage and Need Assessment (DaNA) report the provide estimate on the damages caused by the conflict and the need for reconstruction. According to the report the damage across sectors and regions covered in the assessment was estimated at USD 22.69 billion while the total reconstruction and recovery needs are estimated at about US\$ 19.73 billion ([Gouvernement of Ethiopia, 2022](#)). The total economic losses to the conflict are estimated at 5.5 percent of the country's GDP, while the estimated physical damages to properties and infrastructure amount to 20.4 percent of GDP ([Gouvernement of Ethiopia, 2022](#)). As these estimates are lower bound and constrained by limitations of data availability at the time of assessment, as acknowledged in the report, the magnitude of the economic losses could be more and require further scrutiny.

Review of available studies on the effect of the two-years long war could provide more and detail microlevel overview on the magnitude and severity of the effect of the war on agriculture, infrastructure, and livelihoods in Tigray. A recent study based on cross-sectional survey data from 4376 smallholder farm households in 18 woredas of five zones of Tigray, indicated that 94% of the respondents reported that at least one of their agricultural components (crop, livestock, and farm tools) was looted or destroyed due to the war. More specifically, 81% of the respondents lost their crop followed by livestock (75%) and farm tools (48%) ([Manaye, et al., 2023](#)). The study argues that consequently, more than 5.2 million people are currently in need of immediate humanitarian assistance ([Manaye, et al., 2023](#)). [Tedla et. al. \(2023\)](#) reported a significant impact of the war on animal life, welfare, and livestock infrastructure. Their estimates show that the war has claimed a total loss of 12.87 million of livestock (2.49 million cattle, 1.69 million sheep, 3.08 million goats, 0.61 million donkeys, and 4.28 million poultry) and 0.23 million beehives with a total damage of 53.56 billion Ethiopian Birr (~1.01 billion USD) in financial terms ([Tedla, et al., 2023](#)). The destruction of 10 veterinary facilities was reported with an estimated financial loss of 68.59 million Ethiopian birrs (1.3 million USD) ([Tedla, et al., 2023](#)). A study based on household survey data from 48 woredas of Tigray reported that the war had a significant impact on the health and economy of 12,691 community of internally displaced people and the 3572 hosting households, which were sampled for the survey ([Gebreyesus, et al., 2023](#)).

According to data from the World Bank, people aged 15-34 in Ethiopia's population account for 36.5% of the country's 126.5 million population in 2023 (World Bank, 2024), and the median age of people in the country is 18.7 years ([UN, 2024](#)). This implies that the country has one of the youngest populations in the world, where the youth is the majority in number. Although the youth is both the majority in number and the most affected by conflicts in Ethiopia, there are no studies yet on the impact of the war in Tigray on the youth.

The above-reviewed studies on the of the war are based on surveys conducted after the war. A thorough analysis and impact studies, however, require information on the pre-war situation of respondents. Moreover, although the youth is the majority in number in Ethiopia as in other Sub-Saharan African countries, they are in most cases the immediate victims of conflicts and civil war. The prevalence of high youth unemployment in the country makes it easier for warring parties to easily recruit the youth as soldiers.

In this study we have investigated how the war has affected youth business groups and their members in five districts in Tigray. We utilize rich baseline data from before the war in combination with a new survey of 238 of the same business groups and 1939 of the same members (20% attrition rate) in 2023 to assess how the war has affected their business group activities, asset holdings of the groups and their members. The total sample in 2023 covered 281 business groups and 2528 members, while the total sample in 2019 covered 246 business groups and 2425 members. There are a number of published studies on the the performance of these business groups (Holden and Tilahun 2018; 2021a, 2021b, 2021c, 2022, 2023,2024a, 2024b, Tilahun and Holden 2023, Takashi et al. 2024).

We refer to our Pre-Analysis Plan (PAP) for more details about the survey instruments ([Holden et al. 2023](#)). We aim to answer the following research questions: 1) How has the civil war in Tigray from November 2020 to end of 2022 affected the youth business groups and their business activities before, during and after the war? 2) How has the war affected the individual business group members, their families, asset holdings, and livelihood strategies? and 3) What are the lessons learned in this relation when it comes to the sustainability of the groups and their suitability for creating youth livelihoods in the study areas? We also assess the importance of the youth groups during the civil war as a social network.

Section 2 of the paper provides a brief overview of the sampling, data, and methods used and we present the study findings in section 3. The results are discussed in section four and the last section concludes.

2. Sampling and methods

This study is based on interviews of group leaders of 281 youth business groups and 2528 business group members in five districts in the Tigray region during the period August-December 2023 using standardized survey instruments. This includes some groups that are no longer active or have not restarted any activity after the civil war ended. We benefit from baseline data from 246 business groups and 2425 members (238 of the same groups and 1939 of the same members) from 2019 using survey instruments with many of the same and related questions.

We prepared a pre-analysis plan for the civil war impact study in August 2023 (Holden et al. 2023). The following table lists the outcome indicators for the group level study given the stated main research questions above. The outcome indicators are found among the variables collected in the previous survey rounds at the project's group and group member levels.

Table 1. Group level outcome indicators (Research question 1)

Variable	Data Collection	
	Before	After
<u>Survival of youth business groups</u>		X
<u>Survival of the group as a social network with group meetings</u>		X
The exact time of collapse for business groups that have collapsed		X
Factors triggering the collapse of groups and group business activities		X
<u>Group business assets (trees, irrigation technologies, beehives, livestock, buildings, other equipment)</u>	x	X
<u>Group membership survival by gender (group size)</u>	x	X
<u>Group board survival and gender balance</u>	x	X
<u>Group legal recognition in the community</u>	x	X
<u>Economic Performance</u>		
Group annual net income per group member (if any)	x	X
Average group member work contribution to group business (Mondays/month in 2023 vs 2018-19)	x	X
Average net income per worker per person-day of work last year.	x	X
Group capital investments per member during the project period	x	X
<u>Group activity</u>		
Frequency of group meetings (number of group meetings/month)	x	X
Participation rate during group meetings	x	X
Satisfaction with group members' performance	x	X
Share of members that have been punished by the group for poor performance per year	x	X
Group engagement in other social welfare-related activities in the community		X

Source: [Holden et al. \(2023\)](#).

We use this table as a main reference for the presentation of the findings below. We also rely on our earlier published results as baseline data regarding the pre-war status of the groups, especially the census of all youth business groups in the five districts that investigated their degree of compliance with Elinor Ostrom's Design Principles ([Holden and Tilahun 2018](#)).

In the 2023 survey we also included some questions to better understand the changes from year to year in the period 2020-2023, such as key events like the outbreak of the war in 2020 and its formal ending in December 2022.

3. Results

3.1. Status of groups as of August 2023 versus before and during the war

3.1.1. Business group survival

Our survey revealed that 80.4% of the groups were active in August 2023. 140 of the groups have been functioning during the civil war, 132 groups have not (9 non-responses). The highest shares of active groups were found in Adwa and Raya Azebo with 95 and 91% of the groups being active, and lowest in Samre Seharti (50%) and Degua Tembien (58%). For more details, see Table 2.

Table 2. Group survival after the civil war (Active in August 2023?)

Woreda	Stat.	Is the group currently active (August 2023)?			Type of Activity			
		No	Yes	Total	Joint production	Protecting group resources	Active as social network	Active as a group in social activities
Raya Azebo	Number	4	42	46	19	22	2	0
	%	8.7	91.3	100				
Degua Tembien	Number	22	30	52	16	17	10	0
	%	42.3	57.7	100				
Samre	Number	20	20	40	16	7	13	3
	%	50	50	100				
Kilite Awlalo	Number	3	11	14				
	%	21.4	78.6	100				
Adwa	Number	6	123	129	53	70	1	0
	%	4.65	95.4	100				
Total	Number	55	226	281				
	%	19.6	80.4	100				

Source: Own survey data.

We also asked about the number of active members in the groups at this time. Table 3 provides information about the average number of active members per group by district (woreda).

Table 3. Average number of active group members at the time of the survey

Woreda	Mean active members	sd	Number of groups responding
Raya Azebo	16.6	18.4	43
Degua Temben,	11.9	6.1	43
Seharti Samire	13.6	13.8	39
Kilite Awlalo	.	.	0
Adwa	11.3	6.5	124
Total	12.7	10.8	249

Note: This question was not asked in Kilite Awlalo.

To get a better idea about the changes in group membership and activity, we compare with our data from 2019 for the same groups, including dropped-out members, and new members included (replacement members). Table 4 provides an overview of gender-disaggregated data for all districts combined.

Table 4. Number of group members in 2019, dropped-out, and replacement members 2019-2023.

Variable	Groups	Mean	Std. Dev.	Min	Max
No of members 2019	281	15.7	7.6	7	68
Male_member 2019	281	11.2	10.5	0	98
Female_members 2019	281	6.3	7.0	0	52
Number of interviewed members	281	9.4	2.6	2	16
Number of group members in 2023					
Male members 2023	269	10.8	10.5	0	98
Female members 2023	269	6.2	7.0	0	52
No of dropped out members since 2019	258	1.0	2.7	0	20
Male members dropped out since 2019	72	2.35	2.78	0	20

Female members dropped out since 2019	72	1.11	2.48	0	12
Number of new members included	72	0.96	1.92	0	12
Number of male replacement members	72	0.51	1.14	0	8
Number of female replacement members	76	0.50	1.15	0	6

Source: Own survey data.

For the members that dropped out in 2019-2023, we also asked about their reasons for dropping out. An overview is provided in Table 5. The table shows data for 72 dropped out members, and death was the most important reason for dropout (35 members), followed by migration (17 members).

Table 5. Reasons for members having dropped out in the period 2019-23.

Reasons for dropout	Freq.	Percent	Cum. %
Lack of motivation	4	5.3	5.3
Migrated	17	22.4	27.6
Lack of complementary income	9	11.8	39.5
Lack of training/skills for the activity	3	4.0	43.4
Lack of funds to invest in the activity	1	1.3	44.7
Internal conflicts in the group	1	1.3	46.1
Health problem	3	4.0	50.0
Disagreement within group	1	1.3	51.3
Death	35	46.1	97.4
Severe illness/injury	1	1.3	98.7
Other, specify	1	1.3	100.0
Total	76	100.0	

Source: Own survey data.

For the inactive groups, most of them (38 of 46) stopped functioning when the civil war started in November 2020, and it was the civil war that caused these group to collapse. Of the remaining 8 groups that have stopped functioning, two were dissolved before the war started, four stopped because their activity became unprofitable, and two stopped for other reasons. Many groups suffered loss of assets during the civil war.

Among the groups that were active in August 2023, 108 stopped functioning temporarily when the war broke out. In total, 128 active groups in August 2023 temporarily stopped functioning during the civil war. We also asked when these groups restarted their activity (Table 6).

Table 6. When did the group restart its activity if it was temporarily stopped?

Month restarted	2021	2022	2023	Total
September	0	3	1	4
October	0	8	2	10
November	1	6	3	10
December	0	8	0	8
January	0	7	7	14
February	0	4	0	4
March	0	1	2	3
April	0	1	0	1
May	0	3	3	6
June	0	15	5	20
July	0	3	3	6
August	0	0	41	41
Total	1	59	68	128

Source: Own survey data.

We also asked whether the groups still functioned as a social network even though their activity stopped during the civil war.. Table 7 shows that the large majority of groups continued to function as social networks.

Table 7. If the group stopped functioning as a business group, did it still function as a social network?

Response	Freq.	Percent	Cum.
Yes	252	94.0	94.0
No	14	5.2	99.3
Partially (some members)	2	0.8	100.0
Total	268	100	

Source: Own survey data.

We also asked, conditional on them functioning as a social network, whether they engaged in some activities during the civil war. 150 of the 281 groups did so. Most of them were involved in protecting their common land through conservation activities, guarding, fencing, protecting assets such as bee hives. Some engaged in the planting of crops, irrigation, and honey production.

At the group member level, we asked whether the members were forced to migrate during the war. To assess variation across districts, we present the results disaggregated to the district level in Table 8.

Table 8. Were the members of the business groups forced to temporarily migrate during the war?

Woreda	No	Yes	Total
Raya Azebo	115	294	409
	28.1	71.9	100.0
Degua Temben,	60	461	521
	11.5	88.5	100.0
Seharti Samire	21	316	337
	6.2	93.8	100.0
Kilite Awlalo	10	111	121
	8.3	91.7	100.0
Adwa	110	1030	1140
	9.7	90.4	100.0
Total	316	2212	2528
	12.5	87.5	100

Source: Own survey data.

We see that overall, 87.5% of the members were forced to migrate, but the extent of such migration was lower in Raya Azebo.

We will now assess the extent of group activities (number of meetings per year) and how it has changed during and after the civil war. Figure 1 shows the cumulative distribution of number of meetings per group in 2021, 2022, and 2023. More than 60% of the groups had no meetings in 2021, while only 20% of the groups had had no meetings in 2023 by the time of our survey. This clearly indicates the revival (resilience) of the business groups.

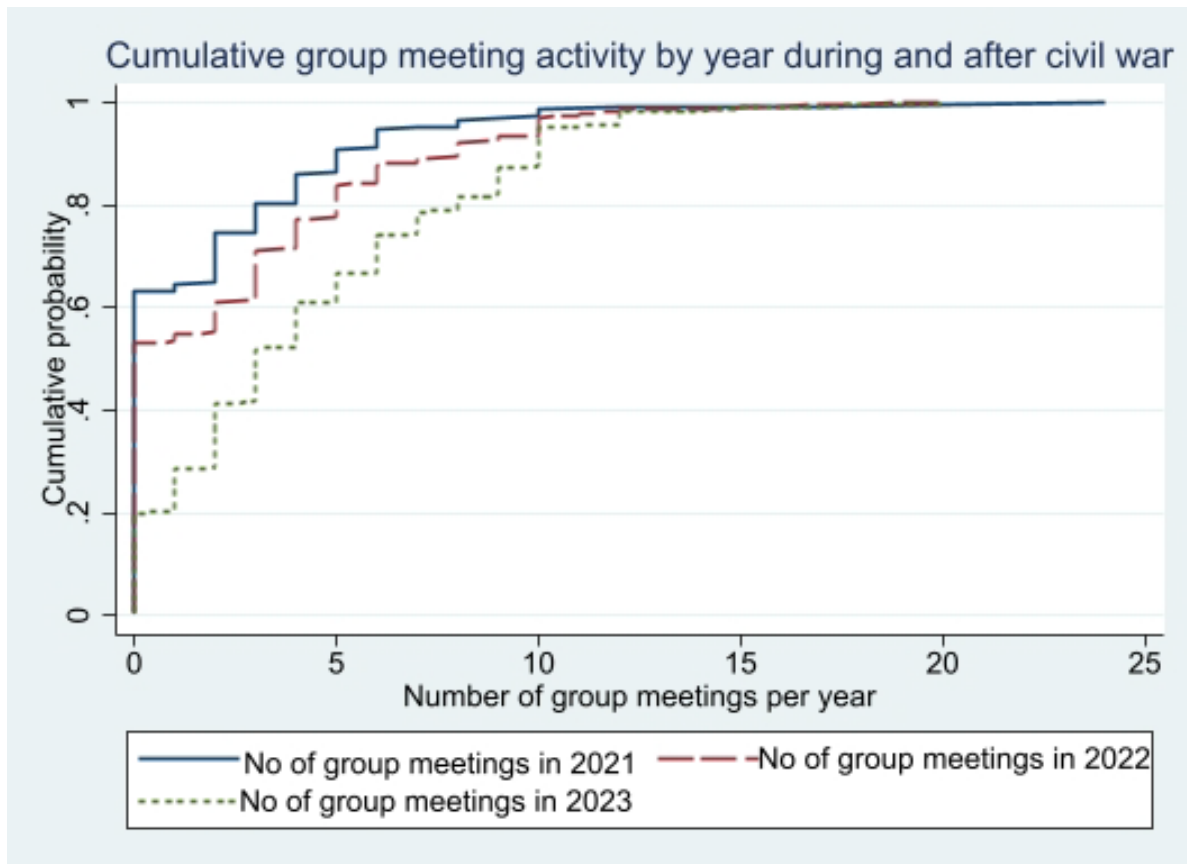


Figure 1. Frequency of group meetings during and after the civil war (Source: Own survey data from group leaders).

To further inspect the number of members participating in these meetings, we show the cumulative distributions of the number of members per group participating in these business group meetings by year in Figure 2. Figure 2 shows that most groups had between 10 and 20 members participating in the group meetings. As most groups are of this size, this indicates high participation rates among active group members in groups who have restarted their activity after the war.

Figures 1 and 2 are based on the information from the group level survey. To further scrutinize the reliability of these responses and to also obtain a benchmark for the situation just before the war started, we present cumulative distributions based on the member survey of 2528 members with the number of meetings per year for the years 2020, 2021, 2022, and 2023. We note that the war started in November 2020, while the war formally ended in December 2022 (although it continued after that in some areas). The data for 2023 were not for the entire year as the survey took place in August-November 2023.

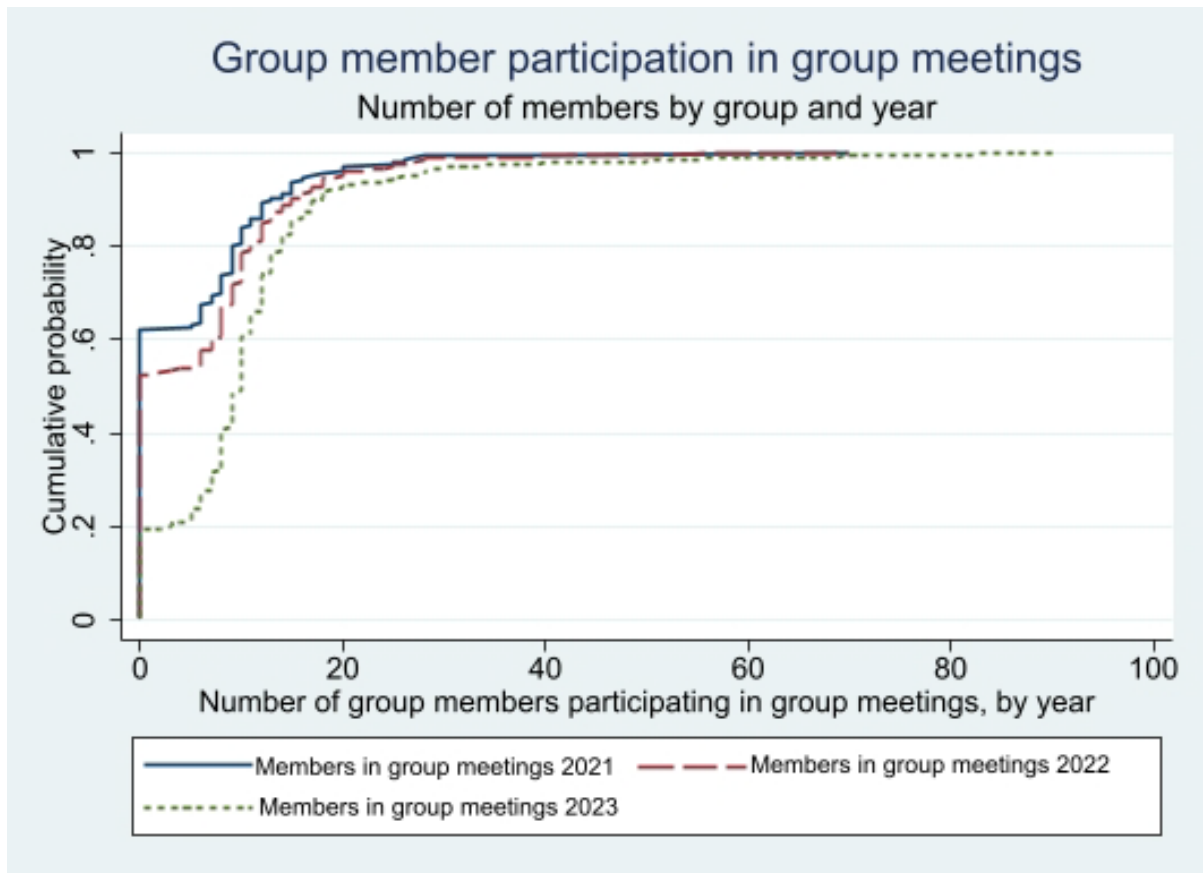


Figure 2. The number of members participating in business group meetings annually before, during, and after the civil war (Source: Own group level survey data).

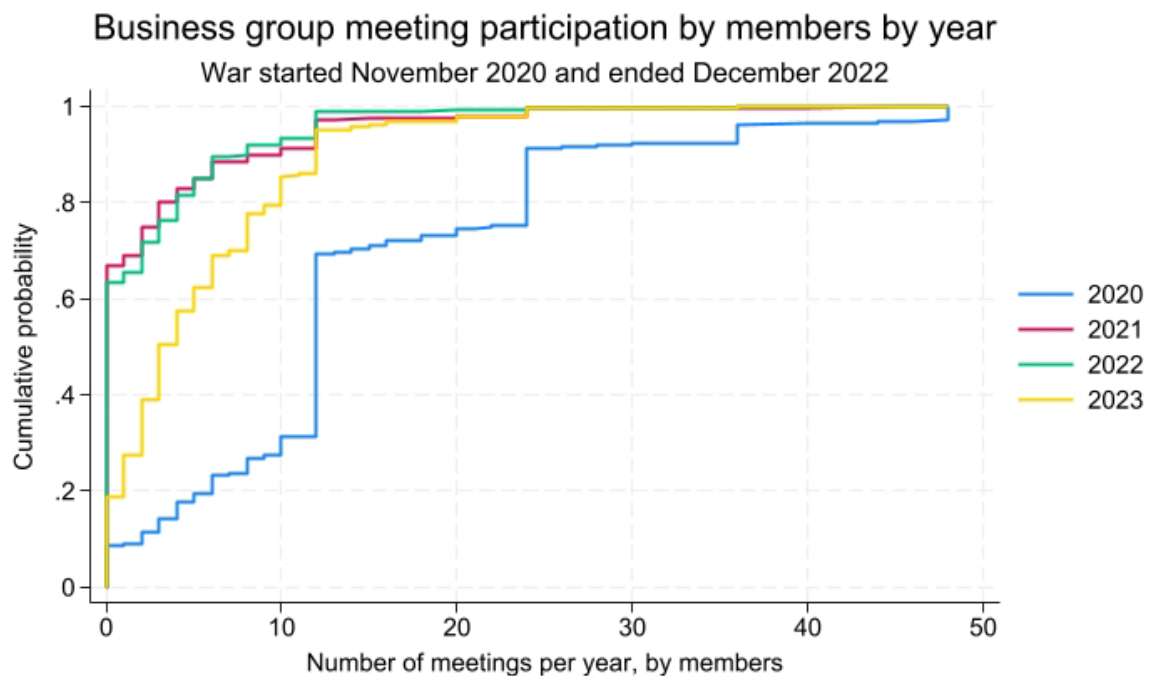


Figure 3. Cumulative number of business group meetings by members by year before, during and after the war (Source: Own member level survey data).

To further inspect the resilience of the business groups after the war ended, we asked the individual members “Do you see the business group as an important source of livelihood for yourself after the civil war to reestablish your livelihood?” with the following coded answer options “1=Yes, for sure, 2=Yes, hope so, 3=Yes, but uncertain, 4=Doubt it but perhaps, 5=No, lost hope in it.”

Table 9. Members’ assessment of business groups as future important livelihood option, by district

Responses	Raya Azebo	Degua Tembien	Samre	Kilite Awlalo	Adwa	Total
Yes, for sure	249	234	168	58	684	1393
%	60.9	44.9	49.9	47.9	60.0	55.1
Yes, hope so	130	244	128	49	384	935
%	31.8	46.8	38.0	40.5	33.7	37.0
Yes, but uncertain	23	23	20	5	53	124
%	5.6	4.4	5.9	4.1	4.7	4.9
Doubt it but perhaps	6	19	18	9	14	66
%	1.5	3.7	5.3	7.4	1.2	2.6
No, lost hope in it.	1	1	3	0	5	10
%	0.2	0.2	0.9	0.0	0.4	0.4
Total	409	521	337	121	1140	2528
%	100	100	100	100	100	100

Source: Own survey data.

Table 9 indicates that 55% of all members strongly believe in their business group as an essential source of future livelihood for them. Very few of the members had lost hope in the business groups.

Our group-level survey interviewed the business group leaders, and we rely on their judgments and reporting. We asked the group leaders about their assessment and satisfaction with the group members’ performance during and after the civil war. From Table 10 we see that most of the leaders regarded their members’ performance as varying, quite good, or very good, while few regarded it as not so good or very poor.

Table 10. Group leaders’ satisfaction with group members’ performance during and after the civil war.

Performace satisfaction	Freq.	Percent	Cum.
Very good	46	16.9	16.9
Quite good	78	28.7	45.6
Variable	127	46.7	92.3
Not so good	17	6.3	98.5
Very poor	4	1.5	100.0
Total	272	100.0	

Source: Own survey data.

We may compare this assessment by group leaders with the members’ own assessment of the performance of the groups and group members, including group boards. We asked the members the following question: “In your youth group, how satisfied are you with your fellow youth group members’ performance?” in our survey in 2023, responses in Table 11.

Table 11. Group members' assessment of the performance of their fellow group members.

Response	Freq.	Percent	Cum.
Very satisfied with all members	921	36.4	36.4
Very satisfied with most members	780	30.9	67.3
Quite satisfied with most members	676	26.7	94.0
Not satisfied with how the group majority performs	116	4.6	98.6
Very unsatisfied with group performance	35	1.4	100.0
Total	2528	100.0	

Source: Own survey data from 2023.

We also asked how satisfied the members were with the group board members (Table 12).

Table 12. Group members' satisfaction with their business group board members.

Response: Group board members	Freq.	Percent	Cum.
Very satisfied	1152	45.6	45.6
Quite satisfied	772	30.5	76.1
Acceptable	476	18.8	94.9
Somewhat unsatisfied	90	3.6	98.5
Very unsatisfied	38	1.5	100.0
Total	2528	100.0	

Source: Own survey data from 2023.

We also asked, “*Are you satisfied with how meetings are arranged in your group?*” 68.6% answered yes to this question. We then asked about the frequency of group meetings and got the following responses (Table 13):

Table 13. Satisfaction with group meeting frequency among group members at the time of the 2023 survey

Meeting frequency ok? Responses	Freq.	Percent	Cum.
There are too many meetings	19	0.8	0.8
The frequency is ok	1422	56.3	57.0
There are too few meetings	770	30.5	87.5
There are no meetings	317	12.5	100.0
Total	2528	100.0	

Source: Own survey data from 2023.

We also asked whether members were satisfied with the way group work activities were organized and 71.6% answered yes, while the rest (28.4%) said no. We did not ask for an elaboration on this question, but the majority of those who were not satisfied indicated that their group had too few or no meetings, which also may indicate a limited number of work activities.

As part of the census of youth business groups made by [Holden and Tilahun \(2018\)](#), the importance of their within-group bylaws and compliance with Ostrom's Design Principles, it was found that a punishment system was in place, with graduated sanctions depending on repeated violations of the groups' bylaws. Such violations could be in the form of late coming or non-participation in group meetings or group work activities. Therefore, we were curious about the role of this punishment system during and after the war for the active groups. Figure 3 gives an overview of how much punishment has been used to make group members comply with their groups' bylaws. Figure 4 shows that a small share of the groups had imposed punishment on group members due to poor performance during and after the civil war. For the 80% active groups in 2023, only 20% had punished some members for their poor performance.

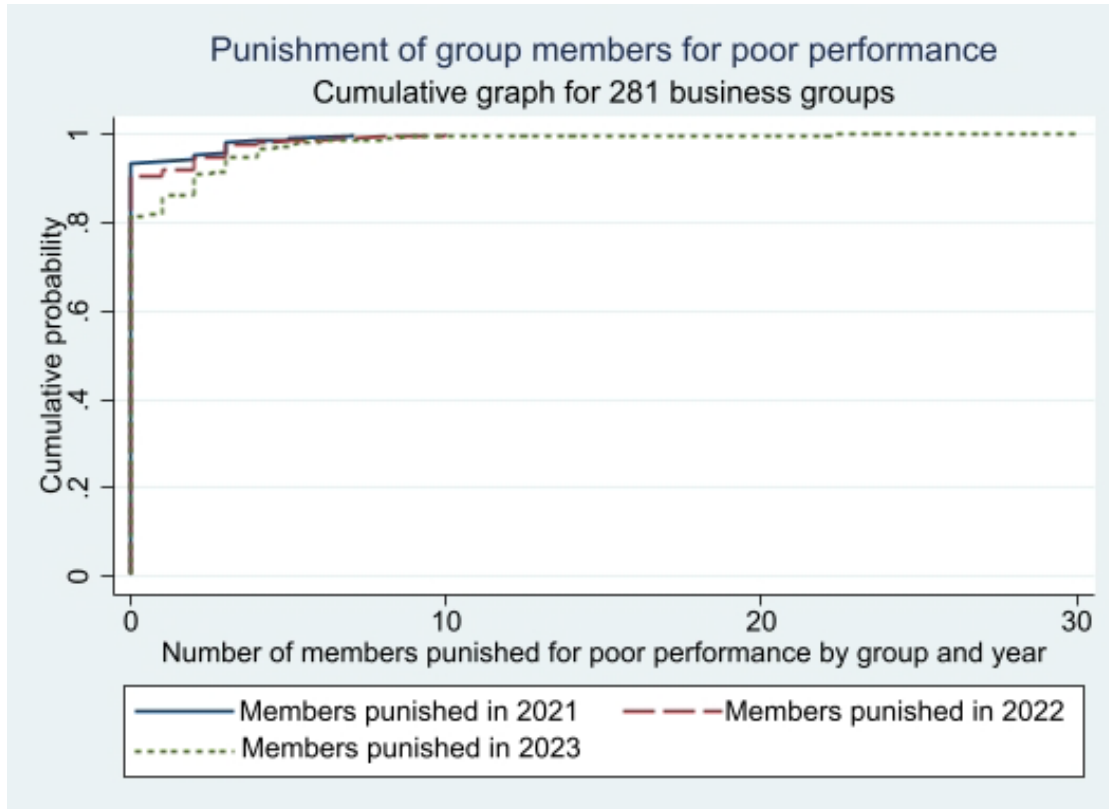


Figure 4. Punishment of group members for violation of group bylaws (poor performance), by year (Source: Own survey data).

3.1.2. Group asset destruction during the civil war.

To investigate how the civil war influenced business groups further, we asked about the extent to which the groups' assets were lost or destroyed during the civil war. Such asset losses may affect the groups' ability to reestablish their business activities after the war. Table 14 provides information on whether the groups experienced any destruction or loss of assets during the civil war.

Table 14 shows that 85% of the groups experienced loss or damage of some of their assets during the civil war, with the highest share of groups having such experiences in Samre and Degua Tembien.

Table 14. Were any of the group's assets destroyed or lost during the civil war?

Woreda	Stat.	No	Yes	Total
Raya Azebo	Number	14	32	46
	%	30.4	69.6	100
Degua Tembien	Number	4	48	52
	%	7.7	92.3	100
Seharti Samre	Number	3	37	40
	%	7.5	92.5	100
Kilite Awlalo	Number	3	11	14
	%	21.4	78.6	100
Adwa	Number	18	111	129
	%	14.0	86.1	100
Total	Number	42	239	281
	%	15.0	85.1	100

Source: Own survey data.

The most commonly reported lost or damaged assets were trees, beehives, buildings, tools, irrigation equipment, and animals.

To get a better idea of the values lost during the war, we made a careful comparison of the productive assets for 238 groups, for which we had detailed data on all their assets in 2019 and 2023. As there has been substantial inflation during this period, we have used deflated median prices in the two years with 2016 as the base year. We divided the groups in four main production types; irrigation, livestock, beekeeping, and forestry. The mean deflated productive asset values by year and type of production are presented in Figure 5.

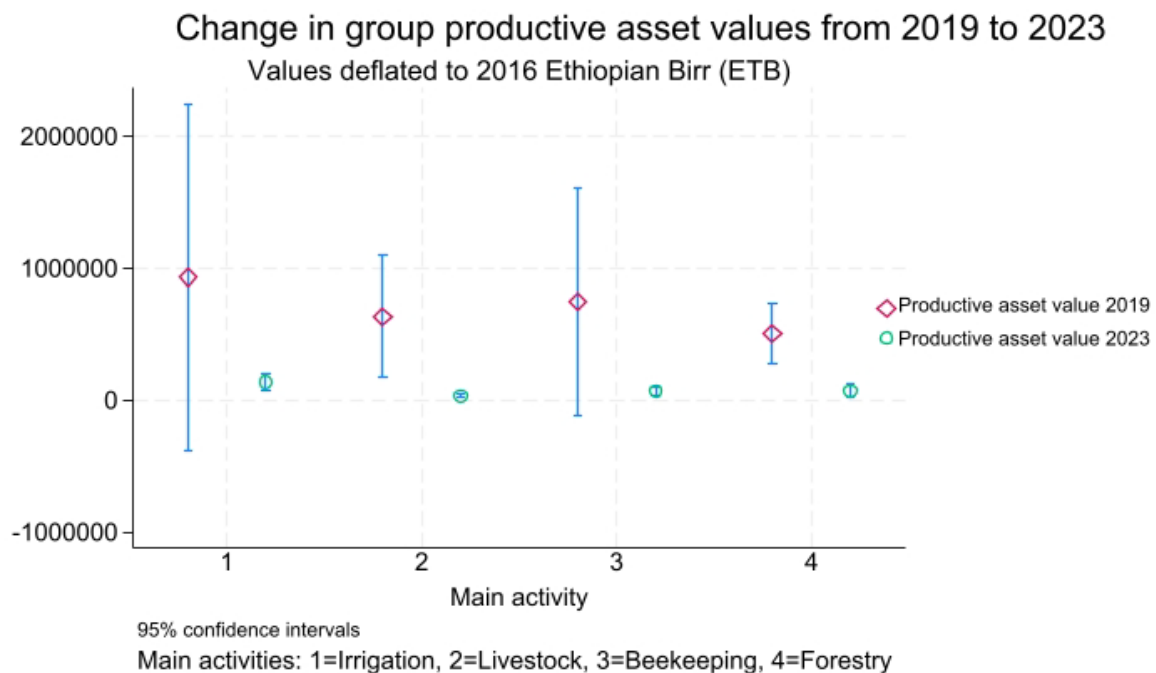


Figure 5. Productive asset values in 2019 and 2023 for 238 business groups

Figure 5 demonstrates drastic reductions in asset values for all the four main production activities. For all types of activities, there is a more than 90% reduction in the average productive asset value from 2019 to 2023, while the median asset value is reduced about 80%. The standard deviation for group

asset values has been reduced by 95%. The hardest hit are the livestock groups, where the average asset value is reduced by 95%.

3.1.3. Group member asset index before and after the war.

We also assessed the assets of business group members at the time of our 2023 survey as well as assets lost during the war. We used these two variables to construct the assets owned at the start of the war. We asked about the individual ownership of the following assets: Ox(en), plough, cow(s), donkey/mule/horse, cart for ox/donkey/horse, camel, house, traditional beehive, modern beehive, other assets. We generated a simple asset index based on the count of the ownership of these asset categories with a value=1 for owning each of them, and zero otherwise. We did the same for lost assets. In addition, we added mobile phone as a separate category in 2023. It was reported under “other” for lost assets during the war. The asset index before the war was generated as the asset index in 2023 + lost assets during the war. Figure 6 shows the cumulate distributions for the calculated asset index before and after the war.

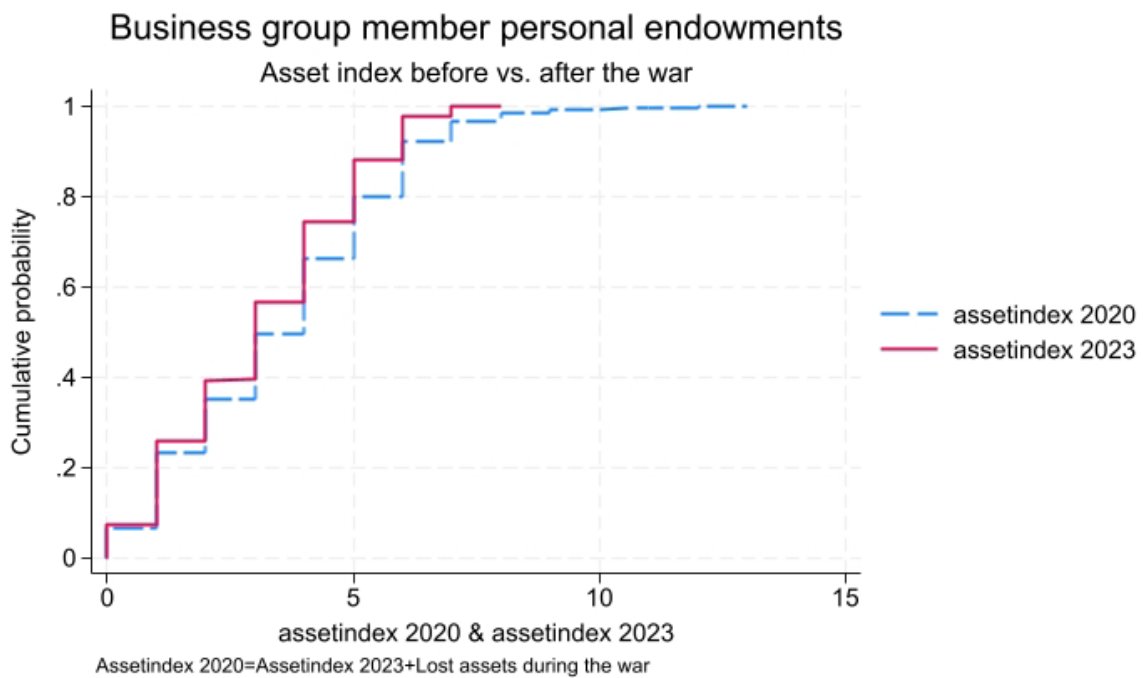


Figure 6. Cumulative distribution of asset index of business group members before and after the war.

Figure 7 shows the mean number of assets before the war per business group member by district with 95% Confidence Intervals. Figure 8 shows the situation in terms of number of assets owned by member and district at the time of our 2023 survey.

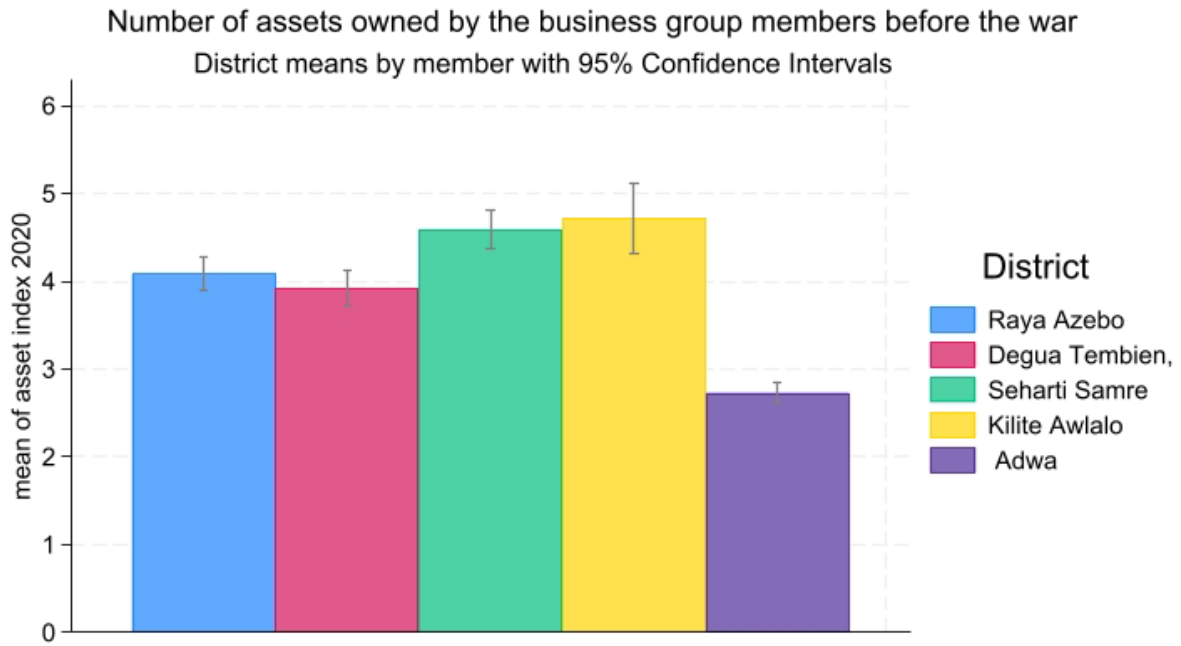


Figure 7. Number of assets owned per business group member before the war by district.



Figure 8. Number of assets owned per business group member after the war by district.

The reduction in the asset index for the business group members is much more modest than the asset losses for the groups. It appears that members were much more able to protect their personal assets than their group assets during the war.

3.1.4. Group investments and income before, during, and after the war.

We asked about the investments in group production activities made by the groups during and after the war, in the period 2019-2023. Furthermore, we asked about income from group activities in 2023 up to the time of our survey. The nominal values of the investments and incomes are shown in Figure 9.

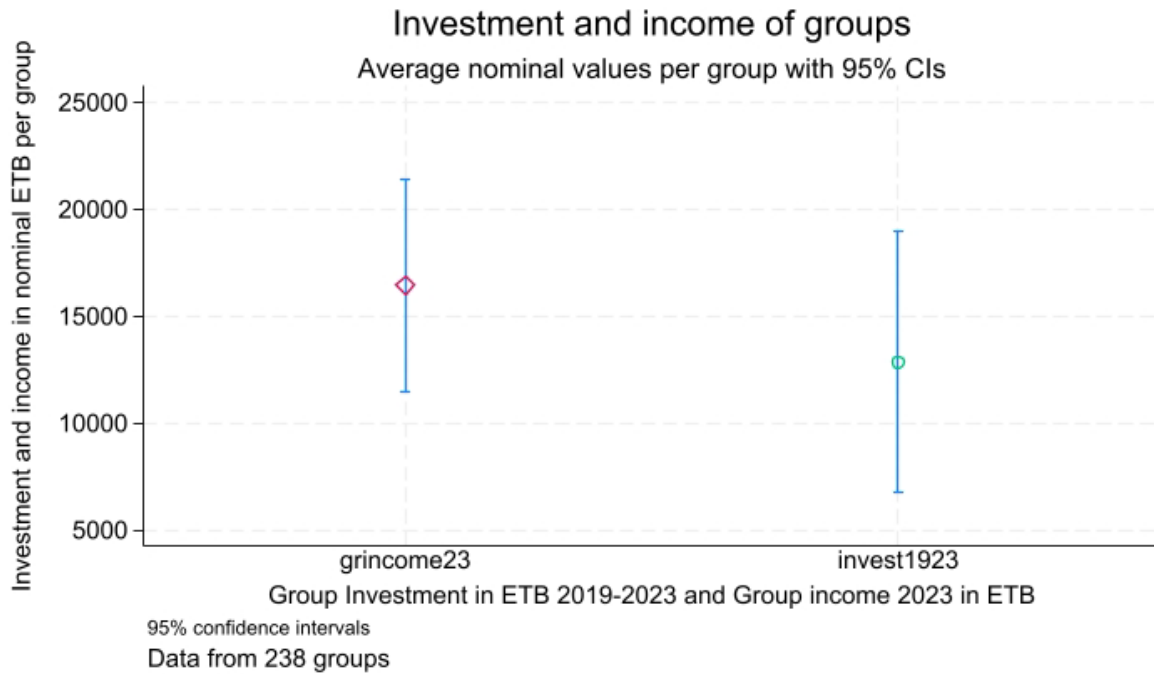


Figure 9. Group investments 2019-23 and income in 2023.

We compare the deflated values in Figure 5 with the pre-war investment levels in 2016-18 and income levels in 2018, all deflated to 2016 values, in Figure 10a and 10b. Average investment level adjusted to a three year period were about 25000 ETB per group before the war and are reduced to 4000 ETB during and after the war. Average group income levels are reduced from about 80000 ETB before the war to about 8000 ETB (10% of pre-war average) in 2023 in deflated 2016 ETB.

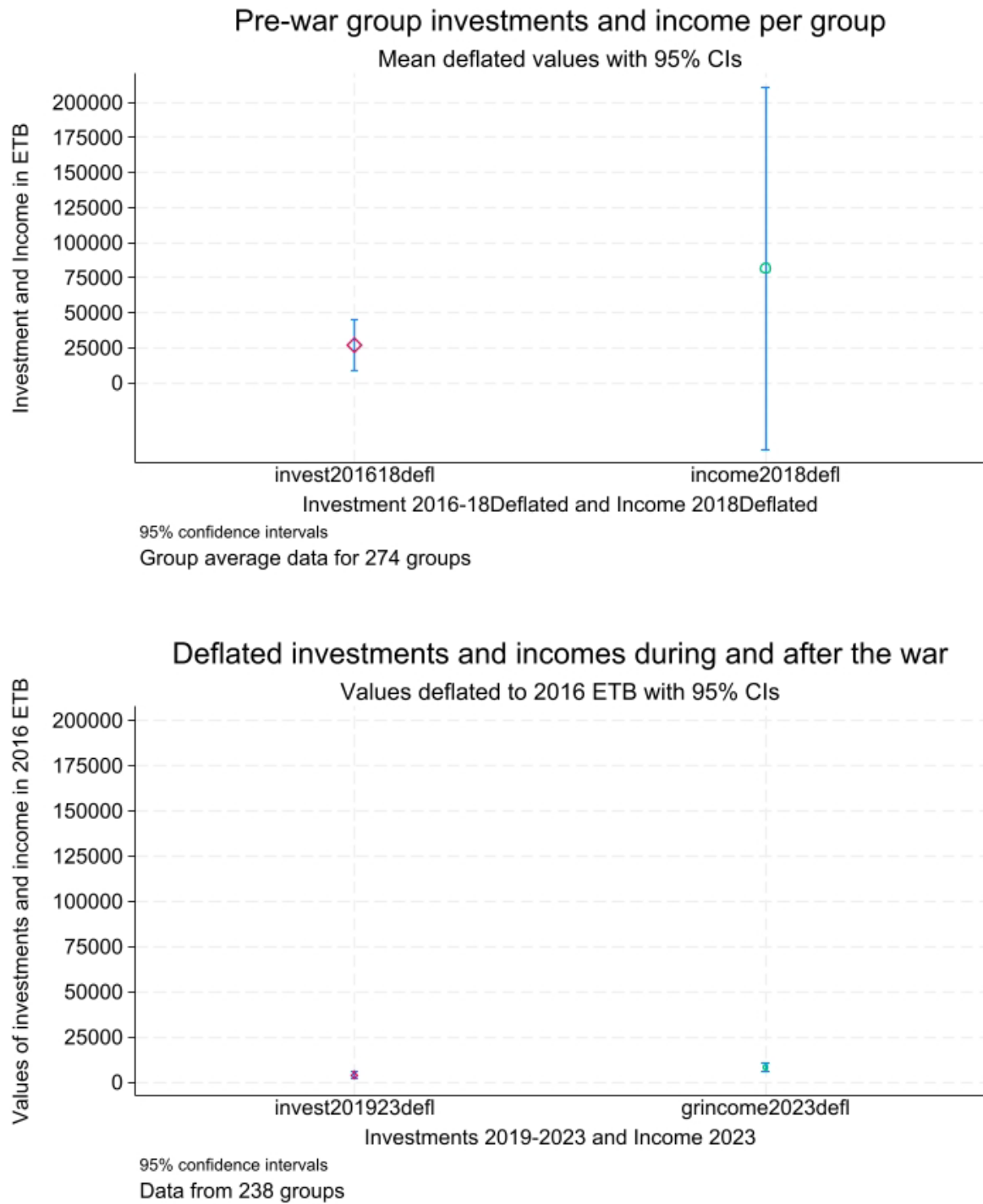


Figure 10a. Pre-war investment levels and income per group vs. Figure 10b. During war investments and post-war income (2023), all deflated to 2016 ETB values.

3.1.5. Status of the land allocated to the groups.

We asked whether the groups are still retaining the land rights to the land they were allocated. We got the following responses (Table 15).

Table 15. Group land rights status after war: Do they still retain the rights to the land?

Response	Freq.	Percent	Cum.
No	13	4.6	4.6
Yes	241	85.8	90.4
Unclear	6	2.1	92.5
NA	7	2.5	95.0
Missing	14	5.0	100
Total	281	100.0	

Source: Own survey data.

We also asked whether the land has been taken good care of during the war, and 56.6% answered yes, and 43.4% answered no. We asked those who answered no, what were the types of damages. Table 16 lists the types of damages and number of responses for each.

Table 16. Types of damages to group land resources during the civil war

Type of damage	Number of responses
Conservation structures destroyed	102
Trees have been cut down and removed	95
Damages by fire	2
Other damages	30

Source: Own survey data.

3.1.6. How is the level of trust in the groups?

We asked the respondents (mainly group leaders) who responded on behalf of their groups how they considered the level of trust in the groups compared to the general level of trust in their community as a reference level. Table 17 shows that more than 75% of the respondents consider the level of trust in their group to be higher or much higher than average trust in their communities. This indicates that most groups still retain much of the social capital in the form of trust that may be important for the functioning of the groups.

Table 17. Stated levels of group trust

Group trust versus community average trust	Freq.	Percent	Cum.
Much higher	116	41.3	41.3
Higher	102	36.3	77.6
The same	54	19.2	96.8
Lower	6	2.1	98.9
Much lower	3	1.1	100.0
Total	281	100.0	

Source: Own survey data.

We also asked for the subjective judgements of trust in the youth groups in the group member survey. Here, we asked the members to use trust in the family and the level of trust in the groups before the war as reference points. However, we also used trust experiments to investigate in-group and out-group trust among group members and refer to Holden and Tilahun (2024b) for more details on how the war has affected the social capital in the groups.

3.2. Food insecurity situation of group members and their families during the war

We asked the business group members about their main sources of livelihood during the war. Table 18 gives an overview of the main sources of livelihood. The respondents were allowed to indicate multiple sources from the list below.

Table 18. Main sources of livelihood (food and other basic needs) during the war

Response	Agg. Freq.	Share of sample
Own food production (on own, family, and rented land)	1842	0.73
Help from family (parents)	936	0.37
Help from the community	1020	0.40
Trade	67	0.03
Extraction of natural resources	248	0.10
From NGOs (WFP, REST, CRS, CARE, WORLD VISION)	225	0.09
Selling livestock	214	0.08
Daily labourer	38	0.02

Source: Own survey data.

We also asked about the food security situation of their families during the war on a scale from 1(=Secure) to 5(Extremely insecure). Table 19 shows the response distribution by district.

Table 19. Food insecurity distribution of youth group members' families, by district

Response	Raya Azebo	Degua Tembien	Seharti Samre	Kilite Awlalo	Adwa	Total
Secured	5	18	13	0	9	45
	1.2	3.5	3.9	0.0	0.8	1.8
Insecure	82	61	41	12	144	340
	20.1	11.7	12.2	9.9	12.6	13.5
Moderate insecure	112	80	51	17	188	448
	27.4	15.4	15.1	14.1	16.5	17.7
Highly insecure	172	220	164	54	613	1223
	42.1	42.2	48.7	44.6	53.8	48.4
Extremely insecure	38	142	68	38	186	472
	9.3	27.3	20.2	31.4	16.3	18.7
Total	409	521	337	121	1140	2528
	100	100	100	100	100	100

Source: Own survey data.

Table 19 shows that the food insecurity situation was worse in Kilite Awlalo and Degua Tembien, but the situation was very bad in all districts as it was highly insecure or extremely insecure for more than 50% of all respondents' households.

We also asked about the main coping strategies that the families used to cope with the food insecurity situation (Table 20). We see that reducing the number of meals and the amount of food consumed in each meal is the most common response, followed by the selling of animals to buy food, grow own food crops, and obtain help from relatives. The food aid system collapsed during the war, so few benefitted from it.

Table 20. Ranking of the four most common coping strategies to deal with food shortages

	Rank 1	Rank 2	Rank 3	Rank 4
Ration food reserves by reducing the number of meals and amount of food per meal	1370	530	192	19
Slaughter and eat own animals	12	19	4	1
Sell animals and buy food	503	783	159	21
Sell assets to buy food	16	32	30	10
Grow own crops	306	246	159	18
Collect edible plants from the forest	11	22	31	16
Cut trees to sell and buy food	4	27	40	8
Obtain help from the community	94	211	228	77
Obtain help from relatives	128	371	355	140
Selling my production (honey and milk)	8			
Remittance	3			
Daily labour	9	18	9	
Trade	10	7	7	
Credit	9	11	10	
Food aid	45	7	28	27
Other		17	8	11
No More		182	1041	912
Missing		45	227	1268
Total	2528	2528	2528	2528

Source: Own survey data.

We also asked the members to rank the three most serious threats to their survival and livelihood during the civil war. Table 21 presents the responses.

Table 21. Ranking of the three most serious threats to survival and livelihood during the war.

Responses	Rank 1	Rank 2	Rank 3
Loss of life due to war incidents	808	132	86
Exposure to violence	594	609	498
Injury/sickness and lack of medical treatment	165	454	608
Rape	51	105	107
Starvation	506	746	645
Severe food shortage	399	470	464
Other	5	12	120
Total	2528	2528	2528

Source: Own survey data.

While we see that loss of life due to war incidents and exposure to violence are ranked highest (Rank 1), starvation (and severe food shortage) is also ranked very high, indicating the severity of the food insecurity during the war.

3.3. Resilience and restitution after the war

In our survey in August-November 2023 we asked, “*How satisfied are you with your current livelihood situation?*” Table 22 summarizes the ranked responses on a scale from 1 (Very satisfied) to 5 (Very unsatisfied (Unbearable situation)). We see that about half of them find the situation not satisfactory or very unsatisfactory.

Table 22. Situation of business group members at the time of our 2023 survey

Responses		Raya Azebo	Degua Tembien	Seharti Samre	Kilite Awlalo	Adwa	Total
Very satisfied		1	3	4	1	10	19
	%	0.2	0.6	1.2	0.8	0.9	0.8
Quite satisfied		73	61	30	22	60	246
	%	17.9	11.7	8.9	18.2	5.3	9.7
Acceptable situation		209	156	134	23	460	982
	%	51.1	29.9	39.8	19.0	40.4	38.8
Not satisfied		113	242	137	57	493	1042
	%	27.6	46.5	40.7	47.1	43.3	41.2
Very unsatisfied (unbearable situation)		13	59	32	18	117	239
	%	3.2	11.3	9.5	14.9	10.3	9.5
Total		409	521	337	121	1140	2528
	%	100	100	100	100	100	100

Source: Own survey data.

We also asked them to rank the three most important challenges they face in developing their livelihoods. The responses are summarized in Table 23.

Table 23. The three most important challenges currently faced by the business group members.

Responses	Rank 1	Rank 2	Rank 3
Lack of/Limited cash income	1010	480	264
Low/No income from youth group activity	92	264	302
Lack of complementary sources of income	459	609	334
Poor cooperation in youth group	19	72	83
Poor housing conditions	33	85	74
Poor market access for outputs & inputs	233	168	206
Lack of skills	16	33	37
Lack of capital for investments	175	185	251
Insecure tenure rights for the land	242	170	159
Food shortage	237	267	240
Other	12	13	10
No more		182	386
Missing			182
Total	2528	2528	2528

Source: Own survey data.

It is obvious that the severe shortage of cash and income threatens their ability to meet their basic needs as well as their ability to invest to reestablish their business activities.

We asked, “*What are the main sources of livelihood (income) you have now after the civil war ended?*” Table 24 summarizes the responses.

Table 24. Main sources of livelihood (income) after the war ended (late 2023)

Source of livelihood	Raya Azebo	Degua Tembien	Seharti Samre	Kilite Awlalo	Adwa	Total
Crop production on own land	220	270	220	83	508	1301
	53.8	51.8	65.3	68.6	44.6	51.5
Crop production on rented land	105	53	40	8	82	288
	25.7	10.2	11.9	6.6	7.2	11.4
Joint production with parent family	31	66	22	11	277	407
	7.6	12.7	6.5	9.1	24.3	16.1
Youth business group	0	5	1	2	5	13
	0.0	1.0	0.3	1.7	0.4	0.5
Trade	23	37	26	6	53	145
	5.6	7.1	7.7	5.0	4.7	5.7
Other non-farm business	27	57	19	5	162	270
	6.6	10.9	5.6	4.1	14.2	10.7
Construction worker	1	25	4	5	35	70
	0.2	4.8	1.2	4.1	3.1	2.8
Other	0	0	2	0	1	3
	0.0	0.0	0.6	0.0	0.1	0.1
Daily labour	0	6	2	1	16	25
	0.0	1.2	0.6	0.8	1.4	1.0
Salary	2	2	1	0	1	6
	0.5	0.4	0.3	0.0	0.1	0.2
Total	409	521	337	121	1140	2528
	100	100	100	100	100	100

Source: Own survey data.

It is striking that almost no members indicate that the youth business groups provided any income at the time of our survey. This may also be due to the loss of assets by the groups and that they have not yet been able to restart any income-generating activities. Still, it is worth noting that the youth group members still see their business groups as an important future opportunity (see Table 9). Time will show whether and how the youth business groups will function in the future. Some support from the outside can be highly instrumental for their success.

We asked, “*What are the most important advantages you see from having joined the youth group?*” Table 25 summarizes the two most ranked responses.

Table 25. Perceived advantages from having joined the youth business group at the time of the 2023 survey.

Ranked responses	Rank 1	Rank 2
Allows me to develop a livelihood in my community/stay close with family	992	314
Good social relation within the youth group/share responsibilities	309	431
Can be combined with other activities - an additional source of income	405	546
Helps to generate capital for investment in the future	447	524
No benefits after the civil war started	333	90
Other	3	1
Animal feed/grass/hay	39	21
No more		601
Total	2528	2528

Source: Own survey data.

Table 25 shows that the business group members regard the business group as an important potential future complementary source of income, although the business groups stopped working as important sources of income during the war.

In Table 26 we present physical investments made by business group members in 2023. The table shows the number of investors out of 2528 members up to the time of the survey. We see that the most popular items to invest in were fertilizers, mobile phones, sickles, and ploughs. 57.4% of the respondents had made at least one type of investment in 2023 by the time of our survey.

Table 26. Investments by business group members in 2023.

Consumer goods	No of investors
Mobile phone	386
Radio	19
Furniture	82
Other, specify	47
Animals	
Cow	34
Ox	81
Donkey	28
Sheep	18
Goat	43
Chicken	82
Beehive	11
Camel	5
Horse	4
Mule	1
Other productive assets	
Plough	167
Ox-cart	4
Hoe	44
Sickle	282
Other tools	40
Fertilizer	1032
Improved seeds	98
Pesticides	41
Other, specify	2

Source: Own survey data.

The amounts invested in four categories of investments among investors are presented in Table 27. Other investments include house and business investments. The figures illustrate the limited capacity to invest by these poor business group members.

Table 27. Amounts invested (nominal ETB) in 2023 by main category of investment.

Variable	Obs	Amount invested			
		ETB, Mean	Std. dev.	Min	Max
Consumer goods	1449	929	2756	0	50000
Animals	1449	3053	10538	0	137000
Productive assets	1449	5381	7706	0	99000
Other investments	1449	1577	16020	0	370000

Source: Own survey data.

4. Discussion

This study aims to answer the research questions on 1) How has the civil war in Tigray from November 2020 to end of 2022 affected the youth business groups and their business activities before, during and after the war? 2) How has the war affected the individual business group members, their families, asset holdings, and livelihood strategies? and 3) What are the lessons learned in this relation when it comes to the sustainability of the groups and their suitability for creating youth livelihoods in the study areas? Our study tried to answer the above research questions by analyzing youth group and member level variables by comparing the post-war status (in terms of group survival, group meeting activity, group and member assets, income, investment, land tenure security and conservation/degradation status, sources of livelihood, and food security) with the war and pre-war situations, assessing the food security situation during the war, and the post-war resilience and restitution. We also assessed the youth group members' satisfaction levels with their current livelihood situation.

4.1. Effects on group functions

During the war (November 2020-November 2022), close to 47% of the youth groups were forced to stop their group activities, and more than 60% and 55% of the groups had no group meetings in 2021 and 2022, respectively. Although these groups were inactive and stopped group activities during the war, close to 94% functioned as social networks for their members. Moreover, conditional on them functioning as social networks, 53.4% of the groups were engaged in some group- or community activities during the civil war. Most of them were involved in protecting their common land through conservation activities, guarding, fencing, and protecting assets such as bee hives. Some engaged in the planting of crops, irrigation, and honey production. [Holden and Tilahun \(2018\)](#), based on census data from youth group members in the same study districts from which samples of the current study were selected, reported that youth groups in the study have established joint decision making and internal monitoring systems that are in line with Ostrom's design principles for collective actions/resource management. These established norms and principles might have helped the youth group members to organize themselves and use their group as a social network during the war and for undertaking some activities during the war.

There were 72 members that haddropped out as of 2023 compared to the 2019 data, which means on average 0.26 members as dropouts per group. Death and migration accounts 72% of the dropouts. Our results also show that 87.5% of the group members were forced to temporarily migrate during the war. This is consistent with reports on internally displaced people during the war. According to the International Organization for Migration (IOM)'s Displacement Tracking Matrix (DTM), there are over 1 million internally displaced people (IDP) across 178 accessible locations in Ethiopia's Tigray region and neighboring Afar and Amhara. An assessment conducted in March 2021, indicated that there were 1 million IDPs in Tigray alone who were fleeing to towns and cities to seek humanitarian assistance and gain access to essential services. Their assessments were indicative and did not cover many areas

in Northwestern, Central, Eastern and Southern zones in Tigray region for the fact that these areas were out of reach to humanitarian partners due to continuing insecurity (IOM, 2021).

In August 2023 (**Post-war**), 80.4% of the youth groups were active and 80% of them had group meetings. Our other findings also demonstrate the resilience of the business groups, which will off course depend on the sustainability of the relative peace and stability of the region and the country. Outside assistance for a period may also be essential for the realization of the potential of the business groups as sources of livelihood, employment creation, economic growth, and welfare enhancement.

4.2. Effects on assets, investment, and income

Our results show that the war has caused severe damages to the business groups' assets. It has also severely affected the groups' postwar capabilities to reinvest to re-establish their business activities. There are substantial reductions in group level investments and average group level income when comparing the prewar and the postwar situations. We found that the average value of group level productive assets in 2023 was reduced by 90% compared to the pre-war 2019 level while the median asset value was reduced by 80%. The livestock groups are the hardest hit by the war with their average assets values in 2023 being reduced by 95% compared to 2019.

Business group members' individual assets were also damaged by the war. However, compared to the reduction in the value of group level assets, the reduction in the asset index for the business group members is more modest (Figures 7 and 8). Members were more able to protect their personal assets than their group assets during the war. Our results are consistent with a recent study by [Manaye, et al. \(2023\)](#). They reported at least one of the agricultural components (crop, livestock, and farm tools) of their sample households was looted and/or destroyed due to the war.

Both group-level investments and income showed significant reductions during and after the war. The average group-level income during and after the war was 90% lower than the pre-war average income of 80,000 ETB per group. [Holden and Tilahun \(2021\)](#) reported that many youth group members were accessing land through the land rental markets as another complementary source of income. Rented land contributed 70% in 2016 and 61% in 2019 to the land operated by youth group members. The war and war incidents severely constrained farming activities and disrupted input supply. Other studies also document very low agricultural production in the region during the war ([Manaye et al., 2023](#), [Nyssen et al., 2021](#)).

4.3. Land allocation and trust.

During their establishment before the war, groups were allocated land to establish their group business and given user rights. Our current study shows that close to 86% of the groups still retain their land rights and close to 57% reported taking good care of their allocated land during the war. Those who reported not caring for their land during the war reported damages to their land resources. These damages include destroying conservation structures, cutting and removing trees, and damage by fire.

Within-group trust is vital for the success and sustainability of youth business groups ([Holden and Tilahun 2021c](#)). Our study indicates that despite the effect of the war on group business activities, assets, investments, and income, most youth group members (>75%) still consider the level of trust in their group to be higher or much higher than the average trust in their communities. This indicates that most groups still retain much of the social capital in the form of trust that may be important for the functioning of the groups.

4.4. Food security situation

Our study showed that youth group members were relying on own food production (on own, family, and rented land) and help from parents and help from community as their main sources of livelihood

(for food and other basic needs) during the war. This indicates that youth group members were undertaking farming activities during the war under difficult conditions. During the war, a large part of the land in Tigray had been tilled under difficult conditions, and crops that require minimal management were sown without fertilizer (Nyssen, et al., 2021). Nyssen et al. (2021) argue that the smallholder farming system in the region is resilient, thanks to community self-organization, combining common strategies of agrarian societies in wartime. Our study indicated that youth group members had very little or almost no access to other livelihood options (trade, extraction of natural resources, support from NGOs, selling of livestock, and off-farm employment) during the war. Communities were relying on communal aid, while the blockade of the Tigray region caused outmigration and off-farm income to be out of reach for the farmers (Nyssen, et al., 2021).

Our study also shows that the food insecurity situation was very bad in all districts as it was highly or extremely insecure for more than 50% of all respondents' households. During the war, the food aid system collapsed so that very few benefited from it. Reducing the number of meals and the amount of food consumed in each meal were the most common responses as a coping strategy, followed by selling of animals to buy food, growing own crops, and obtaining help from relatives. We also found that starvation was among the three most serious threats to survival and livelihood during the war. Loss of life due to war incidents and exposure to violence were ranked highest (Rank 1), starvation (and severe food shortage) were also ranked very high, indicating the severity of the food insecurity during the war. A recent study examining the impact of the war on the food insecurity in Tigray reported that 77% of the households are food insecure with moderately and high calorie deficiency gaps (Araya & Lee, 2024). Araya and Lee (2024) reported similar survival strategies as we found in our study.

4.5 Resilience and restitution

This study also indicated that 49.3% of the group member have at least an acceptable level of satisfaction with their current livelihood situation whereas the remaining 50.7% comprises those who are not satisfied and very unsatisfied with their current livelihood situation. After the war, severe shortage of cash and income both threaten their ability to meet their basic needs and ability to invest to reestablish their business activities. For most of the youth group members, crop production on own land, on rent land, and joint production with parent family are the main sources of livelihood after the war ended (late 2023). Business group members have also started to make investments in 2023. Most popular items to invest in were fertilizers (40.8% of respondents), mobile phones (15.3%), sickles (11.2%), and ploughs (6.6%). 57.4% of the respondents had made at least one type of investment in 2023 by the time of our survey. The highest average investment of members after the war end was on productive asset (5,381 ETB per member) followed by investment on animals (3,053 ETB per member).

It is striking that almost no members indicate that the youth business groups provided any income at the time of our survey. This may also be due to the loss of assets by the groups and that they have not yet been able to restart any income-generating activities. As indicated above, 85% of the groups reported damages of group-level assets and the value of remaining group-level assets worth only 10% of the pre-war average value of assets per group. Still, it is noteworthy that the youth group members still see their business groups as an important future opportunity. Time will show whether and how the youth business groups will work in the future. Given the optimism that group members have on their business group as a future livelihood option and that fact that close to half of them are satisfied with their current livelihood situation, at least because of the relative peace, support from development partners may be instrumental for their success.

4.6. Limitations

This study consists primarily of descriptive statistics based on our survey data collected before and after the two years of war. More careful analyses are needed to more carefully test and estimate various causal relationships. We have rich survey and experimental data that will allow us to do more comprehensive analyses that will follow. Still, we think this initial descriptive overview of the findings

in our postwar survey and the comparison with the prewar situation give important insights about many of the devastating effects of the war.

5. Conclusion

Our study investigates the impact of the November 2020 to November 2022 Tigray war on youth business groups and their members based on survey data from 281 youth group leaders and 2528 youth group members in five districts in the Tigray region of northern Ethiopia. This report is a part of the analysis based on a Pre-Analysis Plan for the Civil War impact study in August 2023 (Holden et al., 2023). The data was collected from August to December 2023 using standardized survey instruments. We benefit from baseline data that indicate the pre-war situation for 238 of the same groups and 1939 of the same members from 2019 using survey instruments with many of the same and related questions. We also rely on our earlier published results as baseline data regarding the pre-war status of the groups, especially the census of all youth business groups in the five districts that investigated their degree of compliance with Elinor Ostrom's Design Principles (Holden and Tilahun 2018).

Our results on the analyses of the post-war, war period, and pre-war status of youth groups and their members on key indicator variables show that the war has had devastating effects on the business group functions (group production and investment activities and meetings) and assets. While group members' individually owned assets were less severely affected by the war, the war has severely constrained their income-generating activities, and this has caused severe food insecurity. During the war, most of the youth group members were forced to temporarily migrate. Though the dropout of members was relatively small, death and migration account for most of the dropouts.

Despite the devastating impact of the war on the youth business groups and their members, most of the groups have retained their allocated land, and most group members still consider the level of trust in their group to be higher or much higher than average trust in their communities. In addition, close to half of the group members have at least an acceptable level of satisfaction with their current (post-war) livelihood situation. The fairly optimistic views about the future of the business groups may be based on a hope for external support. Such support is critical for the resilience and sustainability of the business groups to release their full potential as future livelihoods in the study areas. The extreme test that the exposure to two years of war has represented for the sustainability of the business group model represents strong evidence that resource-poor rural youth that are given a chance to self-organize to create their own livelihood may be a good model to try also elsewhere. We do not believe that the youth in Tigray are very different from youth in many other places. In fact, our studies of their social preferences, trust, risk and time preferences indicate that they are fairly representative of poor rural youth in the African context. We, therefore, think the external validity of our findings is reasonably good. It is certainly better to give the youth resources to generate their own livelihoods than to force them to become destitute migrants and war victims.

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Acknowledgements: This research has been conducted as a collaboration between the Norwegian University of Life Sciences (NMBU) and Mekelle University. The authors acknowledge good support from local government authorities, local Youth Associations, and Mekelle University. Special thanks go to Beliu Hagos for excellent data management, and to the rest of the field team for their strong commitment to doing very good work during the difficult field conditions after the war.

Declarations

▪ Funding

Data collection: Stein T. Holden and Mesfin Tilahun, Grant Number ETH-13/0015 Norwegian Agency for Development Cooperation (NORAD), the NORHED I capacity building project “Climate Smart Natural Resources Management and Policy”

(<https://www.norad.no/en/front/funding/norhed/projects/capacitybuilding-for-climate-smart-natural-resource-management-and-policy-clisnarp-/>) and own research fund of the first author.

Stein T. Holden Grant Number: 288238 The Research Council of Norway <https://www.forskningsradet.no/en/>. The funding institutions had no role in study design, data collection and analysis, publication decisions, or manuscript preparation.

▪ Conflict of interest/Competing interests

The authors declare no conflicts of interest.

▪ Ethics approval

Funding was approved based on an independent assessment and approval of ethical standards being met by the project by a scientific committee.

The School of Economics and Business at the Norwegian University of Life Sciences Ethics Committee has provided ethical approval based on the Pre-Analysis Plan for Ethical Approval (Holden et al., 2023).

▪ Consent to participate.

All subjects participating in the project participated voluntarily and were always asked about their willingness to participate after receiving information about what participation implied and that the project adhered to strict confidentiality and anonymity of individual information (informed consent).

▪ Consent for publication

The article will be published as an open-access article as required by the funding institution.

- **Availability of data and materials**

All (anonymized) data (STATA files) used in the paper will be made available upon publication of the article as supplementary information.

- **Code availability**

All codes (Stata do files) used to analyse the data will be made available upon publication as supplementary files.

- **Authors' contributions**

- **Data cleaning, organization, analyses, and writing the paper.**

Stein T. Holden, Mesfin Tilahun, and Tsegabirhan Gebremedhin. The first author made the initial experimental designs. All authors collaborated on the field testing of the survey and experimental designs and the training of enumerators. The third author was responsible for translating the field survey and experimental tools into the local language. The second and third authors were responsible for data collection and organizing the survey and field experimental teams. The first author oversaw data checking, and the first and second authors contributed to data cleaning and organization. The first author made the data analyses, wrote the sections on sampling and methods and results of the paper, and commented on drafts of the full paper. The second author wrote the abstract, introduction, discussion, and conclusion sections of the paper.